

Newspaper
Cuttings

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Fossil Crab's Nudity Solved

Washington, Jan. 25. — A crab which died while casting its shell 500,000,000 years ago has puzzled scientists for 20 years. The difficulty was to explain a strange crab fossil without a shell which was found in 1908.

This ancient ancestor of modern crabs was discovered in a formation at least 500,000,000 years old. But it had no shell like its ancient brothers. Microscopic studies showed that the membranes of the body were torn from the shell, and that the creature crawled among deep, dark roots until the shell grew to its normal thickness, but watered into a pool of water charged with carbonic acid and died.

The Sud

THE NICKEL DISTRICT

25th YEAR—No. 81

SUDBURY, ONTARIO, W

KENTY MAKES NEW FIND

Chapleau, En Fete Toasts New Field And First Pioneers

Prospectors Stage "Rush" to Join Capitalists in
Celebrating Growth of Newest
Gold Mining Area

Party Visits Swayze By Plane

Chapleau, Jan. 25.—Ontario's newest and, if the high hopes of its operators are realized, possibly its largest gold camp was christened with appropriate formality this week, when citizens of Chapleau marked with a banquet and dance the commencement of actual mining operations on the Kenty Gold Mines Limited, pioneer discovery of the Chapleau gold area in Swayze township.

As if to respond to the toasts in its honor, the Kenty Mine itself sprang an unexpected surprise on Monday when a new vein carrying free gold was exposed while blasting out a round at a depth of 38 feet in the shaft. Announcement of this development at a banquet on Monday night brought salvos of applause from an audience of more than 200 guests, including mining men, prospectors and prominent citizens of the town.

Flight to Swayze

Tuesday saw the revellers taking off in airplanes on a trip of inspection of the Kenty Gold Mine as guests of President Frank Trethewey, the president. Emblematic of the progress of mining since the first discoveries were made in the province is the fact that a party of 15 guests, including two ladies, Mrs. G. B. Nicholson and Mrs. Trethewey, were able to visit the property, a distance of 45 miles from Chapleau, and return in a few hours, a trip that formerly would have occupied a week by trail and dog team.

All Chapleau was en fete as visitors converged from all parts of the mining field for the occasion

and to the men who are behind the mines with their capital: 'You have done all this but we are going to appropriate to ourselves and to the state the results of your years of painstaking toil and the capital you have invested.'

Briefly Mr. Nicholson paid a glowing tribute to the work of the Kenty Gold Mines and its discoverers. He expressed high hopes for the future of the area east of Chapleau and pledged the active co-operation of Chapleau citizens with those engaged in its development. "I am looking forward to the day when thousands of men will be employed in this district, in mining," he said.

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MINING and

CHAPLEAU, EN FETE, TOASTS NEW FIELD AND PIONEERS

(Continued from Page 1)

had secured the option first. Later he recalled having offered an option on 50,000 shares of Hollinger stock at \$4 a share to his British principals, who had refused to take the stock. He recalled the disappointment of interests whom he had sought to get interested in Lake Shore at a time when there was "not a face in ore."

Dr. Tyrell referred specifically to the high cost of power as a contributing factor in the high mining costs which prevail in Northern Ontario, as compared with other parts of the world. "The making of a mine is a very expensive business. While in some parts of the world gold is being mined and treated for less than \$1 per ton, in the Kirkland Lake field we are actually paying more than that figure for power alone. One way in which the people of Chapleau can help development of the mines is for you to help us to get power here as cheaply and as fairly and reasonably as possible. The sooner we get power the sooner will a mill be put up and production will start."

Dr. A. G. Burrows, deputizing for Hon. Charles McCrea, quoted statistics of current mining interest to indicate the impressive stature to which mining has grown in recent years. Out of 25 years of study among the rocks of leading mining areas, Dr. Burrows declared emphatically, "I can see no reason why we can't get other Kirkland Lakes and Porcupines. The producing area of Kirkland Lake is only two miles long, and the mines of Porcupine are scattered over a distance of only a

excellent orchestra continued until an early hour.

Special guests from points outside the district included Mrs. F. L. Trethewey, George W. Lee, Mr. and Mrs. T. Hambley, district superintendent of the Canadian Pacific Railway, Mr. and Mrs. W. R. Kennedy, and Mr. and Mrs. Len McIntosh, North Bay; J. B. Tyrell, president of Kirkland Lake Gold Mines Limited, and R. G. O. Thompson, F. C. Henderson, J. A. Dalton, W. S. Walton, Dr. Graham, directors, of Toronto; W. M. Sixt, general manager Kirkland Lake Gold, Kirkland Lake; Robert McKillop, superintendent Schreiber subdivision C.P.R.; W. E. Mason and E. D. Loney, of Sudbury.

KENTY FINANCES ASSURED AS K. L. PAYMENTS START

New Find in Shaft Adds to Network of Veins

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Falcons Both Bolstered

will fly at the Palace evening when Falcon-Copper Cliff meet for time this season, with of both bolstered.

Roberts and Larry will be back with the airts, while Lepage and ayman are additions to McKinnon and Rodger will referee.

A PLANS 200-TON MILL

Distribution Proposed at an Early Date

General meeting of unit holders Delta Mines Syndicate, will within the next ten days purpose of ratifying arrangement which were completed between indicate managers and J. A. McPhail, of Sault Ste. Marie, where the new company, Delta Corporation will be distributed unit holders on the basis of shares for each unit held, together with a bonus of 100 shares which Mr. McPhail is reported to have offered to take an option for months, on behalf of his principals, at \$3 a share, the 200 shares to be pooled for a period to be determined later.

The details of Mr. McPhail's plans are to include the erection of a 100-ton concentration plant at Worthington, the product to be shipped to Sault Ste. Marie for refining. In his opinion, the Delta executives are reported to have returned to research work carried out by Columbia University, which indicates encouragement for his investigation. The proposed ratio of concentration is 40 to one, and the intention is to mine the deposit by open cut methods.

The concentrates, according to reports obtained in the Fitzgerald laboratories at Sault Ste. Marie, are also believed to contain a certain percentage of vanadium and plans of Mr. McPhail include a sale of this product to the Algoma Steel interests for manufacture of ferro-vanadium. At the present time a ton of material from the Delta property is in Ottawa where tests are being conducted in the ore dressing and metallurgical laboratories on methods of concentration.

Hoover Sees Need Of Stable Currency

Washington, Jan. 25.—President Herbert Hoover feels that the United States is faced with the necessity either of increasing its tariff walls or action to gain stability in foreign currencies, and today he was considering possible moves for speeding up approach to the world economic conference.

caratto; wings, Bellinger and son; alternates, Bradford, S. Pozzo, R. Luzzi, G. Pozzo, W. Luzzi, Davis and Lavasseur.

And now the dear old Sault Star is going to climb up several flights of hysteria. After all the whining it has done for years and years about Referee Bill Duncan, of Sudbury, the Sault Club agrees to his appointment as one of the arbitrators.

The Sudbury club urged the appointment of two referees, pointing out that the system had worked well in the Nickel Belt League. For the first time in a decade, the Sault was in agreement with the Nickel City. The Sudbury club elected Duncan and the Sault a gentleman by the name of Telford.

These two men will also handle the return game in the Sault on February 6th.

CLAIM CASHIER STOLE \$1,000

James B. Pomfret Arrested; Unable to Raise Bail

Accused of having stolen money orders amounting to \$1,000, James B. Pomfret, 34, Worthington Crescent, cashier at the Canadian National Express Company, in Sudbury police court today was remanded until tomorrow to enable three of the company's officials who arrived in Sudbury this morning to complete their investigation. In the meantime, bail was fixed at \$2,500. It was not furnished and the accused was taken to the district jail.

The charge against Pomfret, who is a married man, was laid Monday afternoon by B. K. Kidman, the company's agent in Sudbury.

Pomfret was arrested at the express office Monday at 4 p.m. by Detective Frank Scott. Police say they found blank money order stubs in his possession.

Railway Employes Refuse Wage Award

London, Eng., Jan. 25.—(Canadian Press Cable)—Employes of the major railway companies of England today announced refusal to accept the wage reductions recommended by Sir Harold Morris, chairman of the national wages board.

The definite stand of employes now leaves the companies with necessity of carrying on with former wage scale or the alternative of posting notices instituting wage cuts. Attempts at a compromise have failed.

Klondyke Discoverer Dies in Vancouver

Vancouver, Jan. 25.—Robert "Klondyke Bob" Henderson, whose sensational discoveries at Gold Creek in 1896 started thousands of gold-crazed adventurers on the trail of '98 to the Klondyke, has passed along his last long trail. He died at his residence here last night, age 78 years, and his death snaps another link with the decade that is fast fading.

value of such an event honor of the new industry that through the area to its east is emphasized by the more serious references of speakers who addressed Monday night's banquet. Speaking from a vast fund of knowledge of mining and prospecting, Dr. J. B. Tyrell, who has been responsible for providing \$1,300,000 in funds for development of the pioneer Kenty property, made very clear the difficulties that lie in the path of the mining operator. High cost power, to which he referred specifically, is only one of several obstacles to the progress of mining. These are obstacles which an enlightened public opinion is required to remove. Every dollar that can be cut from the cost of mining in a gold camp, whether in the form of lower taxation, lower workmen's compensation costs, and lower operating expenditures generally, means that millions of tons of ore that otherwise might be valueless can be brought within the range of profitable treatment. This, in turn, means additional expenditures on supplies, transportation and employment of labor.

The development of a successful and profitable mining field east of Chapleau promises to be the most important event that has occurred in Northern Ontario, with the possible exception of the Frood development, since the discovery of Kirkland Lake. At this stage in the progress of the field it is impossible to forecast the future, but optimism and faith in the north's mining resources has paid dividends in the past; we are confident they will again pay dividends in the future.

\$1,200 each. The firm of Carvin Bulluck is also to receive 7 1/2 per cent of the net profits of the such changes, however, bring the trusts more in line with current requirements.

Blue Quartz Mines To Seek Finances

Share Interest of H. C. Crow an Interesting Angle of Capital Structure of Reorganized Company

Interest in Blue Quartz Gold Mines is being revived by its president, Horace C. Crow, who plans making announcement of further financial arrangements next week. The Cartwright Gold Fields, which owned some 600,000 shares in Blue Quartz, is surrendering its charter and its Blue Quartz holdings are being distributed on the basis of 1 1/4 shares for each share of Cartwright held. H. C. Crow was one of the vendors of properties to the Cartwright Gold Fields and as such received about one third of the shares issued and will accordingly receive Blue Quartz shares pro rata.

Blue Quartz Gold Mines, Ltd., was incorporated in 1921, statements at the time being that it was formed to acquire certain holdings of Cartwright Goldfields, Ltd., and La Santa Lucia Gold Mines. The return to the Provincial Secretary, however, shows that of the \$3,000,000 authorized stock \$2,000,000 in stock was given to the vendors for the claims turned over as well as some money and that in 1928 an additional \$200,000 of the stock was given to H. C. Crow and Dr. Tuck for additional claims, leaving only \$800,000 in treasury shares to sell to the public.

Increases Capitalization

In the spring of 1928 the company acquired supplementary letters patent which permitted it to issue share warrants with respect to fully paid up shares upon deposit of the share certificates, the depositors thereupon receiving share warrants with coupons payable to bearer for dividends or other rights which might later be declared upon the shares specified. On the statement that 90 per cent of the company's stock had been subscribed and more than 50 per cent paid for, supplementary letters patent were also granted raising authorized capital from 3,000,000 to 5,000,000 shares of \$1 par value.

Selling of these shares has proceeded during the last ten years.

An advertisement early in 1928 stated that "the expenditure of private funds amounting to \$575,000 has proved Blue Quartz as a mine of assured production." Early in 1927 plans for a 200-ton mill were reported and at intervals during the last decade highly encouraging reports were given to the public and to the shareholders.

Vendors Shares

A few of the advertisement that expenditure of private funds to \$575,000 had been made, state how the 2,200,000 vendors of prop- The vendor of

claims in 1921 to Blue Quartz is shown as J. F. Loudon, who received 2,000,000 shares and \$50,000 cash, nominating these shares to be delivered among others to the following:

	Shares
H. C. Crow, sales manager	200,000
H. C. Crow	100,000
Cartwright Goldfields	600,000
La Santa Lucia Gold	400,000
H. C. Crow (in trust)	119,500
J. H. W. Crow	50,000
E. C. Crow	50,000
Dr. J. A. Tuck	50,000
Dr. J. A. Tuck	100,000
Harry Hibbard	50,000
Jacob Bennett	60,000
C. H. Taylor	50,000
D. A. Marshall	50,000

Marshall, E. C. Crow, J. H. W. Crow, Hibbard are shown as resident in England and so are a dozen others who received less amounts than 50,000 shares. John Loudon, nominal vendor, received 500 shares.

The mine is at Painkiller Lake. Six of the claims owned by the company are shown as either wholly or partly under water and their value would depend on the results of work on other claims. Dr. J. B. Tyrell, well known geologist examined the company's property several years ago with the view to interesting his principals. He did nothing further and it is not known that developments have altered the outlook.

Shares outstanding at the end of 1931 are shown as 2,956,208 shares of which 756,208 shares would be treasury shares as compared with 656,208 treasury shares at the end of 1928, an indication that 100,000 shares have been sold somewhere since 1928. Less than 12,000 treasury shares are shown as having been sold in 1928. The shares, the company states, have been sold all the way from 30 cents to \$1.50 a share. They were offered early in 1928 at 50 cents a share. Earlier in the year the Provincial Secretary's Department was notified that H. C. Crow had offered to purchase 100,000 shares of the company at 30 cents a share.

Questions Asked

The Financial Post, while glad to publish the information given above, believes the shareholders should know much more concerning their company. In view of the fact that at the end of 1931 shares issued to vendors were three times as much as shares sold to the general public, shareholders would be greatly interested to know how many shares of the original allotment are now held by the principal officers of the company. They would be interested also in learning of the actual expenses met by holders of vendor's stock to justify such a huge allotment back in 1921, and they would like to hear from a conservative, independent source an opinion as to the prospects of the property and an estimate as to the funds necessary to test out these prospects.

Catalogue 813
VOYAGES AND TRAVELS

113

1952

DE WIT. Atlas Major—cont.

The most important maps and charts are:—

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80. Greece. With series of 14 coloured views round the sides.
113. East Indies, the Archipelago & N.W. Australia.
117. Continent of Africa.
122. Continent of America.
123. North America.
124. West Indies, Gulf of Mexico & north of S. America.
125. South America.
126. The World in hemispheres, with large engraved vignettes in corners.
127. Large sea-chart of Europe & the Mediterranean.
142. South & West Africa.
143. South & East Africa.
144. Australia & East Indian Islands.
146. Pacific Ocean, with Island of California & parts of New Zealand & Australia, etc.
147. Hudson's Bay & N.E. America.
148. Central America & the West Coast of S. America.
149. West Indies & Tierra Firme.
151. Brazil.
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All maps are in good condition, but there is a small patch on back of title owing to the colour corroding the paper.

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MAGGS BROS. LTD. LONDON

Mining Dividends

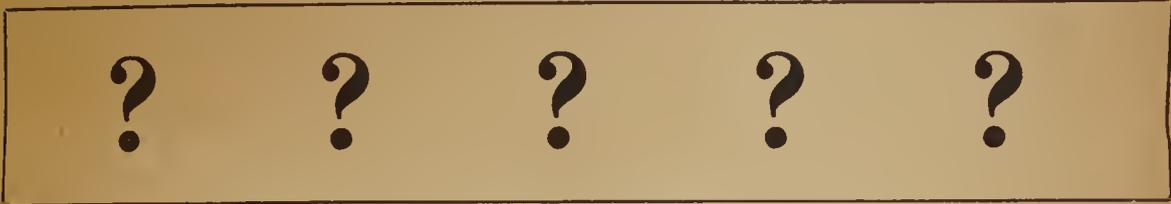
	Rate	Oct. 12	Yield %
Anglo-Huronian	20c	2.00	..
Argus Interests	14c	.25	..
Aunor Gold	16c	.88	18.1
Bayonne	11c	.03	..
Beattie Gold	10c	.51	..
Berens River	9c	.60	..
Bralorne	80c+40c	4.75	*25.4
Broulan Porc.	12c	.26	..
Buffalo Ankerite	130c	1.10	..
Bulolo Gold	33	8.12	..
Can. Malartic	8c	.22	..
Cariboo Gold	15c	.70	..
Central Patricia	15c	.50	..
Chesterville	15c	.43	..
Cochenour Willans	6c	.50	12
Coniagas	10c	.75	..
Coniaurum	110c	.41	..
Cons. Smelters	\$1+\$1.50	36.00	6.9
Delnite	6c	.52	..
Dome Mines	\$1.60	11.50	13.9
East Malartic	45c	.87	..
Francoeur Gold	44c	.12	..
Goldale Mines	2c	.07½	..
Gold Belt	4c	.12½	..
Grandview	2c	.12	..
Grull Wihksne	1.00½c	.01¾	..
Hallnor	40c	1.55	25.8
Hard Rock	3c	.28	..
Hedley Mascot	8c	.19	..
Hollinger	65c	6.00	10.8
Howey Gold	2c	.11¾	..
Hudson Bay	\$2	23.75	8.4
Inter. Nickel, com.	\$2	33.75	5.9
Island Mountain	8c	.85	..
Jason	44c	.09½	..
Kerr-Addison	127c	3.15	..
Kerr Lake	45c	.50	..
Kirkland Lake	6c	.35	..
Lamaque Gold	130+25c	2.80	..
Lake Shore	80c	6.50	12.3
Leitch	8c	.40	20
Little Long Lac	110c	.61	..
Macassa	32c	1.55	20.8
Madsen R. Lake	3c	.35	..
Malartic Gold	110c	1.15	..
McGillivray Coal	1c	.10¼	..
McKenzie Red L.	12c	.44½	27
Moneta	8c	.25	..
McIntyre-Porc.	\$2.22+\$1.11	33.50	*9.9
MacLeod-Cockshutt	10c	.88	..
Negus	5c	.25	..
Nipissing	15c	.91	..
Noranda	84	42.50	9.4
North Empire	110c	2.00	..
O'Brien Gold	3c	.40	..
Pamour Porc.	8c	.30	..
Pato Cons.	125c	2.10	..
Paymaster Cons.	2c	.13	..
Pend Oreille	16c	1.10	..
Perron Gold	16c	.41	..
Pioneer, B. C.	133c	1.14	..
Pickle Crow	30c	1.08	27.7
Placer Develop.	25c	5.00	..
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*Paid in 1941. *Yield including bonus.
†Initial. †Paid in 1942 to date.

Commodity

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MacLeod-Cockshutt, Preston East Dome and Kirkland Lake Gold Position

I have shares in MacLeod-Cockshutt, Preston East Dome and Kirkland Lake Gold. I bought these shares at higher prices than they are at present, but I did not sell when the slump came, as after reading The Northern Miner I came to the conclusion there was a good chance they could recover after the war, and also that they could keep going even if they had to reduce their tonnage and dividends for a time.

I notice Kirkland Lake Gold has again reduced its dividend. I thought from what The Northern Miner said this mine had found more ore and would be able to meet its dividend, and now it is cut in half.

In regard to Preston you have always spoken well of this mine, but I notice you are not quite so definite in your opinion with regard to the lower levels in the last issue of the Miner.

With MacLeod-Cockshutt it seems to be just bad luck that is holding this mine back. Is there any chance of their paying a dividend this year? Any remarks you may choose to make would be appreciated.—A. E. Q., Birtle, Manitoba.

There is no question about the new ore developments on the Kirkland Lake property, particularly in the block between 4,000 and 5,440 ft. in the west section of the mine. We have commented on this situation three times since August. We remarked that the current developments at that depth would attract wide attention in normal times, because not only are they highly important to the mine itself but possibly to neighboring mines as well. The top 400 ft. of this 1,400-ft. block has been fairly fully developed and partially mined, but there remains 1,000 ft. depth in the block which is intact and only partially explored.

There are two types of orebodies: one occurs in the sediments off the nose and along the sides of the porphyry mass; the second type, which has been followed from 4,100 to 5,400 ft., is a series of veins some distance west of the porphyry branch, off to the northeast from No. 6 fault. Of course, there will require to be a lot more development done before the whole picture is visible, but all the evidence accumulated to date suggests an important addition to the reserves.

It is not possible to translate such a development immediately into production and profits. As you probably are aware, this company in common with all the gold mines is suffering from lack of experienced mining labor. The September quarter production figures will shortly emerge and will disclose the position. In any event this mine is shaping up in a highly satisfactory way for future operations.

Preston East Dome is maintaining its production fairly well at the reduced rate, although the third quarter may show some decline in output because of the lower milling capacity. As we have pointed out before, Preston was particularly hard hit by the Metals Controller's order setting the ceiling on mill tonnages. The order caught the company in a particularly vulnerable position, since it was then in the midst of an expansion program arising out of the Government's request last year for increased gold production.

In dealing with the new block of levels between the 7th and the 12th we commented, in September, that because of the irregularity of the Preston orebodies it was difficult to determine tonnage definitely until actual stoping had been done. We said that, although it would be some time before sufficient work was done on the new block of levels, it would appear that all in all they were good and compared favorably with the levels above. This is probably all the information that even the management could give you at the present time, due to the nature of the structure at this particular mine. In any event, at the end of last year the company computed 920,000 tons in reserve, which would be sufficient for three years' operation at the present milling rate, so

that there are no worries at the moment. When more details are available we shall take pleasure in printing them.

We dealt with MacLeod-Cockshutt in considerable detail in September 24th issue. The situation there is quite clear, the company having ploughed back \$750,000 of its earnings into additional milling equipment and into underground development, with a view to raising the milling rate as requested by the Ottawa Government. This money having been spent, the structures and machinery having been erected, and the underground work done, Ottawa then ordered that a ceiling be placed on the milling rate, which restrained MacLeod-Cockshutt to a 700-ton a day operation. The company protested but did not get anywhere; thus shareholders have been deprived of earnings which are represented by structures, machines and work which are non-productive for the time being. When conditions become normal, however, MacLeod will be in excellent position to increase its profits rapidly. As the company has not paid a dividend since last December, it is possible that there may be a distribution before the end of the year. As at September 30th, 1941, the net working capital was about \$500,000, since which date a 10c dividend, calling for \$286,249, has been paid, but operating profits probably have accumulated.

Please bear in mind that the shortage of labor is bothering all gold mines and the government will not permit any mine to expand or any new mine to open. We are surprised you are not aware of the situation. The disabilities will end as soon as the war does and we expect that the government then will be urging the gold mines, through every means at their command, to expand their outfits.

* * * * *

ian Mining News

Swayze Area Regarded As Next Producing Camp Kenty Farthest Advanced

Many Big Interests in the Field — Staking Extensive

OF EASY ACCESS

Government Road of Great Assistance in Aiding Transportation — Railways Close

The new Swayze field is heralded as the first new one that both prospectors and geologists have agreed on as to mine-making possibilities.

Nowhere in Ontario is there such activity, general interest and hopeful development of a new gold mining camp as in the area surrounding Swayze township, which gives its name to this new section.

It happens that this new gold camp is at the junction of the Porcupine belt of Keewatin lavas and the Swayze-West Shining Tree belt, and it is possible that the junction of these two folds may have been the focal point of great disturbances which gave rise to the fractures in which the gold-bearing quartz veins are now found. Another undoubtedly favorable factor is the occurrence of the large masses of feldspar porphyry. It is a well established fact that the great gold mines of Ontario are all associated with these porphyry intrusions.

Good Progress Made

The progress that has been made and the encouragement that has been met with in the past 17 months since the original discovery was made by J. C. and J. L. Kenty, prospectors working for Brett-Trethewey Mines, and associated interests, augurs well for intensive prospecting.

When it is realized that the Swayze area is but 120 miles northwest of Sudbury, within easy access of and lying between the Canadian Pacific and Canadian National railways, further emphasis is given to the importance of first exhausting these close-in and geologically favorable prospects before financing expeditions to far away and less favorable fields about which little is known.

The original find by the Kenty brothers, located in the northeast corner of Swayze township and extending over the boundary into Dore township to the east, holds the greatest interest in the new area because it is the furthest developed.

Form Kenty Gold Mines

Owing to the various interests financing this prospecting programme, the Kenty Gold Mines was incorporated last September to develop the property further. The vendors' interest in this company is as follows: Northern Canada Mining Corp., 37½ per cent; Northern Prospectors, 22½ per cent, and the stakers, Kenty brothers, 10 per cent. In order to finance the future programme, Kirkland Lake Gold Mining Co. purchased 200,000 shares and optioned an additional 1,100,000 shares which, with its affiliated interests, will give it control of the company, if and when all options are exercised, at a total cost of approximately \$1,100,000.

Owing to the absence of other than aeroplane transportation facilities, development in the first 12 months was largely confined to limited surface exploration, with the result that approximately 25 veins or extensions of veins were disclosed, varying in width from a few inches up to ten ft. On the No. 16 vein spectacular showings suggested the "golden sidewalk" of the early days of Dome Mines. Surface exploration at widely separated points was undertaken owing to the excessive overburden. Six trenches over a length of 80 ft. disclosed spectacular gold in quartz averaging approximately 5 ft. in width. The finding of such high grade showings over 80 ft. with easterly and westerly extensions showing a total distance of approximately a third of a mile, indicates the importance of the find. An interesting feature of this vein was that under ten ft. of overburden there were marks of glacial action which had taken place millions of years ago. Both the rock and its liberally splashed gold surface show the glacial scratching and the smoothing down of the surface gold, providing a museum specimen of unusual interest.

Province Builds Road

The Ontario Mines Department early evidenced interest in the new district by sending its geologists into the field and recently a very comprehensive report was published on the district. Interest was further evidenced this fall by the Ontario Government assisting in the construction of a road to the property from Sultan on the Canadian Pacific Railway, about 21 miles distant. About ten miles of the road was new, but from the old Rideout-Cunningham property to the railway, a distance of some 11 miles, was a road cut years ago and it had to undergo rehabilitation. Thus, with transportation facilities improved an extensive and deep development programme was inaugurated this fall at the Kenty property and already heavy mining machinery is being delivered over the new road preparatory to sinking two shafts to an immediate objective of 500 ft. Already supplies have been taken in for the construction of approximately a dozen camp buildings. A Diesel engine-driven power plant is being installed at No. 1 shaft site, while 1,800 ft. southeast preparations are being made for the installation of a duplicate unit at the No. 2 shaft site. Sinking operations will be carried on simultaneously. A start has already been made on the No. 1 shaft by means of a portable compressor and the head frame will be constructed shortly.

Miner Kenty Claims

Immediately following the staking of the original discoveries came staking by Miner Kenty adjoining the pioneer discoveries on the north and east. This group of

Bralorne Gold Mines Output \$1,500 Daily

Bralorne Mines has averaged about \$1,500 in gold bullion daily since the commencement of operations at the old Lore Gold property in the Bridge River area, B.C., last February, according to official figures just given to The Financial Post. Total value of production to October 31, 1932, was \$408,372, including exchange compensation amounting to \$45,393.

The new mill has operated at about 100 tons daily indicating a recovery of about \$13.25 per ton which, with premium, would amount to \$15. Operating costs are reported to be approximately 40 per cent of the gross receipts.

13 claims over the boundary in Dore township was early optioned to the Cyril Knight Prospecting Co., which has been conducting a surface exploration programme. Here about a dozen small quartz veins have been uncovered, similar mineralogically and structurally to the Kenty Gold Mines veins, although their strike is, on a whole, different from the latter property. The vein system on the Kenty Gold Mines appears to be striking directly into the Miner Kenty ground, but as yet this has not been confirmed. The Kenty Gold Mines No. 21 vein is some 525 ft. west of the Miner Kenty boundary and there is a chance that some parallel veins east of the Kenty Gold Mines exist in the low ground, east of the No. 21 vein. Diamond drilling is to be undertaken early in January to prospect this section of the Miner Kenty claims.

The Cyril Knight Prospecting Co., jointly with the Quebec Prospectors Ltd., staked the Stewart group of four claims in the south part of Raney township, about eight miles west of the Kenty Gold Mines. Here a quartz vein has been stripped for a few feet at two points 50 ft. apart. It showed one ft. width in one exposure and three ft. at another, the former assaying \$2.40 across the one ft., the latter nil. Further stripping and sampling is continuing in the hope of finding parallel veins.

Rollo Township Claims

In the autumn of 1932 the Cyril Knight Prospecting Co. staked the Ridley group of 16 claims in the west part of Rollo township, six miles northwest of the Kenty Gold Mines. Here a quartz vein varying in width from two to over 14 ft. was discovered and stripped at

ft. It appears to have a length of about 700 ft. and five shots put in disclosed a little fine native gold. Further stripping and sampling is to be conducted.

Immediately south of the Ridley Lake group of claims of the Cyril Knight Prospecting Co., the United States Smelting, Refining and Mining Co. has a large block of claims in Rollo township where a vein from 6 to 15 inches in width has been found and stripped for about 25 ft. The vein has not been channel sampled, but grab samples give high assays. This vein is about 300 ft. south of the Ridley Lake group and appears to be dipping toward this property. A cabin has been built and extensive surface work is planned.

The third staker in the new district was Tom Montgomery on behalf of the Montgomery Syndicate. This syndicate holds some 15 claims surrounding the southerly and easterly holdings of the Kenty Gold Mines and the Miner Kenty group of the Cyril Knight Prospecting Co. A limited amount of surface work has disclosed two small veins with further surface exploration planned early next year.

Derragh Property

The Derragh property, staked early this year on behalf of a private syndicate comprising principally members of the Lake Shore engineering staff, is regarded as one of the most promising finds in the area. It consists of a group of nine claims bordering on the east side of Denyes township, about five miles west of the Kenty Gold Mines. The find was made in a break about 300 ft. west of the westerly boundary of the Dome Mines holdings, and to date about 700 ft. of the break has been exposed, revealing lenses of ore up to 13 ft. in width and carrying high values in gold.

This property has been optioned to the Kirkland Hudson Bay Gold Mines, controlled by Lake Shore interests, and a party of 12 men has been sent in to continue surface stripping and trenching.

Another find which created considerable interest last August was the Dyment Mining & Investment group of 31 claims situated in the centre of Denyes township, some nine miles west of the Kenty Gold Mines. Here two quartz veins appear to cross each other. These veins have a length of about 160 ft. and average width of around 15 ft. The vein occurs in a schisted area in places up to 700 ft. in width. Further surface work is to be conducted next spring.

Americans Interested

At the Grave-Thorne property consisting of a large group of claims at the north of Raney Lake in Raney township, some eight miles northwest of the Kenty Gold Mines, three main veins from six inches to two ft. in width have been exposed. Messrs. Grave and Thorne are New York pilots operating their own Fokker airplane in the field, number of prospectors in the field, staking claims, supposedly for American interests.

The Hughes-Strong property, consisting of 35 claims in Halerow township, 16 miles west of the Kenty Gold Mines, has been actively explored during past months. A shear zone has been exposed by cross trenches over a length of 720 ft. Three pits have been shored open to a maximum depth of 10 ft.

Feldspar Mined Curbed

One of Canada's Largest

Feldspar is the name given to an important group of rock-forming minerals and having certain common characteristics. It is a definite mineral species of constant chemical composition, an anhydrous silicate of aluminum combined with either potassium, or lime, largely used in the ceramic trade.

Feldspar mining in Canada dates back about 42 years and has been centred about the Verona district in Frontenac county, Ontario, and in the Buckingham district of Quebec. In these areas are numerous occurrences of feldspar, which the whole of Ontario approximates by 110 properties have been worked or known to exist. In Quebec about 60 deposits have been worked and have been reported. In addition, Manitoba and Nova Scotia each have reported a deposit that has furnished a small tonnage. The total quantity of feldspar known is enormous, but a large part is of no commercial value because it cannot be economically separated from the minerals and rock with which it is associated. The feldspars of commerce are obtained primarily from irregularly shaped lenses or elongated intrusive masses called pegmatite dikes which are mined as open pits or quarries. Even those exceptional deposits yielding a high percentage of clean feldspar almost always contain a portion of mixed rock containing quartz or injurious iron-bearing minerals with the result that sorting and cobbing by hand is necessary.

Used in Ceramic Trades

About seven-eighths of the feldspar produced in the entire world is consumed in the ceramic industry. It is used as a flux in the manufacture of glass, pottery, enamel, sanitary ware, brick and tile. In most forms of pottery it is a constituent of both the body and the glaze. Important quantities are used in this industry in vitreous enamelling to produce the smooth vitrified surface found on bath tubs, wash bowls and various forms in enamelled iron, such as cooking utensils. The use of feldspar in the glass industry is increasing, but little use has been made in plate or window glass manufacture. The composition of feldspar approaches that of some types of glass and its use increases the toughness and improves the lustre of pressed glass products, such as bottles for beverages. Most of these industries use feldspar high in potash. Small quantities are used as a binder in the manufacturing of grinding wheels while very small amounts of selected extra high grade potash feldspar are used by the dental trade for the manufacture of artificial teeth. Soda feldspar is used as a component of some

and is the principal component of a nationally advertised product that "Hasn't Scratched Yet."

Crushed feldspar, usually of inferior grade or quarry fines, is used for poultry grit, concrete dash, artificial stone, stucco work, roofing material, sandpaper and fillers. Many attempts have also been made to utilize potash content of feldspar as a fertilizer but this has not been commercially successful. Negligible quantities of some varieties of feldspar are used as semi-precious gem stones which range in color from white, through cream, grey, greenish buff and varying shades of pink to deep brick red. Feldspar mining is widespread throughout the manufacturing nations of the world with the United States by far the world's largest producer and accounting for almost 50 per cent of the average production. In the peak year of production, 1928, the world output was given at 460,637 tons of which United States accounted for 210,811 tons. Next in importance to United States production is the

The centre pit averaged \$3 and \$3.20 over a width of eight ft. A pit 75 ft. west averaged \$0.50 over a width of six ft. and a pit 365 ft. east of the centre pit averaged 85¢ over a width of eight ft. About 1,400 ft. northwest of No. 1 outcrop samples from two pits assayed \$4 over 3 ft. and \$5.80 over 26 ft. Preparation is being made to diamond-drill the property. The Halerow Swayze Mines Ltd. has been formed to develop the claims further.

Many Syndicates

At Hotstone Lake, in Greenlaw township, 12 miles southwest of the Kenty Gold Mines, the Newbec Mining Co. staked a group of ten claims. A quartz vein has been cross-trenched in eight places over a length of 800 ft. and visible gold found over widths of from two to eight ft. Channel sampling and trenching has been done with inconclusive results.

A significant feature of the Swayze area development is the calibre of the companies interested. In addition to those mentioned, McIntyre Porcupine Mines, Dome Mines, Consolidated Smelters and Sylvanite Gold Mines as well as syndicates financed by well known mining men are in the field. Hundreds of claims have been staked in Swayze, Denyes, Rainy, Dore, Halerow and Rollo, much of it solid, and old timers who are in the field are looking forward and expect it will be the next camp to enter the ranks of the producers.

White Water Claims in B. C. Optioned By Alaska Juneau

The White Water group of claims in the Taku River section of the Atlin mining division of British Columbia, have been optioned to the Alaska Juneau Gold Mining Co. for \$80,000. It is reported that \$2,000 has already been paid on the option with a further \$2,000 payable in a year. Work on the claims will start as soon as climatic conditions permit next spring.

These claims have been under exploration by N. A. Timmins Inc. of Montreal for the past two years and in 1931 about 5,000 ft. of diamond drilling was done in 19 holes. Results were inconclusive according to the Timmins interests.

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GEOLOGISTS WHO ARE TO COME NORTH

Many Eminent Men Will Visit Cobalt in August

The Cobalt portion of the program in connection with the International Geological Congress, which is to be held in Toronto in August is now to hand. The congress is held quadrennially and this is the third occasion on which the venue has been the North American continent, and the first time Canada has had an opportunity to do the honors.

The first meeting place of the International Geologists on this side of the Atlantic was Washington and eight years ago saw the second and previous one to this in Mexico with Mexico City as the radial point. Two parties from among the visitors will visit the North Country, the first of these to investigate before the actual congress commences and the second after it is concluded.

The first party will leave Toronto on the 27th of July and will spend the morning of Monday the 28th examining the geological formation around Cobalt. In the afternoon some of the leading mines will be visited, and in all probability in the evening, the visitors will be accorded a similar reception to that by which the Canadian Press Associated representatives were entertained by the Canadian Club of Temiskaming. Tuesday will be spent in more geological investigations of the country around Lake Temiskaming and the party will leave Haileybury for Porcupine that night. Other points in the north which will be visited are Sudbury, Temagami, etc.

The following is the list of the Geologists among whom are many prominent men. Those who will comprise the first excursion are marked A-3, while the members of the party which will come north after the congress, have C-6 before their names. Heading the list are the guides, seven in number, the chief of these being Dr. W. G. Miller, the Ontario Provincial Geologist:

A. P. Coleman, Ph.D., F.R.S., McGill University, Montreal.
W. G. Miller, L.L.D., R.R.S.C., Geologist for Prov. Ont., Toronto.

J. B. Tyrrell, M.A., F.R.S.C., 534 Confederation Life Bldg., Toronto.

A. G. Burrows, M.A., B.Sc., Geologist, Ont. Bureau of Mines, Toronto.

A. A. Cole, B.Sc., M.A., Min. Engineer to the T. & N. O. Ry. Commission, Cobalt.

C. W. Knight, B.Sc., Asst. Provincial Geologist, Ont. Bureau of Mines, Toronto.

T. L. Walker, M.A., Ph.D., Prof. of Mineralogy, Univ. of Toronto.

A-3—J. Stansfield, B.A., M.Sc., McGill Univ., Montreal.

A-3—A. W. G. Wilson, Ph.D., Mines Branch, Dept. Mines, Ottawa.

A-3—G. C. McKenzie, B.Sc., Mines Branch, Dep. Mines, Ottawa.

A-3—A. C. Lane, Ph.D., Tufts College, Boston, Mass., delegate of American Academy of Art and Science, Boston.

A-3—J. Barrell, E.M., Ph.D., Professor of Geology, Yale Univ. Museum, New Haven, Conn. Delegate of Yale University.

C-6—F. E. Wright, Ph.D., Geophysical Laboratory, Washington, D.C. Delegate of Geophysical Laboratory of Carnegie Institute of Washington.

C-6—J. W. Evans, D.Sc., L.L.B., F.G.S., 75 Craven Park Road, Harlesden, London, Eng. Delegate of the Geologists' Assn., London, Eng.

A-3—F. L. Ransome, Ph.D., U. S. Geological Survey, Washington, D.C. Delegate of U.S.A. Government.

A-3—H. Eckfeldt, B.Sc., E.M., 438 Seneca St., South Bethlehem, Penn., U.S.A.

A-3—Miss C. A. Raisin, D.Sc., Bedford College, Baker St. London, W., Eng. Delegate of Linnean Society of London.

A-3—A. E. Kitson, F.G.S., F.R.G.S., I.M.E., "Eadsleigh" 109 Worple Rd., Wimbledon, London, S.W., Eng. Delegate of Univ. of Glasgow.

A-3—S. W. Beyer, B.S., Ph.D., Iowa State College, Ames, Iowa.

A-3—H. F. Bain, Ph.D., 420 Market St., San Francisco, Cal.

C-6—Prof. Dr. W. Veradsky, Geological and Mineralogical Museum, St. Petersburg, Russia. Delegate of the Societe Imperiale des Naturalistes de Moscou, Moscou.

A-3—G. A. J. Cole, Director of Geological Survey of Ireland, Royal College of Science, Dublin, Ireland. Delegate of the Government of Great Britain and of the Geological Survey of Ireland, Dublin.

C-6—E. Howe, M.A., Ph.D., 77 Rhode Island Ave., Newport, R.I.

A-3—Bedford McNeill, A.R.S.M., M. Inst. M.M., 1 London Wall Bldg., London E.C., Eng.

A-3—Mrs. Bedford McNeill, 1 London Wall Bldg., London, E.C., Eng.

C-6—Per Geoger, Ph.D., Univ. of Stockholm, Djursholm, Sweden. Delegate of Stockholms Hogskola, Stockholm.

C-6—W. Archinow, Director de l'Institut Petrographique, "Lithogaea" Ordynka 32, Moscow, Russia. Delegate of Societe Imperiale des Naturalistes de Moscou, Moscou.

C-6—Pierre Southchinsky, Professor a l'Ecole Polytechnique, Nowotsherkassk, Russia.

A-1—Dr. Jules Szadeczky de Szadecsne, Kolozsvar, Hungary. Delegate of University Royale hongroise Francois-Joseph de Kolozsvar, Kolozsvar.

A-3—Giuseppe Mercal, Dr., Prof. Instituto Geologico nella Regia Universita, Pisa, Italy.

A-3—Fred Searls, Jr., Goldfield, Nevada, U.S.A.

A-3—Eugeniusz Romer, Docteur-Sciences, Professor a l'Universite de Lemberg, 25 rue Dlugosza, Lemberg, Austria.

A-3—William Harvey Emmons, A. B., Ph.D., Dept. of Geology of University of Minnesota, Minneapolis, Minn.

A-3—Serafino Cerulli-Irelli, Dr., Maitre de conferences de Paleontologie a l'Universite de Rome, Institute Geologico, Regia Univesite, Roma, Italy.

A-3—Ettore Matirolo, Ingenieur en chef des Mines, Rue Charles Albert 45, Torino, Italy. Delegate of the Societa Geologica Italiano, Rome.

C-6—Jacques Samojloff, Professor de mineralogie, Institute Agronomique, Superieur, Petrowsko-Rasumowskoje, Moscou, Russia. Deleque de la Societe Imperial des Naturalistes de Moscou, Moscou. Moscou et de l'Institut Agromique Superieur de Moscou, Moscou.

C-6—Richard Beck, Oberbergat, Kgl. Sachs Geologische Landesantalt, Leipzig, Kgl. Sachs Bergakademie, Freiberg and of the Freiberger Geologische Gesellschaft, Freiberg.

A-3—George Walter Graham, M.A., F.G.S., Government Geologist, Box 178, Khartoum, Anglo-Egyptian Sudan.

C-6—Benjamin K. Emercon, Professor of Geology in Amherst College Amherst, Mass. Delegate of Amherst College.

C-6—Walter H. Bucher, Dr., Assistant, Geological Dept. of the University of Cincinnati, 2642 Eden ave., Cincinnati, O.

C-6—Arthur G. Leonard, B.A., Ph.D., State Geologist and Professor of Geology University of North Dakota, Grand Forks, N.D. Delegate of University of N. Dakota, Grand Forks.

C-6—Mark Luboschinsky, Geologue-Agronome, Institut Superieur Agronomique Petrowsko-Rasumowskoje, Moscou, Russia.

C-6—Gerald Meyrick Part, F.G.S. Trinity College, Cambridge, England.

A-3—Annie Enbank, 42 Leopold St., Toronto, Ont.

C-6—D. E. Dupuy de Lome, Ingenieur des Mines, Institute Geologico, Mostenses 2, Madrid, Spain. Delegate of the Government of Spain and of the Institut Geologique de l'Espagne, Madrid.

C-6. Sr. D. Agustin Marin Yf Bertran de Lis. Ingenieur des Mines, Instituto Geologico, Mostenses 2, Madrid, Spain. Delegate of the Government of Spain and of the Institut Geologique de l'Espagne, Madrid.

A-3. Arthur G. Charleton, Associate Royal School of Mines, M. Inst. M.M. &c. 559-561 Mansion House Chambers 11 Queen Victoria street, London, England.

C-6. Georgi Bontchew, Docteur, Professor de Petrographie et de Mineralogie a l'Universite de Sofia, Tchepino 4, Sofia, Bulgaria.

A-3. 449 H. Sjogren, Sweden.

A-3. 454 Ch. McDermid, England.

A-3. 472 E. Wherry, U.S.

A-3. 495 E. Ordoz, Mexico.

A-3. Mrs. E. Ordoz, Mexico

A-3. 504 O. Pfordte, U.S.

C-6. 429 D. G. Bontchew, Bilgaria

C-6. H. B. Patten, U.S.

C-6. 438 T. J. Krusch, Germany.

C-6. M. Bleowsky, Germany.

C-6. 480 C. H. Smythe Jr., U.S.

C-488. J. C. Wilson, Canada.

C-528. H. L. Bowman, England.

C-6. 578 S. Visconti, Russia.

C-6. 579 A. Bergeat, Germany,

Delegate of the Deutsche Mineralogische Gesellschaft, Jena.

Toronto World, July 10th 1913.

CITY'S GEOLOGICAL HISTORY REVIEWED

During Important Congress of Men From Many Countries.

An interesting sidelight on the history of Toronto will be given in unusually instructive character in connection with the International Geological Congress which assembles here next month. The occasion will be rather momentous in the calling together of delegates from all corners of the globe and the discussion of peculiar problems of natural science which have presented themselves to them.

J. B. Tyrrell has under way a compendium of facts of interest in the field of natural science which are not generally appreciated, and these will be presented in the form of lectures and afterwards compiled into a book. This, it is understood, is in co-operation with the department of education and will be placed on the government files as a reference of value.

Thirty-six countries will send representatives to the conference, and the arrangement of accommodation will be in the hands of Prof. Coleman of Toronto University.

Toronto Globe - July 10-1913. - Toronto World. July 11-1913.

NOTED SCIENTISTS WILL STUDY TORONTO

Odd Feature of Coming International Geological Congress

MEN FROM 36 COUNTRIES

Mr. J. B. Tyrrell Arranges That Men Famed for Their Research Shall Deal With This Historic Vicinity From All Scientific Phases.

Toronto is to be immortalized, scientifically and historically, at the session of the International Geological Congress here next month. Famed geologists and men of research from some 36 countries will assemble to discuss various scientific problems and developments.

Of unusual local interest, however, is the undertaking of Mr. J. B. Tyrrell, President of the Canadian Institute, to have these distinguished men deal with the various phases of Toronto's formation and character in their respective spheres.

The enterprise has received the encouragement of the Provincial Department of Education, and will take the form of a unique work, never before attempted on this continent, which will deal with the natural science of Toronto and vicinity. The work will treat with the geology, botany, history, natural history, climate, ornithology, animal life and natural characteristics of Toronto, each department being prepared by an authority on the subject dealt with. Thus Toronto will become famous.

GEOLOGISTS ARE ARRIVING FOR CONVENTION

Advance Guard of Big Assembly Which Will Gather From All Corners of the World Is Now at Montreal —Opens Here on August Seventh.

MONTREAL, July 10.—(Can. Press.)

—The advance guard of a great army of geological experts from all over the world has arrived in Montreal and their number will grow day by day, each boat and train bringing its quota to the geological congress.

This will be the twelfth annual congress of the society and the first time Canada has had the honor of entertaining members. The invitation to hold the meeting in this country came from the Dominion Government, the Canadian Institute, the provincial government of Toronto and the Royal Society of Canada.

The congress will be held in Toronto Aug. 7 to 11.

Canadian Mining Journal - July 15-1913.

The undertaking was a gigantic one; but it has been very successfully accomplished. Director R. W. Brock and the whole staff of the Geological Survey have made a splendid success of the work, and the Government printer has shown that Canada has facilities for turning out such work in a remarkably short time. To publish such a large number of maps and accompanying text without taking several years for the work was only a few years ago considered quite impossible. It is therefore very creditable to find that Canada has prepared for our European visitors the best set of guide books yet issued by any country.

The Congress will supply guide books to all those who take part in the excursions. Complete sets will be furnished at a very nominal price.

To non-members the price for the set will be about \$7.50.



BEDFORD McNEILL
President, Institution of Mining and Metallurgy

Canadian Mining Journal. July 15-1913.

GEOLOGICAL GUIDE BOOKS

For use of those attending the Geological Congress in Canada this year, the Geological Survey has prepared a very remarkable set of guide books. All the producing mining districts and areas presenting interesting structural features are described and mapped. The country along the whole length of the transcontinental railroads is described briefly, and illustrated by maps that illustrate the noteworthy features, without being encumbered with a maze of unimportant detail. The guide books contain 140 such maps, and will for years be a valuable source of information. The maps of the whole country have been brought up to date and published in attractive and convenient form.

INTERNATIONAL GEOLOGICAL CONGRESS

During the three years since the last meeting of the Congress, the officers have been preparing for this meeting in Canada. The Dominion and Provincial Governments have contributed liberally, and the railroads have made very low rates for members attending. During the past year a very large number of Government geologists have been working on maps and descriptions of the centres to be visited. The mining companies have given much assistance and will offer the members unusual opportunities of seeing the properties.

Among those who will visit us this summer will be many of the most prominent geologists in the world. It means much that these men by their visit will obtain some idea of the wonderful possibilities of Canada as a mineral producing country.

The first excursion, A1 in charge of Dr. G. A. Young, leaves Montreal July 13. A visit will be made to Quebec and vicinity on July 14, and the following day will be spent on the south shore of the St. Lawrence. Then two days will be spent studying the formation at the eastern extremity of Gaspé Peninsula. On July 19, iron deposits of Bathurst, New Brunswick, will be examined. On July 20 the party will be in Halifax. Visits will be made to the gold and coal mines and the industrial plants at Sydney, Antigonish, Joggins, Moncton, and St. John will be starting points for several local excursions to study geological structures. The party will return to Ottawa Friday, August 1st.

On July 24 Dr. F. D. Adams and Dr. A. E. Barlow lead a party to points of interest in the Haliburton-Bancroft area, Eastern Ontario. The area lies to the north of Lake Ontario, on the margin of the Laurentian Protaxis of the continent. In this district is exposed the most notable section of the Grenville Series in Canada. The strata show to a remarkable degree the results of progressive metamorphism, as a consequence of the intrusion of extensive batholiths of granite, producing various types of amphibolite, etc. This district is also interesting by reason of the very extensive development of nepheline and other alkaline syenites, some of which are of the rarer types. In certain localities these rocks contain an abundance of corundum, while elsewhere sodalite, of a fine depth of colour, is conspicuous. The excursion will also include an inspection of the corundum mines and mills at Craigmont. This party will visit Craigmont on July 30 and arrive in Ottawa July 31.

The guides for the first excursion of members of the Congress to Sudbury, Porcupine and Cobalt will be: Dr. W. G. Miller, C. W. Knight and A. G. Burrows, of the Ontario Bureau of Mines; Professors A. P. Coleman and T. L. Walker, of the University of Toronto; Mr. J. B. Tyrrell, consulting mining engineer, Toronto; and Mr. Arthur A. Cole, mining engineer of the T. and N. O. Ry. Commission, Cobalt.

Dr. W. G. Miller, Provincial Geologist, who is leader on this trip, has arranged to open quarters at his office in the Parliament Buildings for the convenience of the excursionists. The start will be made from Toronto Wednesday evening, July 23, and from Montreal Wednesday morning.

Among those who will make the trip are: J. Stansfield, McGill University; A. W. G. Wilson and G. C. Mackenzie, Mines Branch, Dept. Mines, Ottawa; Alfred C. Lane, Tufts College, Mass.; J. Barrell, Yale University, New Haven; F. L. Ransome, U. S. Geological Survey, Washington, D.C.; H. Eckfeldt, South Bethlehem, Penn.; Miss C. A. Raisin, Bedford College, London,

Eng.; A. E. Kitson, London, Eng., delegate of University of Glasgow; S. W. Beyer, Iowa State College, Iowa; H. F. Bain, Editor Mining and Scientific Press, San Francisco, Cal.; G. A. J. Cole, Director Geological Survey of Ireland, Royal College of Science, Dublin, Ireland; Bedford McNeill, president Inst. of Mining and Metallurgy, London, Eng.; Mrs. Bedford McNeill; Dr. Jules Szadeszky de Szadecsne, Kolozsvár, Hungary; Guiseppe Mercial, Pisa, Italy; Fred Searls, Jr., Goldfield, Nevada; Eugenisz Romer, Lemberg, Austria; William H. Emmons, professor of Geology, University of Minnesota, Minneapolis, Minn.; Serafino Cerruli-Irelli, Rome, Italy; Ettore Matirolo, Ingenieur en Chef des Mines, Torino, Italy; George W. Graham, Government Geologist, Khartoum, Anglo-Egyptian Soudan; Annie Enbank, Toronto; Arthur G. Charleton, London, Eng.; Reginald E. Hore, Canadian Mining Journal; H. Sjogren, Sweden; Charles McDermid, Secretary Institute of Mining and Metallurgy, London, Eng.; Prof. E. Wherry, Lehigh University, South Bethlehem, Pa.; E. Ordonez, mining geologist, Mexico City, and Mrs. Ordonez.

LOGAN MEMORIAL.

At the meeting of the Organization Committee of the Twelfth International Geological Congress, held at the Chateau Laurier, Ottawa, on Tuesday, March 4th, 1913, it was moved by Mr. W. Fleet Robertson and seconded by Mr. W. F. Ferrier and carried:

"That the Logan Memorial Committee, consisting of Messrs. Barlow, Brock, Coleman and Miller, be instructed to proceed with the arrangements for the erection of suitable memorials to the late Sir William Logan, the locations and characters of the memorials to be left to the named committee and that the Organization Committee guarantee the expenses up to the sum of Five Hundred Dollars."

In agreement with this motion the Logan Memorial Committee have asked Mr. Henri Hebert to design and execute a bronze tablet measuring 25 by 30 inches, with a suitable inscription and a bust of Sir William Logan in relief. The original of this tablet will be placed in a suitable and conspicuous place near the entrance of the Victoria Memorial Museum at Ottawa. A duplicate will be securely fastened in position on the southern face of a conspicuous exposure of limestone breccia near the village of Perce, (Gaspé Peninsula), Quebec.

Subscriptions may be handed to any of the members of the Logan Memorial Committee or sent direct to the Secretary of the Twelfth International Geological Congress, Victoria Memorial Museum, Ottawa.

You are cordially invited to subscribe.

The following is a list of the subscribers to the Logan Memorial to date: J. A. Bancroft, \$10; A. E. Barlow, \$25; R. W. Brock, \$5; C. Camsell, \$5; C. H. Clapp, \$5; J. M. Clarke, \$50; D. B. Dowling, \$5; J. A. Dresser, \$20; C. Drysdale, \$5; D. A. Dunlap, \$20; W. F. Ferrier, \$20; Abbe R. Guimont, \$5; E. Haanel, \$5; R. Harvie, \$5; R. E. Hore, \$5; M. L. Hersey, \$10; E. Jenkins, \$5; W. A. Johnson, \$10; E. D. Kindle, \$2; O. E. LeRoy, \$5; G. G. S. Lindsay, \$5; A. P. Low, \$10; Jas. McArthur, \$10; W. McInnes, \$10; D. S. McIntosh, \$5; J. McLeish, \$5; G. F. Matthew, \$5; W. H. Merrill, \$5; Mussels Ltd., \$10; M. Nordegg, \$10; W. A. Parks, \$5; M. E. Purcell, \$1; T. W. Racey, \$5; J. C. Sutherland, \$2; J. B. Tyrrell, \$10; T. G. Wait, \$2; J. White, \$5; A. B. Willmott, \$5; A. G. Wilson, \$5; M. E. Wilson, \$10.

Globe - July 16 - 1913.

Cobalt Nugget - July 18 - 1913.

Cobalt Nugget - July 22 - 1913. (or 29th)

GEOLOGISTS EXPLORE ROCKS OF QUEBEC

FIRST EXCURSION OF CONGRESS
NOW EN ROUTE TO MARITIME
PROVINCES.

(Special Despatch to The Globe.)
Montreal, July 15. Old Quebec has been the scene of many inquisitious and conferences. On numberless occasions the lower province of the Dominion has had its joints ransacked for historical documents, momentos of the early frontier days and relics of the battlefield. It has seen the International Joint High Commission come and go, but now for the first time in its existence it yields to the impulse of men who would go back before history, who would penetrate into the very vertebrae, of the continent. The International Geological Congress will meet in its twelfth session in Toronto on August 7, when some 700 delegates, representing all countries in the world will gather together.

Preliminary to that Congress excursions are being held for those who can participate at this time. The first of these excursions left Montreal last night for a nineteen days' tour through Quebec, New Brunswick and Ontario. Some 300 geologists participated in this "preliminary" side-trip. To-day was spent in Quebec, examining the geological formations at Levis and Montmorency Falls. From Quebec the party will continue along the north shore of the St. Lawrence to Riviere du Loup, where the Bic conglomerates will be seen with their Cambrian pebbles; thence to the "Palaeozoic strata and Appalachian structure at Gaspé Peninsula," and so on through Devonian beds, fish, fauna, volcanic intrusives and iron ore deposits.

The party is travelling in semi-state, a special train being provided with ample accommodation for the carrying of baggage and specimens, a first-class coach for lectures en route, dining and sleeping accommodation with de luxe appointments. The party will return to Montreal by August 1st.

Similar excursions are being arranged into the Haliburton, Cobalt and Niagara Falls districts in Ontario.

GEOLOGISTS TO ARRIVE HERE SOON

Arrangements Made For Their Entertainment

At the annual meeting of the Cobalt Branch of the Canadian Mining Institute the executive were empowered to make all necessary arrangements for the entertainment of the members of the International Geological Congress who visit the camp.

The first party which will consist of about forty members will first visit Sudbury and Moose Mountain, and arrive in Cobalt on their special train on Sunday night, July 27.

On Monday, the Geologists with Dr. W. G. Miller as their guide will be taken up the Little Silver valley following the Kerr Lake branch of the E. & N. O. railway to the Cobalt Provincial Mine. The party will cut across to Diabase Mountain by way of Peterson Lake. In the afternoon the mining engineers who are not particularly interested in geology, will be shown the Temiskaming and Crown Reserve and other producers of interest.

July 29th will be spent on Lake Temiskaming the shore line being followed in gasoline launches. Immediately on their return the special train will leave for Porcupine.

July 30th will be spent in Porcupine camp. The special train will run through to Timmins. The morning will be spent at the Hollinger, the afternoon at the Dome.

The second excursion of members who could not participate in the first trip will follow the same route arriving at Cobalt 29th. The 29th and 21st will be spent in Cobalt and on Lake Temiskaming and the 22nd in Porcupine.

LOADED THEIR POCKETS WITH ROCK SPECIMENS

Geologists Found Plenty to Interest Them at Cobalt Yesterday

It was nearly 9 o'clock before the launch Patricia took the last of the Patricia conveyed the last of the members of the International Geological Congress across Cobalt lake to the Nipissing property yesterday morning. Two trips were required before all the excursionists reached the other side of the lake and two more would have been necessary had the visitors turned out in full. As it was, only about thirty-five accompanied Dr. Miller. Many and varied were the costumes worn, and of these, that of the Abbe Morin, Professor of Natural Sciences at the Seminaire de Joliette, Quebec, was the most remarkable, and it was in striking contrast to the sober black worn by his fellow churchmen. The Canadian contingent for the most part were clad in regulation bush garb, and from that the clothes descended through gradual changes to mufli. "Sore-thumb" leggings and puttees were much in evidence and even a pair of larrigans was sported by Professor Kemp, of Columbia University.

The earlier starters were grouped at the foot of the keewatin rocks on the town side of the "Little Silver Vein" when the late arrivals overtook them and on the uniting of the parties all was hustle and excitement. Cameras were snapping on all sides, the click-click of hammers broke the stillness and magnifying glasses were passed from hand to hand as their possessors satisfied themselves with their examination of their own particular samples. A little further on the "Little Silver Vein" was reached and the geologists clambered on to a heap of rocks near the powderhouse from which a splendid view of the cleft could be obtained and from which Dr. Miller dilated on the formation. About half an hour was spent at this point, and during the halt, numerous Alpine feats were performed by the more interested for the purpose of obtaining a closer and better examination of the rocks.

From there Dr. Miller led the party along the Kerr Lake tracks and before going far, another object of interest was reached. This was a ridge by the side of the track of conglomerate on keewatin and it aroused much interest, discussions in a babel of tongues interspersing the inspections. The party was now "tailing off" considerable, groups and individuals lagging behind busily examining anything that took their particular fancy while the others proceeded. The explanation of this is that while some were interested in the minerals the rocks contained, others found food for reflection in the antiquity of the rocks themselves.

At this point the "Nugget" reporter engaged in a chat with Professor Cole, Director of the Geological Survey of Ireland and Professor Mercini of the Instituto Geologico della Regia Universita, Piza, Italy, both of whom were paying their first visit to Canada. Asked what they thought of the rocks in this part they both agreed that they were very similar to those of Sweden though swept considerably barer. Professor Cole expressed himself delighted with the trip and said that when he got back to his students he would have the country in his mind's eye and would be able to talk to them enthusiastically about the various formations. He said that travel was the only way to learn geology and he quoted Sir Charles Lyell of the University College of London whose advice to those who wanted to learn geology was "The first requirement is travel, the second requirement is travel and the third requirement is travel."

The Provincial workings were next reached and a heap of diamond drill cores lying there were eagerly pounced upon and added to the already swollen collections. Professor Lane, of Boston, had his pockets stuffed with specimens, and when a wag in the party augmented his supply with a few stones picked at random from the roadside, the offender was in danger for a moment of getting samples and all flung at his head.

Advancing in a circle towards Cobalt from this point an old prospect tunnel next aroused attention as it gave a splendid example of the contact of the diabase and Cobalt series a few feet above the floor. An abundance of raspberries and the coolness of the tunnel still further depleted the ranks and it was a mere handful which arrived at the Penn-Canadian on Glen Lake. From this point the party gradually worked their way back to town. In the afternoon the party was split up and the various plants were visited. Mr. Reginald Hore, the editor of the Canadian Mining Journal accompanied the geologists this morning in his professional capacity, and what he has to say about the excursion should make interesting reading.

Globe, July 24-1913.

NOTABLE PARTY LEAVES TO EXPLORE NORTH

Sixty Scientists Here From All Ends of the Earth

COME BACK ON AUGUST 1

President of Institution of Mining, London; Director of Government Survey on Gold Coast; Government Geologist From Khartoum in the Group.

"We are looking forward to having the time of our lives," said Mr. Bedford McNeill, President of the Institution of Mining and Metallurgy, London, Eng., last night to The Globe just before the departure of excursion A3 of the International Geological Congress for Sudbury, Cobalt and Porcupine, and Mr. McNeill's appearance did not belie the statement. He was looking as happy as a school-boy going for a holiday, but his shrewd remarks on Canada showed that little escaped his observation. "There is an inherent vitality about Canadians that is unmistakable," said Mr. McNeill, "and one of the things that impressed me more than anything else is the careful attention that is paid to technical science and the way you are preparing the younger generation." "I shall never forget the few days that I spent in Quebec," said Mr. McNeill. "It is a charming city. Perhaps the most striking impression made upon me so far was the singing of 'O Canada' on board ship coming across the Atlantic."

One of the striking figures on the platform of the station last night was Mr. A. E. Kitson of the Imperial Institute, London, and Director of the Government Geological Survey of the Gold Coast, Africa, a short, thick-set man, wearing a pith helmet much worn on the Gold Coast. "I am charmed with Toronto," said Mr. Kitson, "and the buildings are magnificent." Mr. Kitson travelled to Canada by way of Australia and Frisco, and is, like all scientists, always on the lookout for anything pertaining to his work. "I saw some splendid examples of erosion in Nevada and Wyoming," said he. Mr. Kitson has spent some years in Australia, and climbed to the top of Mount Kosciusko in New South Wales before there was an Observatory established there.

An Empire-builder.
A true Empire-builder is Mr. George Walter Grabham, Government Geologist, Khartoum, Anglo-Egyptian Sudan. Tall and bronzed with exposure to the warm Sudanese sun, he arrests attention. Mr. Grabham and his associates are busy upon a huge dam that is to be erected near Khartoum, which will cost \$35,000,000 before it is completed. There is at

present a bill before the British Government which provides for a loan of \$15,000,000 to be used for the irrigation scheme and also for the building of railways. The district thus irrigated will stimulate the gum and cotton industry and transform the arid region into a smiling land.

Herr Heinrich Schulze of Hanover was full of admiration for Toronto. "Toronto is a wonderful city," said he. "There are few cities in Germany to compare with Toronto. Your buildings are a revelation to me; their size and situation are admirable. The monuments and the buildings in Queen's Park are in beautiful harmony."

Nearly Sixty Leave for North.

The party, which numbered nearly sixty, included some of the leading geologists, mineralogists, paleontologists and mining engineers of the world, and altogether it was one of the most remarkable gatherings of men that ever left the Union Station. The leader is Mr. Willet G. Miller, Provincial Geologist of the Department of Lands, Forests and Mines. With him are associate leaders for Sudbury, Cobalt and Porcupine. This excursion is of special interest to those interested in pre-Cambrian geology, petrography, economic geology and metalliferous mining, as well as glacialists and students of forestry. The chief points of interest are the nickel and copper deposits of Sudbury; the iron mines of Moose Mountain; the iron range of Timagami; the cobalt-silver deposits of Cobalt and the gold quartz veins of Porcupine. In addition to containing some of the world's most famous metalliferous deposits, the localities to be visited possess unexcelled facilities for the study of typical exposures of the Keewatin, Laurentian and Huronian systems.

Members of the Party.

The following are the members of the party, who will return about August 1:—
J. Barrell, Professor of Geology, Yale University; H. F. Bain, Editor Scientific and Mining Press, Frisco, Cal.; S. W. Beyer, Iowa State College, Iowa; A. G. Burrows, Toronto; Serafino Cerulli-Irelli, University of Rome, Italy; A. G. Charlton, Past President, Institution of Mining and Metallurgy, London; Mrs. Charlton; G. A. J. Cole, Director Geological Survey, of Ireland, Dublin; A. A. Cole, M. E. to the T. & N. O. Railway, Cobalt; Prof. A. P. Coleman, Toronto; E. T. Corkill, Copper Cliff, Ont.; W. H. Collins, Geological Survey of Canada, Ottawa; J. A. Dresser, Sault Ste. Marie; H. Eckfeldt, Professor Mining Engineering, Lehigh University, South Bethlehem, Pa.; Mrs. Eckfeldt; W. H. Emmons, Prof. of Geology, University of Minnesota, Minneapolis; Miss Annie Eubank, Toronto; F. H. Forest, Professeur de Geologie, College Bourget, Rigaud, Quebec; Constant Godfroy Ingenieur des Mines, La Haye, Netherlands; George Walter Grabham, Government Geologist, Khartoum, Anglo-Egyptian Sudan; P. E. Hopkins, Geologist, Bureau of Mines, Toronto; R. E. Hore, Editor Canadian Mining Journal, Toronto; J. F. Kemp, Professor of Geology, Columbia University, New York City; C. W. Knight, Assistant Provincial Geologist, Bureau of Mines, Toronto; S. F. Kirkpatrick, Professor of Metallurgy, School of Mining, Kingston; A. E. Kitson, Imperial Institute, London, England; A. C. Lane, Professor of Geology, Tufts College, Boston, Mass.; Mrs. A. C. Lane; E. Lindeman, Mines Branch, Department of Mines,

Ottawa; E. Mattiolo, Ingenieur en Chef des Mines, Rue Charles Albert 45 Torino, Italy; Charles McDermid, Secretary Institution Mining and Metallurgy, London, England; Bedford McNeill, President Institution Mining and Metallurgy, London, England; Mrs. Bedford McNeill; Giuseppe Mercia, Professeur Instituto Geologico della Regia Università, Pisa, Italy; Willet G. Miller, Provincial Geologist of Ontario, Toronto; Louis Joseph Morin, Professeur de Sciences Naturelles, Seminaire de Joliette, Joliette, Quebec; Jos. Alfred Noiseux, Seminaire de Joliette, Joliette, Quebec; Ezequiel Ordóñez, Ingenieur Geologue des Mines, Mexico, D. F., Mexico; Mrs. Ordóñez; Otto F. Pfordte, Cairo, Green County, New York; F. L. Ransome, United States Geological Survey, Washington, D. C.; L. Relnecke, Geologist, Geological Survey of Canada, Ottawa; W. R. Rogers, Topographer, Bureau of Mines, Toronto; Heinrich Schulze, Ingenieur, Hanover, Germany; Fred Searls, Goldfields, Nevada; W. E. Simpson, Fundicón de Los Arcos, Toluca, Mexico; H. S. A. Sjogren, Professor, Academy of Science, Stockholm, Sweden; Jules Szadeczky de Szadeczka, Royal Hungarian University, Kolozsvár, Hungary; J. B. Tyrrell, Geologist, Toronto; Mrs. J. B. Tyrrell; T. L. Walker, Professor of Mineralogy, University of Toronto, Toronto; Edgar T. Wherry, Lehigh University, South Bethlehem, Pa., U.S.A.; A. W. G. Wilson, Mines Branch, Department of Mines, Ottawa; M. E. Wilson, Geologist, Geological Survey of Canada, Ottawa.

Globe, July 24-1913.

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continued on next page.

continued from page 5.

Cobalt Nugget - July 24th 1913.

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WHO'S WHO AMONG THE GEOLOGISTS

Many Parts of the World
Represented in Party
That Will Visit
Mines

Fifty two members will take part in A-3 excursion of the International geological congress and they will arrive in Cobalt late on Sunday night, taking up the whole of Monday in examining the Cobalt camp. Details of their proceedings here have already been published in The Nugget but it may be stated that in addition it is now certain that the Cobalt branch of the Canadian Mining Institute will give the distinguished visitors a reception. There are twenty Canadians in the party, 12 from the United States and 10 Britishers other than Canadians. Six members are bringing their wives.

The revised list follows:

Leader—Willet G. Miller.

Associate Leaders: Sudbury—a. P. Coleman and T. L. Walker, Cobalt—Cyril W. Knight and A. A. Cole. Porcupine—A. G. Burrows and Percy E. Hopkins.

Secretary—W. R. Rogers.

Assistant Secretary—Percy E. Hopkins.

Barrell, J., Professor of Geology, Yale University, New Haven, Conn., U.S.A.

Bain, H. F., Editor Mining and Scientific Press, San Francisco, Cal., U.S.A.

Beyer, S. W., Iowa State College, Ames, Iowa, U.S.A.

Burrows, A. G., Geologist, Bureau of Mines, Toronto, Ontario.

Cerulli-Irelli, Serafino, Maître de conférences de Paléontologie, à l'Université de Rome, Italy.

Charlton, A. G., Past-President, Institution of Mining and Metallurgy, London, England.

Charlton, Mrs.
Cole, G. A. J., Director of the Geological Survey of Ireland, Dublin, Ireland.

Cole, A. A., Mining Engineer to the Timiskaming and Northern Ontario Ry., Cobalt Ontario.

Coleman, A. P., Professor of Geology, University of Toronto, Toronto Ontario.

Corkill, E. T., Safety Engineer, Copper Cliff, Ontario.

Collins, W. H., Geologist, Geological Survey of Canada, Ottawa, Ontario.

Dresser, J. A., Manager Lands Department, the Algoma Central and Hudson Bay Railway Company, Sault Ste. Marie, Ontario.

Eckfeldt, H., Professor of Mining Engineering, Lehigh University, South Bethlehem, Pa., U.S.A.

Eckfeldt, Mrs.
Emmons, W. H., Professor of Geology, University of Minnesota, Minneapolis, U.S.A.

Eubank, Miss Annie, Toronto, Ontario.

Forest, F. H., Professor de Geologie, College Bourget, Rigaud, Quebec.

Godfroy, Constant, Ingenieur des Mines, La Haye, Netherlands.

Grabham, George Walter, Government Geologist, Khartoum, Anglo-Egyptian Sudan.

Hopkins, P. E., Geologist, Bureau of Mines, Toronto, Ontario.

Hore, R. E., editor Canadian Mining Journal, Toronto, Ontario.

Kemp, J. F., Professor of Geology, Columbia University, New York City U.S.A.

Knight, C. W., Assistant Provincial Geologist, Bureau of Mines, Toronto, Ontario.

Kirkpatrick, S. F., Professor of Metallurgy, School of Mining, Kingston, Ontario.

Kitson, A. E., Imperial Institute, London, England.

Lane, A. C., Professor of Geology, Tufts College, Boston, Mass., U. S. A.

Lane, Mrs. A. C.
Lindeman, E., Mines Branch, Department of Mines, Ottawa, Ontario.

Mattiolo, E., Ingenieur en chef des Mines, Rue Charles Albert 45 Torino, Italy.

McDermid, Charles, Secretary Institution of Mining and Metallurgy, London, England.

McNeill, Bedford, President Institution of Mining and Metallurgy, London, England.

McNeill, Mrs. Bedford.
Mercial, Guiseppe, Professeur Instituto Geologico della Regia Universita, Pisa, Italy.

Miller, Willet, G., Provincial Geologist of Ontario, Toronto, Ontario.

Morin, Louis Joseph, Professeur de sciences Naturelles, Seminaire de Joliette, Joliette, Quebec.

Noiseux, Jos. Alfred, Seminaire de Joliette, Joliette, Quebec.

Ordonez, Ezequiel, Ingenieur Geologue des Mines, Mexico, D.F., Mexico.

Ordonez, Mrs.
Pfordte, Otto F., Cairo, Greene county, New York, U.S.A.

Ransome, F. L., United States Geological Survey, Washington, D.C.

Reinecke, L., Geologist, Geological Survey of Canada, Ottawa, Ontario.

Rogers, W. R., Typographer, Bureau of Mines, Toronto, Ontario.

Schulze, Heinrich, Ingenieur, Hanover, Germany,
Searls, Fred, Goldfields, Nevada, U.S.A.

Simpson, W. E., Fundiconde de Los Arcos, Toluca, Mexico.

Sjogren, H. S. A., Professor Academy of Science, Stockholm, Sweden.
Szadeczky de Szadecsne, Jules Royal Hungarian University, Kolozsvar, Hungary.

Tyrell, J. B., Geologist, Toronto, Ontario.

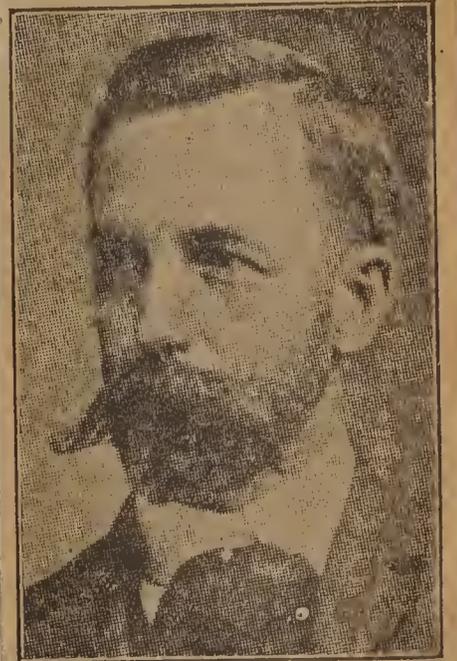
Tyrell, Mrs. J. B.
Walker, T. L., Professor of Mineralogy, University of Toronto, Toronto, Ontario.

Wherry, Edgar T., Lehigh University, South Bethlehem, Pa., U.S.A.

Wilson, A. W. G., Mines Branch, Department of Mines, Ottawa, Ontario.

Wilson, M. E., Geologist, Geological Survey of Canada, Ottawa, Ontario.

Globe - July 24 - 1913.



DR. W. G. MILLER,
Leader of Geologists' excursion into Northern Ontario.

Globe - July 26 - 1913

UNIQUE PUBLICATION A CONGRESS SOUVENIR

Canadian Institute is Issuing an
Interesting Book

THE FIRST OF ITS KIND

Visiting Geologists May Read of Toronto's History, Geology, Archaeology, Climatology and Natural History—Prof. Faull is Editor.

There is in the press a book entitled The Natural History of the Toronto Region, which is to be published on August 1.

Globe - July 26-1913.

Cobalt Nugget - July 25-1913.

Cobalt Nugget - July 29-1913.

The Canadian Institute, in this remarkable publication has produced a work such as has never before been written of any city in America. In it is comprised the History, Geology, Archaeology, Climatology and Natural History of Toronto and its vicinity for a radius of about fifty miles. Professor J. H. Faull of the University of Toronto is the editor, assisted by a committee of the Institute.

All the articles have been contributed by members of the Institute, specialists in the subjects treated. These comprise a specification of the flora and fauna of the Toronto region with details, not alone as to species, but also of the places where they may be found. Interesting illustrations and important useful maps detached and beautifully executed, accompany this book.

The aim of the Institute has been to ensure that all the information contained in the work should be authentic, accurate, and up-to-date. This result the council of the Institute feel they have attained.

The object of the publication of the book at this particular time is on the part of the Canadian Institute to contribute to the literature of and to commemorate the first meeting of the International Geological Congress in Canada at Toronto, and to enable geologists in attendance at the congress to acquaint themselves with the natural phenomena of Toronto and its vicinity.

While that purpose is served, the book will always fill a permanent and important place in the scientific literature of Ontario. The book is coming from the press of William Briggs.

Articles in the Book.

- The twenty-two articles composing the book are entitled as follows: —
- Toronto: An Historical and Descriptive Sketch. By David Reid Keys, M.A.
- The Indians who Formerly Inhabited or Visited the Site of Toronto. By Alexander Francis Chamberlain, M.A., Ph.D.
- Geology of the Toronto Region. By A. P. Coleman, Ph.D., F.R.S.
- The Climate of Toronto. By R. F. Stupart, F.R.S.C.
- Life Zones. By C. D. Howe, Ph.D.
- The Seed Plants of Toronto and Vicinity. By Principal William Scott.
- Ferns and Fern Allies. By T. J. Ivey, M.A.
- Mosses and Liverworts. By G. H. Graham, M.A.
- Mushrooms and Other Fungi. By Thomas Langton, M.A., LL.B.
- The Algae. By J. H. Faull, Ph.D.
- Lichens. By J. H. Faull, Ph.D.
- Mycetozoa, or Slime Moulds. By J. H. Faull, Ph.D.
- Insect Galls of the Vicinity of Toronto. By A. Cosens, M.A., Ph.D.
- Zoology. Edited by J. Playfair McMurrich.
- Mammals. By James H. Fleming.
- Birds. By James H. Fleming.
- Reptiles. By J. B. Williams, F.Z.S.
- Amphibia. By W. H. Piersol, B.A., M.B.
- Fishes. By C. W. Nash.
- Invertebrates Other than Insects and Mollusks. By A. G. Huntsman, B.A., M.B.
- Mollusca. By A. D. Robertson, B.A.
- Insects and Their Allies. By E. M. Walker, B.A., M.B.

GEOLOGISTS NOW IN SUDBURY

Excursion 3 A Away to Good Start

The fifty-six members of the 3A excursion of the Geological Convention are in Sudbury, where they will remain until one o'clock Sunday, when they will leave for Cobalt. There are a good many points of interest of which Sudbury is the centre, Copper Cliff, the Mond smelter at Coniston, the new work at the old Murray mine, and Moose Mountain iron mine. The Sudbury Board of Trade will banquet the party on Saturday night when it is probable the Hon. W. H. Hearst will be present.

The special train of Pullmans as it left Toronto made a good impression and the excursion has so far been attended by fine weather and the best of luck.

The party will arrive here on Sunday night.

"We are looking forward to having the time of our lives," said Mr. Bedford McNeill, President of the Institution of Mining and Metallurgy, London, Eng., just before the departure of the excursion for Sudbury, Cobalt and Porcupine, and Mr. McNeill's appearance did not belie the statement. He was looking as happy as a schoolboy going for a holiday, but his shrewd remarks on Canada showed that little escaped his observation. "There is an inherent vitality about Canadians that is unmistakable," said Mr. McNeill, "and one of the things that impressed me more than anything else is the careful attention that is paid to technical science and the way you are preparing the younger generation." "I shall never forget the few days that I spent in Quebec," said Mr. McNeill. "It is a charming city. Perhaps the most striking impression made upon me so far was the singing of 'O Canada' on board ship coming across the Atlantic."

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World - July 28-1913.

TORONTO REGION'S NATURAL HISTORY

Canadian Institute Publishes Book to Commemorate Visit of Geologists.

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The Canadian Institute in this remarkable publication has produced a work such as has never before been written of any city in America. In it is comprised the history, archaeology, climatology and natural history of Toronto and its vicinity for a radius of about 50 miles. Prof. Dr. Faull of the University of Toronto is the editor, assisted by a committee of the institute.

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Guide to Visitors.

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INSISTED ON SEEING KIRKLAND LAKE

Distinguished Party of Geologists Will Visit New Gold Camp To-night

In spite of the difficulties attending it, so insistent has been the demand to see Kirkland Lake that a party of Geologists will leave Haileybury this afternoon for that camp. Ever since the arrival in Cobalt ways and means have been sought to see the new gold camp and now it has been found. To-day on the arrival of the special train at Haileybury a T. & N. O. Engine will hook on to one of the first class cars and will take the party through to Swastika which could be reached about four o'clock. Mr. Charles O'Connell of the Tough-Oakes has arranged to have conveyances there to carry the party over the five miles of road to Kirkland Lake. They will arrive at or near Gull Lake about five or five thirty and will utilize the remainder of the daylight in seeing the Tough Oakes mine. They will come back in the dark and wait at Swastika station until the special train passes through on its way to Porcupine tonight about half past eleven or twelve o'clock.

The list of those going into Kirkland Lake are:

- Mr. H. Foster Bain, editor of the Mining and Scientific Press.
- Mr. F. L. Ransome, United States Geological Survey, Washington, D.C.
- Mr. H. B. Wallis, M. Inst. M. & M. of London.
- Mr. Bedford McNeill, president of the Institution of Mining and Metallurgy, London, Eng.
- Mr. A. G. Charleton, past president of the Institution of M. & M.
- Mr. A. E. Kitson, Imperial Institute, London, Eng.
- Mr. A. G. B. Wilbraham, M. & M., London, Eng.
- Dr. T. L. Walker, Professor of Mineralogy, University of Toronto.
- Mr. F. A. Jordan, Supt. Moose Mountain Iron Mine.
- Mr. A. Pare, the man who opened up the Hollinger Mine.
- Mr. A. G. Burrows, geologist of the Bureau of Mines, Ontario.

In Mr. Burrows the party will have the best guide obtainable as he has but just returned from studying the new field with the thoroughness characteristic of his work, all through Northern Ontario.

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The Geologists' Visit



LITTLE SILVER VEIN, WHERE GEOLOGISTS COMMENCED THEIR TOUR THIS MORNING.

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DEVIL'S ROCK, LAKE TEMISKAMING. POINT OF INTEREST FOR GEOLOGISTS TO-DAY.

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STEAMER SILVERLAND, WHICH HAS BEEN CHARTERED FOR GEOLOGIST'S TRIP TO-DAY.

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SAW GREAT DIFFERENCE

IN COBALT TOWN

Geologists Arrived in Camp Last Night And Are Spending Day Visiting The Mines

After three strenuous days in the nickel belt of Sudbury the first excursion of members of the International Geological Congress arrived in Cobalt last night on a special train. In spite of the fact that one morning members were routed out of their berths at six o'clock in the morning and the Sudbury Board of Trade banquet lasted till one o'clock in the morning all of the party looked fresh and well and are seeking fresh worlds to conquer. During the stay in Sudbury the party was under the guidance of Prof. Coleman who has made a study of the Sudbury nickel field. With the limited time at the disposal of the party he covered every point of outstanding interest. The great pit at Creighton, the big furnaces and smelting plant at Copper Cliff, the Mond smelter at Coniston, the Murray mine and the Moose Mountain iron mine, all were seen, in the space of two days. On Sunday, Dr. Miller who is in charge of the expedition decreed a rest for those who desired it. Consequently all the party arrived in Cobalt keen to observe the silver field.

The excursion has been admirably arranged. The visitors carry their own dining car and the expedition is in every respect self-contained. The C.P.R. has put the arrangements in the hands of some of their most experienced officials and everything moves smoothly. The visitors are particularly pleased with the arrangements made for their convenience in the baggage car. Here all their trunks and grips are on shelves and easily obtainable. Underneath trains and boxes have been provided for specimens. Each member has also been provided with sample bags and maps of all kinds. Dr. Miller has seen that in each car maps of all kinds, illustrating the district have been pinned up and he and Prof. Cyril Knight and Prof. Burrows, all of the Ontario Geological Department have been marking out the chief points of interest on every available occasion.

This morning all the members were up bright and early to catch the gasoline over Cobalt Lake, the trip for the day commencing at the Little Silver vein on the Nipissing, where the original Nipissing company took out \$200,000 in the very early days of the camp. Afterwards they studied geological conditions under the guidance of Dr. Miller, as far as Diabase Mountain returning to their dinner for lunch. This afternoon the

part will be split up among various mines. The five ladies accompanying the party visited Haileybury this morning.

The language question which at one time promised to be serious, has been solved. Two thirds of the visitors have enough English to understand and be understood but those who were not conversant with the Anglo-Saxon found a common basis of conversation in German with the exception of the Italian representatives. It was surmised by the leaders of the expedition that the representatives from Quebec might find a common Latin basis with the Savants from Italy and so it proved and there is no longer any language problem; it has been solved. Owing to the International and polyglot nature of the gathering it was a bright conception to tag every man with his name. Every delegated has, in fact, his surname and initial quite legibly printed on a tag so that introductions are much facilitated. To-night the Canadian Mining Institute will give the visitors an informal reception at the Masonic Hall.

Dr. Miller will give a general sketch of the geological conditions in the camp, Mr. A. A. Cole will show some of his pictures of the most remarkable veins in the camp with the aid of the lantern, and Mr. Fraser Reid of the Coniagas, will give a short sketch on concentration. Afterwards some of the visitors will give some of their views of the camp.

That the preliminary stroll round the town before the excursion started this morning gave a favorable impression is evidenced by the remarks of Mr. Chas. McDermid, secretary of the Institution of Mining and Metallurgy, London. Mr. McDermid was here five years ago when Cobalt town was in a rather chaotic condition. He said this morning, "I am astounded at the change that has taken place in your town. I was quite prepared to see a great change in your mines but the improvement in the town is wonderful."

The list of eminent geologists, metallurgists, and mining engineers who are seeing Cobalt camp to-day has had to be considerably revised since the middle of the week. Prof. Boyer of Iowa State College, Mr. E. T. Corkill, Safety Engineer, Copper Cliff; Dr. W. H. Emmons, of the University of Minnesota; Mr. Constant Godfrey of the Hague, Netherlands; Prof. Kirkpatrick of Kingston; M. Ezequiel Ordonez, of Mexico, and Prof. Edgar T. Werry of

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Leligh University, could not come. Their places have, however, been taken up with men, who found that they were at liberty to come on the first excursion.

Leader—Willett G. Miller.

Associate Leaders: Sudbury—A. P. Coleman and T. L. Walker. Cobalt—Cyril W. Knight, and A. A. Cole. Porcupine—A. G. Burrows and Percy E. Hopkins.

Secretary—W. R. Rogers.

Assistant Secretary—Percy E. Hopkins.

Barrell, J., Professor of Geology, Yale University, New Haven, Conn., U.S.A.

Bain, H. F., Editor Mining and Scientific Press, San Francisco, Cal., U.S.A.

Burrows, A. G. Geologist, Bureau of Mines, Toronto, Ontario.

Cerulli-Irelli, Serafino, Maitre de Conférences de Paléontologie, à l'Université de Rome, Italy.

Charleton, A. G., Past-President, Institution of Mining and Metallurgy London, England.

Charleton, Mrs.

Cole, G. A. J., Director of the Geological Survey of Ireland, Dublin, Ireland.

Cole, A. A., Mining Engineer to Timiskaming and Northern Ontario Ry., Cobalt, Ontario.

Collins, W. H. Geologist, Geological Survey of Canada, Ottawa, Ontario.

Dresser, J. A., Manager Lands Department, the Algoma Central and Hudson Bay Railway Company, Sault Ste. Marie, Ontario.

Eckfeldt, H., Professor of Mining Engineering, Leligh University South Bethlehem, Pa., U.S.A.

Eckfeldt, Mrs.

Enbank, Miss Annie, Toronto, Ontario.

Forest, F. H., Professor de Geologie, College Bourget, Rigaud, Quebec.

Grabham, George Walter, Government Geologist, Khartoum, Anglo-Egyptian Sudan.

Hopkins, P. E., Geologist, Bureau of Mines, Toronto, Ontario.

Hore, R. E., Editor of the Canadian Mining Journal.

Kemp, J. F., Professor of Geology Columbia University, New York City U.S.A.

Knight, C. W., Assistant Provincial Geologist, Bureau of Mines, Toronto, Ontario.

Kitson, A. E., Imperial Institute, London, England.

Lanc, A. C., Professor of Geology, Tufts College, Boston, Mass., U.S.A.

Lindeman, E., Mines Branch, Department of Mines, Ottawa, Ontario.

Mattirolo, E., Ingenieur en chef des Mines, Rue Charles Albert 45 Torino, Italy.

McDermid, Charles, Secretary Institution of Mining and Metallurgy, London, England.

McNeill, Bedford, President Institution of Mining, and Metallurgy, London, England.

McNeill, Mrs. Bedford.

Mercini, Guiseppe, Professeur Instituto Geologico della Regia Università, Piza, Italy.

Miller, Willett, G., Provincial Geologist of Ontario, Toronto, Ontario.

Morin, Louis, Joseph, Professeur de Sciences Naturelles, Seminaire de Joliette, Joliette, Quebec.

Noisuz, Jns. Alfred, Seminaire de Joliette, Joliette, Quebec.

Mordt, Otto, F. Cairo, Greene County, New York, U.S.A.

Ransome, F. L., United States Geological Survey, Washington, D.C.

Reincke, L., Geologist, Geological Survey of Canada, Ottawa, Ontario.

Rogers, W. R., Typographer, Bureau of Mines, Toronto, Ontario.

Shultze, Hebrich, Ingenieur, Hannover, Germany.

Searls, Fred, Goldfields Nevada, U.S.A.

Simpson, W. E., Fundiconde de Los Arcos, Toluca, Mexico.

Sjogren, H. S. A., Professor Academy of Science, Stockholm, Sweden.

Szadeczky de Szadecse, Jules Royal, Hungarian University, Kolozvar, Hungary.

Tyrrell, J. B., Geologist, Toronto, Ontario.

Tyrrell, Mrs. J. B.

Walker, T. L. Professor of Mineralogy, University of Toronto, Toronto, Ontario.

Wilson M. E., Geologist, Geological Department of Mines, Ottawa, Ontario.

Wilsoo, M. E., Geologist, Geological Survey of Canada, Ottawa, Ontario.

F. A. Jordan, Supt. Moose Mountain Iron Mine.

P. Piatnizky, Kharkoff, Russia.

A. G. B. Wilbraham, M. Inst. M. of M., London, E.C.

H. B. Wallis, M. Inst. M. & M. of London, Mr. and Mrs. Kirby Thomas, New York.

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**ASTOUNDED
BY CHANGE
HERE**

**Successful Reception to
Geologists Last
Night**

A most successful reception was tendered the visiting geologists last night at the Masonic Hall by the Cobalt branch of the Canadian Mining Institute. It took the form of short papers, shorter speeches, light refreshments and a dance without which any event in Cobalt is incomplete.

In addition to the visitors there was a good number of the members of the Mining Institute present.

Mrs. E. V. Neelands, whose husband is this year chairman of the local branch, received the guests, assisted by Mrs. R. P. Rogers, and Mrs. B. Neilly. Mr. A. A. Cole exhibited with the aid of the lantern a set of pictures from his unique collection of views of the camp. A more graphic method of showing the occurrence of the narrow rich veins in the various formations it would have been impossible to obtain. Equally lucid was his exposition of the slides.

The paper of Mr. Reid has been noticed in another column. The chairman (Mr. E. V. Neelands) called the meeting together with a few words of welcome to the visitors said that if the eminent scientists who were with them today would not only tell them where the ore came from but where to go for more he could assure them that they would forever after live in the memory of the mine managers of the camp. (laughter.)

Called upon to speak for the visitors, Mr. Chas. McDermid, secretary of the Institution of Mining and Metallurgy, London, Eng., said that probably one of the reasons he was asked to speak was that he had been to the camp five years before and was therefore in a position to make comparisons. He said he was very much impressed with the importance of the Cobalt camp, not only to Canada, but to the whole world. "What I have seen today," said Mr. McDermid "has absolutely astounded me." He added laughingly that when the veins of the camp are nearing their end—which will not be in this century or the next—(laughter) they might change Cobalt into a pleasure resort for Europeans to visit.

Called upon as the representative of Ireland, Mr. G. A. J. Cole, director of the Geological Survey of Ireland, said that he was hardly competent to speak to the question since in Ireland his department had little to do with economic geology. But he could appreciate the important position the economic geologists did occupy in building up camps, towns and provinces even. He had a good word to say for Ireland. As an agricultural country it was singularly prosperous. In Ireland the housing problem had been solved for houses had been built for the peasant and he was now an independent landowner on a small scale.

To-day before the Steamer Silverland leaves for the Wright mine down Lake Timiskaming a number of members of the party will visit mines that they had no time to see yesterday.

Under the general leadership of Dr. Miller with the very able assistance of Mr. R. W. Rogers, secretary, all the arrangements have gone quite smoothly.

The C.P.R. conductor of the special train among his accomplishments, numbers that of an expert player on the bagpipes and the swelling notes of the pipes drew the last stragglers to the reception at the Masonic Hall, the conductor playing the part of the Pied Piper for the nonce.

**THREE VOLUMES ON
WORLD'S COAL SUPPLY**

Important Work Issued in Connection With Congress

IS COMPILED BY EXPERTS

Mr. G. G. S. Lindsey, K.C., of This City, Chairman of the Committee—Co-operation of All Countries Secured in the Production.

For some years the attention not only of geologists and mine-owners, but also of the general public, has been directed to the question of the coal reserves of the world. The very large increase in the consumption of coal in recent years makes this question of the world's supply of great importance to almost every country. The Eleventh International Geological Congress dealt with the iron ore reserves of the world, calling attention to the fact that, along with coal, the iron ore supply is one of the most important factors in industrial development, and to the radical importance of the relations between supply and demand in these materials to the industry of the future. The Swedish Congress published a monograph of two quarto volumes and one of maps. The twelfth session of the International Geological Congress, to be held in Toronto, therefore, decided to make coal the chief subject for discussion at that session. In order to obtain a sure basis for the discussion and to secure a profitable result the co-operation of colleagues in every country has been received, so that statistics of the amount and distribution of the world's supply of coal should be available.

Early in 1911 a committee was appointed by the Executive to apply to the Governments of all countries for information and to publish a monograph on the coal resources of the world, of which committee Mr. G. G. S. Lindsey, B.A., K.C., is Chairman. The other members are:—

- Frank D. Adams, D.Sc., F.R.S., Dean of the faculty of applied science and Logan professor of geology, McGill University, Montreal, Canada.
- R. W. Brock, M.A., F.R.S.C., director of the geological survey of Canada.
- D. B. Dowling, B.A.Sc., F.R.S.C., geologist geological survey, Ottawa, Canada.
- James McEvoy, B.A.Sc., mining engineer and geologist.
- J. B. Porter, Ph.D., D.Sc., professor of mining engineering, McGill University, Montreal.
- Charles Fargie, M.E., Montreal.

continued on next page.

Continued from page 9.

Cobalt Nugget, July 30-1913.

Globe, July 30-1913.

New Classification.

The initial difficulty was to find a universal classification of coals acceptable to the world at large, but so successfully was this accomplished that only one country raised any question as to its sufficiency. This entirely new classification will henceforth require all coals to be standardized according to it.

The work, which has been edited by D. B. Dowling, William McInnes, B.A., F.R.S.C., geological survey, Ottawa, and William W. Leach, B.A. Sc., geologist geological survey, Ottawa, is now ready. It consists of three large quarto volumes of letter press, making fourteen hundred pages and a volume of seventy maps in colors.

Each country of the world selected its leading authorities, usually experts connected with the official Government Geological Surveys or Departments of Mines, to secure material for and write its chapter. In many cases new investigations in the field were necessary, unpublished material was drawn upon, and old work revised and brought up to date. The result is a most complete and authoritative statement of the coal resources of the globe. Not only is the quantity of coal discussed, but also the amount of each kind, its mode and conditions of occurrence in each country and in each State. Even the Arctic and Antarctic regions are covered. Fifty-two countries have articles of length, fifteen are covered by short articles, nine report no resources of coal, twenty-five colonies are included in the reports of the mother lands. A chapter of about one hundred pages summarizes the individual statements and totals the resources of the world.

The work is well illustrated with figures, maps, etc., but in addition to these text illustrations there is the atlas of maps in color showing the distribution of the coal areas and the geology of the more important fields.

OLDEST SILVER MINE IN NORTH AMERICA

Visiting Geologists Quite Interested in Old Wright Property

Reduced by about a dozen of their the property. It is marked on old number A 3 excursion of the Inter-voyageur maps as the Anse a la mine national Geological Congress spent a and appears to have been known when very pleasant day on Lake Timiska-Lake Timiskaming was an almost ming from Martineau Bay to the unknown water route on the way to old Wright mine. The steamer Silver-Abitibi and Hudsons Bay. A glance land had been chartered for the at the exposure of argentiferous galyena right at the waters edge makes an of the South African war again it plain why it was so early discovered. The first voyageurs and Jesuits geologists from the station at Hail-Boston country would hear of it. A eybury to the boat. On the boat Boston company last worked it and whenever there was a favorable op- there there is a shaft down to the portunity the pipes skirled and there was a distinct Scotch flavor to the proceedings.

The boat first touched at the old Aganico mine where Dr. Miller showed a very interesting contact between the Cobalt and the Timiskaming series. The next port of call was Martineau Bay to see the granite and the next Paradis Bay to observe the quartzite. The scenery at Devils Rock was very much admired and compared with the rugged cliffs along the Saguenay.

But undoubtedly the chief point of interest was the old Wright mine, almost beyond question the oldest property worked by white men in Canada or the United States. There is an old stake near the mine bearing the date 1744 and mentioning on it the old mine as one of the boundaries of

the property. It is marked on old number A 3 excursion of the Inter-voyageur maps as the Anse a la mine and appears to have been known when very pleasant day on Lake Timiska-Lake Timiskaming was an almost unknown water route on the way to old Wright mine. The steamer Silver-Abitibi and Hudsons Bay. A glance land had been chartered for the at the exposure of argentiferous galyena right at the waters edge makes an of the South African war again it plain why it was so early discovered. The first voyageurs and Jesuits geologists from the station at Hail-Boston country would hear of it. A eybury to the boat. On the boat Boston company last worked it and whenever there was a favorable op- there there is a shaft down to the portunity the pipes skirled and there was a distinct Scotch flavor to the proceedings.

After their success at the La Rosa at Cobalt the Timmins-McMartin-Dunlap syndicate took an option on the old Wright mine and it is still in their possession, though they never worked it.

From a geological point of view it is a unique ore body and yesterday caused as much interest to the geologists as to the mining men. The ore is said to run 20 to 30 ounces in silver to the ton and the mining men of the party could not see why this, the oldest known mine worked by white men on the North American continent could not be worked at a profit.

The weather for the trip on the lake was ideal. A number of Cobalt and Haileybury ladies accompanied the party and afternoon tea was delightfully served on board the boat.

Back in Haileybury most of the members deployed back to their train while a few enthusiasts were enticed by Dr. Miller to see a rock exposure half way between Cobalt and Haileybury. The special train left Haileybury last night about nine o'clock. The first class coach containing the Kirkland Lake excursionists was picked up at Swastika and today the Hollinger and the Dome will be visited in the order named. It is also probable that a visit will be paid to the McEaney and the greater part of the time will undoubtedly be spent in the Pearl Lake section.

LANGUAGE PROBLEM INGENIOUSLY SOLVED.

Touring Metallurgists Tagged According to Nationality

COBALT'S NEW ROLE

One of the Geologists Suggested That the Northern Town Might be Changed to a Pleasure Resort for European Visitors.

(Special Despatch to The Globe.)

Cobalt, July 29.—Over to Nipissing Hill there came yesterday M. H. Lantenois, Chief Engineer of the Department of Mines for Indo-China. The journey, which commenced at Tonkin, ended yesterday on Nipissing Hill. This is but an indication of the international nature of the Congress and this particular excursion. The language question has been most ingeniously solved. Every man is tagged with his own name most legibly written. But there also flutters at his buttonhole one, two or three ribbons. If one only and red, that means that he talks English only, blue signifies that he is a French linguist, and yellow that German is no mystery to him. With these three key languages everyone is getting along. Still it is a little difficult.

A Dumb Explanation.

An Italian was left at the top of the shaft with a Canadian geologist entirely innocent of everything but Anglo-Irish. They went through the mill together, the Canadian explaining all in dumb show. The Italian delegate made him his best bow at the end of the performance, and told the Canadian in rapid-fire Latin, according to a French-Canadian, that he was everlastingly in the debt of the distinguished Senor.

There is not a Scotsman nor a real Irishman in the party. Mr. G. A. J. Cole, Director of the Geological Survey of Ireland, is merely Sassenach improved by sojourn in Ireland. Yet when the versatile C.P.R. conductor of the special train piped the members to the reception tendered them in the Masonic Hall here there was loud applause from the aliens present.

At last night's reception Mr. Chas. McDermid, Secretary of the Institution of Mining and Metallurgy, said he was astounded at the progress that had been made in the camp since he was there five years ago. "When the veins pinch out, which will not be in this century or the next," he said jocosely, "Cobalt might be changed to a pleasure resort for Europeans."

Mr. Fraser Reid of the Coniagas told the visitors on paper that the mills of the camp were treating 2,000 tons per day and producing fourteen million ounces a year.

After the reception there was a dance of all the nations before the visitors returned to their berths on the special train. To-day the main party will visit the oldest silver mine in Canada on Lake Timiskaming. A party of twelve distinguished metallurgists will go north to Kirkland Lake this afternoon, they having expressed a very keen desire to see this new telluride camp.

Cobalt Nugget, July 30-1913.



LITTLE MILL ON FOSTER-TOUGH PROPERTY, WHICH GEOLOGISTS VISITED LAST NIGHT. MILL IS NOW COMPLETE AND WORKING.

Canadian Mining Journal. Aug. 1-1913. (see other side of this paper)

THE TWELFTH INTERNATIONAL GEOLOGICAL CONGRESS

The Twelfth International Geological Congress, which is to be held in Canada this year, gives promise of being a marked success. The governments of twenty-five different countries have signified their intention of sending official delegates, and various scientific institutions in thirty-eight countries will be represented. The membership already is about 800, consisting of leading geologists and mining engineers of the whole civilized world.

The session of the Congress will be held in Toronto on August 7 to 14, inclusive, during which papers of great general geological interest will be read and dis-

On December 2, 1910, an inaugural meeting was held in Toronto. It was called at the instance of the general secretary, R. W. Brock, acting for the government as the Director of the Geological Survey. At it were present representatives of the Institutions who had invited the Congress to be present in Canada and a small executive committee was appointed with instructions to appoint such other committees as might be required as and when they were required.

Committees dealing with the following subjects were appointed: Organization, coal resources, editorials, excursions, finance, leaders of discussions, official



The Late Sir W. E. Logan
First Director, Geological Survey of Canada.

cussed. The most attractive feature, however, is the opportunity that will be afforded to visit the leading mining districts and points of greatest geological interest in the country. To this end a great number of excursions have been arranged for.

Arrangements for the Session in Canada.

The Congress visits Canada this year on the invitation of the Government of Canada, transmitted through the foreign office and through the British Ambassador in Sweden. It was supported at the Stockholm session by Dr. W. G. Miller, for the Province of Ontario, and Dr. Frank Adams, who represented on this occasion the Government of Canada.

invitations, patronage, publications, qualifications for membership, Toronto local, transportation, and a committee to appoint an assistant secretary. Some of these committees have completed their work and have been dissolved, but most of these are still active and consist of one or two members of the Executive committee with in some cases other gentlemen but in each case they report direct to the executive committee which makes itself responsible for the financial arrangements.

Preparations were made for publication of a monograph on the Coal Resources of the World to consist of 1200 pages published in three volumes accompanied by an atlas of 70 maps. The work has been accom-

continued from page 11.

(see other side of this paper)

Governments, given it a higher standing as a science, and rendered possible its increased economic application.

The country entertaining the Congress is repaid in many ways. The excursions are participated in by the more eminent geologists and mining engineers of the world, giving them a knowledge of its resources and possibilities, which they spread abroad, for they are the advisers of capital; the writers of text books and authoritative articles; and the instructors in universities and schools. Their criticisms and suggestions based upon their experience with similar problems and conditions in other parts of the world are helpful and stimulating to the home geologists and mining engineers. After leaving any country they have learned where to obtain reliable information concerning it and they follow its developments and discoveries as announced in the press and technical papers.

Character of Attendance.

Geologists from every quarter of the globe attend the Congress. The word "International" in the title was well chosen and the character of the attendance at each Congress has been remarkable for the number of different nationalities represented. As to the personnel of the members, they may be broadly classed in three divisions.

1st. Professors and teachers from the leading colleges and universities as well as the technical mining schools.

2nd. Officers of Government geological surveys or equivalent organizations.

3rd. Geologists and mining engineers in private practice.

History.

The foundation of the Congress was inspired by the collections of geological maps and sections from various regions of North and South America, as well as from many countries of Europe which were shown at the International Exhibition in Philadelphia in 1876. The advantage of such comparative study so deeply impressed visiting geologists that at the annual meeting of the American Association for the Advancement of Science held in Buffalo, August, 1876, a committee was appointed to arrange for an international congress of geologists at the 1878 Paris Exhibition.

It is interesting to note that Dr. T. Sterry Hunt, who from 1847 to 1872 was chemist and mineralogist to the Geological Survey of Canada, was Secretary of this first committee—the Comité Fondateur of 1876, and at the first session of the Congress, held in Paris in 1878, Messrs. A. R. C. Selwyn, T. Sterry Hunt and Paul de Caze were the Canadian delegates, twenty-three countries being represented.

ORGANIZATION OF THE CONGRESS

The following paragraphs are from a circular sent out to geologists in the year 1876 by D. T. Sterry Hunt and associates. It presents the aims of the men who organized the Congress.

"The activity which has prevailed in the study of geology within the past generation has given to it a great importance both from a scientific and an economic point of view, and has resulted in a large accumulation of facts and materials. Workers in different countries have, however, pursued their labours to a great extent independently of each other, and have given their results in such ways that it is often difficult to co-ordinate them. Those geologists from Europe and America who have been at the International Exhibition at Philadelphia in 1876, have found there important collections of geological maps and sections, with rocks and organic remains from various regions of North and South America, as well as from many countries of

Europe, and they have become deeply impressed with the great advantages to be gained by their comparative study. It was, moreover, evident that the bringing together of a still larger number of such collections in accordance with a previously arranged plan, could not fail to lead to important results for geological science. The International exhibition to be held at Paris in 1878 will furnish such an occasion, and it is proposed to invite to that end governmental geological surveys, learned societies and private individuals throughout the world, to send to Paris such collections as will make the geological department of that exhibition as complete as possible.

"In order to take advantage of the collections which may thus be brought together it is moreover proposed to convoke an International Geological Congress, to be held at Paris at some time during the Exhibition of 1878, and to make that Congress an occasion for considering many disputed problems in geology.



The Late Dr. T. Sterry Hunt
Secretary of the Committee of 1876

"In accordance with this plan it is proposed that the geological department of the International Exhibition of 1878 shall embrace:

"I. Collections of crystalline rocks, both crystalline schists and massive or eruptive rocks, including the so-called contact formations and the results of the local alteration of uncrystalline sediments by eruptive masses. In this connection are to be desired all examples of organic remains found in crystalline rocks, including Eozoon and related forms. These collections should moreover comprehend all rare and unusual rocks of special lithological, mineralogical and chemical interest, examples of ore-deposits and of veinstones of all kinds, with their encasing rocks. As far as possible these collections should be limited to specimens of

continued from page 12.

(see other side of this paper)



Honorary Vice-President:

**Hon. W. H. Hearst, Minister of Lands, Forests
and Mines of Ontario**

a size convenient for examination, and be accompanied with sections prepared for microscopic study. In the arrangement of all these materials regard should be had to their natural associations rather than to theoretical notions or artificial classifications, so that they may be studied not only petrographically but geognostically.

"II. Collections illustrating the fauna and the flora of the paleozoic and more recent periods, particularly of such horizons as present a more critical interest to paleontologists from the first appearance or the disappearance of important groups of organic forms. It has appeared to the committee named below that the organic remains of the Cambrian, Taconic or so-called Primordial strata merit especial attention in this connection.

"These various collections should be explained as fully as possible by labels, catalogues, monographs and maps.

"III. Collections of geological maps, and also of sections and models, especially such as serve to illustrate the laws of mountain structure. In the geological maps regard should be had to various questions which deserve the special consideration of the Congress, such as the scales best adapted for different purposes, the colours and symbols to be used, and the proper mode of representing superficial deposits conjointly with the underlying formations. A discussion of these will prepare the way for improved general geological maps of the continents.

"In pursuance of the above plan the American Association for the Advancement of Science during its annual meeting at Buffalo, under the presidency of Prof. William B. Rogers, unanimously adopted the following resolution on the 25th of August, 1876:

"Resolved, That a Committee of the Association be appointed by the chair to consider the propriety of holding an International Congress of Geologists at Paris during the International Exhibition in 1878, for the purpose of getting together comparative collections, maps and sections, and for the settling of many obscure points relating to geological classification and nomenclature. And that to this committee be added our guests, Prof. T. H. Huxley, of England; Dr. Otto Torell, of Sweden, and Dr. E. H. von Baumhauer, of the Netherlands, who shall be requested to open negotiations in Europe looking to a full representation of European geologists at the proposed Congress. The said committee to consist of Prof. William B. Rogers, Messrs. James Hall, J. W. Dawson, J. S. Newberry, T. Sterry Hunt, C. H. Hitchcock and R. Pumpelly in behalf of the Association, with the addition of Prof. T. H. Huxley, Dr. Otto Torell and Dr. E. H. von Baumhauer.

"On the same day, at a meeting of the Committee, Prof. James Hall was elected chairman, and Dr. T. Sterry Hunt, secretary. It was then resolved to prepare the present circular, to be printed in English, French and German, and distributed to geologists throughout the world, asking their co-operation in this great work of an International Geological Exhibition and an International Geological Congress to be held at Paris in 1878; the precise date of the Congress to be subsequently fixed.

"All those interested in this project are invited to communicate with any one of the following members of the Committee: Prof. T. H. Huxley, London, Eng.; Dr. Otto Torell, Stockholm, Sweden; Dr. E. H. von Baumhauer, Harlem, Holland; Dr. T. Sterry Hunt, Boston, Mass., U. S. A."
Boston, Massachusetts, Sept., 1876.



Honorary Vice-President:

**Hon. E. H. Armstrong, Commissioner of Works
and Mines of Nova Scotia**

continued from page 13. (see other side of this paper ↓)

faulted structure. The fossiliferous beds were here industriously attacked by the European and American visitors. The German geologists were especially busy with their little hammers, as may be seen in some of the accompanying photographs.



Dr. B. Weigand, Germany

Professor B. Weigand, delegate of the Oberrheinischer Geologischer Verein, Stuttgart, is the eldest of the German visitors. He is an indefatigable traveller and is noted for his custom of choosing the longest excursions. In Sweden he was one of the few who made the trip to Spitzbergen. This year he intends to be a member of the party which will go to the Ynkon. Dr. Weigand always has been much interested in the study of earthquakes and was the first to systematically record the shocks.



Chutarido Kido

Director of the Geological Institute South Manchuria Railway Company, Tokyo, Japan



Aubrey Strahan, F.R.S.

Director Geological Survey of Great Britain



P. M. Termier

Director Geological Survey of France

P. M. Termier, Director of the Geological Survey of France, has made a special study of the changes in rocks brought about by mountain building forces and has done much towards making clear Alpine geology. He is a delegate of the Service de la Carte Geologique de la France, the Societe Francaise de Mineralogie, the Ecole Polytechnique, Paris, and of the Association Amicale des Eleves de l'Ecole Nationale Supérieure des Mines, Paris.

continued from page 14. (see other side of this paper)



Faulted conglomerate bed, Levis, Quebec

Burling, L. D., Geological Survey of Canada, Ottawa.

Cadell, H. M., Grange, Linlithgow, Scotland.

Caillebotte, Jean, Paris, France.

Carruthers, R. G., H. M. Geological Survey, 33 George Square, Edinburgh, Scotland.

Clarke, John M., Dr., New York State Geological Survey, Albany, New York, U.S.A.

Cole, L. H., Department of Mines, Ottawa.

Cushing, H. P., Dr., Professor of Geology, Western University, Cleveland, Ohio, U.S.A.

Faribault, E. R., Geological Survey of Canada, Ottawa.

Gardner, S. Mc., Mining Student, Mount Vernon Colliery Co., Ltd., Glasgow, Scotland.

Goldman, M. J., Dr., Johns Hopkins University, Baltimore, U.S.A.

Gurich, Georg, Dr., Professor, Lubeckertor 22, Hamburg, Germany.

Haniel, C. A., Dr., Venusbergweg 8, Bonn a. Rh., Germany.

Hartnagel, Chris., Education Building (State Museum), Albany, U.S.A.

Harvie, R., Dr., Geological Survey of Canada, Ottawa.

Hayes, A. O., 112 Mercer Street, Princeton, New Jersey, U.S.A.

Haycock, E., Professor of Geology, Acadia College, Wolfville, Nova Scotia.

Hobson, B., Thornton, Hallamgate Road, Sheffield, England.

Holbrook, E. A., Prof., Nova Scotia Technical College, Department of Mining Engineering, Halifax, N.S.

Holtedahl, Olaf, Dr., Maitre des conferences, Universitetets mineralogiske Institut, Kristiania, Norway.

Hore, R. E., Canadian Mining Journal.

Howley, J. P., Director of the Geological Survey of Newfoundland, St. John, Newfoundland.

Hudson, J. G. S., Mines Branch, Department of Mines, Ottawa.

Hyde, J. E., School of Mining, Kingston, Ontario.

Jehu, J. T., Dr., The University, St. Andrews, Scotland.



Viewing an Exposure of Levis formations

M. B. Baker, Kingston

E. M. Kindle, Ottawa

E. O. Ulrich, U.S.A.

H. P. Cushing, U.S.A. A. C. Lawson, U.S.A.

Canadian Mining Journal. Aug. 1-1913.
continued from page 15- (see other side of this paper &)



At the Foot of Montmorency Falls

P. Zoude, Belgium and P. D. Quensel, Sweden

Mitscherlich, H. E., Bergingenieur, Parkstrasse 9, Karlsruhe, Germany.

Part, G. M., Trinity College, Cambridge, England.

Pauleke, W., Dr., Professor der Geologie an der Grossh. Badischen Technischen Hochschule Fridericiana, Karlsruhe, Baden, Germany.

Powers, S., Technology Chambers, Boston, Mass., U.S.A.

Pruvost, P., 159 rue Brule-Maison, Lille, France.

Quensel, Percy D., Dr., Lecturer in Petrography, University of Upsala, Upsala, Sweden.

Rathgen, Miss A., Argelanderstrasse 11, Bonn a. Rhein, Germany.

Raymond, Percy, Assistant Professor of Paleontology, Harvard University, Cambridge, Mass., U.S.A.

Riedel, A. J., Gausstrasse 25, Braunschweig, Germany.

Saint-Clivier, Hubert, Paris, France.



Fossil Hunters at Montmorency

Mlle M. Termier, France; W. Pauleke, Germany,
H. E. Mitscherlich, Germany



At Montmorency Falls

M. B. Baker, Kingston; Percy Raymond, Harvard, U.S.A.;
P. Zoude, Belgium; Theo. Denis, Quebec

Schuchert, C., Professor of Geology, Yale University, New Haven, Conn., U.S.A.

Strahan, A., Dr., 28 Jermyn Street, London, S. W., England.

Stolley, E., Dr., Professor, Technische Hochschule, Braunschweig, Germany.

Termier, Mlle M., 164 rue de Vaugirard, Paris XV., France.

Termier, P. M., Directeur du Service de la Carte Geologique de France, 164 rue de Vaugirard, Paris XV., France.

Tillman, N., Dr., Lemmestrasse 19, Bonn a. Rhein, Germany.

Tolmacev, I. P., Conservateur en Chef du Musee Geologique Pierre le Grand de l'Academie Imperiale des Sciences, St. Petersburg, Russia.

Twenhofel, W. H., Dr., Lawrence, Kansas, U. S. A.

Ulrich, E. O., 2421 First Street, Washington, D.C., U. S. A.



Dr. A. C. Lawson, U.S.A.

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PROGRAMME FOR THE SESSION AT TORONTO

The following programme is provisional and subject to change. The Secretary will be glad to receive suggestions. If requested by the Presidents or Secretaries, special time will be allotted for meetings during the Session of any of the International Committees.

The following sections have been suggested:

- Section 1—(a) Pre-Cambrian; (b) Economic; (c) Petrology. Mineralogy, etc.
- Section 2—Paleontology and Stratigraphy.
- Section 3—Glacial Geology and Physiography.

p.m., Ladies' Luncheon. All day, Excursion B-3, Hamilton.

Saturday, August 9th.—9 a.m. Meeting of Council. 10.00 a.m., General Meeting: Topic No. 7. 2.30-4 p.m., Section 1: Topic No. 3; Section 2: Topic No. 7 continued. 4.30 p.m., A Garden Party will be given to the members of the Congress by Mr. and Mrs. D. A. Dunlap. All day, Excursion B-5, Moraines north of Toronto. Evening, Excursions 8-6, Muskoka, and B-10, Madoc, leave.

Monday, August 11th.—9.00 a.m., Meeting of Council. 10.00 a.m., General Meeting: Proposals and con-



President, Twelfth Session

Frank D. Adams, F. R.S., Dean of the Faculty of Applied Science and Logan Professor of Geology, McGill University

Wednesday, August 6th.—8.00 p.m., Reunion and informal reception by the Toronto Local Committee. Costume de voyage. Convocation Hall, University of Toronto.

Thursday, August 7th.—10.00 a.m. Meeting of Council for organization and appointment of Bureau. 12.00 noon, Opening General Meeting, Convocation Hall. 3.00 p.m., General Meeting—Reports of International Committees of the Congress. 8.00 p.m., Popular lecture in Convocation Hall, University of Toronto.

Friday, August 8th.—9.00 a.m., Meeting of Council. 10.00 a.m., General Meeting: Topic No. 1. 2.30 p.m., Section 1: Topic No. 2; Section 2: Topic No. 6. 1.15

Continuations of Reports of International Committees. 2.30 p.m., Section 1: Topic No. 5; Section 2: Miscellaneous; Section 3: Miscellaneous. Evening, Reception by His Worship the Mayor and Aldermen of the City of Toronto at the City Hall.

Tuesday, August 12th.—Excursions only.—All day, Excursion B-1, Niagara; B-2, Don and Scarboro; B-4, Credit River.

On application being made by ten or more members, excursions will be arranged to any accessible point and leaders provided.

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Three members in Sweden, 1910

Lady R. McRobert (Miss Workman), P. D. Quensel
and W. G. Miller

Japan; J. J. Sederholm, Finland; A. Strahan, England; and others have promised to take part in the discussion or to present papers.

Topic No. 6.—To what extent was the Ice Age broken by Interglacial Periods?—Messrs. T. W. E. David, Australia; H. L. Fairchild, U.S.A.; G. W. Lamplugh, England; W. Lozinski, Austria; A. Penck, Germany; F. B. Taylor, U.S.A.; Warren Upham, U.S.A.; W. Wolff, Germany; and others have promised to take part in the discussion or to present papers.

Topic No. 7.—The Physical and Faunal Characteristics of the Paleozoic Seas, with Reference to the Value of the Recurrence of Seas in Establishing Geological Systems.—Messrs. Chas. Barrois, France; T. C. Chamberlain, U.S.A.; Chas. Schuchert, U.S.A.; C. D. Walcott, U.S.A.; and others have promised to take part in the discussion or to present papers.

Miscellaneous.—In addition to papers on the topics mentioned, contributions on other subjects of interest have been received from: Messrs. L. E. Gentil, France; C. N. Gould, U.S.A.; C. R. Keyes, U.S.A.; J. Samojloff, Russia; Bailey Willis, U.S.A.; and others.

Proposals.

The Phosphate Resources of the World.—A proposal has been received from Prof. J. Samojloff, of Moscow, Russia, suggesting the world's phosphate resources as a timely subject for the consideration of the Thirteenth International Geological Congress.

The Fractures of the Earth's Crust.—Regarding the proposal made at the Eleventh Session of the International Geological Congress by William H. Hobbs, and which was referred to the Executive Committee of the Twelfth Session, the Executive Committee will report to the Council of the Congress as follows:

“The Executive Committee regret that, owing to the demands made upon their time in connection with the preparation of the extended series of excursions arranged for the Twelfth International Geological Congress, as well as in the publication of the Monograph on the Coal Resources of the World, they have been unable to undertake the preparation of an additional Monograph dealing with the fractures of the Earth's Crust as suggested by the Eleventh Session of the International Geological Congress. The Committee would,

therefore, respectfully request that this task be transmitted to the Executive Committee of the Thirteenth International Geological Congress.”

Reports of Committees.

Reports will be presented at the Twelfth Session of the International Geological Congress from the following Committees:

1.—International Glacier Committee.—Elected in 1894 to encourage and advance studies of the size and variations of glaciers.

2.—Committee of the International Geological Map of Europe.—This committee since the Congress at Stockholm, has decided to publish a map of the world on a convenient scale, and to add to the number of the Committee by inviting representatives from non-European countries.

3.—Palaeontologia Universalis Committee.—An International Committee formed in 1900 to study the proposition of Mr. Oehlert regarding the reproduction by photographic processes of a series of type fossils.

4.—Spendiarow Prize Committee.—Charged with the award at each Session of the interest from a sum of 4,000 roubles, donated in 1897 by Mr. Spendiarow, of Russia, for the most important geological work on a subject proposed by the Committee, that has been accomplished by an individual subsequent to the last Session.

5.—Stratigraphical Lexicon Committee.—Elected to carry out the proposal of Mr. Waagen regarding the publication of a stratigraphical lexicon.



Chairman, Finance Committee

G. G. S. Lindsey, K.C.

continued from page 18. (see other side of this paper)



W. G. Miller,
Provincial Geologist of Ontario



Cyril W. Knight
Assistant Provincial Geologist, Ontario

6.—Committee on Valuation of Iron Ore Resources.
—To carry out and complete, according to a uniform method, the valuation of the world's iron ore resources, principally from an economic point of view.

7.—Committee on Institute for Study of Volcanoes.
—Elected to consider the proposal of Mr. E. Fried-

lander, regarding the establishment of an Institute for the study of volcanoes.

8.—Fossil Man Committee.—Elected to examine the proposal of Mr. N. O. Holst regarding the election of a Committee for the study of fossil man and for presenting a programme at the next Congress.



A. A. Cole,
Mining Engineer T. & N. O. Railway



A. G. Burrows
Geologist, Bureau of Mines, Ontario

Canadian Mining Journal. Aug. 1-1913.

The International Geological Congress. — The members of the Congress, who will participate in the Nova Scotian excursion, are expected to spend the 23rd, 24th and 25th of July in the neighbourhood of Sydney, Glace Bay and Sydney Mines. Extensive preparations are being made for the visit by the large coal and steel companies in this vicinity, and if the weather is propitious the occasion will no doubt be a very enjoyable one. There is a great deal to see in Cape Breton to interest both the purely scientific geologist and those interested in industrial enterprise in other parts of the world.

Toronto Globe. Aug. 1-1913.

HONORS FOR GEOLOGISTS.

Five of Them to Receive Degree From McGill.

(Canadian Press Despatch)

Montreal, July 31.—A special convocation of McGill University has been called for Saturday for the conferring of five honorary degrees on the occasion of the visit of the Congress Geologique Internationale. The delegates who are at present attending the meeting of the Congress in Toronto will spend the week-end in Montreal, where they will be received at McGill and Laval Universities. In Toronto six of the visitors were granted the honorary degree of Doctor of Laws, arrangements having been made to prevent any conflict of honors between the two universities.

Among those to receive degrees on Saturday are: Dr. Helge Backstrom, Professor of Mineralogy and Petrography in the University of Stockholm; Dr. Alfred Bergeat, Professor of Geology in the University of Konigsberg; Prof. Alfred Harker, who represents the Royal Society and the University of Cambridge; Dr. James Furman Kemp, Professor of Geology at Columbia University; and Dr. Alfred Lacroix, Professor of Mineralogy at the Paris Museum of Natural History.

Bobak Daily Nugget.
Aug. 5-1913.

GEOLOGISTS BACK

IN QUEEN CITY

MONTREAL, August 5.—To day all the members of the International Geological Congress are hastening back to Toronto to be ready for the opening of the congress on Thursday morning. On Saturday McGill University conferred Doctor of Laws degrees on Dr. Helge Backstrom, professor of Mineralogy and Petrography in the University of Stockholm; Dr. James Furman Kemp, professor of Geology in Columbia University; Prof. Alfred La Croix of the Natural History Museum of Paris; Prof. Alfred Bergeat of the University of Konigsberg and Prof. Alfred Harker, lecturer on petrology at the University of Cambridge and fellow of the Royal Society.

In the afternoon Prof. J. P. Telmachov, of St. Petersburg, who had won distinction as an Arctic explorer; Prof. W. Pauleke of Karlsruhe, Germany, noted as a mountain climber; Col. H. M. Cadell of Lullithgow, Scotland, and Dean Adams of McGill University, who were all made to go through the steps of the Indian war dance of adoption and received names before becoming full chiefs of the Caughnawaga tribe of Indians.

Yesterday the delegates were received at Laval University.

GEOLOGISTS ARE HERE FROM 45 COUNTRIES

600 Eminent Scientists, From Places as Distant as China and Uruguay.

30 LADY GEOLOGISTS

Sir Charles Fitzpatrick Will Welcome Delegates at Noon To-morrow.

Geologists and geologesses, from 45 different countries, and claiming some 20 languages for their own, are pouring into Toronto for the Twelfth International Geological Congress, which opens at the University of Toronto to-morrow. There are nearly 600 of them, all told, and they know more about glaciers and mines and fossils than any other 600 people in the world. Included in their ranks are the most famous and learned geologists in the world. Some of them are Directors of Geological surveys, others are University professors, all are authorities on some branch of their subject. Now, for the first time since the eleventh Congress at Stockholm, three years ago, they are meeting to-gether again, to discuss the discoveries made since that time, and bring themselves thoroughly up to date.

Cosmopolitan Gathering.

Among the more outstanding figures are Dr. Emil Tietze, director of the Geologische Reichsanstalt, Professor R. Zuser, the world famous expert in oils, who travels all over the world examining oil bearing rocks, and deciding which of them will yield high grade oil. Dr. Strahan, of London, En., Director of the English geological survey, and an authority on glaciers, Professor John Horne, of Edinburgh, whose book on the Scottish Highlands is a classic, J. J. Sederholm, of Helsingfors, Finland, who specializes on archaic rocks, and who is spending much time among the ancient Laurentian rocks of Canada. Professor Lacroix, a French servant who went out to Mt. Pelee after the terrible eruption in 1901 which wiped out St. Pierre, and who subsequently explored the interior of Madagascar, Dr. R. Beck, mining expert of Freiberg, Germany, Professor Tcherychew, of St. Petersburg, a former president of the congress, and a host of others, equally important in their own particular branches of geology.

To show the cosmopolitan character of the congress, there are three delegates from Japan, one from China, one from Turkey, and several from Bulgaria and Roumania.

The Learned Ladies.

Nearly 30 ladies are coming as members of the congress. Some of them have reputations as geologists that many of the men might be proud of. There is Mlle. Elisabeth Jeremine, associate professor of geology in the women's college of St. Petersburg, Miss F. Bascom, who occupies a like position at Bryn Mawr; Mrs. Raisin, of London, Eng., and several more women professors. Especially notable is Lady McRobert, who is the daughter of the Workmans, who gained a reputation by their discoveries in climbing the Himalayas and the Andes. Also there is Mrs. Quesnel, a noted zoologist, who is such a firm believer in hygienic principles that she has never been kissed.

To look after the comfort of these hundreds of delegates, elaborate arrangements have been made by the local committee, and by Mr. W. S. Lecky of Ottawa, secretary. The members register at the West Hall in the main building of the University, and enroll for discussion groups and excursions. Then they are taken in charge by red-coated public school cadets, picked from the schools of the city, and shown to their quarters in the University residences, which have been converted to their use. Each member is given a map of the city with the points of interest marked in red.

Branch Bank For Them.

A branch of the Royal Bank has been fitted up in the West Hall to facilitate their financial business. Stenographers speaking French and German are provided. The ladies are being looked after by Mme. Hoffman, of Paris, who speaks English, French, and German fluently. A rest room, lounges and writing tables, has been fitted up. Everything possible has been done to secure the comfort and convenience of everybody.

The congress opens officially to-morrow, when Sir Charles Fitzpatrick, representing the Duke of Connaught, will bid the members welcome at noon, in the University Convocation Hall. At 1 o'clock in the afternoon, the congress will get down to business and start discussing the monumental report on the coal supply of the world, which the Canadian Geological Survey, with the co-operation of geologists throughout the world, has been compiling for the past three years. The report fills three bulky volumes, and the coal deposits in all countries of the world are dealt with exhaustively.

Their Diet.

After to-morrow the congress will meet in three sections, one discussing Glacial Geology, another Palaeontology ("Fossils"), and a third Pre-Cambrian, Economy, and Petrology and Mineralogy. Six other topics besides coal will be discussed. They include: Differentiation in Igneous Magmas, the Influence of Depth on the character of Metalliferous Deposits, the origin and extent of the Pre-Cambrian Sedimentaries, the Subdivisions, Correlation, and Terminology of the Pre-Cambrian, the extent of the interruption of the Ice Age by Inter-Glacial Periods, and the Physical and Faunal Characteristics of the Palaeozoic Seas, with reference to the value of the recurrence of seas in establishing geological systems.

Globe - Aug. 6 - 1913.

Mail & Empire. Aug. 7 - 1913.

World - Aug. 7 - 1913.

CANADA'S WELCOME TO GREAT CONGRESS

**Sir Charles Fitzpatrick to
Extend Greeting to the
Distinguished Geologists
From Many Countries
Who Meet in Toronto
This Week**

To-morrow at noon in the Convocation Hall of the University of Toronto, Sir Charles Fitzpatrick, Administrator and Chief Justice of Canada, will, on behalf of the Dominion Government, welcome the delegates of the International Geological Congress who are meeting in the city for their twelfth session. The delegates to the Congress are a strenuous lot of people. At three o'clock there will be presented to the gathering the famous monograph upon the "Coal Resources of the World," and the work of the members will immediately commence in earnest.

Preparations to Entertain.

The scene at the University presages something of the activity that will reign within the walls when the delegates meet on Thursday. The West Hall is already seething with life, and at the heart of it all is the main-spring, Mr. W. Stanley Lecky, the Secretary, whose remarkable executive ability was much in evidence yesterday. He knows everything and where it is. Nearly five hundred delegates have been allotted to Annesley Hall, South Hall, the University residences, Wycliffe College, Knox College, Queen's Hall, and Queen's Hall Annex. As the delegates enter the West Hall they register their names and immediately a cadet boy in uniform appears to escort the visitor to his place of residence. Close by are offices which will supply the visitor with any information he desires, a postoffice, messenger service, telephones stenographers who can type in three languages, French, German and English, and even a bank will establish a branch there, the Royal Bank of Canada, with Mr. Baine in charge, being open for business.

The East Hall will be the rendezvous of many for a quiet chat and smoke. Lounges and commodious chairs are scattered over the hall and in one corner is a display of maps and charts which will serve to illustrate the mining industries and mineral resources of Canada. The bureau is in charge of Mr. J. McLeich of Ottawa. A comprehensive display is shown here, the work being a co-operative one in which the Bureau of Mines, the Geological Survey of Canada, Ontario Bureau of Mines, British Columbia, Quebec, Nova Scotia and Alberta take part.



SIR CHARLES FITZPATRICK,
Who will officially welcome the visiting
Geologists.

Work for the Ladies.

The ladies are very much in evidence at the Congress, not merely for the social side, but to a great extent in the academical sense. The ladies have a room beyond the East Hall where man will have to knock and inquire at the door if he may enter. When he is allowed he will find himself in a fairy bower, for the ladies have transformed the room with flowers and all the things which make woman's realm charming. Here men will be invited to partake of afternoon tea. On Friday the ladies are giving a lunch at the Parliament Buildings. The Secretary of the Ladies' Restaurant is able to speak in several languages, so that strangers will not feel altogether lost in a strange land.

Mail & Empire. Aug. 7 - 1913.

Party of Geologists Visits the Royal City

Delegates to Congress Study Palaeontology of West Ontario.

Special to The Mail and Empire.

Guelph, Aug. 6.—Eighteen delegates to the International Geological Congress, which meets to-morrow in Toronto, paid Guelph a visit to-day. The party is studying the palaeontology of the Onedaga, Guelph and Hamilton formations in Western Ontario. The leader of the excursion is Dr. W. A. Parks, of the University of Toronto.

During the morning they visited Kennedy's Quarry and the prison farm quarry, did some collecting of fossils, and studied the Niagara-Guelph transition, after which they motored back to the city via the Ontario Agricultural College. At noon they were entertained by the city at the Wellington Hotel and welcomed by the Mayor. The visitors left in motor cars in the afternoon for Hespeler and Galt.

Congress Delegates Will be Welcomed

Sir Charles Fitzpatrick to Address
Geologists in Behalf of Government.

Sir Charles Fitzpatrick, Administrator and Chief Justice of Canada, will welcome the delegates to the 12th International Geological Congress, which goes into session to-day at the University Convocation Hall, in behalf of the Dominion Government. Acting Mayor Church will extend the city's welcome to the congress.

Secretary W. Stanley Lecky has been busily engaged in making preparations for the event for several days, and at 3 o'clock this afternoon the work will be started in earnest with the presentation of the famous monograph on "The Coal Resources of the World."

Nearly five hundred delegates have been allotted quarters in Annesley Hall, the university residences, Wycliffe College, Queen's Hall and Queen's Hall Annex. As the delegates enter the west hall they will register their names, and immediately a boy in uniform appears to escort the visitor to his place of residence. Close by are offices that will supply the visitor with such information he desires, a post-office, messenger service, telephones, stenographers, who can type in three languages—English, French and German, and a branch bank.

There will be a comprehensive display of the mineral products of Ontario and other provinces of Canada. The ladies are giving a luncheon at the Parliament Buildings on Friday.

World - Aug. 7 - 1913.

SIX HUNDRED HERE FOR BIG CONGRESS

International Geological Convention Opens Today in
Queen's Park.

"BY MIND AND MALLET"

Object of Gathering Is to Enlarge
Human Knowledge
Regarding Mother Earth.

With much shaking of hands and ultra-scholarly shop talk, the 12th International Geological Congress was informally opened last night in the University College building, Queen's Park. Over 600 members arrived in Toronto during the day and were directed to rooms where they may find lodging for the next week. The congress will be opened officially today noon, when Sir Charles Fitzpatrick, chief justice of Canada, welcomes the delegates and members at a reception in convocation hall.

Rarely does the quiet University College building house such a bustle as was prevalent there yesterday. Even the "Lit" elections demand the use of only one language, but more than 20 are in use at this congress of geologists from all countries of the world. Twenty-three languages, to be exact, and that total does not include the most unintelligible of them all—the language of geology. French is the official tongue, and the letter paper of the congress bears its name in that language, but the majority of the business will be transacted thru the medium of English.

"Mente et malleo," which means "by mind and by mallet," is the motto of the congress, which aims thru meetings, committees, publications, excursions and prizes to enlarge the field of human knowledge concerning the earth from both a scientific and commercial viewpoint. The last congress was held in Sweden in 1910, and accomplished the preparation of an exhaustive report on the "Iron Ore Resources of the World," as well as a volume of papers on "Changes of Climate Since the Maximum of the Last Period of Glaciation." It meets in Canada this year at the invitation of the Dominion and Ontario Governments, the Canadian Mining Institute, and the Royal Society of Canada.

Complete Office Staff.

A complete office staff from the geological survey department at Ottawa, is established in west hall, a large reception and lecture room. R. W. Brock, F.R.S.C., who is general secretary of the congress, is in charge of arrangements.

As each member or delegate arrives at the headquarters he is provided with a badge bearing the name and a number, as the number of different nationalities represented will make it very hard to distinguish the visitors one from another.

Following the reception at noon today new officers will be elected to replace the Swedish officers appointed in 1910. At 3 o'clock the international committees will report and a popular lecture will be delivered in the evening in convocation hall, by M. De Margerie of Paris, on the "Geological Map of the World."

World's Coal Resources.

The most important business of the present congress will be the discussion of a monograph on the coal resources of the world, which has been in preparation for two and a half years by the executive committee. Information has been provided by government officials and geological and mining engineers thruout the world. The monograph, when published, will fill three volumes and an atlas.

Excursions will be run daily to points near Toronto possessing especial interest for geologists. Garden parties and luncheons will be of almost daily occurrence, and on Monday evening the congress will be received at the city hall by Mayor Hocken and the city council.

The congress will close on Thursday, Aug. 14, with a garden party, when the University of Toronto will act in the capacity of host. This will be preceded by a special convocation, at which honorary degrees will be conferred.

Toronto Globe - Aug 7 - 1913.

DELEGATES TO THE GEOLOGICAL CONGRESS

Toronto will be besieged with men of science from some forty-five countries to-day, when the International Geological Congress opens at Convocation Hall. The leading figures in the geological world will be present and the proceedings will be of supreme importance and deep interest. The excursions so far have proved of the greatest value, and the party which toured the Maritime Provinces and Quebec had an engaging time at Levis, when a discussion took place over the anticline which was examined there. So earnest was the discussion and so interesting that the guides had to drag the visitors away almost by force, and it was only when a promise was made that the spot would be visited again that the delegates would be appeased. This formation at Levis will no doubt crop up at the Congress and will be a source of much discussion.

The following are the members of the Congress and the countries from which they come, and, with a few exceptions, they will all be present:—

Anglo-Egyptian Sudan.

G. B. Grahham.

Argentino Republic.

H. G. Backlund, C. A. Gallarce, D. A. Gallardo, E. M. Hermitte, J. Keldel, W. Mohring.

Australia.

R. A. Farquharson, Sir S. Fleming, C. F. Heathcote, A. G. Matland, E. C. Playford, J. T. Wilson.

Austria-Hungary.

T. V. Danes, C. Diener, B. Grannig, A. Grund, C. Illawatsch, V. de Lozinski, J. Niedzwiedzki, J. Oppenheimer, J. Perner, K. Redlich, E. Romer, R. Sieger, F. Slavik, L. Szajnoch, W. K. Teissyre, R. Zuber, M. Haltenberger, L. Lozzy de Lozzy, F. Schafarik, J. Szadeczky de Szadecseu.

Belgium.

M. Bodart, L. E. de Buggenouts, R. Cambier, J. Cornet, H. de Dorlodot, P. F. Fourmarier, H. Krusemann, L. C. A. Legrand, A. Lemonnier, M. Lerche, M. Lohest, J. A. F. L. Morel, M. Murlon, G. T. Paquet, A. Renier, P. Zoude.

British Isles.

R. J. Anderson, E. M. Anderson, F. E. Armstrong, G. H. Ashwin, J. Ashworth, Sir A. F. Baker, J. Barrowman, E. A. Bather, L. L. Belinfante, W. H. Bell, H. Boyd-Wallis, H. L. Bowman, H. M. Cadell, R. G. Carruthers, A. G. Charlton, C. T. Clough, G. A. J. Cole, R. D. Commons, Miss K. M. Crosse, W. H. Davis, J. Dennison, C. H. Dinham, J. Drugman, G. L. Dunn, J. W. Evans, Wm. G. Fearnsides, C. W. Fennell, S. McC. Gardner, J. W. Gregory, F. W. Harbord, A. Harker, J. A. L. Henderson, Robert S. Herries, Mrs. R. S. Herries, B. Hobson, J. Horne, M. Huril, J. McG. Hurll, H. Jeans, T. J. Jehu, Miss M. S. Johnston, G. H. Kefer, C. Lapworth, D. A. Louis, H. Louis, A. M. Luttman-Johnson, M. Maclaren, H. Marshall, Sir H. A. Miers, R. B. Murray, C. McDermid, P. McIntyre, Bedford McNeill, Mrs. McNeill, T. C. Nicholas, G. M. Part, B. N. Peach, Count G. N. Plunkett, J. S. Pryor, Sir A. McRobert, Lady A. McRobert, Miss C. A. Raisin, F. H. C. Reed, S. H. Reynolds, W. Schofield, T. E. Sibly, W. J. Sollas, A. Strahan, C. W. Thrington, E. W. Turnbridge, S. Vivian, A. H. Whalley, A. H. Williams, J. M. Wordle.

British West Africa.

A. E. Kitson.

British West Indies.

J. Cadman.

Bulgaria.

G. Bontchew L. Vankow.

Canada.

F. D. Adams, Mrs. F. D. Adams, J. A. Allan, C. C. Ambrey, H. M. Aml, F. Arnoldi, J. W. Astley, F. R. Aufhammer, L. W. Bailey, M. B. Baker, J. A. Bancroft, E. W. Banting, A. E. Barlow, W. A. Bell, Leon Benoit, M. Borkowitz, W. H. Boyd, H. Bradley, W. Brainerd, D. A. Brebner, R. W. Brock, A. H. Brown, J. S. Brunton, G. L. Burland, L. D. Burling, P. Burns, A. G. Burrows, D. D. Cairnes, A. Camirand, C. Camsell, T. Cantley, C. T. Cartwright, R. E. Chambers, J. Charbonnier, P. P. Choquette, C. H. Clapp, J. M. Clark, A. A. Cole, L. H. Cole, A. P. Coleman, E. A. Collins, W. H. Collins, E. T. Corkill, E. Coste, J. H. Cote, J. L. Coulson, P. Cox, J. M. Crnlekshank, T. C. Denis, E. Deville, W. J. Dick, A. Dickson, D. B. Dowling, J. A. Dresser, C. W. Drysdale, S. Dufault, A. O. Dufresne, P. E. Ludieux, Rev. P. Dupaigne, F. C. Dyer, H. V. Ellsworth, Miss A. Enbank, R. D. Falconer, E. R. Fairbault, J. H. Faill, B. E. Fernow, W. F. Ferrier, Mrs. W. F. Ferrier, O. S. Finlay, T. J. Flynn, P. Fontanel, D. L. H. Forbes, F. X. Forest, J. E. Fraser, H. Frechette, A. J. Galbraith, C. Galloway, Th. W. Gibson, W. L. Goodwin, J. M. Gordon, R. P. D. Graham, G. A. Guess, Mrs. G. A. Guess, Abbe R. Guimont, John G. Gwillim, B. Haanel, Eugene Haanel, A. Hardy, R. Harvie, H. E. T. Hautain, A. M. Hay, E. Haycock, Hon. W. H. Hearst, R. R. Hedley, C. H. Heys, E. A. Holbrook, P. E. Hopkins, C. D. Howe, Abbe V. A. Huard, J. E. Hyde, E. D. Ingall, G. Jarvis, W. A. Johnston, R. A. A. Johnston, J. Keele, Mr. Kennedy, H. L. Kerr, D. E. Keys, E. M. Kiddle, S. F. Kirkpatrick, C. W. Knight, Father A. LaJeunesse, R. B. Lamb, H. Mortimer-Lamb, L. M. Lambe, W. W. Leach, W. S. Leaky, O. E. LeRoy, F. C. Loring, G. H. Ling, E. Lindeman, G. G. S. Lindsey, A. B. Macallum, W. T. MacClement, J. D. Mackenzie, A. S. Mackenzie, G. C. Mackenzie, A. MacLean, A. Malliot, G. S. Malloch, G. F. Matthew, R. McConnell, R. G. McConnell, J. McEvoy, Mrs. J. McEvoy, Rev. J. McInire, W. McInnes, D. S. McIntosh, J. McLeish, J. C. McLennan, J. G. McMillan, J. P. McMurrich, W. H. McNaughton, W. K. McNeill, Rev. H. McPherson, L. J. Morin, G. F. Morrison, A. Mosco, Vic. J. C. Murray, T. Mullens, W. Nicol, J. A. Noiseux, M. Nordegg, J. Obalski, N. J. Ogilvie, W. A. Parks, A. L. Parsons, J. Patterson, E. Poltovin, H. M. Porteous, J. B. Porter, M. E. Purcell, P. W. Racey, L. A. Ray, L. Reincke, C. Reinhardt, W. F. Robertson, W. R. Rogers, B. Rose, J. G. Ross, H. Y. Russell, Hugh S. de Schmid, S. J. Schofield, O. N. Scott, Wm. Scott, R. F. Segsworth, C. O. Senecal, F. H. Sexton, S. Smith, F. B. Smith, L. Sohier, A. Stansfield, J. Stansfield, J. T. Stirling, W. J. Sutton, J. C. Sutherland, T. F. Sutherland, A. J. Tonge, Ellis Thomson, E. W. Thomson, R. Topley, H. Tory, W. B. Tyndall, J. B. Tyrrell, Mrs. J. B. Tyrrell, J. H. Valliquette, H. Waern, T. L. Walker, R. C. Wallace, J. C. Watson, E. B. Webster, K. Weiss, S. W. Werner, F. F. Wesbrook, J. White, M. Y. Williams, J. P. Williams, T. B. Williams, A. B. Willmott, Miss A. E. Wilson, M. E. Wilson, W. J. Wilson, A. W. G. Wilson, E. R. Wood, W. J. Wright, G. A. Young, H. G. Young.

Chile.

E. Maier.

China.

W. Broad, Kwong Yung Kwang, O. Mamet.

Colombia.

Timothy Mullens.

Denmark.

O. B. Boggild, N. Madsen, E. M. Norregaard.

Egypt.

W. F. Hume.

France.

M. M. Allorge, P. C. d'Almeida, C. Barrois, R. Bell, J. P. G. Bergeron, P. C. E. Bertrand, L. Bertrand, A. Bigot, A. Briquet, J. Caillebotte, L. Carez, Madame R. Carez, L. Cayeux, H. Saint-Clavier, G. Delapine, A. Deline, E. Fallot, L. Fevre, L. E. Gentil, G. R. Gontand, A. de Gramont, J. Hermann, A. Hermann, M. Kilian, A. Lacroix, Mmc. A. Lacroix, P. Lemoine, P. C. Lory, M. Lyon, E. de Margerie, Mmc. E. de Margerie, L. Meunier, L. Michalon, H. Montaudon, P. Nicou, R. Nickles, D. Oehlert, A. Offret, H. de Peyerimhoff, P. Pruvost, L. Raveneau, A. Riche, C. Rodrigues-Ely, P. M. Termier, Mlle. M. M. Termier, A. Thevenin, M. Sangrahn.

Germany.

L. von Ammon, K. Andrec, H. Arlt, H. Arndt, P. Bamberg, R. Bartling, R. Beck, M. Belowsky, E. W. Benecke, A. Bergeat, W. A. Bergt, K. Boden, H. E. Boeke, H. E. Boeker, F. Broili, A. Dannenberg, P. Dienst, K. E. Dittman, E. Esch, H. Fischer, C. Gaebert, Fran C. Gaebert, B. Gossner, A. Greim, F. von Grote, G. Gurich, H. Hamm, A. C. Hanf, F. Heimbrodt, F. Heise, G. Holste, F. Imhoff, E. Kayser, G. Klemm, F. Klockmann, J. Koenigsberger, P. G. Krause, P. J. Krusch, P. Kukuk, R. Lachmann, R. Lepsius, H. Lotz, H. F. P. Luck, A. Maceo, S. G. Martins, G. Merzbacher, R. Michael, L. Milch, H. E. Mitscherlich, H. Mueller, K. O. Oebeke, W. Panleke, A. Penck, K. Pletsch, F. Plieninger, J. F. Pompeckj, Fr. A. D. Rathgen, A. J. Riedel, C. H. F. Rosenbusch, A. Rothpletz, R. Scheibel, A. Schenck, W. Schilling, E. Schnass, H. C. F. Schulze, H. H. von Scotti, W. von Seiditz, G. Selgmann, M. Semper, G. Steinmann, H. Stille, E. Stolley, O. Stutzer, N. Tilmann, C. Uhlig, O. Vorberg, J. Walther, M. Weber, M. Weg, B. Weigand, E. Weise, O. A. Weiter, E. A. Wepfer, O. Wickens, T. F. W. Wolff, L. Wolff, J. Wysogorski, E. Zimmerman.

Greece.

C. A. Ktenas, P. Negriz, T. Skoufos.

Guatemala.

G. N. Morang.

Hawaiian Islands.

C. H. Hitchcock.

India.

L. L. Fermor, Sir Thomas Holland, E. W. Vredenburg.

Indo-China.

J. Deprat, H. Lantenois.

Italy.

L. Baldacci, R. W. Brock, G. Capellini, S. Cerulli-Irelli, C. Crema, G. Dainelli, H. Dervieux, I. Friedlaender, A. Grimaldi, P. Marengo, E. Mattiolo, R. Mell, G. Merclai, V. Novaresse, G. Angelis d'Ossat, A. Pelloux, G. Platania, A. Portis, P. Vinassa de Regny, F. Sacco, E. Sanna, C. Segre, C. de Stefani, C. Wright.

Japan.

T. Hiki, S. Ichikawa, R. Katayama, M. Inonye, H. Yabe, S. Kozu.

Manchuria.

C. Kido.

Mexico.

E. Agermann, C. Burckhardt, C. Castro, F. Flores, H. W. Hixon, H. Larios, E. Ordóñez, T. Paredes, R. M. Raymond, W. E. Simpson, F. Urbina.

Netherlands.

E. C. Abendanon, C. Godfrey, A. Gruterink, G. A. H. Molengraaff, A. Stoop.

Netherlands India.

P. F. Hubrecht.

Newfoundland.

J. P. Howley.

New Zealand.

J. M. Bell, P. Marshall, R. Speight.

Norway.

O. Andersen, S. Foslie, O. Holtedahl.

Peru.

C. I. Lisson.

Philippine Islands.

F. A. Dalburg.

Portugal.

A. Ferraz de Carvalho, F. F. Roquette.

Roumania.

L. Mrazec, G. Murgoei.

Finland.

A. Alexien, W. Archinow, C. Bogdanovitch, N. N. Bogolubow, A. Borissiak, T. Fegroeus, A. S. Guinsberg, Mlle E. Jeremine, N. Karakasch, B. Karandenff, F. Loewison-Lessing, W. Loewison-Lessing, L. I. Lontouguine, M. Luboschinsky, J. Makerov, W. Obroutcheff, A. P. Pavlow, A. W. Pavlow, P. P. Platinsky, N. Pogrebov, P. Pravoslavoff, A. Riabinine, D. Rudnev, J. W. Samojloff, W. Smirnof, P. Soustchinsky, P. Stepanow, M. Stratanovitch, I. N. Strigeoff, M. Tchernichew, I. P. Tolmantchew, W. Vernadsky, C. Viscont.

Spain.

P. Fahrega, A. Marin y Bertran de Lis, E. Dupuy de Lome, D. L. de Adaro y Magro.

Sweden.

H. Backstrom, L. E. T. Dahlblom, E. W. Dahlgren, Baron G. de Geer, P. Geijer, A. Hadding, A. G. Hogbom, N. O. Holst, K. F. Johansson, P. D. Quensel, Mrs. P. D. Quensel, H. S. A. Sjogren, C. J. P. Skottsberg, J. M. Sobral, A. H. Westergard, A. Wilbraham.

Switzerland.

H. Brockmann-Jerosch, C. L. Dnpare, T. Fruh, U. Grubenuan, H. L. Rollier, H. Schardt, C. Schmidt.

Tunis.

P. Weiss.

Turkey.

L. Dominian.

Union of South Africa.

A. L. Hall, E. T. Mellor, S. Nettleton, E. R. Schoch, H. W. Smyth, R. S. G. Stokes.

The United States.

R. C. Allan, O. Anderson, M. Arcowski, W. W. Atwood, H. F. Bain, P. L. Barker, J. Barrell, W. L. Barrows, Miss F. Bascom, Wm. D. Bayley, G. F. Becker, Ch. P. Berkey, S. W. Beyer, W. H. Bixby, D. Bodine, N. L. Bowen, A. C. Boyle, J. C. Branner, A. H. Brooks, S. C. Browne, H. C. Bryant, W. H. Bucher, H. Buehler, L. C. Butler, M. R. Campbell, G. L. Cannon, E. C. Case, Mrs. E. C. Case, T. C. Chamberlin, H. M. Chance, R. H. Chapman, F. G. Clapp, W. B. Clark, J. M. Clarke, Mrs. J. M. Clarke, H. F. Cleland, F. L. Clerc, C. R. Corning, A. R. Crook, W. O. Crosby, W. Cross, H. P. Cushing, A. Day, R. A. Daly, J. Daniels, W. M. Davis, A. L. Day, H. C. Deming, H. M. Doherty, J. Douglas, E. T. Dumhile, H. N. Eavenson, H. Eckfeldt, B. K. Emerson, W. H. Emmons, Miss M. Ewald, H. L. Fairchild, N. M. Fennerman, C. N. Fenner, Miss E. F. Fisher, A. C. Gill, M. J. Goldman, Miss W. Goldring, J. W. Goldthwait, C. E. Gordon, C. N. Bould, U. S. Grant, F. P. Gulliver, A. Hague, Ch. Hartnagel, Miss L. Hatch, A. O. Hayes, Miss A. Heine, R. R. Hice, T. McD. Hillis, W. H. Hobbs, R. Holden, C. Vey Holman, T. C. Hopkins, R. E. Hore, R. F. Van Horn, E. O. Hovey, E. Howe, J. D. Inrd, J. P. Iddings, W. R. Ingalls, G. van Ingen, E. V. d'Inwilliers, J. D. Irving, H. G. Ives, J. F. B. Ives, C. Jacobs, G. F. Kay, A. Keith, J. F. Kemp, Mrs. J. F. Kemp, Ch. Keyes, E. H. Kraus, H. B. Kummel, G. F. Kunz, A. C. Lane, Mrs. A. C. Lane, A. C. Lawson, J. H. Lees, H. Leighton, C. K. Leith, A. G. Leonard, F. Leverett, W. Lindgren, S. J. Lloyd, G. D. Loderback, A. F. Lucas, R. S. Lull, D. R. MacIver, M. Manson, L. Martin, E. B. Matthews, W. W. Mein, G. P. Merrill, B. LeRoy Miller, A. M. Miller, E. S. Moore, W. Neal, R. van Asdale Norris, Miss I. H. Ogilvie, H. F. Osborn, L. O. Packard, S. Paige, C. Palache, H. B. Patton, F. B. Peck, R. A. F. Penrose, G. H. Perkins, P. Pfening, O. F. Pfordte, A. H. Phillips, L. Pirsou, S. Powers, L. M. Prindle, C. S. Prosser, W. F. Prouty, F. L. Ransome, P. E. Raymond, H. F. Reid, W. N. Rice, J. W. Richards, C. H. Richardson, P. E. Raymond, H. F. Reid, H. Ries, J. G. Rothermel, C. Schuchert, W. B. Scott, F. Searis,

Toronto Globe. Aug. 7-1913.

NEVER KISSED? ABSURD! SAYS MRS. A. QUENSEL

*Charming Lady From Sweden
Laughs Over the Reports
That She Belongs to
the Continental Anti-kissing
League — Attending
Geological Congress*

We had read that Dr. Quensel and Mrs. Quensel of the University of Upsala, Sweden, who are in attendance at the International Geological Congress here, were strict adherents to the rules of the Continental Anti-kissing League, and that they had never kissed one another nor anyone else. When we asked for Mrs. Quensel at the University yesterday afternoon, and were told, "Why, I don't know where she is, but there is her husband," we glanced about us, selected from the group of busy men a cadaverous-looking individual who looked as though his wife might never kiss him, and said:

"Ah—yes, I see—that gentleman!" Our feminine intuition would have told us instantly that he was the one!

"Oh, no, no," corrected our informant. "The tall one."

"Oh!" He was tall, indeed, and extremely good-looking, and we began to disbelieve. When he began to speak to us, in delightful English, with just enough foreign accent to add charm, our doubts doubled. But when we had taken his advice, hied us to Annesley Hall and beheld Mrs. Quensel, we knew the story was untrue.

"Oh, those absurd stories," she laughed; "there isn't one word of truth in them, not one."

"How dreadful!" we sympathized. "Oh, no, not dreadful," this loveliest lady replied, "only funny."

"But however did they get such a story?" we wondered.

"I cannot imagine," with a shake of the head. "It isn't as though there were one atom of truth in it. I haven't even spoken to a reporter before, excepting one German in New York, to whom I said only a few words because I could not escape him. But that sort of thing—oh, it is absurd. Some people say, 'Why do you not deny it?' But what is the use? I say, let them have their fun; it really doesn't matter."

What Mrs. Annie T. Quensel really is is a very beautiful and charming young zoologist from the University of Upsala, where her husband is professor of zoology.

"I am only here on my husband's account," she explained. "I just came to-day, but he has been here since June, preparing for the Congress."

POLLY PEELE.

Rev. J. A. Shannon, W. H. Sherzer, W. J. Sinclair, J. Singewald, E. A. Smith, G. O. Smith, W. D. Smith, J. G. Smock, C. H. Smyth, J. W. Spencer, C. R. Stauffer, J. J. Stevenson, R. Stevenson, H. H. Stock, J. H. Stoller, O. Sussman, Miss M. Talbot, F. B. Taylor, S. A. Taylor, E. Teller, K. Thomas, C. F. Tolman, W. H. Twenhofel, R. D. Tyler, J. A. Udden, W. L. Uglow, W. Upham, T. W. Vaughan, S. D. Walcott, Y. T. Wang, T. L. Watson, W. H. Weed, C. M. Weld, E. T. Wherry, D. White, I. C. White, E. Wigglesworth, E. H. Williams, H. S. Williams, A. N. Winchell, N. H. Winchell, H. V. Winchell, F. W. de Wolf, J. E. Wolff, J. E. Woodman, J. B. Woodworth, F. E. Wright, G. F. Wright.

Venezuela.

C. D. Lecuna.

Women Geologists in Toronto

A busy place was the main building of University of Toronto yesterday and one centre of activity was the little office adjoining the ladies' reading room in the east hall, for here Madame Hoffmann, versed in five languages, was busy making ready for the fifty ladies, from many different lands, who are now in the city for the International Geological Congress—not all of these are geologists but those who are not are at least vastly interested in the work of their geologist husbands.

Miss Anna Rathgen from Germany is a geologist herself and a pupil of Professor Steinman; then there is Lady McKobert, daughter of Dr. and Mrs. Workman, Madame Lacroix of Paris, particularly engrossed in her husband's lifework, Mrs. Fermer from India, Miss F. Baseon, Professor of Geology at Bryn Mawr, and Miss Hatch and Miss Marina Ewald, also of Bryn Mawr.

Madame Hoffmann's desk overflows with letters and circulars, papers of pins, hand-painted place cards and what not and, red coated public school cadets dart in and out at her behest for many preparations must be made so that the visiting ladies will suffer no inconvenience among strange people and strange tongues, and that the entertainments planned may be enjoyed to the fullest extent.

Miss Helena Coleman is Chairman of the local committee of ladies, among whom are Mrs. McEvoy, Mrs. J. B. Tyrrell, Mrs. Parks and Mrs. Frank Adams. This committee has sent out invitations to a luncheon for the ladies connected with the Congress, in the Speaker's rooms at the Parliament Buildings on Friday at half-past one. Tea will also be served in the university quadrangle this afternoon, Saturday, Monday and Wednesday. On Saturday also Mr. and Mrs. D. A. Dunlap are giving a garden party in honor of the visitors.

TWELFTH GEOLOGICAL CONGRESS.

Toronto is honored by the presence of men from all parts of the world distinguished in fields of geological research. The Congress which opens to-day will be the twelfth that has been organized with worldwide scope, and will further enlarge interest in geological research while helping toward the systematizing of knowledge already gained. It is only within recent years that the accumulation of geologic evidence has completely and in a large measure unconsciously changed the thought of the world. Every record and disclosure is now accepted in the light of practical speculation. Whether it be the footprint of an extinct bird in the rock, the petrified remains of an insect, or the preserved vination of a leaf, the fact is duly accepted that these lived, moved, or grew, and that the conditions essential to their life must have existed. The baffling record of time is freely accepted, as are evidences of alternating ages of ice and of warmth.

Each new piece of evidence helps to unlock Nature's carefully-guarded secrets. With the great disclosures of enthusiastic research and the new expanse of human knowledge we still humbly recognize the fact that only the fringe has been touched and the chief secrets of the world are yet to be revealed. In that humbleness our scientists preserve an open mind, prepared to accept new evidence at all times, and to relinquish any conviction or theory that is out of harmony with later disclosures.

The city fully appreciates the service rendered the world by the men who read the record of the rocks. They have done and are doing much to enlarge the human mind, to broaden the human outlook, to increase human knowledge, and to discover means of supplying important human needs. Their services in the cause of human culture and in the supplying of material requisites are fittingly acknowledged by the city on the occasion of this Congress and by the world at large in an appreciative regard.

Toronto Globe. Aug. 7. 1913.

MEN OF MANY NATIONS IN A BIG BROTHERHOOD

Remarkable Scenes at Congress of Geologists Last Night

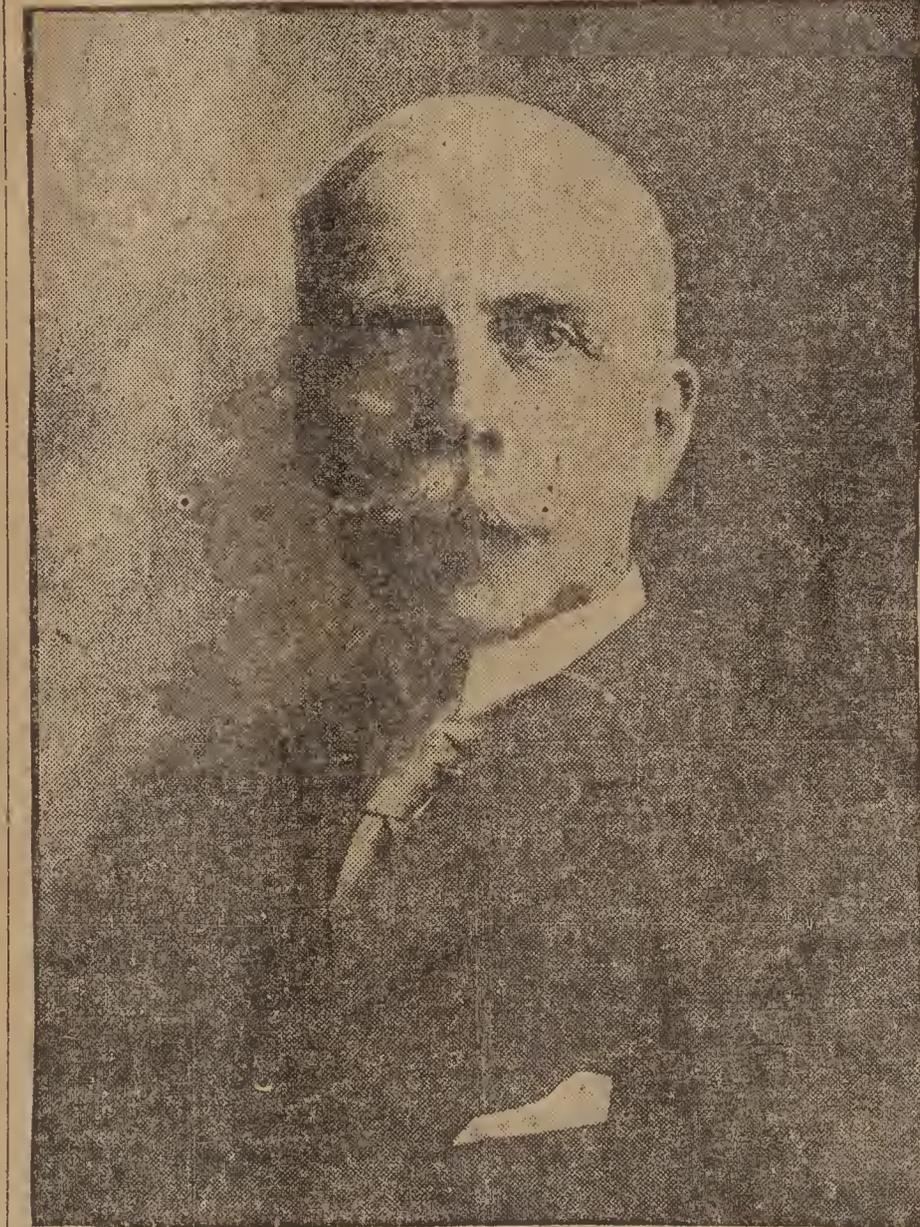
**WORDS OF WELCOME
WARMLY RECEIVED**

Hon. Mr. Hearst and President Falconer Bespeak Ontario's Greeting

Toronto, the Mecca of the geologists of the world in this year of grace, is besieged by as distinguished and erudite a body of men as ever gathered within its limits. The scene at the University last night, when a large number of the returning excursionists from the various geological tours gathered together to register, was unprecedented in the history of the institution. They are a remarkable body of men, whose presence will do much for Canada, and to whom no welcome can be too cordial. Hon. W. H. Hearst, Minister of Lands, Forests and Mines of the Province of Ontario, who extended welcome, struck a good note when he declared: "As far as I can give it to you, you have the freedom of the Province." And he added, amid a burst of laughter, "if I had the vaults of the Treasury I would open them for you." "I am sure," said the Minister, "that if you enjoy yourselves as much as we wish you to do, you will enjoy yourselves to the full." President Falconer expressed his delight at being able to welcome such a body of men to the University of Toronto. "We believe," said the President, "that you will confer not only a great honor upon us, but an inspiration that will extend far beyond this country."

A Cosmopolitan Company.

Professor Coleman, the Chairman of the local committee, in a delightful little speech, asked the delegates to consider themselves at home, which they immediately did, restraint being thrown to the wind. The scene in the East Hall where they had gathered became animated and interesting. Here were to be seen a German, Frenchman, Belgian and Englishman discussing with evident enjoyment their visit to Quebec. It seemed as if every group was speaking a different language. They attacked the bureau in the corner, where books, maps, charts and brochures pertaining to the mineral resources of Canada were laid out, with zest. The studious na-



**PRESIDENT INTERNATIONAL GEOLOGICAL CONGRESS,
TWELFTH SESSION.**

He is Dean of the Faculty of Applied Science and Logan Professor of Geology, McGill University, Montreal.

ture of the gathering was evidenced by the behavior of a few who, when they had obtained something in which they were interested, sat down and seemed utterly obliterated so far as the room was concerned. If a cannon had gone off it would not have moved these men. Others with their arms loaded with books set off to their residences early to get to the bottom of their treasures as quickly as possible. Dr. Tadasu Hiki, Professor of Geology, Mineralogy and Ore Deposits in the Imperial University of Kyoto, Japan, was delighted with everything. He was almost excited over the display and the gathering. The old idea that men of science, and geologists in particular, become fossilized was absolutely exploded last night. One could almost imagine it

was a picnic, so infectious was the laughter. A body of real men, breathing vitality and virility, no restraint, no aloofness; a real brotherhood meeting.

A Monumental Production.

The three volumes and atlas upon "The Coal Resources of the World," which were exhibited in the West building, were the centre of admiration. It is a monumental work, and it came in for much commendation at the hands of the delegates. The lay mind is not much impressed with seeing large volumes lying upon a table accompanied by an atlas, but when mention is made of the fact that ten tons of type has been used in producing the work, even the novice is interested. Orders have been received from the four ends of the world

for the production. The editors, Wm. McInnes, B.A., F.R.S.C.; D. B. Dowling, B.A.Sc., F.R.S.C., and W. W. Leach, B.A.Sc., of the Geological Survey of Canada, are to be congratulated upon their wonderful product. The work is in three languages—English, French and German.

Another volume which was much admired was the gift of the city of Toronto to the delegates of the Congress, which takes the shape of a series of views and a description of Toronto. The cover is a work of art, being done in gold, green, blue and red. The inscription reads: "Toronto of to-day. To commemorate the Twelfth International Geological Congress, 1913, Toronto, Canada." Photos of the Governor-General and the Mayor and Controllers of Toronto are shown on the first two pages. The views are exceptionally fine and very comprehensive.

To-day's Proceedings.

To-day the chair will be taken at twelve o'clock by Sir Charles Fitzpatrick, who will deliver an address of welcome to the delegates. The welcome on behalf of the Dominion will be given by Hon. G. W. Perley, Acting Prime Minister; on behalf of Ontario, by Hon. W. H. Hearst; on behalf of the University of Toronto, by President R. A. Falconer, LL.D. Dr. Helges Baekstroem, delegate of the Royal Swedish Government, representing the Eleventh International Geological Congress, will transmit the

affairs of the Congress to this session. At three o'clock a general meeting will be held, the topic being "The Coal Resources of the World." To-night at 8.30 M. Emmanuel de Margerie, Ancien President de la Societe Geologique de France, will deliver a popular lecture on "The Geological Map of the World" in Convocation Hall.

The authorities have published a splendid map of the University of Toronto and surroundings. Every building is numbered and the large black numbers on a white background on the various buildings correspond with the numbers in the map. There will be no confusion or delay to delegates in finding where various topics are being discussed during the Congress.

To-morrow the Toronto Ladies' Committee will tender a luncheon to the visiting ladies in the Speaker's chambers, West wing of the Parliament buildings, No. 28.

Delegates Visited Guelph.

Eighteen delegates to the Congress visited Guelph yesterday. The party are studying what is designated in their program as "the palaeontology" of the Onondaga, Guelph and Hamilton formations. The leader of the excursion was Dr. W. A. Parks of the University of Toronto. During the morning they visited Kennedy's quarry and the prison farm, did some collecting of fossils and studied the Niagara-Guelph transition, after which they motored back to the city via the Ontario Agricultural College. At noon they were lunched by the city at the Wellington Hotel and welcomed by the Mayor on behalf of the city, Dr. Parkes replying cordially. The visitors left in motor-cars in the afternoon for Hespeler and Galt.

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GEOLOGISTS CONSIDERED COAL FIELDS

Charge That the Classification as Outlined in Monograph is Wrong

QUESTION RAISED BY MONTREAL MAN

Six Days of Solid Work is Now Before the Visiting Scientists

The International Geological Congress has already had its official opening, first addresses and preliminary discussions, and from the opening session to-day the distinguished scientists have before them six days of solid work. The great monograph on the Coal Resources of the World, which was summarized yesterday afternoon by Mr. R. W. Brock, General Secretary of the Congress, has only offered to the assembly the material on which further addresses and discussions will be founded. This important subject, the value of which is patent to nations and householders alike, will probably occupy the greater portion of the time of the Congress.

Will Travel 20,000 Miles.

The European and Asiatic delegates are looking forward eagerly to the Western excursions which are to be conducted at the close of the Congress to the important geological fields in Alberta and British Columbia, with tours to Mount Elias and the Yukon, the total distance traveled to be some 20,000 miles.

It was noticeable throughout the addresses made yesterday that the visitors do not regard their duties here as routine work. Dr. Emil Tietze of Austria put the case very happily. "It is not out of complaisance or international politeness," he said, "that we have come to Canada, but from a good heart and with pleasure."

Nearly Consternation.

The discussion yesterday afternoon arising from the report presented in the monograph was opened by Mr. J. M. Gordon, of Montreal, who rose and asked to be allowed three-quarters of an hour to prove that the classification of coal as outlined in the monograph was entirely wrong. At this there was something as near to consternation as can be imagined in a scientific gathering. It was already half-past three, and the ladies would be waiting as four o'clock in the University Quadrangle to give tea to the Congress. The Chairman of the Conference, M. Theodosius Tschernyschief, of the Imperial Academy

of Sciences, Russia, asked the Congress its pleasure. At first there was some demurring, and a few delegates contended that it was the quantity and not the quality of coal which was in point. Even later in the proceedings, a French delegate declared that classification of coal was a subject for engineers and not for geologists.

All Wanting in Accuracy.

Mr. Gordon, however, was asked to read his paper on coal-classification. He stated that there could be no distinction made on the basis of volatile matter, which had no relation with fixed carbon. Neither was oxygen of any value as a primary basis for classification. One by one he analysed in a scholarly manner the various classifications, commercial and scientific, and found them all wanting in accuracy. He concluded by pointing out that the only way in which a satisfactory classification could be found was by the use of the microscope, the petrological formation being of more value in this respect than chemical analysis.

He was followed by M. A. Defline, of Paris, and Herr Dr. J. P. Krusch, of Berlin, who spoke on the resources in France and Germany respectively, the latter reading a paper by Herr Boker, who has been unable to attend.

African Coal Fields.

Short speeches were also made by Dr. J. W. Evans and Mr. A. S. Kitson on the African coal fields, particularly in Nyassa and Southern Nigeria. The latter also spoke on the brown coal resources of Victoria, Australia, the greatest in the world, which had not been fully mentioned in the monograph. In one part of Victoria there is a seam of this lignite, 888 feet thick in strata, of altogether 1,110 feet.

At the evening session, M. Emanuel de Margerie, past president of the Geological Society of France, addressed the meeting in Convocation Hall on the plotting of a geological showing water and land on Mercators does not favor the "mundial" map showing water and land on Mercator projection, which militates against a true conception of land areas. On the other hand, a projection of each continent is the best map for geological purposes, as there is no necessity of showing the oceans.

Plotting Maps.

The speaker suggested that the work of plotting maps, adopted in the case of North America by the United States Survey, acting in conjunction with Canada and Mexico, should be entrusted to various nations. South America might be mapped by a German survey, Asia by Great Britain, Africa by France, and Australia by the Commonwealth of that continent.

Announcement was made at the garden party in the afternoon that automobiles had been provided by the City of Toronto for sight-seeing tours for the Congress.

Tea for Visiting Delegates.

The tea which might almost be called a garden party, given in the Quadrangle of the University of Toronto yesterday afternoon for the delegates attending the 12th International Geological Congress was a great success and enjoyed by all. Mrs. Adams, Miss Coleman and Mrs. J. B. Tyrrell received the guests, among whom were only a few Toronto people, who formed the local committee. Tea was served in a large marquee which was erected on the lawn, the table being prettily arranged with pink asters and in charge were:— Miss Joan Arnoldi and her guest Miss Maud Arnoldi of Ottawa, Miss Hilda Ingles, Miss Mary Tyrrell, Miss Ethelwyn Gibson, Miss McLennan.

A Morning With the Geologists

Their Opinions of Canada — Think Canadian Women Charming and Hospitable

What shall I say? Who shall I ask for?" These were the thoughts that kept running through my head as I walked with hesitating steps towards Queen's Park. You see this was my very first attempt at reporting or interviewing of any kind and I was just a little timid—in fact so timid that I walked right by Annesley Hall, where I was told the ladies of the convention were staying, casting furtive glances "doorward." However, by the time I had reached Queen's Hall I had summoned all my courage together and walked boldly up to the door. On the verandah I saw a lady intent on perusing a Baedeker and I immediately side stepped and put forth my question, "Are you a geologist?" She smiled sweetly and shook her head. "No, I am just the wife of a geologist." I knew right away that I was going to like this lady so I calmly pulled up a rocking-chair and sat down. After explaining the nature of my little visit and assuring Mrs. Charleton, for I found later that I had been talking to the wife of that eminent geologist Mr. Charleton, of London, England, that I only wanted her impressions of Canada and not the opinions of the geologists at large—we had a very interesting conversation. "I think," said Mrs. Charleton, "the thing that impressed me most was the colossal greatness of Canada, the bigness of everything—why, even your railroad engines are big." Then I was told of the very interesting trip to Cobalt and Porcupine and how they went down into the largest gold mine in the world. And then there was their trip to Niagara, the awe-inspiring beauty of the great falls far exceeded their fondest imaginings. I really think they enjoyed this trip the most, especially the ladies of the party.

"What do you think of the women of Canada?" I asked Mrs. Charleton. "They are the best dressed women I have seen—you don't seem to have any poor people at all—and so energetic. I think your delightful climate must have something to do with this." At this juncture I was introduced to Mr. Charleton, who, I feel sure, must have visited Ireland to perform the sacred right of kissing the Blarney Stone. He was most complimentary in his remarks about the women of Canada and what struck him most was the great capability and independence of the Canadian woman.

I was quite pleased with myself to think that I had "interviewed" successfully and gaily walked to Wycliffe Hall in pursuit of more geologists.

Here I found a large register and upon peering into it I discovered such interesting names as Mark Luhoschinsky, Moscow, Russia; and T. Hiki, Klotz, Japan; and incidentally saw T. Hiki's laundry wrapped up with a large pink bill on the top from Lee Kam Chu, and Professor Stelmann, Bonn, Germany. This gentleman

made his appearance on the scene while I was there—dressed in rather negligee attire and gesticulating wildly—making great efforts to have his trunk brought up to his room. I was quite relieved when I saw two busy baggage men finally hoist it on their shoulders and disappear with it upstairs. There were about ninety men living in this building—men from nearly every country on the globe. I spoke to several of them—or rather they came and spoke to me—and I found them most interesting. But I remembered that my interests lay chiefly with the women and that I had come purposely to see them—so I tore myself away and with reluctant feet I crossed over to the main building of the university. The campus was thronged with men and women going over to a meeting at Convocation Hall.

At last I reached my long sought for goal—the women's headquarters. Here I was treated very cordially by the most delightful little lady with large dark eyes and curly brown hair—this was none other than the charming Madame Hoffman—who is taking such an active part in the great convention—Madame Hoffman, who is the "interpreter," speaks seven languages. French, German, Spanish, Swedish, Danish and Norwegian. She is a Parisian by birth and was married at the early age of eighteen to Professor Bolette Hoffman, a German. They have one child, a daughter of seventeen, and have been living in Toronto for the last six years. A great many of the ladies at the convention were friends of Madame Hoffman when she studied at the universities of Geneva and France, so is it any wonder that she is one of the busiest women at the convention? Other noted women were: Fraulein Bathgen, a geologist from Germany; Miss Bascam, Fraulein Grutterink, of Rotterdam, Holland, a doctor of philosophy and a zoologist; Mrs. Quensel, a professor of zoology at Upsala University; Madame Lacraix, of Paris, and four women professors from Bryn Mawr, in the United States.

The hands of the clock now pointed to one o'clock and as these great women, like their less great sisters, are intensely human after all, and hunger is just as real to them as it is to you and me I troubled them no longer and left them to enjoy a dainty luncheon while I trudged to the car, glad that I had taken my first opportunity to interview.

Evelyn.

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POLITENESS A FEATURE OF CONGRESS

Scientists From Many Lands
Raise Hats When Greeting
Each Other

ALL KNOW HOW TO
BOW GRACEFULLY

Courteous Manners of the Old
World Are Much in Evi-
dence and Seem Novel

What is, perhaps, the most noticeable characteristic of the European and South American geologists who are attending the twelfth annual congress of the international geological society at the university, when seen in comparison with Canadians and indeed all Anglo-Saxons, a comparison which is hardly favorable to the latter, is their charming and polished politeness. Their manners are a revelation to the Canadian. To them raising the hat is not merely a ceremony to be indulged in upon the meeting of ladies, but a common form of ordinary politeness.

Graceful Bowing.

Two friends or acquaintances meet on the Varsity campus or in the Quadrangle at tea and each, with a grace and manner that is nothing less than astonishing to the phlegmatic Anglo-Saxon, lifts his hat and bows to the other with the utmost punctiliousness. To us, such exhibitions seem superficial, to them only the ordinary observation of politeness. The manner alone with which they raise their hats is indeed impressing to one unused to such a spectacle and, to the thoughtful who realize the truth in the old adage which is the motto of a big English public school, "Manners maketh the man," not without significance.

Polish and Culture.

Happening, as it does, on the heels of an appeal from no less a person than Lord Rosebery for a higher standard of politeness and a deprecation of the usual manners of a material age, this display of polished and cultured good breeding cannot but have a good effect on all those who have come in contact with the learned scientists.

Even several years in this country have failed to affect the manners of M. de Champ, of the University of Toronto, who could be seen yesterday on the steps of Convocation Hall greeting and acknowledging the salutations of old friends and acquaintances by raising his hat and bowing

to then with all the grace and impressment for which his country is famous. M. de Champ found many old friends among the delegates to the congress from European seats of learning.

Fine Collection of Men.

The geologists are a splendid collection of men, and their politeness does not consist solely of what to the Anglo-Saxon seems to be its superficial forms. The discussions and debates are carried on in the most courteous language and terms imaginable, no matter how opinions may differ or feeling run strong. Bronzed and clear-eyed the scientific visitors are representative of the best of their nationalities, courteous, cultured and healthy men, charming and pleasant to meet.

Like the Doukobours.

A curious fact about the members of the congress is the widespread regard and admiration which they have for the Doukobours, a communion inclined to be held rather lightly in Canada. To The News many of the geologists were warm in their praise of this strange sect and expressed their intention of paying them a visit.

"I like them," said one member, a veteran geologist from Manchester, Mr. John Ashworth, "and I am going to make every effort to see them again. They are splendid people and such hard workers."

COLOR OF RIBBON TELLS LANGUAGE

How Delegates to the Congress
Know What Tongue to Use
in Greeting

Much to the mystification of the lay visitor to the Geologists' Congress, each delegate wears, attached to the emblem of the Geological Society on the lapel of his coat, two or three ribbons of vivid colors. These, according to a representative of the Swedish Government, are worn for the purpose of informing other delegates the language, or languages, the wearer speaks, and not to satisfy any futurist taste for color members may possess. A red ribbon conveys the intelligence that the wearer speaks English; yellow, German; and blue, French.

Hence, if a man is seen with all three ribbons fluttering at his buttonhole it means that not only is he a scientist of distinction but a linguist of no mean capability as well. By the ribbons you may know just what tongue in which to accost a member you may meet.

NOT GREATEST COAL COUNTRY

Too Much for Canada to Expect
Says Eminent Russian
Geologist

WAS HERE BEFORE

Trip From St. Petersburg to
Quebec Only Took Nine
Days This Time

The greatest Russian geologist at the Congress is M. Theodosius Tschernyschef, of the Imperial Academy of Sciences, St. Petersburg, and Director of the Geological Survey, and withal he is genial and polite by all the traditions of that nation. He is a happy-looking man with a snow-white Imperial and flowing hair.

In the University Quadrangle. The News found him conversing with a group of friends, and at a favorable moment approached him on the subject of Russian immigration to Canada and less weighty matters.

Speaking in French, M. Tschernyschef (pronounced Chernishef), declared that this is not his first visit to Canada.

"I was here about twenty-five years ago," he said, "when I went as far West as Lake Superior, visiting the American States as well. This summer I am going as far as Vancouver with the geological excursions after the Congress."

Not the Greatest.

The Russian geologist liked Canada, but when The News asked him half-seriously whether he thought Canada would ever be the first coal-producing country in the world, this was more than the distinguished visitor expected.

"Oh, no! That is too much," he replied; "that is what you are always wanting to know. Quite important, yes, but surely not the greatest," and breaking into English, he laughed. "The greatest country on earth, eh?"

The visitor liked Quebec, especially its solidity, and said that Canadian cities must not be "Americanized." He had come to Quebec from St. Petersburg in nine days, which was splendid, and "with a night in London as well," he added.

More Russians Coming.

On the subject of immigration, M. Tschernyschef believed that Canada would receive more and more Russians, "but," he added, "you have the best now, the Doukobours."

"And you think they are the best?" he was asked.

"Certainly. They are good fellows and good workers."

"But will they make good citizens?"

"I hope so. Why not?" was the answer.

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To Entertain Delegates.

The Ladies' Committee of the Geological Society are giving a tea this afternoon, to-morrow afternoon and on Monday and Wednesday of next week in the University Quadrangle, to which all members attending the Congress in Toronto are invited. A luncheon is being given to-morrow, and Mr. and Mrs. D. A. Dunlap give a garden party on Saturday.

GEOLOGISTS OF WORLD GIVEN KEYS TO CITY

Congress Opens With One Thou-
sand Delegates in Attend-
ance

WERE WELCOMED BY
THE CHIEF JUSTICE

Men of Science Ready for Week
of Hard Work in Convo-
cation Hall

At noon to-day Sir Charles Fitzpatrick, Administrator and Chief Justice of Canada, formally opened the Twelfth International Geological Congress in the Convocation Hall of the University of Toronto, before a gathering of a thousand distinguished scientists from all over the world.

His Excellency delivered his address in French, with an English preface, saying that it was fitting the inaugural speech should be delivered in the official language of the society. "It was also the language," said Sir Charles, "spoken by the hardy pioneers, the priests, warriors and traders who first sailed up the St. Lawrence, discovered the Mississippi and laid broad and deep the foundations of this great nation. It has made it possible that our citizens should bless the name of our sovereign in the language spoken by Cartier."

The absence of H. R. H., the Duke of Connaught and the Prime Minister was regretted by both," said the Administrator. Sir Charles stated that he had received this morning a cable from the Governor-General welcoming the Congress to Canada and expressing his regret.

Sir Charles welcomed the Congress and spoke of its coming as a fresh encouragement to science in Canada. He paid a tribute to the work of the former congresses at Washington and Mexico, and to the co-operation of the Crown Prince of Sweden. In Canada were all the strata of all the ages, and it is fitting that Canada should welcome such a distinguished gathering.

The Tie That Binds.

Hon. Mr. Hearst, Minister of Lands, Forest and Mines, welcomed the Congress on behalf of the Ontario Government. He remarked that it was an honor to have such a gathering of men from all nations but that this honor was doubly enhanced by the fact that the visitors occupy a leading place in the field of science in not only their own country but in the wide world.

"There is nothing," he declared, "that makes for peace as much as such conventions and congresses, where we of different nationalities and creeds meet in common fellowship and friendship. It is the formation of a tie that binds."

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In concluding Mr. Hearst pointed out that Ontario had much to offer to geologists, having, as it did, 360,000 miles of country belonging to the Crown, thousands and thousands of acres of mineral lands untouched by the geologists.

Civic Welcome.

The civic welcome was extended by Controller Church, who in the name of the Mayor and the Corporation of the city, presented the visiting scientists with the freedom of the city. "Toronto," he stated, "is called the convention city and indeed its name, derived from the Indian tongue means the 'Place of Meeting.'" On behalf of the city I offer you a right royal welcome and I hope that your stay amongst us will be of the most pleasant description. It is with unbounded pleasure that I offer you the freedom of the city."

President Falconer of the University of Toronto, called upon by Sir Charles Fitzpatrick, aptly remarked that having heard the welcome and tribute given science from without it was his pleasure to be able to offer them tribute from within, as it were. "Your science has ancient prestige," he said. "Geologists engage in a ceaseless pursuit of the truth."

He went on to point out that the meeting of the Congress in Toronto should not only be profitable to the members of the society but to the community in which the great Congress is being held. "And so we profit together from this scientific gathering," he said. "I welcome you also as men of science pure and simple, in addition to science applied."

24 Countries Represented.

Reports will be read during the Congress from fifty-eight different lands and countries in the world, from the bleak coasts of ice-bound of the northern countries to the tropical countries in the south.

This fact illustrates the sources from which the delegates to the great gathering of scientists which is being held in Toronto have been drawn. Universities from every civilized and uncivilized portion of the globe are represented. More than twenty-four countries have official representatives attending the congress. And they come from Indo-China, from Iceland, from Europe, Asia, Australia, America, South America and Africa. But as French is the official language of the society, the greater part of the discussion is carried on in that tongue.

The members of the congress have been pouring into Toronto from all corners of the world ever since Monday. The University has been thrown open to them, and they are quartered in the various colleges.

It is said that if the total distance traveled by all of the visiting scientists could be added up it would be greater in extent than three times the circumference of the globe.

Luncheon to Delegates

The Toronto Ladies' Committee of the twelfth International Geological Congress entertained the delegates at luncheon in the Speakers' dining-room of the Parliament Buildings at one o'clock to-day, when the guests were received by Mrs. Adams, the wife of the president of the society, Miss Coleman and Mrs. J. B. Tyrrell. Covers were laid for one hundred guests at the long table, with three shorter ones which formed an E. The decorations were of roses and the name cards were very attractive, each having either a summer or winter Canadian scene painted on it. Mrs. Adams, in a short speech, welcomed the delegates, Mrs. Strachan responding on their behalf. A few of the guests were:—Lady Pellatt, Lady Aylesworth, Mrs. Frank Arnoldi, Miss Arnoldi, Mrs. J. B. Tyrrell, Mrs. D. A. Dunlop, Mrs. Parks, Mrs. Adams, Mrs. London, Mrs. Arthur Meredith, Mrs. and Miss Denton, Mrs. Kemp, Mrs. Wilmot, Mrs. Strahan, Mrs. Charleton, Mrs. Quensel, Mrs. Lacroix, Mrs. Cross, Mrs. Ferrier, Mrs. Bedford McNeill.

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ALL THE WORLD IS HERE NOW

AT GEOLOGISTS' CONFERENCE.

Gathering Last Night Had Representatives From Forty-five Countries—'Twas Like Tower of Babel.

The walls of Varsity which have echoed the words of languages dead and living for more than half a century, gave back echoes that were strange even to them last night. Every continent was represented among the delegates from the forty-five countries represented at the International Geological Congress, and it seemed as though every group was speaking a different language. Even in the ladies' reading room, where the fifty ladies attending the Congress were registering, Madame Hoffman, who was in charge, had to make use of five languages.

The old idea that men of science must become fossilized if they would succeed in their pursuit of knowledge, received many a jolt, for the gathering in the East Hall looked more like a picnic than a gathering of sober-minded students drawn from every part of the globe in a desire to learn or see some new thing.

WELCOME TO CANADA.

Words of welcome to the visiting geologists were spoken by Hon. W. H. Hearst, Provincial Minister of Mines; Dr. Falconer, of the University, and Dr. A. P. Coleman, chairman of the local committee.

"We believe," said Dr. Falconer, "that you will confer not only a great honor upon us, but an inspiration that will extend far beyond this country."

Since arriving in Canada, the delegates have divided into parties to visit points of geological interest in this

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HON. W. H. HEARST



Minister of Lands, Forests and Mines of the Province of Ontario, Who Welcomed the Geologists Last Night.

country. One party visited the coal and iron deposits at Sydney, while another under Prof. W. G. Miller visited the nickel, gold and silver deposits in New Ontario. Though conditions resembled those at the building of the Tower of Babel, interpreters were found who could speak four languages, one of which at least was known to the polyglot tongued scientists, and the richness of this new land was explained to them in this roundabout way.

WHERE THEY CAME FROM.

About 650 delegates have already registered and been taken to their quarters by the red-coated public school cadets. Canada has 217 representatives at once eager to learn from the leaders in geology from other lands and to tell of the treasures to be found hidden in the North American Continent. With these may be joined the 263 from the United States and the 74 from Britain and joined in their common Anglo-Saxon speech.

Nearly every country in Europe is represented among the 288 geologists who came from that continent. Greek, Bulgarian, Roumanian and Turk, far from recent battle-fields rub shoulders in the more peaceable and profitable pursuit of learning. Germany, the home of research, has 96 of her leading geologists at the congress, and France, scarcely less renowned for scientific discovery, has 48. From Northern Europe come 57 scientists representing Denmark, Norway, Finland and Sweden; and the influence of Britain as a colonizing nation is shown by the presence of representatives from the regenerated Soudan, United South Africa, India, Indo-China, Egypt and British West Africa.

Dr. Tadasu Hike, professor of geology at Kyoto University, heads the deputation from Japan, and Kwong Yung Kwang, with two companions, is on hand to tell of the geological and mineral wealth of China.

In spite of revolutions and rebellions 11 geologists have escaped from Mexico to attend the congress, and South America has sent men from the Argentine, Chili, Colombia, Guatemala, Peru and Venezuela. From the Antipodes Australia has six representatives, and New Zealand three.

THE FABLED ATLANTIS.

According to J. W. Spencer, of the United States delegation, the existence of Atlantis, which loomed large in Greek and Roman mythology, is still shrouded in gloom. There is a large submerged ledge in the Atlantic which may have been the abode of the blessed, but geologists are not prepared to speak definitely on the question. They have no hesitation, however, in declaring that Lamuria really existed, but has been submerged in the Indian ocean.

The orthodox can take what comfort they will from the scientific statement that while there was a flood it was purely local, and Noah and his companions in the ark cannot have been the only survivors.

THE LADY GEOLOGISTS.

Miss Anna Rathgen from Germany is a geologist herself and a pupil of Professor Steinman; then there is Lady McRobert, daughter of Dr. and Mrs. Workman, Madame Lacroix of Paris, particularly engrossed in her husband's lifework, Mrs. Fernor from India, Miss F. Eason, professor of geology at Bryn Mawr, and Miss Hatch and Miss Marina Ewald, also of Bryn Mawr.

Miss Helena Coleman is chairman of the local committee of ladies, among whom are Mrs. McEvoy, Mrs. J. B. Tyrrell, Mrs. Parks and Mrs. Frank Adams. This committee has sent out invitations to a luncheon for the ladies connected with the congress, in the Speaker's rooms at the Parliament buildings on Friday at half-past one. Tea will also be served in the university quadrangle this afternoon, Saturday, Monday and Wednesday. On Saturday also Mr. and Mrs. D. A. Dunlop are giving a garden party in honor of the visitors.

VISITED GUELPH.

Eighteen delegates to the congress visited Guelph yesterday. The party are studying what is designated in their programme as "the palaeontology" of the Onondaga, Guelph and Hamilton formations. The leader of the excursion was Dr. W. A. Parks, of the University of Toronto. During the morning they visited Kennedy's quarry and the prison farm, did some collecting of fossils and studied the Niagara-Guelph transition, after which they motored back to the city via the Ontario Agricultural College. At noon they were lunched by the city at the Wellington Hotel and welcomed by the Mayor on behalf of the city. Dr. Parks replying cordially. The visitors left in motor cars in the afternoon for Hespeler and Galt.

WOMEN AT THE GEOLOGICAL CONGRESS

It seemed almost uncanny on an August night to see old grey University College ablaze with light. But last evening forth from every ivy-clad window of Varsity there were golden gleams as beacons for the strangers in our midst. For there the ends of the world had met. Inside its historic walls an informal reception was being held for the hundreds of distinguished scientists who had just come from forty-five countries for the International Geological Congress in Toronto.

Geologists! Perhaps it was because the first one we ever knew was such a moth-eaten remnant of humanity



Mrs. Quesnel, the noted zoologist, who denies story that she does not believe in kissing, and knows nothing about an anti-kissing crusade.

that that word did not arouse much enthusiasm. For truth to tell, the men we pictured to be gathered there were anything but inspiring. But it did not take many minutes last night to find how mistaken we had been. Instead of the pedantic old fossils we had imagined, there on every side were splendid six-foot specimens of manhood, who looked fit for any work. Men who had seen and done things. Men who had penetrated the wildernesses of a whole world's continents. Men who had browsed over books but long enough to be able to go forth and conquer old Mother Nature herself.

Geologists unromantic! Why if there is any romance left in this practical century of ours you can find it among those seekers of the world's gold and sterner minerals. Hear them tell of their explorations in unknown mountains and valleys and they appear before you veritable Captain Kidds of the Twentieth century!

Last evening was a night of contrasts. While the men of action were there you could also see the typical

old world scholars. And such a variety of tongues were there that comparisons to the Tower of Babel were inevitable. Then too in the midst of these most primitive men, the men of the strong arm, were found the newest of the new women, the women of brain. No less than 50 feminine names are included among Toronto's present visitors and among them are women who have done notable work as practical geologists!

In the case of most of the married women members of the Congress theirs is but an honorary membership out of compliment to work done by their husbands. Lady McRoberts, a daughter of the famous Workmans by the way, however, is an exception as she distinguished herself by her work before her marriage at the Royal College of Science, London, and elsewhere. Madame Lacroix, of Paris, France, has also assisted her husband in his work.

Other married women members in some cases have gone in for other sciences other than geology. Mrs. Charlton is a famous botanist, and Mrs. Quesnel, of Upsala, Sweden, is a distinguished zoologist.

When last night we were introduced to the young and charming pink cheeked Mrs. Quesnel we stammered out, "Why were you not the lady a Monday paper said was such a strenuous upholder of the anti-kissing crusade?"

"Oh, these fearful American papers," laughed Mrs. Quesnel, "what imaginations they have got! There is absolutely nothing in that story. My husband and myself have been most amused at it. We are doing nothing these days but telling people it was just a foolish story."

Mrs. Quesnel and her husband have been enjoying some of the geological expeditions in the Maritime Provinces, and she declares that Canada is much like her native Sweden.

Bright little Doctor Alide Grutterink, of Rotterdam, "Privaat docente in Mikrochemie" at the University of Leyden, was another interesting member of the Congress we saw last night. Microchemistry, which is her specialty, is a comparatively new work. The doctor studies the minerals as she is interested in crystals to be used in chemical work and toxicology.

Most interesting was her talk of the recent "Woman's Exhibition" in Holland. There a complete review of what Dutch women have done in the last one hundred years has been placed before the public in a whole exhibition of their own. When one thinks of our Woman's Building, with its woman's work displayed in the form of baking, preserves, sewing and fancy work, it almost makes Toronto seem back in the sixteenth century.

Asked about woman suffrage in Holland, Dr. Grutterink declared it was but a matter of a very few years. "The Clericals have lost at the recent elections and the Liberals promise it to us," said she, "though we will not follow the militant example of the English women to get it."

Still another interesting feminine figure is Fraulein A. Rathgen, a student of Bonn University, who bears the distinction of being the only German woman representative at the Congress. Fraulein Rathgen, though the only woman student in geology at her university, is a dauntless little lady. She has done work in the mountains of France, Germany, Switzerland,

Austria, Greece, has explored Egypt, is now on her way to the Rockies, from thence to the United States peaks and Central America.

In the face of all this she actually pleaded not to be mentioned. "I am nothing; I have done nothing," quoth she. Truly there was modesty indeed. It is evident Germany does not believe in puffing up its scholars.

We had but a few moments with Miss Florence Bascom, geological professor at Bryn Mawr. We had been told that Miss Bascom had done some notable work, particularly with the microscope. Recently she has been on a U. S. Government geological survey in Pennsylvania. Her pupil, Miss Ida H. Ogilvie, assistant professor of geology at Barnard College, New York, is also attending the Congress, as is also Miss Marina Ewald from Bryn Mawr. The famous Mount Holyoke College, Massachusetts, has also sent its geological professor in five-foot Miss Talbot.

The famous Bedford College of England is represented by clever Miss C. A. Raisin, who tells of the interest shown by Queen Mary at her geological class when her Majesty paid her recent visit to that institution. From far-off India, with her husband, has come Mrs. Fernow and Miss Elizabeth Jeremine, geological professor at the Woman's College at St. Petersburg, is among the delegates yet to arrive.

Many of the women delegates are quartered at Annesley Hall with gracious Miss Addison as hostess, while Miss Helena Coleman is head of the ladies' committee. The local committee of ladies, among whom are Mrs. McEvoy, Mrs. J. B. Tyrrell, Mrs. Parks and Mrs. Frank Adams. This committee has sent out invitations to a luncheon



Fraulein A. Rathgen, of Bonn University, Germany's only female representative at Congress.

for the ladies connected with the Congress, in the Speaker's rooms at the Parliament Buildings on Friday at half-past one. Tea will also be served in the university quadrangle this afternoon, Saturday, Monday and Wednesday. On Saturday also Mr. and Mrs. D. A. Dunlap are giving a garden party in honor of the visitors.

But a small host in herself is Madame Hoffmann, the piquant little Parisienne, to whom seven languages is as nothing. The lady is installed in the east hall of the University and welcomes the feminine visitors in their own tongue as they register.

CORNELIA.

Among the Geologists

Prof. G. F. Kay, Professor of Geology, University of Iowa and State Geologist, who is a graduate of Toronto University, outlined some of the work before the congress to The Telegram. Four of the divisions which will be taken up are glacial, economic, stratigraphic and paleontological geology. The first has reference to the surface formations of the earth, the second to the ore deposits, the third to the formation of rocks, and the fourth to fossils. The various hill formations, north of Toronto, and as a matter of fact, the entire formation of the country, will be taken up by the men more especially interested in the glacial geology.

COAL AND OIL.

Mr. Charles M. Gould, State Geologist, Oklahoma, makes a specialty of coal and oil deposits in his state.

"What do you think?" he was asked, "of the possibilities of finding such deposits in Ontario?"

"Well," he said, "it is known that between Detroit and Buffalo on the north side of Lake Erie, there have been deposits of oil and gas."

"Do you think that in Ontario we have touched all our resources?"

"Oh," he said, holding up his right hand as if to deprecate such a question, "you have been merely scratching the surface. It is not the business of the geologist to prophesy, but I dare say that within a hundred years your mineral resources will be quadrupled. But you have certainly a country rich in national resources. Your metalliferous resources are no doubt abundant."

Reverting to his home state, Oklahoma, Mr. Gould stated that the geologists had estimated the supply of coal there to be somewhere between 50 and 75 billion tons.

A FRENCHMAN IN ONTARIO.

"What do you think of the topographical formation of Ontario?" was asked of Professor Cambrien of Paris.

"It offers abundant opportunity for geological study," he said. "To trace the history of some of these formations would be most interesting."

"Should the Government, in your opinion, encourage the study of geological science in Ontario?"

PROGRESS IN TORONTO.

"From what I have seen I think the science has not been neglected here. There is one thing that strikes me about the American and Canadian business men, that is their realization of the value of geology. Instead of squandering thousands of dollars in guessing as to the whereabouts of mineral deposits and such things, they see the wisdom of having the work done scientifically."

This made an American delegate prick up his ears.

"Our Government could have saved \$100,000 when they started work on the Panama," he said, "had they sent a geologist down there for six months or a year at a cost of less than \$5,000, to obtain necessary information before they started cutting."

THE MATTER OF PAY.

"Are geologists well paid?" was the blunt question put to a delegate.

"In colleges," he replied, "geologists would probably get from \$2,000 to \$2,500 per year. Whereas if they get out into the field with a mining company they might make \$3,000 to \$4,000. The average is somewhere between \$2,000 and \$4,000."

With that the American lighted a 25-cent cigar and sauntered off to talk to a German colleague, smoking a cheroot, which from the perfume, was no doubt a product of the paleolithic age.

AT THE GEOLOGICAL CONGRESS



Baggage waggons in front of University. Many specimens for talks and lectures are contained in these boxes.

ENGLISH LANGUAGE SHELVED
IN GEOLOGISTS' WELCOME

Sir Charles Fitzpatrick Chose
French Out of Twenty-five
Tongues in Which to Talk.

W. H. HEARST TALKS ENGLISH

But French Is Lauded by Rt. Hon.
Sir Charles Fitzpatrick as the
Language of the "Pioneers
Who Laid the Founda-
tions of This Great
Country."

Convocation Hall presented a scene of brightness and animation at noon to-day, when the great Geological Congress was officially opened.

"When first asked to come to welcome you to Canada," said Rt. Hon. Sir Charles Fitzpatrick, "I was tempted to address my welcome to you in the English language, but on learning that there are no fewer than twenty-five languages spoken at this congress, I decided to speak the words of welcome in the official language—French—the language spoken by the pioneers who laid the foundations of this great country. It is a great tribute to the wisdom and liberality of the British Constitution that it is made possible to bless the name of our Sovereign in the language spoken by Champlain and Cartier."

Sir Charles then proceeded to read his address of welcome in French. He conveyed the regrets of H.R.H. the Duke of Connaught that the Governor-General was unable to welcome the Congress in person. Premier Borden also sent his regrets.

ONTARIO'S WELCOME.

On behalf of the people of Ontario, Hon. W. H. Hearst, Minister of Mines and Lands, extended a warm welcome to the visitors.

"We hear much about peace celebrations in the world," he said, "but to my mind nothing makes so much for the peace and advancement of mankind as does a meeting of this kind."

He welcomed these scientists, who represented so many countries, and hoped they would appreciate, as he felt they would, the 400,000 square miles of Ontario, so rich in mineral wealth.

"Millions of those acres have never been mapped by geologists, millions never visited by geologists.

"The province is yours."

TORONTO'S LAND.

Acting Mayor Church received an ovation of hand clapping when he came forward to welcome the delegates on behalf of the City of Toronto.

"It is an honor to have so many men of great learning in our midst," said the Controller.

He turned the keys of the city over to the Congress.

IN PURPLE AND SCARLET.

Wearing his purple gown and scarlet hood, President Falconer, of Toronto University, extended a welcome to Congress on behalf of the university.

"Your science is indeed of ancient prestige," he said. "Thousands of years ago a Hebrew prophet, whose words are recorded in the Bible, spoke of mines for silver, a place to refine it, of stone and of brass.

In coming to Toronto University, they came to the "hearth and home" of learning, where science is nurtured.

"In your movements," went on President Falconer, with a smile, "while you are here, not only will you teach Canadian geologists something, but I think our own geologists will teach you something." (Applause.)

The result of this great congress would, he felt sure, bind still tighter the bonds which held the Empire of learning together. Science to-day was a benevolent factor, on its streams and rills it bore down deposits providing a finer soil upon which men might practise the peaceful arts and crafts.

NEWLY-ELECTED BUREAU.

The general secretary announced the result of the election of the Congress Bureau:—

Ancient President, Prof. Hofrat, Tietze.

President, F. D. Adams.
Sec.-Treas., R. N. Brock.

MAPS, JAPS AND GEOLOGY

RED'S ENGLISH, BLUE FRENCH.

And Yellow Shows You Speak German—There Are Many Wonders at the Geologists' Conclave.

No matter how far governments and armies and navies in the abstract would put the nations asunder, science in its irresistible, burning search for the truth will weld the people together. The scientists are too busy to hold back because of the silver standard or the stock markets or the tariff. When America's geologists want to know just why Niagara flows down, and Canada's stone dissectors wanted to know what was under Niagara and how it got there, they just put their heads together like sensible human beings and have produced a remarkably scientific map which they call a "Topographic Map of the Niagara Gorge," surveyed in co-operation by Dr. George Otis Smith, director of the United States Geological Survey, and Dr. Reginald W. Brock, director of the Geological Survey of Canada.

NO RED TAPE ABOUT IT.

"We didn't make any fuss at all about it," said Dr. Smith at the Geological Congress this morning. "I wrote to Dr. Brock and suggested the idea, and he gladly coincided with it. I don't want to be quoted as saying this, but the Congress heartily approve of the resultant map."

It is really a wonderful map. The more you study it the more there is in it, and after some ten minutes you feel as satisfied as if you had had a trip to the Falls. Every last house and building is marked; the lakes are tinted differently from the ponds, and the different rock strata are indicated by colorings. Even the cemeteries are included, and the depressions in the soil. This map is being distributed in Guide Book No. 4 of Excursions in Southwestern Ontario, issued by the Geological Survey at Ottawa.

WORKED ON BOUNDARY LINE.

"I have often worked so near the boundary," continued Dr. Smith, "that I couldn't tell if I was working on Canadian or United States soil. The boundaries weren't so closely marked as they are now."

"I suppose Yellowstone Park is your best hunting ground," was suggested.

"It's good, but at present we are spending a lot of time at Glacier National Park. That extends into Western Canada. Canada should make a park of their half of it also."

Evidently nature wasn't a bit careful when she ran this big mine of research carelessly across the border line of two countries. But, of course, nature got there first—and nature will get there last, when there will be no more boundary lines.

NEW YORK IS HORRID PLACE.

Dr. Tadasu Hiki, Professor of Geology of the University of Kyoto, was patiently polite when he was asked if Japan afforded a good field for study. It was an idiotic question, considering the formation of the island, but the Japanese are proverbially courteous.

"Japan is all volcanic rocks and earthquakes, you know," he answered, laughingly. "We have four universities possessing geological research departments."

continued on next page.

Toronto Telegram. Aug. 7-1913.

To say that Dr. Hiki is delighted with Canada is too mild. He arrived first in New York, and struck the hot week there. It has turned nice and cool since then, and, standing in the big stone porch of the University building, looking over the green campus, while a strong breeze swept in the odor of burning hushes—well, it gave a lovely impression of Toronto. We didn't awaken the doctor as to Toronto's real character when the thermometer lets loose as she did about ten days ago. So he just stood and heaved and breathed in the cool air and said.

"New York is a most disagreeable place. Very hot. Stifling. Up in Canada here it is nice and fresh. Good air."

There are three of these visitors from Japan. Dr. Kozu is studying geology in Washington, and Dr. Kido, who is also from Kyoto, is returning to Japan after joining in the excursion which goes through to Vancouver. Dr. Hiki himself intends to study in New York for a time before going back to his own land.

NEW MUSEUM OPENED TO-DAY.

The new university museum on Bloor street is suffering from shock this morning. It was called out of bed in its curl papers, so to speak, to receive distinguished visitors, and it is visibly quivering with rage and disappointment, with its best dress all ready upstairs if the visitors had only waited a week or so.

The pavement hasn't been put down yet, and the approach is over rough planks. At the door there is a big express wagon and some men unloading iron doors or table covers therefrom. But the Congress is on and the doors were promptly thrown open to visitors at 10 o'clock this morning. The public are not invited yet and must wait for the formal opening.

On the ground floor are a number of framed exhibits that looked exactly like the family linen when it comes back from the laundry. The same old tears and frays were there, but the sign on the frame dispelled any idea that it was that lost roller towel at last. It was found in a tomb at Egypt in the third century A.D., and is very valuable, as it won't last much longer.

CANADIAN SPECIMENS.

Upstairs, however, is the goal of the geologists. Here are long cases with glass covers, under which are rows and rows and rows of meek, small stones and pieces of rock, with names that only a stone could bear and live. The meekest-looking gentleman of the lot was N. W. Scopus, a plain, unassuming little chap, with white spots on him. One round, fat specimen with prickles claimed to have come from ancient Jericho, and another from Solomon's Pools. There were a large number of tables containing the collection of Mr. Z. A. Lash.

On the top floor were the specimens from Canada in particular, and it was to this hall that most of the visitors found their way. Very few ordinary people walked past the little sign pointing to this retreat. It said: "Department of Palaeontology," and after reading that the uninstructed decided to attend a lecture before going any further in the matter. But, according to the guide, the value of

the exhibits contained in Toronto's new museum is beyond price. Canada has no need to be ashamed of the display she can spread before these learned men from Russia, Germany, France, Sweden, Japan and every other country not mentioned.

COLORS FOR LANGUAGES.

If you wear a red ribbon you can speak English at this Congress. If you wear blue you're French, and yellow means you know what they mean when they say "Wie gehts." If you wear the whole three it means people will stand back and look at you and be afraid to speak to you at all. But some of them do it, though there are some conscientious people who are nervous about even claiming a right to the red ribbon.

In a little room in the West-Hall, Madame Hoffman sits and pins these ribbons on as the case requires. You have the choice of a bar pin or a stick pin or a button. And Madame Hoffman is having the nicest possible kind of time in the cool, vine-shaded little room, for she is an exile from Paris, and every so often some one will rush in with extended hands and the French floats round your head in torrents.

"I am charmed," she declares. "I have met the most interesting of people, and they know all my own people in France."

This is a mutual delight, for it gives Toronto a nice cosmopolitan feeling to have a real Parisienne to receive our French visitors. And Mme. Hoffman speaks seven languages, so there weren't enough colors to decorate her with.

So far as madame can say, there is only one lady student of geology present—a Miss Rathgen, from Berlin. But there are many who are helping their husbands in the work. And they've all left their babies at home. Madame was much amused at the story of the lady, Mrs. Quesnel, who never kissed her husband.

"Why, as soon as I saw her I knew that wasn't true," she remarked naively.

DR. KIDO.



Director of the Geological Institute South Manchuria Railway Company, Tokyo, Japan.

J. B. TYRELL

D. ADAMS FR.S

DR. A. P. COLEMAN

SIR CHARLES FITZPATRICK

P. M. TERMIER OF FRANCE

Star. Aug. 7-1913.

DIPL.-BERGINGENIEUR HEINZ MITSCHERLICH
ASSISTENT AM GEOLOG. U. MINERAL. INSTITUT
DER TECHN. HOCHSCHULE

KARLSRUHE

Card of the gentleman with the longest name at the Congress.

Toronto Daily Star. Aug. 7-1913.

With The Delvers-Into-Things

Points About the Ready-for-Emergency Explorers of the Rocks, Who are Now in Congress at Toronto—Men Speaking Many Languages Foregather From Ends of the Earth.

From the ends of the earth, from dim laboratories in hoary old European universities, from mountain camps in the Andes, or the Pyrenees, or the Alps, or the Caucasians, from Siberia and from London, from France and from South America, the Twelfth Geological Congress of the World has assembled itself in a dim room in the west wing of the University of Toronto. It speaks in French, Chinese, German, Japanese, English, and almost every language in the civilized world. It is ready to discuss the world's coal supply, the nitrate deposits of South America, earthquakes and tidal waves, fossils and the authenticity of Genesis, biology and Cobalt silver deposits, how to live for ten days on five ounces of prepared food on a bald mountain top, and the best methods for estimating your chances of getting out of a volcanic crater alive. Not a geologist among them but can set a broken leg, or navigate by the stars, or read the palm of a mining proposition, tell where an earthquake came from, or how old the piece of stone is which crops out of your old home farm up in Perth County. Never has there been seen in Canada or in the City of Toronto such a distinguished gathering of men—and women. They are not merely scientists, but persons of personal bravery and endurance who have made perilous excursions into the outlandish parts of the earth in the cause of science. And above all, they are a human, good-natured, interested, and interesting aggregation of people.

The fact that the Geological Congress has come to Canada this year signifies a great thing for Canada. These are not merely five hundred tourists, or five hundred learned persons who will see and forget. These men and women, having already spent several weeks in exploring Ontario, Quebec, and the Maritime Provinces, will, after visiting the Canadian West and Alaska, return to their respective parts of the world to report on the things they saw in Canada. Some of them will do so in lectures to their students in a hundred great universities; others will report to their Governments, to their commercial employers, and almost all of them will write in some publication or other their impressions of Canada. Twenty-five Governments, thirty-eight countries, and hundreds of scientific institutions are thus being brought directly in touch with Canada and its possibilities.

☆☆☆
This great congress is almost forty years old. It began with a collection of maps and other geological records at the International Exhibition at Philadelphia in 1876. Geologists there conceived the idea of having some international organization to facilitate the exchange of data and opinions among the geologists of the world. Consequently the first Geological Congress was held in Paris in 1878 at the Paris Exhibition. The secretary of the first committee was a Canadian, the late Dr. T. Sterry Hunt, Chemist and Mineralogist to the Geological Survey of

Canada from 1847 to 1872. There were three Canadians on the committee which organized the first Congress—the Comite Fondateur of 1876: Dr. Hunt, A. R. C. Selwyn, and Paul de Caze.

☆☆☆

Aubrey Strahan, F. R. S., the Director of the Geological Survey of Great Britain, is a heavy built Englishman of the kind that says little and thinks much, and is not to be coerced into conversation with anyone.

He has a brushy beard and deep-set eyes that peer at everything as if it were a stone, to be chipped, and read, and either thrown aside or preserved. He wears loose-fitting clothes and smokes a dog pipe, whose warm bowl he smuggles into the palm of his big hand while he speaks. When he is finished speaking, he puts it to his teeth again. He is a typical scientific Englishman. He was educated at Eton and Cambridge.

☆☆☆

Dr. B. Weigand is a short little man with a great beard and spectacles. He is the representative of the Oberheimischer Geologischer Verein, of Stuttgart. He is the senior member of the party from Germany.

Dr. Weigand is the most indefatigable traveler in the Congress. He has a passion for seeing everything that can be seen, knowing that what can be known, and achieving that which seems impossible or at all events difficult to achieve.

"I never travel too much," he said to The Star. "It is good."

For instance he was one of the few in Sweden to make the trip to Spitzbergen. This year he is going to be one of the party that will visit the Yukon. He is greatly interested in earthquakes and seismic phenomena.

☆☆☆

J. B. Tyrrell, the Toronto explorer and geologist, is one of the outstanding men in the gathering. Mr. Tyrrell's big frame is to be seen moving among the crowd, finding old friends and making new ones, listening to stories or telling them himself, and helping the strangers to feel at home generally. Mr. Tyrrell is the man who made the famous journey across the barren lands of our northern wilderness. A journey to Port Nelson or Churchill is only a trifling matter to him. He only recently returned from an excursion to the shores of Hudson's Bay to survey and report on the strip of territory allotted to Ontario out of the partition of Keewatin.

Mrs. J. B. Tyrrell has accompanied her husband on some of his less serious expeditions. Recently she accompanied the geologist on their excursion to the Cobalt region. One of the events of the trip was a journey to Bear Island in Lake Temagami. Here the party met certain Indians who greatly interested the geologists from Europe by their moccasins-making. The chief, White Bear, had a little tame bear which caught Mrs. Tyrrell's fancy. She wanted to buy it. A little trifle like a bear or two in his backyard did not for a moment phase her husband. He bought the bear, had it crated and shipped to Toronto. Rumor says it escaped on the way to the train. Mr. Tyrrell does not say.

H. M. Caddell, a Scotch geologist, showed certain Indians who live along the shores of the Lachine Rapids that the dancing of the Canadian Indian is not in it for a minute with the terpsichorean abilities of the Scotch. The Committee of Entertainment in Montreal, took some of the geologists up to visit the reserve. Here a courtship and wedding ceremony was put on by the Indians, much to the delight of the visitors. A pretty Indian maid stood in the centre of the clearing, and one by one her suitors appeared, making speeches and offering gifts. Finally came one brave with furs and trinkets—and the squaw capitulated.

After this, four or five of the geologists were initiated into the tribe, including Mr. Caddell. The Indians had heard of the degrees bestowed by McGill and they thought they could do as much themselves. Part of the ceremony included the doing of certain tripe dances by the candidates. They all did so in the best way they could, following in the steps of the Indians. But Caddell was no imitator, no mere mimic; he did the Highland fling and the hornpipe to the consternation of the white folk and the delight of the Indians. They christened the Scotchman "Big Dancer."

☆☆☆

At Sudbury, the Board of Trade gave a banquet. It was one of the most successful the geologists have attended in Canada. But bewilderment showed on the faces of the guests as they looked at the beverages placed before them. Polite questions and doubts flew softly about the table in five different languages.

"What is it," they whispered. "It" was pink and red and orange and green. Such wines the European had never dreamed of. But it wasn't wine—but pop. It was a sober dinner.

☆☆☆

They call Herr Zoud, one of the Belgian delegates, the "little steam roller." He is a short, stout man and very powerfully built. He is always carrying bundles. He is to be seen on the hottest day with at least two cameras, or a bag full of the biggest "specimens" he could carry away. He is never content with little chips, but carries off whole boulders to his scientific lair. If he has no boulder of his own, he carries somebody else's but boulders he must have.

☆☆☆

Mrs. Fermor, the young wife of one of the geologists from India, was the only lady to accompany the party, that visited the asbestos mines in Quebec. She won her spurs, say the old geologists, because she did not fuss. She wore stout, heavy clothes and thick boots. Geologists at work abhor finery.

☆☆☆

Professor Hobbs, of the University of Michigan is keen on the trail of the earthquake. Earthquakes are his hobby. He knows the history of the earthquake better than anyone else in the party. His middle name is earthquake.

During the trips over various parts of the country, he was continually looking for "faults" in the rock, signs of earthquakes that may have happened a thousand years ago.

MEN WHO WELCOMED GEOLOGISTS OF THE WORLD



PRESIDENT FALCONER HON. W. H. HEARST

VOICED WELCOME OF UNIVERSITY AND PROVINCE.

President Falconer, of the University of Toronto, in welcoming the delegates said: "We believe you will confer an inspiration that will extend far beyond this country." Hon. W. H. Hearst, Minister of Lands, Forests, and Mines for Ontario, said: "As far as I can give it to you, you have the freedom of the Province."

Toronto Daily Star, Aug. 7-1913.

PICTURESQUE GATHERING OF THE MOST RENOWNED GEOLOGISTS OF WORLD TO TAKE PART IN GREAT INTERNATIONAL CONGRESS

Five Hundred Delegates, Representing the Great Countries of the World and Twenty-Three Different Languages, are Attending Meetings at the University.

THE COAL RESOURCES OF THE WORLD WILL BE THE MAIN DISCUSSION

Sir Charles Fitzpatrick, Administrator of Canada; Hon. G. H. Perley, and Hon. W. H. Hearst, Welcomed Delegates on Behalf of the Dominion and Provincial Governments.

See Also Page Four of This Edition.

Proceedings at the Twelfth International Geological Congress opened this morning at Toronto University by a meeting of the Congress Council at 9 o'clock. The formal opening occurred at noon in Convocation Hall, when the Excellency, the Right Hon. Sir Charles Fitzpatrick, Chief Justice of the Supreme Court of Canada, and administrator during the absence of his Highness the Duke of Connaught, took the chair, and in behalf of the Dominion Government Hon. G. W. Perley welcomed the delegates. The Provincial welcome was extended by Hon. W. H. Hearst, Minister of Lands, Forests, and Mines, while the city was represented by the Acting Mayor. President Falconer spoke in behalf of the university.

The chief business to-day was the election of the Bureau, as nominated by the Council this morning, and the presentation of the colossal monograph entitled "Coal Resources of the World," in Convocation Hall at three o'clock.

A Geographical History of the Earth.

This evening at 8 o'clock Monsieur Emmanuel de Margerie, former president of the Geological Society of France, will deliver a popular lecture on the geological map of the world, tracing the various rock formations underlying the world's surface, and unifying continents despite political boundary lines and fortifications.

Entertained By Ladies.

One of the features of this afternoon's program particularly concerned the ladies of the congress. Ladies of the local committee served tea from 4 to 6 p.m. on the shaded lawn in the university quadrangle. Those of the congress who found geology a little dry and unentertaining in view of such a temptation proved more numerous than the formidable degrees after the names of the delegates would have lead one to suppose.

The Congress Government.

The International Geological Congress is governed by a council consisting of members of the original committee who founded the congress in Paris in 1876, members of the present organization committee, presidents in office of various geological societies, directors of important surveys, members of the present bureau, and former vice-presidents and other office holders, and certain others added by the congress. This council met and nominated the "Bureau," which is practically the general executive committee, including a president and an international representation. The nominations were submitted to the general meeting of the congress after the opening ceremonies, and the report upon the affairs of the congress, as transmitted to this session by Dr. Helges Balckstroem, delegate of the Royal Swedish Government.

Delegates Fraternize.

The scene in West Hall, where the delegates fraternized and sorted themselves out into their various committees for the work which begins tomorrow, was one of liveliness and good nature. All the world seemed to be shaking hands and laughing. English speakers wore red badges, French blue, and German yellow. Japanese and other varieties don't wear any distinguishing badges; they must speak one or other of the three international languages, and laugh without words. But everybody talked—there were none without the gift of tongues visible in Toronto University this morning from 9 o'clock onward.

A Bilingual Address.

"When I was first charged with the very pleasant duty to welcome you it was my natural impulse to address you in my mother tongue," began Sir Charles Fitzpatrick in opening the formal session of the Congress in Convocation Hall. But as there were 23 languages represented in the gathering, Sir Charles considered it only proper to make an address in the recognized international medium of the Congress, "La langue de la belle France." This was, he said, particularly appropriate in a session which met in Canada, the scene of the exploits of Jacques Cartier, La Salle, and Champlain. Sir Charles thereafter used the two languages, French and English, alternately, in the bilingual system, as prevails at Ottawa.

On behalf of Mr. Borden, Sir Charles pleaded the pressure of public business for his not being present. He read a message from His Royal Highness the Duke of Connaught, welcoming the Congress and regretting his absence in person.

Sir Charles then gracefully welcomed the delegates in French. He called the attention of the geologists to Canada's Laurentian plateau, the world's oldest rock formation, which, in this country out-crops so extensively; the nickel deposits of Sudbury, the silver at Cobalt, the gold at Porcupine, the water power at Niagara Falls, the mineral deposits of Saskatchewan and Alberta, including the mines at Rossland.

The Official Opening.

The Administrator arrived at Convocation Hall in a carriage with Sir Henry Pellatt promptly at 12 o'clock. He was welcomed by the officials and shortly afterwards escorted to the platform, where Hon. H. W. Hearst, Minister of Ontario's mines, Acting Mayor Church, President Falconer, of Toronto University, Chairman Engleheart, of the T. & N. O., and about fifty representative Torontonians were seated.

The Provincial Minister.

"The area of this Province, which many of you are visiting now for the first time," said Mr. Hearst, "is over 400,000 square miles. Only 10 per cent. of this land has as yet been alienated from the Crown. During the last ten years the mining output of Ontario has increased by 40 per cent. Yet we have thousands of miles that have never yet been put on our geological maps.

"The Province is yours," declared Mr. Hearst, heartily, "its Government, its people, and its resources generally."

The City's Welcome.

Acting Mayor Church explained that Toronto was an Indian word meaning the "place of meeting." Toronto was the convention city.

"The study of geology is a great study," said Mr. Church. "It has done so much for civilization. Toronto is honored. We give you a hearty welcome and turn the keys over to you. There will be a continuous series of entertainments for you by the city, the Province, and the University of Toronto. I hope you will have a good time, and once more I welcome you."

President Falconer followed in behalf of the university, saying that the convention was an evidence of the scientific progress of Canada.

"You have brought with you the experience of many years," continued President Falconer, "and you have brought with you the seeing eye. You will, in your progress through our land, in company with our geologists, see things that they have not seen, or by which they have been baffled. And—for I think I may say our own geologists include distinguished men—you will see things that they will show you and you will learn from them as they will learn from you.

"You represent science, and science surely is one of the beneficent factors in this civilization of ours to-day," continued the University president, speaking for the University. "We welcome you—not only as Canada and part of the British Empire, but as students, representing the world within."

A Reply in French.

Dr. Tietzer of Austria followed, speaking in official French.

Then Dr. Helges Balckstroem, delegate of the Royal Swedish Government, gave the congress a resume of the position of affairs at the opening of this present session.

Officials Elected.

The Council's nominations for the members of the official bureau were submitted to the Congress by Sir Charles Fitzpatrick and approved by the delegates. These included President "Ancien" Hofrat E. Eletszl of Austria; president, Dr. Frank D. Adams; secretary-treasurer, R. W. Brock, and representatives from the 23 different countries.

To Tour Canada.

Secretary Brock announced the outline of the preparations for the tour of Canada and the various excursions. The delegates will see all of geological Canada conveniently available, traveling in all some 20,000 miles. A trip up the Pacific Coast, to Mount Elias, and into the Yukon is included.

Toronto Daily Star. Aug. 7-1913.

Toronto World. Aug. 8-1913.

DISTINGUISHED DELEGATES TO GEOLOGICAL CONGRESS



DR. C. WHITE
STATE GEOLOGIST
WEST VA. and CAPT.
BAIRD HALBERSTADT
MINING ENGINEER OF
PENNSYLVANIA



PROF. C. VEY HOLMAN
OFFICIAL DELEGATE FROM
MAINE



DR. TADASU HIKI
IMPERIAL UNIVERSITY
OF KYOTO, JAPAN.

GATHERING OF GEOLOGISTS MOST NOTABLE EVER HELD IN CANADA DELEGATES WARMLY WELCOMED

Chief Justice Sir Charles Fitzpatrick Delivers Greetings on Behalf of Dominion at Opening Session of International Conference—French Professor's Evening Lecture Was Keenly Appreciated.

Except the British Association itself no greater gathering of scientific men has ever assembled in Canada than has come to attend the 12th International Geological Congress which was opened yesterday in the convocation hall of Toronto University. The really great men who have come to Toronto to the number of 500 or more, represent the topmost attainment of knowledge on all that has to do with the bowels of the earth, for of those regions they know but little, but of the epithelial tissue or outer skin to the depth of a few miles. And as M. Emmanuel de Margerie said last night in his lecture, the earth's surface is seven-tenths water, and we know nothing of half of the rest. The more honor to the brilliant intellectual achievement that has done so much to add to our understanding of terrene development

Among the world-famous men present are. Prof. Molengraaff of Delft, Holland, where general achievements as a geologist place him in the highest rank; Prof. Reid of Johns Hopkins, an eminent seismologist; Aubrey Strahan, a leader in English science; P. M. Termier, a specialist in archaean work from France; Tadasu Hiki, with the new light from Japan; Dr. Sederholm, director of the geological survey of Finland, who wishes to study our archaean formations and compare them with the Finnish; Dr. Weigand of Germany; Dr. Tietze, the great palaeontologist, from Vienna; Dr. Hague, the oldest member of the U.S. survey; Dr. Auster of the German survey; Prof. Cole, the brilliant Dublin authority; besides hundreds of others from the two score or so of countries represented. Nor is Canada without a voice. The land in which Logan and Dawson have gained renown, maintains the tradition in the persons of Coleman, Miller, Adams and others, who size up well with the best of the visitors. Prof. Coleman is to lay two papers before the sections, one on the classification of the archaean in the interglacial formations of Toronto, and one even more important geologically, on the separation of a new series of strata between the Huronian and the Keewatin, which he calls the "Sudbury." The differentiation he bases on stratigraphical grounds and not on fossil evidence. For the general public it may do more than add a few million years to the age of the earth, whose antiquity is judged by the number of suits of clothes it has worn.

Another Suit of Clothes.

There is an old story of the Afghan war about a tribesman who was brought in and found to be unspeakably dirty. The colonel ordered him away to be washed before examination. After two hours he sent to know why the delay. The corporal reported that the washing was going on and they had just come on another suit of clothes. Prof. Coleman has found another suit of clothes on the earth, "Sudbury" fashion.

The visitors were welcomed in the morning by Sir Charles Fitzpatrick on behalf of the Dominion, while Hon. W. H. Hearst, for the province, the acting mayor for the city and the president for the university conveyed salutations.

President Falconer was most happy in his remarks. "Your science," he said, "has ancient prestige. Geologists engage in a ceaseless pursuit of the truth.

"You have brought with you the experience of many years," continued President Falconer, "and you have brought with you the seeing eye. You will, in your progress thru our land, in company with our geologists, see things that they have not seen, or by which they have been baffled. And—for I think I may say our own geologists include distinguished men—you will see things that they will show you and you will learn from them as they will learn from you."

Acknowledgments were made by Dr. Helges Baekstroem, Sweden, and Dr. Tietze, Austria.

The outstanding feature of the congress which will make it memorable in scientific history is the huge record on the coal resources of the world. The three volumes and atlas of which it consists constitute a landmark in a very real sense in a most important economic investigation. The work is written in English, German, and French.

For the Learned Only.

Those who expected a treat in Kindergarten geology last night in Convocation Hall at the "popular" lecture given by Prof. de Margerie, were doomed to disappointment. He was introduced by President Falconer in the absence of the president of the executive committee, Dr. Frank D. Adams, who was concealed in a seat half way down the hall. Then everybody settled down to hear how Lake Iroquois turned into Lake Ontario, and whether the earth, like other forms of life, was simply a gigantic cell, and what happened to Rhiphaeus and Latona and Lemuria and Atlantis, the legendary continents of ages past when the walls of the cell had a convulsion, and whether it was hot inside, or cool like the bottom of the sea seven miles down. But Dr. de Margerie was like Gallia, and cared for none of these things. He started

continued on next page

in French to explain that out of compliment to the eminent Canadian geologists he would speak in English. We had time to see that he was the same size and build as King George, and had the same features as his gracious majesty, and the same whiskers, and we all listened loyally till he took his first drink of water. Then quite a number of us got up

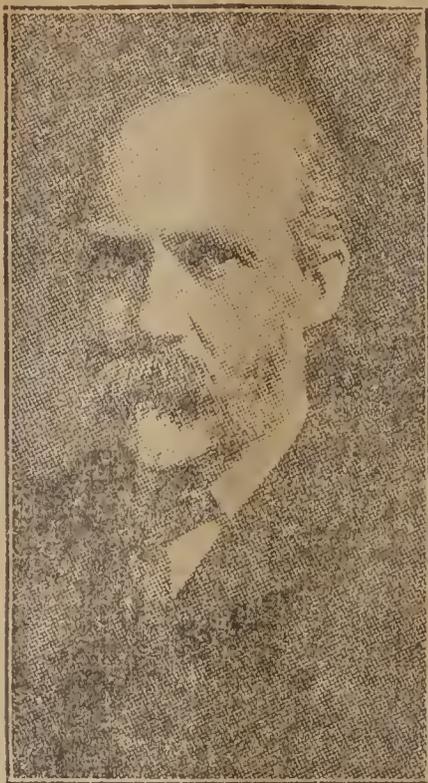
and went out. The rest of us sat awaiting them till he took another drink, but he didn't need another, and those who missed the first chance reflected on the tide in the affairs of men. Of course this only refers to the laity.

The lecture was of great interest to the scientific men, and dealt with the necessity of co-operation in producing a standard geological map of the World. The more recent discoveries made the old maps useless. The composite plan, allotting a Mercator projection with the results attained by the Prince of Monaco, whose work on the bed of the ocean was complimented, was discussed.

A Model Map.

The 1 to 15,000 map of Europe, the source of glory to the congress of 1881, was pointed to as a model, and the difficulties of a scale of reduction were regarded as commercial rather than scientific. The scale of 1 to 1,000,000 was becoming the standard geological scale the world over. In discussing what had been done, the lecturer paid a high compliment to the German geologists for their most valuable contributions in South America. The French in North Africa had done

Today the council meets at 9 o'clock in room 16, west hall. At 10 the general meeting with miscellaneous papers will be held in the physics building. The ladies' committee will give a luncheon



DR. A. P. COLEMAN

Chairman of Toronto local committee.

to the visiting ladies at 1.30 in the Speaker's chambers, parliament buildings. At 2.30 in room 8, main building, "Differentiation in Igneous Magmas," and in room 11, "To what extent was the ice age broken by interglacial periods?" will be discussed.

Canada's great future as a coal producing country, as compared to the small share she now takes in the coal output of the nations of the world, formed the basis of some intensely interesting information given in a review of the coal resources of the world,

which was read before the International Geological Congress at the afternoon session yesterday by R. N. Brock, general secretary of the congress.

According to reliable statistics, which were prepared under the direction of the executive sub-committee of the coal resource committee, while the production of Canada at the present time is only about 12,000,000 tons annually, the output from now on is expected to increase rapidly, and the actual exhaustion of the supply lies far in the misty future.

The actual coal reserves of Canada are 675,000,000 tons class A, 29,161,000,000 tons class B, and C, and 384,968,000,000 tons class D. In addition to these, the probable coal reserves of the Dominion are estimated as: 1,483,000,000 tons class A, 254,500,000,000 class B, and C, and 563,482,000,000 tons class D. British Columbia, Alberta and Nova Scotia are the big coal provinces of the Dominion. Ontario shows a probable reserve of 25,000,000 tons of the soft variety.

The total "actual," "probable" and "possible" coal reserves of all qualities for the entire world are set down at 3,397,553,000,000 tons. Of this estimate 5,105,528,000,000 tons are credited to America, including north and south continents; to Asia 1,270,586,000,000, Europe 734,190,000,000, Oceania 170,410,000,000 and Africa 57,839,000,000. The big feature of these figures is that they show America has more coal several times over than all the other continents.

Discussion of coal reserves included addresses on the coal reserves of France and Germany, speakers giving their addresses in their native tongues.

One of the big features of the convention lies in the fact that the visitors from foreign lands employ their own languages and when it is considered that 25 different languages are represented among the delegates, it will be seen that he who gets the full benefit of all that is said must be an expert linguist, indeed. That this was to be the case was shown right from the start, when the geological congress was officially opened. And French was the tongue to receive first place.

"When first asked to come to welcome you to Canada," said Rt. Hon. Sir Charles Fitzpatrick, "I was tempted to address my welcome to you in the English language, but on learning that there are no fewer than 25 tongues spoken at this congress, I decided to speak the words of welcome in the official language—French—the language spoken by the pioneers who laid the foundation of this great country. It is a great tribute to the wisdom and liberality of the British constitution that it is made possible to



DR. W. A. PARKS,
Secretary of local committee.

bless the name of our sovereign in the language spoken by Champlain and Cartier."

In reading his address of welcome in French, Sir Charles conveyed the regrets of H. R. H. the Duke of Connaught, that the governor-general was unable to welcome the congress in person. Premier Borden also sent his regrets at being unable to attend.

Hon. W. H. Hearst, minister of mines and lands, in extending a welcome on behalf of the people of Ontario, remarked on the great opportunities for the geologists here. There were 400,000 square miles of Ontario rich in mineral wealth and millions of these acres had never been mapped by geologists, millions never visited by geologists.

The delegates were welcomed to the city by Acting Mayor Church, who extended the freedom of the city to the visitors.

President Falconer of the University of Toronto, in extending a welcome, said: "In your movements while you are here, not only will you teach Canadian geologists something, but I think our geologists will teach you something."

The reply was made by Dr. Tietzer of Austria, who addressed the gathering in French.

A JAPANESE DELEGATE



DR. TADASU HIKI

Professor of geology, mineralogy and ore deposits, Imperial University of Kyoto.

He was followed by Dr. Helges Balstream, delegate of the Royal Swedish Government, who gave the congress a resume of the position of affairs at the opening of the present session.

Secretary Brock announced the outline of the preparations for the tour of Canada and the various excursions. The delegates will see all of geological Canada conveniently available, traveling in all some 20,000 miles. A trip to the Pacific coast, to Mount Elias and into the Yukon is included.

The result of the election to the congress bureau was as follows: Ancient president, Prof. Hofrat Tietzer; president, F. D. Adams; secretary-treasurer, R. N. Brock.



FRANK D. ADAMS, F.R.S.,

McGill University, president of twelfth session.

splendid work and hoped to extend their cartographical work down thru the Sahara and the British territories. A scheme for the division of the continents was outlined, Australia, Asia, Japan, Dutch Borneo, the Malay peninsula, Western Asia, Persia, familiar names dwelt upon. "A single gap remains in the east China," concluded this section.

Dr. Bartholomew's "Masterpieces of map-making and color printing" had a final eulogy and then the speaker ended as he had begun in his native tongue an address full of professional and technical interest.

Mail & Empire. Aug. 8-1913.

GEOLOGISTS OF THE WORLD MEET IN GREAT CONGRESS

Remarkable Gathering of
Scientists Welcomed by
the Dominion, Province
and University.

Leading Students of Every
Nation Join in the Dis-
cussion of Matters of
Universal Interest.

Coal Resources of the
World One of Outstand-
ing Subjects With Which
Convention Will Deal.

Of all the many conventions which have made Toronto their rendezvous this year none has brought such honor to the city as that at present in session of the 12th International Geological Congress of the World. Its delegates, men of international reputation in the world of science, come from every civilized nation, and there is scarcely any considerable section of the habitable globe which is not represented by one or more geologists familiar with its conditions. The representation is close upon 500, and there are twenty-three languages spoken, although the congress recognizes only the three official tongues of science, French, German and English, in any one of which the addresses may be made.

It was an interesting sight yesterday at almost any hour to notice dwellers in countries as far removed almost as the poles conversing together, French, as is usual, appearing to be the common medium of expression. Here might be observed a Jap in animated conversation with a European, or a Norwegian talking to a representative of one of the Latin countries of South America. The men seem all of a fine type, clear-eyed and thoughtful visaged, while their occupation, which demands an active life out of doors as well as the seclusion of the study, has developed a physique in most of them that is in striking contrast to the general undevelopment, bodily, of the student.

GEOLOGISTS IN TORONTO.



A. S. Gunnsberg and P. P. Platzkay, of St. Petersburg.

The university main building has been converted into a series of offices, bureaus, and temporary libraries, where the many details of a congress, which does more than merely assemble and remain in the city, are attended to. The necessary materials for the discussions require literature and maps in great numbers, and statistical reports of all sorts are available in the libraries. The offices include the usual ones to arrange accommodation for the delegates; others for looking after the numerous excursions; a cashier; a branch of the Royal Bank, and an office for the Morang Publishing Company, who have prepared the elaborate monograph on the "Coal Resources of the World," a work in three quarto volumes with atlas, for which a special rate has been fixed for delegates. To add to the conveniences at the disposal of the congress, cadets in uniform are present to act as messengers or guides at all times, taking the place in the sessions of the page boys in Parliament.

The morning's proceedings opened with a meeting of the Congress Council at 9 o'clock. The International Committee met at 10, and the formal opening took place at noon in the Convocation Hall of the university. Sir Charles Fitzpatrick, Administrator of Canada in the absence of H.R.H. the Duke of Connaught, occupied the chair, welcoming the delegates on behalf of the Dominion Government. Hon. W. H. Hearst, Minister of Lands, Forests and Mines, extended a welcome from the province, while the Acting Mayor on behalf of

the city and President Falconer for the university also welcomed the delegates.

The Official Welcome.

Sir Charles Fitzpatrick delivered his address in French, prefacing it with a few remarks in English, stating that it was fitting his address should be made in French, the official language of the organization.

A message from H.R.H. the Duke of Connaught welcoming the delegates to Canada and regretting his absence from the congress was read by Sir Charles, who also made excuses for the Prime Minister. The latter was prevented from being present by the pressure of public business. The address was concluded with references to the work of former congresses and some remarks on the geological and mineral wealth of Canada.

Hon. W. H. Hearst, who followed, spoke of the honor that the province receives in this visit, particularly in considering the high positions occupied by the delegates in the world of science. He made reference to the value of such conventions in making for the peace of the world, and concluded by calling attention to the great field before the geologist in this province.

The civic address was presented by Acting Mayor Church, who remarked on the fact that Toronto is living up to its reputation as "a place of meeting." He was followed by President Falconer, who pointed out that the congress is evidence of the scientific development of Canada. The mutual advantages that the geologists from abroad and those of Canada will receive from their intercourse was dwelt upon, and Dr. Falconer concluded by extending a welcome as from students of the world within.

The nominations for the members of the official bureau as prepared by the council were submitted to congress by Sir Charles Fitzpatrick and approved.

An announcement of the outline suggested for a tour of Canada was made by the secretary. The delegates will travel in all 20,000 miles, seeing

GEOLOGISTS IN TORONTO.



Mr. Hurl, Edinburgh, Scotland.

most of the important geological formations of Canada, the tour to include a trip up the Pacific to Mount Elias and into the Yukon.

The World's Coal Resources.

The public business of the congress began with a meeting in Convocation Hall at 3 o'clock, when the topic, "Coal Resources of the World," was introduced, Mr. R. W. Brock, general secretary of the congress, reading a paper on the monograph, which was presented to the opening session, on "The Coal Resources of the World."

In introducing his remarks Mr. Brock explained that one regrettable feature of the undertaking was the curtailment of some of the reports and work upon some of the maps, owing to the necessity of having the work prepared in time for the present congress. Some of the material was delayed, said he, through the late arrival of new material. Mr. Brock's address was in part as follows:

This monograph is intended to form a companion work to the "Iron Ore Resources of the World," published under the auspices of the eleventh congress. Its preparation and publication were entrusted to a committee consisting of G. G. S. Lindsay, convenor; F. D. Adams, R. W. Brock, D. B. Dowling, Charles Fergie, James McEvoy, J. B. Pater, and William McInnes; while the actual editing was done by William McInnes, D. B. Dowling and W. W. Leach, of the Geological Survey.

continued on next page

The main body of the monograph has reports on 64 countries, most of them in English, while all the reports are summarized in English in the first volume.

The preface by R. W. Brock calls attention to the very cordial support given by geological surveys and other similar departments of Governments throughout the world. In addition, information was obtained from specialists who had had unqualified opportunities for the study of particular fields, though unofficially connected with the fields about which they write. A particular contribution of this sort deals with the coal resources of China, written by Dr. Noah Drake, whose long university experience has given him exceptional opportunities for the study of this question.

It is explained that owing to the lack of uniformity in the usage of the different countries of the world regarding the classification of coals, it was found necessary to adopt an arbitrary classification that might be used by all. A scheme of classification was drawn up and most of the reports have been prepared in accordance with it.

In the introduction Mr. Dowling summarizes the results, dealing first with the distribution of coal in the various geological systems.

7,397,533 Million Tons of Coal.

Some interesting figures give statistics of the coal reserves of the world, as compiled from the reports received. The total is 7,397,533 million tons. Of the anthracite coals, Asla, with the great Chinese fields, has by far the largest supply of any of the great continental divisions, furnishing 407,637 million tons. The world's production of coal for 1910 was about 1,145 million tons, so that, allowing for areas which cannot be economically mined, there is still enough coal left for many hundreds of years. In individual countries, however, the end is in sight already.

The production of Canada at the present time is only in the neighborhood of 12 million tons annually, and as it is estimated that there are in the neighborhood of 1,000,000 million tons in reserve, the future appears safe.

Following the introduction is a summary by the editors of each of the detailed reports.

The main portion of the work, which, of course, is given up to the detailed reports, shows that very few countries of the world are without coal resources of some kind. In the remaining part of volume I, there are very valuable reports of China and Japan, together with the islands of Oceania.

Volume II, contains reports of Africa, America, the West Indies and part of Europe. These are prepared by a number of eminent men in their respective fields, and give interesting information regarding the resources of the different countries. The Canadian report is prepared by D. B. Dowling, and there is another by J. P. Howley on the coal areas of Newfoundland, which he believes are extensions of the coal fields of Nova Scotia. The American fields are taken up by Mr. M. R. Campbell, of the United States Geological Survey, who estimates that of an original content of 3,225 billion tons, 11 billion have been used up to the present.

Has Little Coal Left.

Great Britain is estimated to have a reserve of 189,534 million metric tons, most of it bituminous, while France has 17,584 million, also chiefly bituminous. Two other interesting countries mentioned in this volume are Switzerland and Turkey, the former because it has almost depleted its coal supply, having only 4,000 tons of anthracite and 500 of bituminous coal left, while Turkey has large quantities of brown coal and cannel-like bituminous coal.

The third volume is devoted to the other countries of Europe, the German report being exceptionally exhaustive. Germany's actual reserve is 94,865 million tons of Stein coal and 9,314 million of brown coal, though it is probable that there is a large further reserve. The volume closes with the Russian report, which gives 235,997 million tons reserve of all grades for the country.

In addition to the very numerous maps and illustrations in the three volumes, there is an atlas containing 68 pages of maps, most of them in color. Especially noteworthy among the plates are perhaps the colored maps of China, Corea, Manchuria and Japan. Those of Austria and France and the eight maps of the coal fields of Canada are also of great interest.

Declared Classification is Wrong.

That the entire monograph does not meet with the approval of all delegates present was made strikingly evident when at the conclusion of Mr. Brock's paper, J. M. Gordon, of Montreal, rose to lodge a vigorous protest against the classification of coal. He declared that he was prepared to prove the system adopted absolutely wrong, and pointing out that it is impossible to judge a coal by its chemical constituents, which vary greatly, and even when not varying appreciably often cover coals of two complete classes, he maintained that the only satisfactory method to be adopted is to have a classification worked out by the petrographer as a result of microscopic examination of the coal. The difficulty in classification lies apparently in the difference in texture of the flora which went to make up the coal when laid down in the different localities. Finally he urged that until such a classification is prepared the only method to adopt is to stick to the rough classifications of commerce into anthracite, steam, household, cannel, lignite, etc.

Speeches were also heard from M. A. Define, one of the most eminent of the corps of French engineers, and Dr. J. P. Krusch, of Berlin, both of whom spoke in their native tongues. The former spoke chiefly on the resources of France, while Dr. Krusch delivered a paper by M. Boker dealing with the situation in Germany, and pointing out the difficulty of making a classification at the present time.

Two short extempore speeches were heard from Dr. J. W. Evans on the African fields, and A. S. Kitson, an eminent authority on Australian conditions, who spoke upon the fields of Victoria and also of Southern Nigeria.

At the conclusion of the session the delegates had tea served to them by the Ladies' Local Committee in the quadrangle of the university.

A Geological World Map.

Practical suggestions for the plotting of a geological map of the world were presented last evening by Emmanuel de Margerie, past president of the Geological Society of France, in an address before the Geological Congress in Convocation Hall. The latest complete maps of the kind, M. Margerie said, were published in 1845 and 1861 respectively. The second of these had often been reproduced since then, but was now of little use, due to the progress and widening of knowledge in the meantime.

There are at present modern scientific geological maps of Europe and North America, M. Margerie said. The former is the production of a commission, and the other is issued by the United States Geological Survey, that body having co-operated in its compilation with the surveys of Canada and Mexico.

M. Margerie favors what he calls a continental plan of mapping the world, as opposed to a "mundial," the latter comprising the whole area of land and water on the globe on Mercator's projection. The chief objection to the whole-world projection

is that it deforms surfaces to such an extent that comparison of widely separate latitudinal areas is very difficult. Using an individual projection for each single continental map reduces this fault to a minimum. A secondary objection lies in the fact that seven-tenths of the earth's area is covered with water, and therefore comparatively barren from the geologist's standpoint; an immense waste of expensive space in the map is therefore saved by using the continental in preference to the mundial plan.

M. Margerie's suggestion is that the method already adopted in mapping Europe and North America be extended to the other great land areas of the world. He would have the map of South America first undertaken, and would entrust the work to German scientists and German printers. He would have the map of Australia prepared under the auspices of the Government of that Commonwealth. Africa, he said, should be entrusted to the French. In the case of Asia, much of the data could be supplied by the official bodies of various European nations, and the maps, M. Margerie suggested, should be produced by Bartholemew, of Great Britain. This would leave only Antarctica and Oceania unmapped, and M. Margerie believes there is no great need for the geological cartographer's art in those regions just yet.

M. Margerie, who is a frail-looking, dark little man with scholarly shoulders and a bushy French beard, gave his address in English, by request, opening and closing, however, in his own tongue. He was introduced by President Falconer, of the university.

GEOLOGISTS IN TORONTO.



Dr. Tabasu Hiki, Imperial University of Kyoto, Japan.

THE GEOLOGISTS.

We wish the International Geological Congress a prosperous session in Canada. Its meeting in Toronto and its several excursions through the country will, we hope, prove in the highest degree instructive and pleasurable for the members, and fruitful of good for the Dominion. Canada's turn for a session of the congress was bound to come. The immense tract of the Dominion has been sufficiently explored by the field men of our Geological Survey and by the experts of the several provincial mining bureaus to unfold the main features in the story its rocks have to tell. And the work done by these pioneers of science, and the prospectors who followed in their wake, or in some cases preceded them, has contributed greatly to the progress of the country.

Our geological survey has been of great public usefulness. Its labors, especially in the last twenty years, have been largely directed along economic lines, and in that way have been most serviceable. The survey and the various Provincial Mines Departments have brought to light mineral deposits whose utilization has caused large capital investments here, and has built up industries affording employment to multitudes of workers. The Geological Survey of Canada has indeed justified its existence. It came into being in a very unambitious way 71 years ago, and after a period of meagre aid by the Government, and of precarious existence, it finally was admitted to its proper status as a branch of Government, and to-day the director of the survey has the rank and title of a Deputy Minister. In its struggling days it had the services of very distinguished men. Sir William Logan, its first head, who was Provincial Geologist of the old Province of Canada, presided over it and toiled in its behalf from 1842 till 1869, when he resigned. Dr. Sterry Hunt, who was chemist and mineralogist of the survey, was one of the foremost original workers of his day in these departments of science. Elkana Billings, paleontologist of the survey, also rose to great distinction in that particular field of enquiry. Of the men who were with Sir William Logan, Dr. Robert Bell is the only survivor. Upon him some years ago was conferred the medal of the Royal Geographic Society. Dr. Bell, who was acting director of the survey for years, and who should have been titular director during that time, has a fine record as explorer and discoverer.

The survey has issued about a thousand maps and publications, and many of its works are of great authority. At all the International Exhibitions held since the middle of last century the exhibits of Canada's Geological Survey have been the fullest and the

continued on page 37

Mail & Empire. Aug. 8-1913.

Globe. Aug. 8-1913.

GEOLOGISTS IN TORONTO.



O. Andersen, Mr. and Mrs. Holtedahl, University of Christiania, Norway.

most interesting. When information was sought about the route of the National Transcontinental Railway, the volumes and maps of the survey were drawn upon, and very copious was the supply of relevant facts obtained therefrom. The fine work of the survey and the wide publicity its reports have given to Canada in geological circles throughout the world have done their part in bringing this congress to Toronto.

causa, upon seven distinguished delegates to the 12th International Geological Congress, now in session in Toronto.

The list includes a representative of all the larger European nations. It is as follows:—

Aubrey Strahan, F.R.S., Sc.D., assistant director of the Geological Survey of England and Wales.

P. M. Termier, directeur du service de la Carte Geologique de la France.

Thomas Chrowder Chamberlain, graduate of Beloit College and the University of Michigan, professor and head of department of geology and director of the Walker Museum, University of Chicago.

Richard Beck, professor and rector of the Konigliche Sachsische Bergakademie, Freiberg, Germany.

J. J. Siderholm, directeur de la Commission Geologique de Finlande.

Theodosius Tshernyschew, Academie Imperiale de Sciences, St. Petersburg.

Willet G. Miller, geologist of the Province of Ontario.

A special convocation has been arranged for Thursday afternoon, August 14, for the purpose of conferring the degrees. It will be held at 4 o'clock in the afternoon, and following the closing of the ceremony a garden party will be held in the university quadrangle.

HONORARY DEGREES FOR GEOLOGISTS

Toronto University to Honor Seven Distinguished Delegates.

ONE CANADIAN ON LIST

Willet G. Miller, Provincial Geologist of Ontario, to be Made LL.D.

At a meeting on Tuesday evening the Senate of the University of Toronto agreed unanimously to confer the degree of doctor of laws, honoris

WITH THE GEOLOGISTS

By BEN HUGHES.

It was acclaimed at the opening of the twelfth session of the International Geological Congress yesterday that while Toronto is known as the city of conventions this was the first of a truly international nature.

If the delegates had been gifted with all the tongues of Pentecost there would have been many solitary souls wandering round the West wing of the main buildings of the University of Toronto yesterday for want of an interpreter. But the modern world has grown to be so much closer knit that the three key languages of the world gave a solution. English, of course, served well enough for all parts of the British Empire and the United States. It also served for the three Japanese delegates, one of whom spoke very passable Anglo-Saxon. The French blue ribbon, typifying the official language of the Congress for many centuries, used exclusively in the Courts of Europe as the polite tongue of diplomacy, the sciences and the arts, waved in many a buttonhole. To it turned all the Latins, from the Argentine and Chili, Colombia and France, Greece and Guatemala, Indo-China and Italy, Mexico and Peru, Portugal and Spain. The German tongue sufficed for the many German delegates, the Bulgars and the Roumanians, Austria and Hungary, Denmark and Finland, the Netherlands and Norway, Russia and Sweden.

The Geological Departments of both the Federal and Provincial Governments rose magnificently to the occasion, and provided linguists for all comers. The stalwart, broad-shouldered young giant who supplied the members with literature and delighted the hearts of the Teutons with the familiar gutturals, was a Boer who fought valiantly for Paul Kruger some thirteen years ago. To-day he is a valued member of the Geological Survey of the Department of Mines at Ottawa. There were, of course, Frenchmen in plenty. Looking over the benches at Convocation Hall it was apparent that there was little of the market place among these men. They were savants, seekers after knowledge, more interested in the discovery of a well-defined fault than of all the gold and silver mines in Northern Ontario. Each from a different angle was working on the same problems, and once every three years they journey from the utmost parts of the earth to rub theory against theory and report progress.

But with a few the lures of the financial world had been too strong to resist. Such a one was a bearded geologist from the United States.

"Here is another kind of wildcat," the writer was told, and immediately stepped aside to hear.

It appeared that the man of science had obtained the rights of several thousand acres of molybdenite deposit. He had sunk several pits, but had neglected to close them in. There appeared on the scene "wildcatters" who, innocently or willfully, staked out the greater portion of the savant's holdings and proceeded to advertise. They induced New York bankers to come out, took them over the ground as their own, and had them photographed in the pits where the ore was richest. These pictures were sent to Germany, where the value of molybdenite is best appreciated, and hundreds of thousands of shares of stock were sold. Finding what was

going on the savant had a three-foot wire fence put round the property and the promoters put in jail when they poked their noses over it. Now the investors in the Fatherland have only the photographs to console them.

One of the most popular members of the Congress is Mr. Bedford McNeill, familiar wherever a drill is run as the author and possessor of the standard code for mining men. Look on the letter-head of a consulting firm of mining engineers and you will surely see "Code, Bedford McNeill." Mr. McNeill is also President of the Institution of Mining and Metallurgy, a mining guild of the British Empire. No man can enter its ranks unless he has had fifteen years' experience in full charge of a mine or works appertaining to the industry. Mr. McNeill has made a study of precious metal mining, and is an authority upon the history of early attempts to dig silver and gold out of the rock at a reasonable profit. But he is by no means only a sojourner in the past. As the owner of a silver mine in Mexico, he is in pretty close touch with the trend of prices in the precious metal market.

Mr. McNeill is not inclined to view with too much apprehension the trouble in Mexico.

"I believe it has been much overstated," he said, "or, of course, it would be very serious. For the present, at any rate, the enormous stocks of silver held by Indian speculators will prevent any sensible rise in silver. But if conditions continue to be disturbed, nothing could prevent a gradual trend upward in the price."

In such a case Cobalt, and through it Canada, would materially benefit, as a rise of a cent an ounce means hundreds of thousands of dollars a month in the aggregate to the Cobalt producers in the greatest silver camp in the world.

"High tea" as a social institution has been established on all the excursions of the geologists, and to-day the prestige of Toronto was well maintained by the ladies' committee on the lawns of the University.

WHAT WISE MEN SAY OF FUEL ALL BURN

Big and Valuable Monograph
on World's Coal

WORK OF THE GEOLOGISTS

Ontario Shows Only Small "Probable"
Reserve—Nova Scotia, Alberta and
British Columbia Credited With
Canada's Supply.

That monumental contribution to the world's stock of knowledge, which will mark the Twelfth International Geological Congress, "The Coal Resources of the World" was laid under the lenses of the geologists, mineralogists and petrologists of the world yesterday, and was found practically without flaw. A discussion interesting in the extreme was the outcome of the appearance of the monograph, and Convocation Hall rang with German, French and English echoes as eminent men spoke to the subject of coal resources.

The last Congress at Sweden beheld the appearance of a work upon the iron ore resources of the world, which consisted of two volumes. The present monograph upon the coal resources consists of three volumes containing 1,360 pages, and an atlas in color 13½ x 19½ inches, published by Morang & Company, Limited, of Toronto.

The preparation and publication of the monograph was entrusted by the Executive Committee to a Coal Resources Committee consisting of Messrs. G. G. S. Lindsey (Convener), F. D. Adams, R. W. Broek, D. B. Dowling, Charles Fergie, James McEvoy, J. B. Porter and William Melnes.

Sixty-four Countries Contribute.

In the main body of the monograph the reports are gathered from no fewer than sixty-four countries, some of which occupy over 100 pages. The greater number of the reports are in English, ten are in French and six in German. Mr. R. W. Broek, the General Secretary of the Congress, who wrote the preface to the monograph, pays generous tribute to the assistance which the Coal Resources

Committee received from all sources. "In three instances only," says Mr. Broek; "Greenland, Peru and Brazil, has it been necessary to compile from published literature; consequently, the reports presented may be taken as the very latest and most authoritative pronouncements upon the coal resources of the world. In many cases they represent the first complete statement yet made, and in other cases much field work has been undertaken for these special reports."

Although the reports have in the main been compiled from official sources, valuable contributions have been supplied by specialists unconnected officially with the fields about which they write. Dr. Noah Drake, who has written upon the coal resources of China, and whose experience there has eminently fitted him for the work, is one of these.

How Coal is Divided.

Owing to the lack of uniformity in the usage of the different countries of the world in regard to the commercial classification of coals into anthracite, bituminous coal and lignite, it was found necessary to adopt an arbitrary classification which might be used by all, and thus make the results more easily comparable. The Coal Resources Committee drew up a scheme of classification dividing the coals into A, B, C and D groups, with various subdivisions, based mainly on composition and heating value. In this scheme A roughly corresponds to Anthracite, B and C to bituminous coal and D to sub-bituminous coal, brown coal and lignite.

The total reserves of the world compiled from all the reports received, amount to 7,337,533 million tons, of which nearly 4,000,000 millions are bituminous coals, nearly 3,000,000 millions are brown coals of various grades and nearly 500,000 millions are anthracite coals. Of the anthracite coals Asia, with the great Chinese fields, has by far the largest supply of any of the great continental divisions, furnishing 407,637 million tons; in bituminous coals America with 271,080,000 million tons leads by a great margin as she does also in the various grades of brown coals. The world's production of coal for the year 1910 was about 1,145 million tons, so that, though much must be allowed for loss in mining and for areas that for various reasons cannot be economically mined, there still remains many hundred of years before exhaustion of the supply may be looked for. Taking up the individual countries, however, it is found that in more than one case the end is in sight.

Production in Canada.

The production of Canada at the present time is only in the neighborhood of twelve million tons annually and though the output may be expected to increase rapidly the figures given above show that actual exhaustion of the supply lies very far in the future. The monograph shows Ontario with only a small "probable" reserve of 25,000,000 tons of inferior soft quality.

Spoke Many Tongues.

The chairman of the afternoon session was Dr. T. Tschernyschew, the Director of the Russian Geological Survey, a striking personality. Long, grey hair well thrown back revealed a head of leonine proportions, but he was as simple and unaffected as a child. It was a delightful scene which occurred when one gentleman got up to speak and sat down again under the impression that he was not allowed to speak in English. The Doctor motioned upward with a broad smile and the gentleman went on. The first speaker caused somewhat of a sensation by attacking the classification used by the editors of the Coal Resources. Mr. J. M. Gordon, a mining engineer of Montreal, said "Many attempts have been made to classify coals, but there is not a single classification to-day that can be said to have any degree of accuracy." A classification very much in use by the commercial men was the classification of coal by the length of flame, but this could only be comparative. Cannel coal, Mr. Gordon mentioned, conformed to none of the chemical classifications, nevertheless it is a true coal.

Resources of France.

Mr. A. Deflincq, of Paris, an eminent French engineer, gave a paper setting out in detail the resources of France. Prof. Krusch of Germany read a paper which had been prepared by Mr. Bokar upon the classification of coal. An ideal classification in the opinion of the author is not now possible because we do not know enough about the combination and the genesis of the coal. Mr. A. E. Kitson of the

Gold Coast, who has also spent some time in Victoria, Australia, gave an interesting account of the brown coal deposits of Victoria which attain the extraordinary thickness of from 808 to 1,110 feet. Dr. J. W. Evans gave an interesting account of the work done in the Nyassa field.

BIG MEN OF SCIENCE IN WORLD CONGRESS

Messages by Leading Canadians Inaugurated Week
of Work

"GIVE IT OUR BEST,"
DECLARED VETERAN
Plans for Completing Geological Map of World in
Uniform Character

Convocation Hall presented a unique spectacle yesterday morning when Sir Charles Fitzpatrick delivered his address of welcome on behalf of the Dominion to the geologists gathered for the Twelfth International Congress. Side by side were seated men from all corners of the world. A native of Japan, slim and dapper, was sitting next a big, burly German with long, flowing beard. Alongside a much-burnt Englishman was a chic Parisian, and then came a stolid Russian. A cosmopolitan gathering and a quiet, studious one in the main, although they woke up once or twice and applauded like schoolboys.

Words of Welcome.

Sir Charles Fitzpatrick said that when he was charged with the very important duty of welcoming the delegates on behalf of the Government of Canada his first intention was to address the gathering in English, but, having learned the official language of the Congress was French, he would use that tongue. The Administrator read a message from the Duke of Connaught regretting his inability to be present, and addressed the gathering in French. He referred them to the wonderful resources of Canada, and expressed the hope that their stay would be a pleasant and profitable one. Hon. W. H. Hearst again welcomed the delegates on behalf of the Provincial Government. Referring to the fact that a great movement was afoot to-day in the world towards universal peace, the speaker said that, after all, the greatest movements for peace were gatherings of the sort that had now met. Controller Church welcomed the delegates on behalf of the city of Toronto.

President's Happy Greeting.

President Falconer made a splendid address, and was most warmly applauded for his welcome, a welcome couched in brilliant terms and happily-woven phrases. "We have had a welcome from the Dominion and the Province, and you have listened to the welcome of the city. This is the tribute that has been given by the world without. I propose to give you the tribute of the world within if I may be allowed the expression." President Falconer referred to the hoary traditions of the science of geology, to the Hebrew prophet, who,

in times of old, had first lispied in the science, "an ancient and honored science," said the President, amid loud applause. The speaker referred to the fact that they had come from old countries where much study and research had made them familiar with formations, and it was the seeing eye and the experience which was theirs that he hoped would be used while they were here to help their geologists.

Dr. Adams Takes Chair.

The Chairman then read the names of the new officers, and asked Dr. Adams to take the chair as President. Dr. Adams, who spoke in French, thanked the Congress for the honor conferred upon him, and in a few words extended a welcome to those present. Mr. R. W. Broek, the General Secretary, then addressed the gathering, and referred to the honor for a young country like Canada to entertain a concourse of world-renowned scientists from every nation of the earth. The speaker referred to the difficulty, following in the train of such a magnificent gathering as that of Sweden, for a young country like Canada to maintain the standard. "The excursions planned before, during and after the Congress," said Mr. Broek, "covered a distance of 20,000 miles, and afforded delegates an opportunity to see typical examples of most accessible features of geological interest, and to obtain a clear idea of the geology and natural resources of the northern half of the North American continent. The efforts of the Executive have been confined mainly to the excursions, and the success of the session rests with the members and delegates. To the distinguished delegates and members who have graced this session with their presence we tender a cordial welcome and sincere thanks. As the men who have made the geological science of to-day, your visit will do much to inspire young geologists, and to stimulate the science in this country."

Septuagenarian Replies.

Dr. Emil Tietze, on behalf of the delegates, thanked the officials of the Congress for their invitation, and referred to the good work done by the Canadian geologists. "This work," said Dr. Tietze, who also spoke in French, "is only a part of the general development, and our best should be given to it." The doctor, who is nearly 70 years of age, looks remarkably youthful, and he received a great cheer at the close of his address. Dr. Helges Baekstroem, the Swedish delegate, transmitted the affairs of the morning session to the Congress.

Among those present on the platform were Col. Sir Henry Pellatt, Mr. C. D. Massey, Mr. G. G. S. Lindsey, Hon. A. E. Kemp, Hon. W. H. Hearst, Principal Gandier, Dr. George Kennedy, John King, K.C., Mr. T. H. Plummer, Prof. Walker, J. M. Clarke, K.C., Mr. J. L. Englehart, Mr. J. B. Tyrrell, Dr. A. E. Barlow, Mr. Mortimer Lamb, Prof. Coeiman, J. M. McEvoy, Dr. A. Strachan, Hon. J. Coderre, Dr. J. A. Macdonald, Mr. Lambe and Controller Church.

continued on page 39.

Globe. Aug. 8-1913.

News. Aug. 8-1913.

Map of the World.

"The Geological Map of the World" was the subject of a lecture delivered in the Convocation Hall in the evening by M. Emmanuel de Margerie, Ancien President de la Societe Geologique de France. The lecturer reviewed in detail the principal geological maps in common use, pointing out their merits and defects. In his opinion the best map in existence is the geological map of North America, which was prepared under the direction of Mr. Bayley Willis, Director of Geological Survey for the United States. This map, which covers the United States and Canada, is prepared on a five millionth scale. He suggested that in order to obtain the best possible map of the world, the map of North America should be imitated and a complete map secured by a co-operative system. South America, he said, could be surveyed by Germany, Asia by Great Britain and Russia, Africa by France, and Australia by Australians. By this method the entire world would be covered and a uniform map obtained.

News.

Toronto, Friday, August 8, 1913.

The Geologists

"Surely," said Job, "there is a vein for the silver, and a place for gold where they find it. Iron is taken out of the earth, and brass is molten out of the stone. But where shall wisdom be found, and where is the place of understanding? Man knoweth not the price thereof; neither is it found in the land of the living."

Job may not have been much of a geologist, but he excelled in humility, and no doubt equally modest men are to be found amongst the great gathering of scientists who honor Toronto by their presence this week. Already we have one of them confessing in an interview that no one yet knows of what material the centre of the earth is composed. There must be pockets of molten matter and gaseous material with a highly dense mass at the very heart of the globe, but all is supposition.

Science has examined the vomitings of volcanoes, together with the displaced formations of rock thrown to the surface by seismic disturbances. Science has even scratched the crust of the earth to a depth of over a mile, but the most eminent of geologists will admit with the ancient Hebrew that there still is much guesswork about their knowledge.

Bret Harte puts into the mouth of an alleged geologist an eloquent address to a Pliocene Skull, found in a California gold diggings. The "fragmentary fossil" of primitive humanity is referred to as "older than the hills, those infantile eruptions of earth's epidermis," and it is exhorted to tell

the wondrous story of the world's creative period of which it was a witness. Suddenly the skull ejects a quid of tobacco and replies:—

"Which my name is Bowers, and my crust was busted
Falling down a shaft in Calaveras County,

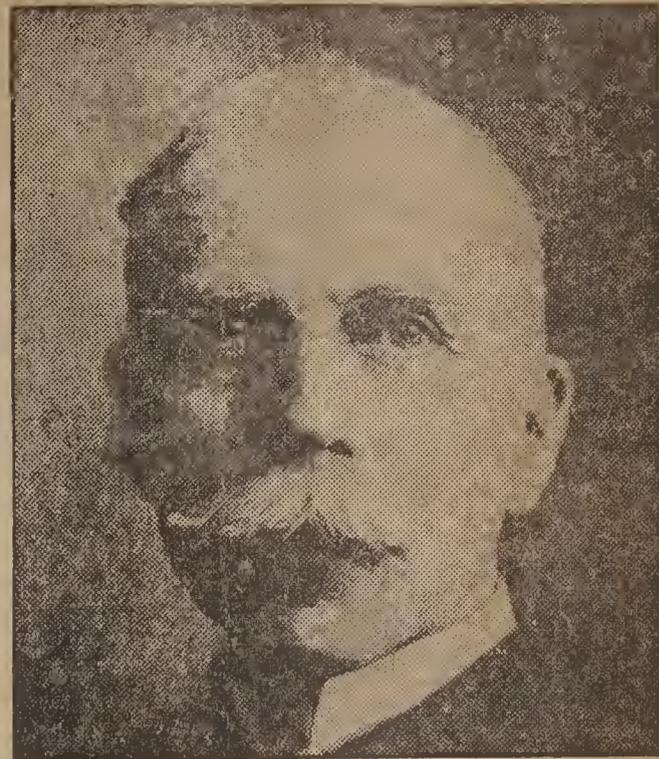
But I'd take it kindly if you'd send the pieces
Home to Old Missouri."

Much license is allowed to poets and particularly to humorous poets. It would be indeed an amateur scientist who would take a Forty-Niner's skull for that of a pliocene man. The fact remains that not until late in the nineteenth century was the science of geology placed upon its present foundations by such men as Darwin, Humboldt and William Smith. Even yet there is much to learn. The whole thickness of the stratified sedimentary rocks in their normal development is supposed to be about 30,000 feet, or less than six miles, and the time for the accumulation of these layers is placed at 90,000,000 years. But these are only estimates.

Within a generation or two long established conceptions have been swept aside, and in this as in other fields of science there is a great deal concerning which scientists cannot say, "We know." They have, however, taught us much of interest concerning the surface of this curious spinning globe upon which we live out our short lives, and their coming to Toronto from all parts of the world is an event of importance. Intellectually the community will gain from the visit of many eminent men, and it is reasonable also to expect that industrial and commercial benefits will spring from their presence in the country.

Outstanding Figures at The Geological Congress

Top figure
Prof. Frank
D. Adams,
Dean of Mc-
Gill Univer-
sity, President
of the Con-
gress; below,
on the left,
Sec'y R. W.
Brock, Ottawa
Director
Dominion
Geological
Survey; right,
Mr. W. S.
Lecky, Gen.
Secretary
Geological
Congress



Taking a Rest Between Sessions of the Geological Congress



From left to right: Dr. Webber, Bonn, Germany; Dr. Lachmann, Breslau; Dr. Mann, Bonn, Germany; Dr. Honiel, Bonn, Germany; Dr. Baden, Meiningen. Below: Prof. Alfred LaCioix, member of French Institute, one of the world's greatest authorities on precious stones.

BUENOS AYRES IS AFTER THE NEXT CONGRESS

M. Gentil, of Paris, Was This Morning Added to the List of Vice-Presidents

ADDRESSES IN FOUR LANGUAGES

Cosmopolitan Atmosphere of the Reading and Waiting Room

The council of International Geological Congress met this morning at University College, and after disposing of the routine business, added the name of M. L. E. Gentil, of Paris, France, to the list of vice-presidents of the society.

Following the meeting of the council the congress convened at 10 o'clock in the Physics Buildings. The

President of the Society, Dr. Frank Adams, D.Sc., F.R.S., of McGill University, acted as chairman, and in the selection of languages used in reading the various papers impartiality was shown.

Mr. H. Keidel, of Buenos Ayres, Argentine, read a paper treating the age characteristics and structure of the Argentine mountains in German, and G. A. F. Molengraaf, of Delft, Holland, on Earth Movements in the Malay Archipelago, in English. Mr. Molengraaf was followed by M. Gentil, who explained, in French, the Geology of Morocco.

The Next Congress.

Dr. Adams announced during the course of the morning that an invitation had been received by the council from the Argentine Republic to hold the next International Geological Congress at Buenos Ayres. The delegates cheered enthusiastically when Dr. Adams concluded the announcement.

Petroleum in the Bondoc peninsula of the Philippine Islands formed the topic of a discussion lead by Mr. W. E. Pratt of Manilla, and Mr. Olaf Holtdahl, of Christiania, Norway, read a paper dealing with the old Red Sandstone series of northwestern Spitzbergen.

Mr. Bailey Willis addressed the Congress on the forty-first parallel survey in Argentine.

At 1.30 o'clock the visiting ladies were entertained at luncheon by the Toronto Ladies Committee in the Speaker's Chambers, in the west wing of the Parliament Buildings and the various sections met in the afternoon.

Cosmopolitan Atmosphere.

Nowhere, perhaps, is there a more cosmopolitan atmosphere at the Congress than in the reading and writing room which has been fitted out for the delegates on the second floor of University College. Here one can hear almost every tongue spoken under the sun, and as the heavy, leaden skies in the morning gave promise of rain, many of the members of the society gathered around the little tables in circles instead of scattering over the lawns and walks of the University Grounds.

In one corner of the room two or three Russians, with great beards, were reading the daily papers, or talking together, a group of English and Germans were arguing in another corner, while some fair-minded Norwegians engaged in an animated discussion with the representative of Bulgaria in another part of the big room.

The Ladies' Local Committee will again give a tea party in the Quadrangle if the weather permits this afternoon at four o'clock.

Enjoying Excursions.

Forty-nine delegates to the Geological Congress left the Union Station this morning for Grimsby and Hamilton on one of the numerous excursions which the Executive Council and the Local Committee have arranged for the entertainment of the visiting scientists. Upon arriving at Grimsby the party walked from the station and ascended the Niagara Gorge where they found many interesting formations of rock. Luncheon was served at the Village

The Canadian and Hamilton Clubs of Hamilton will give the visitors a ride around the city in motor cars and later entertain them at dinner at the Hamilton Club. They will arrive in Toronto this evening at 10.30 o'clock.

Another expedition leaves this evening for Madoc, where the scientists will have an opportunity to study the pre-Cambrian rock area and visit certain rock deposits in the vicinity. The Henderson talc mine will also be visited and the pyrite mine of the Canadian Sulphur Ore Company examined.

See other side of page.
 Canada, in which many Canadian military officers, including Colonel Oscar Pelletier and Gen. Lessard received their early training, has been disbanded. The corps has been in existence 101 years.

see other side of the papers on this page.



STRANGE TOPICS WERE CONSIDERED AMID ENTHUSIASM

The Geological Congress Hard at
Work on a Varied
Program.

HUMAN FOSSILS
WILL BE STUDIED

Periodical Prize for the Best
Performance of Geolog-
ical Discovery.

COLEMAN ON GLACIERS

Hamilton Mountain Being Exam-
ined by Special
Party.

A glance at the program of the geo-
logical conference to-day will give an
idea of what a formidable association
it is.

The new council of the Congress
elected yesterday met in business ses-
sion this morning at 9 o'clock. Matters
of routine arrangements were under
discussion.

The general meeting of the delegates
opened at 10 o'clock in Physics Build-
ing of Toronto University. Mr. H. Kei-
del, Buenos Ayres, Argentine, read a
paper upon the structure and forma-
tion of the Andes Mountains, in the
Argentine. Mr. G. A. F. Molengraaf,
Delft, Holland, contributed a treatise
upon the subject, "Earth Movements
in the Malay Archipelago." Mr. L. E.
Guétit of Paris treated of the geology
of Morocco. Petroleum deposits on the
Bondoc Peninsula, Province of Tay-
abas, in the Philippines, was discussed
by W. E. Pratt of Manila. Olaf Ralt-
dake of Christiania, Norway, gave a
paper upon the Old Red Sandstone
series of North-Western Spitzbergen.
Mr. Bailey Willis of the United States
concluded the morning program with
an interesting account of the survey of
the forty-first parallel in Argentina.

The ladies of the congress lunched
together in the Legislature restaurant
at 1.15.

Practical Questions.

Six committees, or "commissions,"
also met this morning for considera-
tion of the following special practical
questions referred to them by the Con-
gress yesterday.

The inauguration of a periodical
prize for the best performance in the
way of geological discovery:

The creation of an international re-
view of geology.

A commission for the study of Uni-
versal Palaeontology—namely the study
of plant and animal life in the differ-
ent geological periods.

A commission for the study of the
human fossil.

A commission for the publication of
a "lexique de stratigraphie," namely
a dictionary including all the rock
strata in alphabetical order.

An international commission of gla-
ciers.

Some Startling Topics.

After a little light refreshment, the
famous men and women of the geolo-
gical world went to their work again
at 2.30. This time they divided into
three sections, so as to cover more
ground, and a larger number of rocks.

Section one met in the main build-
ing. Their topics comprised six very
technical considerations, including such
things as "Sills and laccoliths illus-
trating petrogenesis," as elaborated up-
on by R. A. Daly, of Cambridge, U. S.
A., "Fractional crystallization the prime
factor in the differentiation of rock
magmas," by Alfred Harker, of Cam-
bridge, England; "Some examples of
magmatic differentiation and their
bearing upon the problem of petro-
graphical provinces," "The Volcanic
Cycles of Sardinia," by Henry S. Wash-
ington, of Washington, U.S.A.; A
classification of the eruptive rocks of
Italy, by Venturnio Sabatini, of Rome,
and another paper upon magmatic
differentiation, namely the inherent
constitution of the parent rock forma-
tions. Mr. Hobbs concentrated upon
that phase of the subject bearing up-
on "variations in the composition of
pelagic sediments, in relation to mag-
matic differentiation."

Enthusiasm in the Work.

So far, so good. This is a geological
congress, and such subjects have to be
discussed by somebody. This congress
has undertaken to discuss them, and to
all appearances is going ahead with
the task, with cheerful and indus-
trious enthusiasm.

Section 2 does not meet to-day, its
members being absorbed in the various
commissions.

Section 3 devoted itself to glaciers
with six papers on their program for
this afternoon's work. The first was
contributed by Mr. G. W. Lamplugh,
St. Albans, England, upon the "Inter-
glacial problem in the British Islands."

A. P. Coleman of Toronto, discussed
the "postglacial and interglacial time
in North America."

N. O. Holst, Jemshogsby, Sweden,
considered the commencement and the
end of the glacial period; Mr. Warren
Upham, St. Paul, considered the San-
gamon interglacial stage in Minnesota,
and westward; Mr. W. Wolff of Berlin,
Germany, talked about the "glacial and
interglacial deposits of Norddeutsch-
land" (North Germany), while William
C. Alden went into the matter of the
"Early Pleistocene glaciation in the
Rocky Mountains of Glacier National
Park, Montana.

Out-of-town Trips.

Two excursions took parties of the
congressional delegates out of town—
one to Hamilton and Grimsby, to ex-
amine the famous "Mountain" and pro-
nounce upon its genuineness, and the oth-
er to Madoc, to look at important
areas of the pre-Cambrian rocks, and
to visit the Henderson talc mine and
mill, and the pyrite mine of the Can-
adian sulphur ore company. Certain
veins of fluorite near the town will
also be looked into.

COAL PRICE DUE TO MONOPOLISTIC SWAY

So Says Mine-Owner Holman,
Who Assuredly Should
Know.

HAS MOLYBDENITE

Hon. C. Vey Holman, L.L.N., official
delegate from Maine, and formerly
State geologist of Maine, lecturer on
mining law in the law school of Bos-
ton University, is one of the 500 in-
teresting types in this parliament of
the world's rock and mineral ex-
perts. Mr. Holman has his wife along
and she is a geologist and mining
"man," too. She has taken hold of the
Holman properties in Alaska and else-
where, and looked after her husband's
work and interests just as if mining
and geology was her proper sphere,
and she was her husband's partner in
business as well as at the breakfast
table.

Mr. Holman is the owner of the
Holman molybdenite mine in Maine.
This material is one of the world's
rarest metals. It is found in Canada
and in Maine.

Mr. Holman owns a mile of mining
ground just north of the famous
Alaska Treadwell Mine—the greatest
producing gold mine under individual
management in the world, situated on
Douglas Island, Alaska. He is an
owner, also, of anthracite coal mines
in Pennsylvania; also is he manager
and part-owner of the Caribou gold
mines of Nova Scotia, his corporation
controlling the producing gold mines
of the Caribou district of Nova Scotia.
Consequently Mr. Holman naturally
values the services of his geological
help-meet, for he is a geologist, a
manager, and a mine-owner all in
one.

"What makes anthracite so dear?"
The Star asked Mr. Holman, remind-
ing him of the sad announcement that
the price was to go up fifty cents a
ton on September 1. "Is it because
anthracite is becoming so scarce as to
soon constitute a mere luxury?"

"There is plenty of anthracite yet,
comparatively speaking," replied Mr.
Holman. "The high price is due to
monopolistic control, which is a
crime."

As Mr. Holman confesses to owning
anthracite mines himself, this state-
ment may be regarded as detachedly
frank.

CANADIAN DELEGATES ACTIVE AT CONGRESS

Montreal Doctors Addressed
the Great Medical
Meeting.

A SPINAL OPERATION

Canadian Associated Press Cable.

London, Aug. 8.—The Canadian dele-
gates to the Medical Congress were
active in several of the twenty-six sec-
tions, assembling yesterday. Prof. Mc-
Taggart of Montreal spoke in the dis-
cussion on infant mortality. Dr. Pirie
of Montreal gave an interesting dem-
onstration of the application of the
cinematograph in the study of the in-
testinal canal. Dr. Maude Abbott has
been elected secretary-treasurer of
the Medical Museum.

An operation to cure tuberculosis of
the spine was performed for the first
time in England this afternoon at the
Orthopedic Hospital by Dr. F. H. Al-
bee, of New York, in the presence of
fifty surgeons. The patient was a four-
year-old boy. Part of his shin-bone
was used to repair the spine. The
operation lasted twenty-two minutes. It
is the 145th performed by Dr. Albee.

Prof. Harvey Cushing, of Harvard
University, addressed a gathering of
7,000 persons. The professor vigorously
defended vivisection.

THE INTERNATIONAL CHARACTER OF THE GEOLOGICAL CONGRESS IS SHOWN IN THE ACCOMPANYING SKETCHES BY MR. GRAY OF THE STAR



DR. EMIL TIETZE
PRESIDENT ANCIEN
AUSTRIA



JAPANESE DELEGATES.

DR. TADASU
HIKI.
PROF. OF KYOTO
UNIVERSITY.
KYOTO,
JAPAN.

MR. S. KOSU
JAPANESE
EMBASSY
WASHINGTON
D.C.



OTTO A.
WELTER.
GERMANY



DR. HELGES
BAECKSTROEM
DELEGATE OF THE
ROYAL SWEDISH
GOVERNMENT



ITALY.

L. BALDACCII
DIRECTOR OF THE
ITALIAN GEOLOGICAL
SURVEY AND GENERAL
INSPECTOR OF MINES.

C. DE
STEFANI
PROF. OF GEOLOGY AND
PRESIDENT OF THE ITALIAN
ANTHROPOLOGICAL SOCIETY

"I must again lay stress on the fact that the whole trend in the evolution of the United States Geological Survey has been to make it more practical in results, and yet without becoming a bit less scientific in either standards or methods. Never before has the general American public looked to this federal bureau to so large an extent, nor have the executive officers of the federal Government depended so largely as at present on this scientific organization for the decision of administrative questions relating to national development."

Largest in World.

The United States Geological Survey is largely represented at the present congress. There are more than a score of delegates from Washington, some present as delegates from the United States Government, and some as representing the survey itself. The survey is the largest organization of its kind in the world, with a membership of about nine hundred. The area covered comprises the whole country, including Alaska and Hawaii. The appropriation from the federal Administration is a million and a half dollars a year, to which must be added something like another quarter of a million from various States.

"This bureau," said Dr. Otis Smith, "has been in existence for thirty-four years, and I am its fourth director. But it is only in the last seven years that we have taken up the problem of the classification of public lands, though this was, in fact, the main object of its institution. But there was a great deal of pioneer work to be done, in the way of building up the organization and obtaining a knowledge of the geology of the country. Of late years the survey may be said to have paid dividends on the work of earlier years."

Chooses Practical Men.

"It is significant of the spirit of the organization that every important administrative position is filled by a practical field man who has worked up from the ranks. We have three large field branches for (1) geology, (2) topography, (3) water resources, to which should be added the land classification board which handles field data. Except in the extreme Southern States the field season lasts for only the five summer months. Just now we have some two hundred in the field."

"As showing the public interest in the work, I may mention that the sales of our topographic maps far exceed half a million copies. This, with other distributions, gives a total circulation of a million and a quarter to the publication survey. And this, with the exception of the distribution designated 'libraries,' is all in response to requests from the public."

GEORGE OTIS SMITH TELLS OF SURVEYS

Head of U. S. Geological Survey Describes Useful Work.

SCIENCE IS UTILITARIAN

Even the Classifying of Fossils Has Practical, Everyday Results.

That geologists on this continent seem to have somewhat more practical aims in view than do many of them in other countries was the opinion of Dr. George Otis Smith, director of the United States Geological Survey.

"As in Canada, so in the United States," said he to The Star, it is recognized that full and wise reutilization of national resources depends on

an exact knowledge of physical facts. It is the spirit of the North American citizen, whether he lives north of south of the international boundary line, to ask practical questions. It is the task of the scientist to make his science exact, and to convince this hard-headed citizen that he knows whereof he speaks, and that his scientific opinion can be relied on in a practical way.

Utilitarian Results.

"Personally, I believe that this public demand requires the highest type of science, and while, under present conditions, the Government geologist or engineer must look to his love of science for part payment of his services, we must recognize, on the other hand, that all scientific work under Governmental auspices must look to practical results. The casual observer of the working geologist, however, may fail to appreciate that even such branches of the science as the collection and study of fossils are altogether utilitarian in the results they yield. This is illustrated in our own work, by the dependence of the geologist, in collecting data for Government coal lands, on the palaeontologist, to whom he must look for the exact correlation of the coal-beds in different parts of the fields under examination. It has been the good fortune of the United States survey to

co-operate closely with that of Canada. With so great an extent of common boundary—with the economic, national, and scientific problems of the two countries so closely allied—we have naturally been in constant conference and correspondence. One instance of these happy relations is the issue this month, of a detailed topographical map of Niagara gorge, so important to the student of economy, or history, of nature, in either country. The survey was made last year through the co-operation of the American and Canadian organizations, and the map is pronounced by visiting geologists to be a credit to both."

Some Big Figures.

"Although Canada," proceeded Dr. Otis Smith, "has larger areas of undeveloped and unexplored territory than we have, yet there are hundreds of millions of acres of unappropriated, and largely unknown, lands in the United States. For instance, there are fifty-eight million acres of land in coalfields which remain withdrawn from public entry, and are awaiting examination and classification by the United States Geological Survey. There are also two million acres of possible phosphate lands now under executive withdrawal. These things illustrate the magnitude of the practical problems in national administration, to the solution of which this scientific bureau is contributing."

Star. August 8th 1913.

Telegram. Aug. 8-1913.

JAP THOUGHT SCOTCH ACCENT WAS RUSSIAN

And It Made Geological Address Very Hard Indeed to Follow.

STUDY OF THREE JAPS

They Listen Seriously, Very Earnestly, With Note Books Open.

Interesting it is to watch the intent brown faces of the three Japanese delegates. These blue-suited little gentlemen with the gold-rimmed spectacles, and the close-cropped, virile black hair, look very much alike. They, too, are types—types of the serious-minded and awakened Japan.

Mr. S. Kozu is a Japanese from Tokio, Japan. Also he is an American cosmopolitan from Washington, U.S.A., and elsewhere. Not so long ago he was lecturer upon petrography, or the science of rocks, at the Imperial University at Tokio, Japan. Since then he has traveled, and studies now in the geophysical laboratory of the Carnegie Institute.

South Manchurian Engineer.

His friend and confrere, Dr. Kido, is the one-time mining engineer of the South Manchurian Railway. He left Japan one year ago to make a studious trip around the world. He studies coal fields. He arrived here from the East, having been in Europe last.

Mr. T. Hiki is assistant professor of geology at the Imperial University of Kyoto, Japan. He, too, arrived at this congress from the East side of the world by way of Europe. He has been studying up-to-dateness in several of the world's foremost laboratories, in Germany, Austria, England, and other lands.

The three little brown men with the stiff hair and the black moustaches stare gravely through their gold-rimmed spectacles at the speakers on the platform—very grave, very silent, very studious, note books are held in their laps.

Understand English.

"Do you understand English well?" asked The Star.

"Pretty well," replied Mr. Kozu. "But I read and speak it better than I listen to it. You see our teachers of English in Japan are not Englishmen as a rule, they are Japanese. It is difficult for me to get the accent. And when others speak, if they have a marked accent, it is very difficult. That gentleman who spoke last, he was difficult. He spoke English with the Russian accent—did he not?"

"Scotch," corrected The Star. "Oh, Scotch!" exclaimed Mr. Kozu. He shook his head gravely.

"The Scotch makes English very hard, don't he?" Mr. Kozu inquired sadly.

CREATION TEN TO HUNDRED MILLION YEARS IN THE PAST

Dr. Aubrey Strahan Says Little Profit in Speculation.

NOBODY NOW THINKS 4004 B.C. THE DATE

Greatest of British Geologists Describes Work of British Geological Survey.

Dr. Aubrey Strahan, Assistant Director of the British Geological Survey, is one of the most conspicuous figures at the Congress, in fact several of the other delegates expressed the opinion to The Star that he is the most eminent geologist in attendance. Educated at Eton and Cambridge, Dr. Strahan is the author of several geological memoirs, dealing, in particular, with various parts of Wales.

Asked by The Star as to what geology had to teach with regard to the creation of the world, Dr. Strahan scarcely thought that there was much profit in discussing a subject so speculative.

"Hardly anybody," he said, "believes to-day—as they did forty years or so ago—that the account of the creation given in Genesis is to be interpreted literally. We have many clergymen interested in our geological work, and they find no hindrance in this. One does not now, as formerly, hear it asserted that the world was created in 4004 B.C. Various dates have been assigned as that of the creation, varying from ten million to a hundred million years ago. It must all be a matter of speculation. And by the expressed 'creation' different people seem to mean different things, most people probably understanding by it the time when there first was life."

Start of British Work.

Dr. Strahan then went on to give some account of the British work in geology.

"Our geological survey," he said, "was started by De La Beche. And Sir William Logan, who was, of course, a Canadian, was one of our earliest members. Logan had been engaged in South Wales, making a geological survey of the great coal fields there. He showed his maps at the meeting of the British Association at York, in the forties, and there met De La Beche, who explained that he had just started a national survey. This conversation resulted in Logan handing over all his maps to the national survey, and himself becoming a member of the staff. I have all his notes now just as he left them.

"This survey at first included the whole United Kingdom, and the work consisted primarily in making a geological survey of it on the scale of one inch to a mile and on the topographical basis of the 'old series' map

About twenty years later the six-inch ordnance maps became available, and were used by geological surveyors for observation in the field. These are now used exclusively, and the work reduced for publication to the 'new series' one-inch map. About ten years ago the Irish branch was placed under the Irish Board of Agriculture, but the Scottish and English surveys remain under the Board of Education.

How Work is Done.

"The English staff consists of three field units, each under a district geologist, and these units work in districts which are determined beforehand. Each sheet of the one-inch map is published as soon after the surveyings as practicable, and is accompanied by an explanatory memo. In Scotland a similar organization exists, but in two units. The 'old series' one-inch maps are all hand-colored, but are being replaced by the 'new series' maps, which are all color-printed. Manuscript maps of districts where no mining is in progress are deposited at headquarters for reference, and maps of districts where mining is in progress are published. In addition to the sheet memos of which I have spoken, we publish general memos dealing with water supply, records of deep borings made in search of coal, and geological formations such as the Jurassic rocks of Britain.

"Our survey has attached to it a museum of practical geology, in which are exhibited fossils stratigraphically arranged, and therefore not duplicating the functions of the geological department of the British Museum, where the arrangement is zoological. As I happen also to be president of the Geological Society of London, I can speak with knowledge of the interest taken in our work by non-professional geologists, men who take up the work as a hobby. An eminent Canadian geologist was lamenting to me the other day that in this country interest in geological work is confined to professional geologists."

NEXT MEETING OF CONGRESS IN SPAIN OR BELGIUM

Though Argentine Republic Would Like to Have It.

The Argentine Republic has asked that the Geological Congress meet at Buenos Ayres, if not at the next session, three years from now, at an early date. Spain and Belgium have also issued invitations to the congress. Dr. Adams, the president, favors either Spain or Belgium. Six years ago the delegates met in Mexico. This year Canada has the congress, which meets every three years. Delegates feel that Europe has the next turn. The expense to the Europeans, who form a very considerable proportion of the membership, is very heavy when the congress is held on another continent. Argentine will have to wait. Dr. Adams mentioned that the invitation had been received from the Republic at this morning's session at the conclusion of a paper upon the folding of the Andes mountains in Argentine. The requests of Spain and Belgium have not yet been announced to the congress.

MAPPING OUT THE WORLD

GEOLOGY AND MAPOLOGY.

Learned Scientist Delivered a "Popular" Lecture Last Night — Tribute Paid to German Geologists.

Tempted thither by the attractive announcement that a "popular lecture" on the Geological Map of the World would be given by Mr. Emmanuel de Margerie last night, many citizens of Toronto paid a visit to Convocation Hall. What they saw and heard was scarcely for lay eyes and ears, and the word "popular," apparently, was meant only to appeal to members of the International Geological Congress the "popularity" of the subject could no doubt be explained by the fact that as those attending the congress, being geological scientists, are necessarily interested in a survey of the whole world.

SPOKE IN ENGLISH.

The lecturer, who is Ancien President de la Societe Geologique de France, spoke in English. He reviewed in detail the principal geological maps in common use, pointing out their merits and defects. In his opinion the best map in existence is the geological map of North America, prepared under the direction of Mr. Bayley Willis, Director of Geological Survey for the United States. This map, which covers the United States and Canada, is prepared on a five-millionth scale. He suggested that in order to obtain the best possible map of the world, the map of North America should be imitated and a complete map secured by a co-operative system. South America, he said, could be surveyed by Germany, Asia by Great Britain, and Russia, Africa by France, and Australia by Australians. By this method the entire world would be covered and a uniform map obtained.

TAXED THE LAYMEN.

The lecture was of great interest to scientific men. The 1 to 15,000 map of Europe, was pointed to as a model map, and the difficulties of a scale reduction were regarded as commercial other than scientific. The scale of 1 to 1,000,000 was becoming the standard geological scale the world over. The lecturer paid tribute to the German geologists for their valuable contributions in South America.

TO HAVE 'VARSITY LL.D.'S.

At a special Convocation on Thursday the Senate of Toronto University will confer the degree of LL.D. on Aubrey Strahan, of the geological survey of England and Wales; P. M. Termier, of France; Thomas C. Chamberlain, of Chicago University; Prof. Richard Back, Freiberg, Germany; J. J. Sederholm, of Finland; Theodosius Tshernyschew, of St. Petersburg, and Willett G. Miller, of Toronto, delegates to the Geological Congress.

STAR MAN SNAPS SOME DISTINGUISHED DELEGATES AT CONGRESS



DR. GEORGE F. KING - GEM EXPERT OF TIFFANYS' N.Y. (on left)
PROF. A.F.A. LACROIX OF PARIS FRANCE

Telegram Aug. 8-1913



PROF. JOS. PAXSON IDDINGS OF THE U.S. GEOLOGICAL SURVEY



DIRECTOR HOLTEDAHL AND WIFE OF CHRISTANNA NORWAY



Mrs. Frank D. Adams, wife of the president of the Congress.

Cobalt Nugget - Aug 8 - 1913.
NORTH WELL REPRESENTED AT GEOLOGICAL CONGRESS

The Opening Proceedings in Toronto; Mexican Situation and the Price of Silver

(From Nugget Representative.)

TORONTO, August 6. — The North was very well represented on the platform at the opening of the International Geological Congress in Convocation Hall, yesterday, when the slight graceful figure of Sir Charles Fitzpatrick rose to open proceedings. It is true that Mr. A. A. Cole, mining engineer for the T. & N. O. railway, was the only actual resident from the North Country, but there were many whose names the North has made famous. There

was J. L. Englehart, chairman of T. & N. O. Commission, one tier below Major Leonard, whom the Coniagas has made a millionaire, and who has promised to have Transcontinental trains running through Cobalt by December, and there was Dr. Miller, known far and wide as the god-father of Cobalt. The Hon. W. H. Hearst, who welcomed the delegates on behalf of the Province of Ontario, may also be claimed as from the great hinterland of the North.

The speeches were for the most part in French, that being the official language of the Congress. Sir Chas.

Fitzpatrick gracefully referred to it as "le doux parlance de France," which the wisdom and liberality of the government had allowed thousands of fellow subjects to do honor to the name of their sovereign in their native language.

It is eminently an assembly of savants. They sat wearing their various ribbons and labelled with their name and number, listening with the greatest interest to the various papers on the magnus opus of the Congress, "the Coal Resources of the World," this afternoon. The work comprises papers from every country in the world, and it is all original matter so that its value is manifest.

Today has for the most part been one of preparation. The last excursions came in this morning and last night from Kingston, Niagara and Montreal, and the secretary and his assistants have been overtaxed supplying them with their hedges, putting them in touch with fellow countrymen, and seeing that they obtained their right locations.

SILVER AND MEXICO.

Mr. Bedford McNeill, who has as good a right as any man to discuss the silver question as it might be affected by the anarchy in Mexico, is not much concerned at present. Although his own mine in that troubled country, is at present shut down, he believes that the condition of affairs in Mexico has been rendered much worse in the despatches than it really is. "But if, it is not so," he said, "and the disturbances continue, nothing can prevent the price of silver going up. The tremendous stocks held by the Indian speculators will support the market for some time, but it could not do so indefinitely."

All of which is very interesting to Cobalt operators, to whom a cent rise or fall in the price of silver, means millions of dollars in the course of a year.

Tonight a French scientist is giving a paper on the geological map of the world, and this afternoon the ladies' committee saw that the European tradition of high tea, which has been well maintained so far, should not suffer in Toronto.

For the Woman of To-day

"ZOOLOGICAL TEAS" AT VARSITY

Newport may go in for the "tango tea" but Toronto can give them something newer than that. It is the zoological tea. They are being held every afternoon now in the University quadrangle. There just about five, everywhere you look are lions, lions, lions. But they are quite harmless and seem as much at home balancing their tea cups as they are with arms laden with fossils. And in and out among them speed some of Toronto's prettiest girls in the daintiest of summer frocks. What matters if the maidens cannot chatter French, German or Swedish? Smiles are a universal language.

Charming Mrs. Frank Adams, the wife of the president of the congress too is here and there and everywhere among the many guests who have dropped in for a little relaxation after an afternoon with jaw breaking words and phrases. Every few minutes, Mrs. Adams encounters a member whom she met at the last congress in Mexico. Then there are reminiscences and reminiscences. Among those Mrs. Adams greets is Miss Florence Bascom, geology professor at Bryn Mawr. But to see Miss Bascom in her garden party lingerie frock which only an expert in clothes could have selected you would never dream that she was a lady whose greatest delight was ugly dirty rocks.

Over in the corner little Dr. Gruterink, of Rotterdam, is having a chat with Fraulein Rathgen, of Bonn. The doctor is quite relieved to find our thermometer has not climbed to 90, as she felt sure it was going to in the morning. For in Holland, declares she, 80 is hot, hot, hot. As for 100, she almost faints when you tell her such a temperature is possible.

But one of the most charming things about the Congress is the number of wives who have accompanied their husbands. They seem almost as interested as their spouses who have nearly the entire alphabet after their names. Among them we found a young Norwegian, the wife of Mr. O. Holte-dahl, of the University of Christiania. A mere schoolgirl she looked in her pale blue and white frock, with big white hat. Both were surprised to find Toronto so large and fine a city.

But perhaps the feminine visitor whom most of our Toronto women will want to meet again is Lady McRoberts. It is not her first visit to this city, as Lady McRoberts, then Miss Workman, attended the last meeting of the International Council of Women, which was held in Toronto.

Lady McRoberts is one of the best known women geologists. We had looked and looked for her. But the picture those words presented did not

exactly call up the slight young fair-haired vision in the smart cerise and white summer gown we at last located in a corner of the quadrangle. Lady McRoberts is much interested in the educational section of the International Council, but expressed much delight when she heard that Toronto now had a woman's court and feminine police. Asked as to the suffrage war in England, Lady McRoberts smiled.

"That is the first question we are asked on our arrival from England," said her ladyship. "I believe that the granting of the vote is nearer and nearer. It will not come with this present Government. It is constitutionally impossible since the passing of that bill they did of a few months ago.

"As for the militant methods alienating people's sympathies," concluded Lady McRoberts, "I believe with many others that the sympathy of such has not meant much to the cause."

Lady McRoberts is a profound admirer of her Excellency, the Countess of Aberdeen, who is her "next door neighbor" in Scotland as their estates join. As a daughter of the famous Workmans, Lady McRoberts was born an American, the grand-daughter of Governor Bullock, of Massachusetts.

CORNELIA.

MAY MEET IN BELGIUM NEXT GEOLOGISTS HAVE BUSY DAY

Secrets of the Movements of the Earth Delved into by Scientists.

NO "POPULAR" LECTURES

Quite a Few of Delegates on Pleasure Trips To-day—Impression of Congress Council in Session — Few Papers in English Read This Morning.

The Physics Building, University grounds, drew only a small number of the members of the 12th International Congress of Geologists together this morning, when a number of papers were read on questions raised by world-wide exploration.

"Many of our delegates are exploring your beautiful city. It is not only the earth's interior which interests members of this Congress of Geolog-

ists," said a merry-eyed little Frenchman, then making a bolt after two charming young ladies.

"I don't blame him," said an American delegate, removing a toothpick which might have presented a more interesting appearance had its geological age been known.

"THE LATEST WORD."

During the session the following papers were read:

"Earth Movements in Malay Archipelago," by G. A. F. Molengraaf, Delft, Holland.

"La Geologie du Maroc," by L. E. Gentil, Paris, France.

"Petroleum on Boudoc Peninsular, Philippines," by W. E. Pratt, Manila, P.I.

"On the Old Red Sandstone Series of Northwestern Spitzbergen," by Olaf Holdedahl, Christiania, Norway.

"The Forty-first Parallel Survey, Argentina," by Bailey Willis.

The earth appears to have been providing geologists with a feast of good things in the Malay Archipelago in recent years.

"I do not know—I have not seen that," was the more than once refreshing confession of Professor Malengraaf, as he pointed, with bamboo cane, to points of geological interest appearing on the maps, but about which he was not certain. He talked in English

with comparative ease, and the earth's deposits assumed more intelligible shape. Groups of bills which had held their secrets for countless ages, had at last had their secrets wrenched from them by the investigating ubiquitous geologist.

GENERAL COUNCIL.

In room 16, main building, Toronto University, the general council of the Geological Congress, met this morning. There was little done of interest, but the manner of its doing provided entertainment.

The members of council sat at an oval table, 25 of them, and spoke as occasion arose. The chairman talked in English, a Frenchman inserted most of the lively interjections, a German took exception to most things, and a Japanese beamed silently upon the whole, through a pair of gold-rimmed glasses. When the German delegate wished to catch the chair's optic, he put up his hand, very much after the manner and custom of small boys in schoolrooms. The French member of council was white-headed, moustached, and his chin carried a frisky-looking Napoleon, which kept remarkable time with his chin. Belgium was represented by a vigorous-looking gentleman, who appeared to understand the art of tailoring as well as the science of geology. Indeed, most of these geologists pay tribute to the art of dressing by looking sleek, well-groomed and bandboxy.

MERELY DETAILS.

They talked over small affairs, did these councilmen this morning—a

Congress is crowded with detail which cannot all be left to the general secretary.

"What about another 'popular' lecture, such as we had last night?" asked an English-speaking delegate.

The word "popular" brought a smile.

"I feel we owe it to the people of this centre," he went on as seriously as a dyspeptic judge.

A delegate had come to congress armed with photographs of various changes in earth formation, and was willing to let a thirsty populace feast upon their irresistible beauties—if the council would fix a time and place. Council did not.

"POPULAR?"

The laymen present who had attended last night's "popular" lecture on the geological map of the world wondered whether "popular" geological lectures were really a sort of humor revelled in by the scientists who may leave Toronto without telling us what evolutionary changes have taken place in the earth of North Toronto and St. Clair avenue, to justify the jump in land values. That's the worst of being outside the charmed circle of geological science—you can't tell whether the learned men are cracking the earth or only jokes.

BELGIUM NEXT?

It has not yet been decided where next congress will be held.

"Probably in Belgium, but I do not say so," said the chairman.

It seems that council must exercise great care in choosing the next place of meeting. If a bad choice were made the work of these world-wide scientists would lose much of its value to the country visited. For instance, it would be obviously absurd to select a tropical country in which to discuss ice formations, as it would be equally unwise to choose a coal centre like Newcastle for a study of silver products. It will be seen from this how perfectly Canada lends itself to the diverse studies of geology. No country in the world offers the geological scientist so many opportunities for investigation. In many countries where this congress would be welcome, their resources being limited, congress would "specialize" sending word beforehand to all scientific societies to study their country's geological products.

"ICE AGE" LECTURE THE BEST

JUST WHAT GEOLOGS. WANTED.

Corridors and Cool Spots Well Patronized by Members To-day—200 Sign In for the Excursions.

The International Congress of Geologists is going to be a great advertisement for Canada. It would be difficult to find a more cosmopolitan congregation than that which strolled about the corridors and lawns of the University this morning.

Lectures and papers were being given in several of the classrooms, but a large number of delegates sat about the reading room with a strong desire showing on their faces for relief from the heavy humidity.

SO-SNOW-ICE IS GOOD.

"This is terrible weather," said a doctor from Switzerland. "Several of my friends from Paris and myself were not prepared for such conditions."

continued on page 46.

Telegram. Aug. 8-1913.

Toronto World. Aug. 9-1913.

Prof. Thomas Surzychi, from Sosnowice, Poland, joined the group, and the little party sat down by an open window for a few minutes' chat.

These geologists are a great brotherhood. From congress to congress they carry their acquaintances and when they meet again introductions do not appear necessary.

When you are talking to them you must not be surprised if passers-by interrupt your conversation with numerous foreign salutations. If these greetings could be translated into English they would read, "Hello, Bill! How are you?" But as they are mostly in French, you must lift your hat and make a sweeping bow, and wiggle your arms and go through other violent exercises to carry out the bluff that you really understand them.

PADEREWSKI'S FRIEND.

Prof. Surzychi is deeply interested in coal, and has come out from his far-off native land to look into the coal conservation of this country.

"We know very little of Canada in Poland," he said, "and other than that it is an extensive place and a British possession, we are ignorant. What surprises me most is your ever-changing scenery. Coming up from the sea, we passed the most wonderful rocks, trees, country, and flowers, and I intend to go right across and see some more."

This Polish professor is a great friend of the great pianist Paderewski. He stayed off at the musicians' home in Switzerland on his way to the Congress.

Nearly every member is eagerly looking forward to the excursions next Tuesday to Niagara Falls and to Scarborough Bluffs.

"It is such a pity that both come on the same day," said one gentleman, "but I would rather go to Scarborough than to the Falls. This place is much talked of but so few of us know what it really is."

THE RIVER OF ERIE.

It was at this stage of the conversation that Dr. H. M. Ami, of Ottawa, approached the group. Niagara Falls is a special subject of his. "I tell you gentlemen," he said, "the day is coming when Lake Erie will be turned into a beautiful river with grand agricultural land on both sides. As soon as the Falls wear their way back through the rocks to Erie, this lake is doomed for it will be drained just as sure as we are standing here."

COAL IN TURKEY.

There are many practical mining men at the gathering. Hungary and Turkey have contributed to this section. "There is a wonderful bed of fine steaming coal in Turkey that is not known in this part of the world," said one of these gentlemen in broken English and as for Hungary, some of their mines are wonderful.

Belgium, Germany and Italy have contributed to this mining group, but it seems a strange matter that France appears to have contributed the bulk of the geologists proper.

Some person glanced over the programme for the day and discovered that a lecture on the Ice Age was just about to start. A member from Dublin turned musty silence into a practical joke. "Let us go and see if we can get cool" he suggested as the group broke up.

Up to 11 o'clock some two hundred members had signed the books as their intention of taking in one or more of the excursions.



Dr. Iddings, of U. S. Geological Survey, talking with two professors from Paris.

Toronto World. Aug. 9-1913.

The ladies' committee of the 12th International Geological Congress gave a most enjoyable luncheon in the parliament buildings yesterday, about one hundred ladies being present. Mrs. Adams, Mrs. J. B. Tyrrell and Miss Coleman received the guests at the entrance to the Speaker's chambers, and luncheon was served upstairs in the members' dining room at long tables arranged with a profusion of pink Killarney roses and ferns in silver vases. Those seated at the table across the top of the room were the following: Lady Aylesworth, Mrs. A. Meredith, Mrs. Hocken, Mrs. Strachan, Mrs. Bedford McNeil, Mrs. Kemp, Lady McRoberts, Mrs. Winchell, Miss Grutterink, Miss F. Bascom, Mrs. Charlton, Mrs. Fermor, Mrs. Whitman Cross, Mrs. F. Adams, Mrs. Coleman, Mrs. Arnoldi, Mrs. Tyrrell, Mrs. Parks, Mrs. Frech. The ladies who were unable to be present were: Mrs. R. L. Borden, Lady Whitney, Lady Gibson, Mrs. George Perley, Madame Coderre, Mrs.

Frank Cochrane, Lady Pellatt, Lady Walked. After luncheon Mrs. Adams, Mrs. Tyrrell and Mrs. Strachan spoke briefly and very much to the point. Mrs. Adams wore a very pretty gown of pearl gray silk with real lace and a black hat faced with cherry velvet, with plumes of the cherry and black; Mrs. Tyrrell, a white gown patterned with royal blue, a wide brimmed hat to match with a wreath of small flowers; Mrs. Strachan wore peacock silk with real lace scarf and a toque of shaded roses; Mrs. Parks, the indefatigable secretary, who has done so much to make this thing "go" during the meeting of the congress, looked very pretty in black and pale blue with a black plumed hat and a corsage bouquet of lilies and maidenhair fern; Miss Coleman wore cream color with lace and a black tulle hat with wreath of tiny roses; Mrs. David Dunlop, who entertains at a garden party this afternoon, wore a gown of real lace and a hat

faced with green velvet with a wreath of pansies and green apples. After luncheon a group was photographed on the front steps of the parliament buildings. The guests included the following: Mrs. W. Loudon, Mrs. Arthur Meredith, Miss Arnoldi, Mrs. McEvoy, Mrs. Wilmot, Mrs. Dunlap, Miss Addison, Madame Hoffmann, Mrs. Lecky, Miss Annie Eubank, Mrs. Peck, Mrs. Udden, Mrs. M. R. Holman, Mrs. C. H. Gordan, Frauline Rathgen, Mrs. Charleston, Mrs. Taylor, Mrs. Matthews, Mrs. Stevenson, Miss Stevenson, Mrs. Walker, Mrs. Fermor, Mrs. Ferrier, Mrs. T. Murray Clark, Mrs. W. L. Simpson, Mrs. Hautain, Mrs. Gandier, Mrs. Quensel, Mrs. Lacroix, Mrs. Dowling, Mrs. Denis, Mlle. Terrier, Mrs. G. T. Kay, Mrs. C. K. Leith, Miss Heine, Miss Gregory, Mrs. C. L. Taber, Miss Lindsey, Mrs. J. A. Dresser, Miss M. Talbos, Mrs. H. V. Winchell, Dr. A. Grutterink, Mrs. John Clark, Mrs. Edgar Teller, Mrs. Pirsion, Mrs. Adams, Mrs. Ferrier, Mrs. Denton, Miss Denton, Mrs. Guess, Mrs. McNairn, Madame Carez, Miss C. Brazell, Mrs. W. R. Rogers, Mrs. Smyth, jr., Mrs. Haltedahl, Mrs. W. McNeil, Mrs. Arthur L. Day, Lady McRoberts, Mrs. Arthur L. Day, Lady Lane, Mrs. W. A. Johnston, Mrs. Squair, Mrs. Burrows, Miss A. Hatch, Mrs. Renier, Miss Teller

Mr. and Mrs. David Dunlap, 93 Highlands avenue, are giving a garden party this afternoon from 4 to 6.30 o'clock in honor of the International Geological Congress.

The ladies' committee of the Geological Congress was at home at tea in the university quadrangle yesterday afternoon when about two hundred people were present, among whom were present the mayor of Toronto and Mrs. Hocken and many distinguished people. Tea was served from a rose-decked table in a large scarlet and white marquee. A presentation was made to Mr. W. R. Rogers who personally conducted the party to Cobalt, and the beautiful silver tea pot presented by Mrs. J. B. Tyrrell was an appreciation of the trouble he had taken for the party in his charge. The tea pot was suitably inscribed, and a bouquet of pink roses was given to Mrs. Rogers at the same time. The girls assisting at the tea were Miss Mary McLennan, Stratford; Miss Gibson, Miss Moffatt, Miss Nairn, Miss Reid, Miss Arnoldi, Miss M. Arnoldi, Ottawa; Miss Squair and Miss Tyrrell. In the evening a great many of the members of the congress went to the band concert at the yacht club on the invitation of the commodore, Mr. Aemilius Jarvis.

Telegram. Aug. 8. 1913.



Top circle is Lady F. D. McRoberts, who visited Toronto at last meeting of International Council of Women.

Below is Mrs. O. Holtedahi, of Christiania, Norway, who is talking to Frauein Rathgen, of Bonn.

To the right is Miss Florence Bascom, who teaches Bryn Mawr girls about rocks.



Toronto World - Aug. 9 - 1913.

THINK IN AEONS DO GEOLOGISTS

Nor Do They Recognize National Distinctions in Research Work.

PRE - GLACIAL PERIOD

Professor Coleman Delivers Address to International Conference.

One sure indication of the importance of the Geological Congress, which held its second day's sessions yesterday at the university, is the privilege accorded its members of walking without molestation on the university lawns. The university constables, who are accustomed to all varieties of the academic human, seem awed in the face of such an array as throngs the halls and corridors, and the grass is allowed to suffer. Even if the American and Japanese representatives should organize exterminating committees and proceed to settle the national differences on the front campus, it is doubtful whether they would be disturbed.

No scenes of strife have marred the cosmopolitanism of the congress as yet, however, for the delegates do not recognize national distinctions as affecting scientific research. The national boundaries of the world are all products of a few centuries, but geologists think in aeons. Yesterday's program included an address by Prof. A. P. Coleman of Toronto, dealing with pre-glacial times in America, and a talk on the volcanic cycles in Sardinia, delivered by Henry S. Washington, of Washington, D.C.

Glacial geology occupied the entire time of section 3, which met at 2.30 in the afternoon, following the ladies' luncheon in the parliament buildings at noon. Papers were read in each of the three official languages of the congress, and covered the topic as it is manifested in Canada, the United States, North Germany and the British Isles. Section 1 at the same time devoted itself to the question of magmatic differentiation, introduced by six papers, of which four were prepared by geologists on this side of the Atlantic.

To Explore Hamilton.

A number of the delegates took advantage of the excursion to Hamilton to escape for a day from the atmosphere of speeches. Still others left at 5 o'clock in the afternoon for Madoc, where the rock formation will be examined and noted.

"We will really not know what good this congress has done until we get back home and have a look at our notes," said a delegate yesterday. "There is so much to see and hear that one cannot digest a fraction of it."

A marquee has been erected in the University College quadrangle and there tea was served in the late afternoon. Mayor Hocken and Mrs. Hocken were present, as well as several members of the university faculty. No sessions were held in the evening.

Today's work at the congress will begin at 10 o'clock in the morning with a general meeting in the amphitheatre of the physics building, at which the topic of discussion will be, "The Physical and Faunal Characteristics of the Palaeozoic Seas with Reference to the Value of the Recurrence of Seas in Establishing Geological Systems." Papers relative to the subject will be delivered by T. C. Chamberlain, Chicago; Gustave Steinman, Bonn, Germany; Charles Schubert, New Haven; Paul Krasch, Berlin, Germany; Olaf Holtedahl, Christiania, Norway; E. O. Ulrich, Washington, D.C., and T. C. and R. T. Chamberlain, Chicago.

Discuss Tectonics.

At 10.45 a special sectional meeting will discuss tectonics. At 2 o'clock in the afternoon the committee on the geological map of Europe and the world will meet. At 2.30 a series of pine papers on miscellaneous subjects relating to economics and chemistry will be read before section 1 in the University College building.

Mr. and Mrs. D. A. Dunlap will entertain the delegates at a garden party at 4 o'clock in the afternoon, and the day's program will conclude with an illustrated lecture on Western Canada by Cy. Warman, at 8.30 in the evening.

Excursions to moraines and to Muskoka will leave during the day.

A large party of the members of the Geological Congress went to Hamilton and Grimsby yesterday, lunched at The Village Inn at Grimsby and were given a dinner by the members of the Hamilton Club in the evening.

Mail & Empire, Aug. 9 - 1913.

Detailed Account Of Toronto Region

"The Natural History of the Toronto Region" (Briggs) is a collection of short monographs, prepared with special reference to the convenience of delegates to the International Geological Congress, at present meeting in the city. It is edited by James Faull, B.A., Ph.D., of Toronto University, and includes contributions by local scientists on a wide range of subjects covering the fauna and flora of the region.

While of particular value to scientists, the work should prove of interest to the general reader, at least in Toronto, because of the many items of information about the city and its history. The opening chapter, which serves as an introduction to the volume, entitled "Toronto; an Historical and Descriptive Sketch," is written by Professor Keys. This is an excellent short review of the city's early history and development; and combines with it a descriptive account of the present conditions of population, industries, the University, and other items. It must be confessed that, while he blows the city's trumpet rather loudly, the author has not scrupled to criticize some points which richly deserve it, particularly the short-sightedness which was responsible for the loss of the lake front, and the unfortunate judgment displayed in the method of laying out the streets.

The University is described with considerable detail, as far as the scope of the article will permit.

A chapter on the Indians who formerly inhabited the district shows that these belonged to the Mississauga tribe that formerly inhabited the region of the lake's western end. These people became a seventh member of the Iroquois League and engaged in the wars against the French. The most progressive of all the tribes that inhabited the region dwelt formerly near the mouth of the Credit and some very interesting details are given of their customs. One item that is instructive in the light of later developments recalls that when the Indians became indisposed they paid a visit to the Island to recuperate, its health-giving properties being appreciated even at that early date.

Professor Coleman, Ph.D., F.R.S., has contributed an article on the geology of the region, of which the particular interest to the general reader lies in the description of the great lake called by geologists "Lake Iroquois" that formerly filled the great basin made by the ridge which forms the Heights at Queenston, the Hamilton "Mountain" and the Davenport hills. This lake existed at the end of the Glacial age and its eastern shore was evidently formed of ice. The tremendous size of it can be appreciated when it is remembered that Hamilton, Toronto, St. Catharines and a score of other places are built upon what was formerly the bottom of this great lake where it began to grow comparatively shallow towards the shore. A most interesting note on Niagara Falls describing the process by which the falls have receded from Queenston to their present position, is included in the article, the time taken by this recession being estimated at 39,000 years.

An article on the climate of Toronto has been contributed by R. F. Stupart, F.R.S.C., director of the Meteorological Office, which necessarily consists chiefly of records of average temperatures.

The last eighteen chapters are devoted to the botanical and zoological details, and consist chiefly of lists which are not of interest to the general reader. There are forty-one species of mammals, two hundred and ninety-two birds and eleven reptiles recorded, and of the last-named, among the snakes, there are none harmful.

The volume includes several good detail maps, one showing the County of York and vicinity; another a road map of Toronto and environs; and a third an excellent map published by the Department of Lands, Forests and Mines, giving the geological formations in color.

GEOLOGISTS IN TORONTO.



Prof. Alfred La Croix, of Paris, France, Greatest Iving Mineralogist.

GEOLOGIST PARTY VISITS HAMILTON

Forty-five Members of the Congress See Points of Interest.

FOUND SOME SPECIMENS

Spent Some Time Collecting Objects From the Mountain Brow.

Special to The Mail and Empire.

Hamilton, Aug. 8.—About 45 members of the geologists' congress which is in session in Toronto visited Hamilton this afternoon and were shown the sights of the city. They were driven in motor cars to the various points of interest, and spent some time along the Mountain brow collecting specimens. They were very much impressed with the collection in the rooms of the Hamilton Scientific Association, which Col. Grant has gathered.

Dr. W. A. Park, an old Hamilton boy, who is now the professor of palaeontology in the University of Toronto, was the official guide and lecturer of the party. A dinner was given at the Hamilton Club, at which C. R. McCullough presided. Dr. J. Heurner Mullin was in charge of the local arrangements.

Globe, Aug. 9 - 1913.

The following ladies were among the invited guests at the luncheon given by the Toronto Ladies' Committee of the Geological Congress: Lady Aylesworth, Mrs. Arthur Meredith, Mrs. Strahan, Mrs. Bedford McNeil, Mrs. Kemp, Lady McRoberts, Mrs. Winchell, Lady Pellatt, Miss Grutterink, Miss F. Bascom, Mrs. Charleton, Mrs. Fermor, Mrs. Whitman Cross, Mrs. Adams, Mrs. Coleman, Mrs. Arnoldi, Mrs. Tyrrell, Mrs. Parks, Mrs. Frech, Mrs. Hocken, Miss McLennan, Mrs. Loudon, Mrs. Frank Adams, Mrs. Wilmot, Mrs. Dunlap, Miss Addison, Mrs. Forsyth Grant, Madame Hoffman, Mrs. Lecky, Miss Annie Eubank, Mrs. Peck, Mrs. Udden, Mrs. M. R. Holman, Mrs. C. H. Gordan, Fraulein Rathgen, Mrs. Charlestone, Mrs. Taylor, Mrs. Matthews, Mrs. Stevenson, Miss Stevenson, Mrs. Walker, Miss Mary McLennan, Mrs. Fermor, Mrs. Ferrer, Mrs. T. Murray Clark, Mrs. W. L. Simpson, Mrs. Haultain, Mrs. Gandier, Mrs. Quensel, Mrs. Lacroix, Mrs. Dowling, Mrs. Denis, Mlle. Terrier, Mrs. G. T. Kay, Mrs. C. K. Leith, Miss Heine, Miss Gregory, Mrs. C. L. Taber, Miss Lindsey, Mrs. J. A. Dresser, Miss M. Talbos, Dr. A. Grutterink, Mrs. John Clark, Mrs. Edgar Teller, Mrs. Pirsson, Mrs. Denton, Miss Denton, Mrs. Phillips, Mrs. Guess, Mrs. McNairn, Madame Carez, Miss C. Brazell, Mrs. W. R. Rogers, Mrs. Smyth, jun., Mrs. Haltedahl, Mrs. W. McNeil, Mrs. Arthur L. Day, Mrs. Lane, Mrs. W. A. Johnston, Mrs. Square, Mrs. Burrows, Miss A. Hatch, Mrs. Renier, Miss Teller.

Mail & Empire. Aug. 9-1913.

GEOLOGIST TRACES AGE OF LAKE ONTARIO

Toronto Island and Lake Surrounding it Shown to be Over Eight Thousand Years Old.

Congress Hears Interesting Address on Post-glacial and Interglacial Time in North America.

Toronto's history of an age long past, written in hieroglyphics more ancient than those of Egypt, but unlike them, by the hand of nature, not man, was related at one of the sessions of the Geological Congress yesterday afternoon, when Professor A. P. Coleman, of Toronto University, delivered a lecture, with his subject "An Estimate of Postglacial and Interglacial Time in North America." Unlike the majority of the lectures at the congress, this was not of the highly technical order intelligible only to the trained mind of a geologist, for it dealt largely with the question of the time taken to form the Toronto Island, from which an estimate of one stage of the postglacial time was reckoned, and touched upon the interesting subject of the vast lake which formerly filled the entire basin where now Lake Ontario and a large portion of country lie. It included, also, a number of most interesting lantern slides made from photographs of the leaves of trees, shells and other interesting living things that have been found in deposits which undoubtedly were made between the periods when great sheets of ice covered the entire region to the north and far to the south of the city. The slides prove clearly that between the great ice ages there was a period when Toronto and its environments enjoyed a climate as warm as that of Philadelphia and places in Southern Ohio.

Professor Coleman's address was preceded by an interesting paper by G. W. Lamplugh, of St. Alban's, England, maintaining that the generally accepted idea of long interglacial periods in the British Isles, where first the glacial theory was propounded, is incorrect, and giving convincing evidence for his stand.

The Interglacial Period.

In introducing his subject, Professor Coleman stated that he did not intend to deal with the controversial question as to whether there were, or were not, warm periods between the great ice ages in Great Britain, but that he would show evidence to prove that in North America we had an interglacial period of great warmth.

As a starting point from which to establish his estimate of the time since the glaciers disappeared from over Toronto, the speaker took up first the question of the time required to build up the Toronto Island. This, he declared, has been caused by the gradual wearing down of the great Scarborough Bluffs and the drift of currents towards the west, carrying the sediment to form the present island. This has grown stage by stage and is still growing, and, moreover, it has all been formed since Lake Ontario came into existence as a lake at about its present level. Thus if the rate at which the Island is being built up can be fixed, the age of the lake can be determined.

To illustrate the manner in which the Island has grown, a map was shown giving the depths off the shore from Scarboro to the Exhibition. These lines all converge at the southwestern point of the Island, and thus show that a great promontory formerly extended from Victoria Point to the present great bluffs at Scarboro.

The retreat of the cliffs has been estimated at 1.62 feet per annum, and fifty years have been taken to demonstrate this since first the cliffs were accurately surveyed. As the great promontory was composed of about 13,000 feet, the time taken to destroy it can be figured by dividing by 1.62, which makes the time about 8,000 years.

Lake Ontario 8,000 Years Old.

To check these figures the rate at which the Island has been built up was estimated, this being done by noticing the amount of sand deposited per year. Since records have been kept within the last thirteen years about 22 acres have been added. As the Island contains approximately 320,000,000 cubic yards of sand, by dividing by the annual accumulation it works out at about 7,600 years, thus seeming to verify the former figures within a fairly close margin, and establishing the age of Lake Ontario at about 8,000 years.

The ancient Lake Iroquois, as geologists name the lake formerly occupying the greater Ontario basin, shows from its gravel bars on the Hamilton escarpment, at Queenston Heights, at the Davenport ridges and beyond, the same maturity as Lake Ontario, and thus Lake Iroquois took about the same length of time for its work, roughly, 8,000 years.

Was Formerly Under the Sea.

The shifting of the land level at one time put the Ontario basin below sea level, and this occurred between the two lake periods. The estimate for this time works out, roughly, at about the same, 8,000 years, thus showing that the ice left this part of the continent about 25,000 years ago, thus establishing the post-glacial age in years as about 25,000.

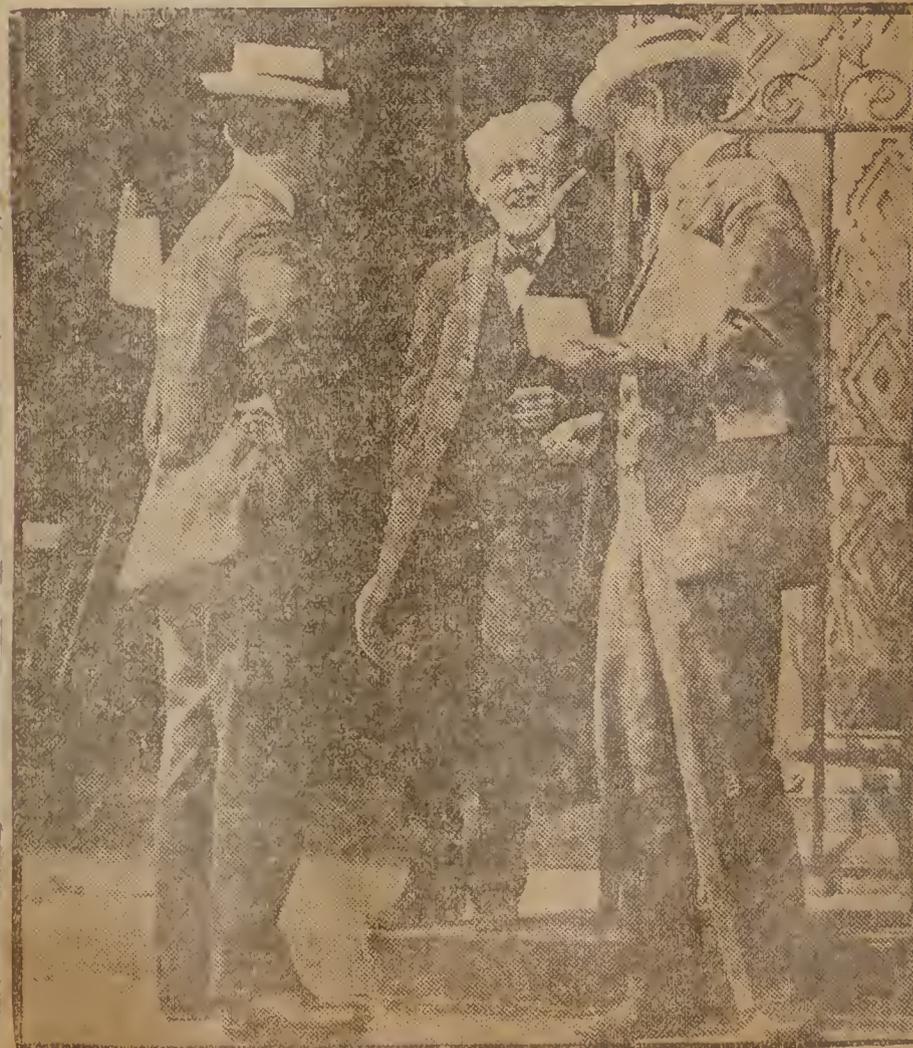
Since the Iroquois Lake period the north-eastern shore of the lake has been gradually rising, as is shown by the differing elevation of its shore

continued on page 50.

GEOLOGISTS IN TORONTO



H. Lantenois and J. Beprat, of France.
GEOLOGISTS IN TORONTO.



F. W. de Wolfe, State Geologist of Illinois; Wm. North-Rice, State Geologist of Connecticut; H. B. Kummel, State Geologist of New Jersey.

line. In interglacial times there was also a lake at Toronto, which must have had some dam other than ice at its end and the same rise and fall of this part is apparent, so that the interglacial age is estimated at three times that of the postglacial.

The illustrations shown by Professor Coleman were specimens of the plants and animals obtained in the interglacial beds at the Don Valley Brickyards. About two-thirds of these, chiefly leaves of trees and shells, and all petrified, show that the flora and fauna were approximately the same as those to the south of Lake Erie to-day, though many of the specimens obtained are extinct varieties. The hypothesis is not without good foundation, as Professor Coleman stated he has about 150 species from these beds. In conclusion, the speaker showed that with a climate similar to that of Iowa there must have been a great removal of ice far to the north which would necessitate a long interval between the glacial eras.

The Interglacial Problem.

The interglacial problem in the British Isles was treated of by G. W. Lamplugh, F.R.S., who found it impossible from the evidence which his long observations have given him that there had ever been any warm periods between the ice ages in the British Isles, and that the theory of interglacial ages which was formulated in Great Britain, though held formerly as practically proven, does not now agree with the evidence. The warm temperature theory was propounded to explain the presence of some marine shells at high levels in sand and gravel beds which were supposed to have been laid down while this part was submerged under the sea in a warm interval.

While declaring that he had started out with a firm belief in the theory, Mr. Lamplugh declared that he could find no evidence of an interruption of the glacial conditions, except in very local areas, and that these are evidently only marginal fluctuations, and deposits probably formed in small inlets temporarily. Masses of pre-existing shell deposits were probably swept forward over the land by the ice, just as were the boulders found in the boulder clay.

Several papers dealing with different aspects of the interglacial periods and in different countries, were also heard, including one on the postglacial and interglacial periods in Northern Germany.

A second topic under discussion by another section of the congress was that of "Differentiation," and a number of important papers of a technical order dealing with various phases of the subject of formation of rock into the variety of classes, and the causes for this differentiation, were heard.

At the morning session a paper on the age, characteristics and structure of the Argentine Mountains, one on the earth movements in the Malay Archipelago, and a third dealing with the geology of Morocco were among those heard.

Next Congress in Europe.

An invitation from the Argentine Republic to hold the next congress, three years hence, at Buenos Ayres, was read to the delegates, but as meetings have been held twice within the last six years in America, the general opinion is that Spain or Belgium, which also have issued invitations, should have the next congress.

Luncheon was served to the delegates at the Parliament Buildings by the Ladies' Local Committee, who also served afternoon tea in the quadrangle again yesterday. An interesting occurrence at this was an informal presentation to Mr. W. R. Rogers, of the Bureau of Mines, who was in charge of the Sudbury-Cobalt expedition, of a silver teapot made of Cobalt silver.

One of the excursions which are a feature of the congress was made yesterday to Grimsby and Hamilton to study the formation of the escarpment and its fossils. Forty-nine went on the excursion, and, in addition to the business end of it, enjoyed the hospitality of the two points visited. Several excursions have been arranged for to-day, one having left for Madoc last evening, while another is making Muskoka its objective.

Globe. Aug. 9. 1913.

**TORONTO DISTRICT
APPARENTLY OF AGE**

Ice, However, Covered It
24,000 Years Ago

SINCE THEN THAWED OUT

Geologists Keep Cool by Discussing
Interglacial Periods—Many Inter-
esting Scientific Facts Concerning
This Region.

Of the many interesting papers yesterday at the Geological Congress none was listened to with such attention as that of Prof. A. P. Coleman of Toronto University, who spoke upon "An Estimate of Postglacial and Interglacial Time in North America." During the course of the lecture, which was delivered in an easy, conversational style, adding much to its charm, the Professor said that the Island had been formed by the erosion of a promontory, and that the great process had been done from east to west. The Island has grown during the lifetime of Lake Ontario. The wearing away of the Scarborough cliffs is estimated at 1.62 feet per annum, and these figures are the results of fifty years' observation. From calculations made it is estimated that the ice left 24,000 years ago. The basin of Lake Ontario has been growing deeper and the land has been rising to the northeast, but the opinion is held by Dr. Spencer that it is no longer moving. During the interglacial period the lake was several feet higher than the present lake. Some very interesting slides were then shown of the Toronto district. At the Don Valley brickyard there are shells some of which do not live in Lake Ontario, but farther south. Seventy-two species of beetles have been found, only two of which now exist in this region. The mammals bear a great resemblance to the mammals of the Aftonian period of Iowa.

No Ice-belt Round Britain.

The paper upon the "Interglacial Period in the British Islands," by G. W. Lamplugh, F.R.S. of St. Alban's, England, was interesting, inasmuch as in 1906 Mr. Lamplugh criticized the interpretation of the British drift deposits as being the product of alternating periods of glaciation and complete deglaciation. "It has been an essential part of the interglacial hypothesis as applied to Great Bri-

tain that the ice-sheets which covered most of the land and filled the neighboring shallow sea-basins were melted out entirely during at least one warm interglacial period and reappeared at a later stage. Mr. Lamplugh had re-examined parts of Yorkshire, the Midlands and the borders of North Wales, where it had been supposed that interglacial conditions were represented, but without finding any justification for the hypothesis. The conclusion reached by the scientist was that there was no reason for supposing that the Islands of Great Britain had been more than once enveloped by ice-sheets, whatever the case may have been in other countries.

Mr. Warren Upham, D.Sc., of St. Paul, Minn., in a paper upon the "Sangamon Interglacial Stage in Minnesota," said that throughout the long glacial period of growth, culmination and decline of the North American and European ice-sheets, the climate responsible for this snowfall and ice accumulation fluctuated to such an extent that the boundaries of the continental glaciation were alternately extended and checked or drawn back.

Many Scientific Subjects.

Other papers given during the day were as follows:

Über das Alter, die Verbreitung und die gegenseitigen Beziehungen der verschiedenen tektonischen Strukturen in den Argentinischen Gebirgen, by H. Keidel, Buenos Ayres, Argentine.

Earth Movements in the Malay Archipelago, by G. A. F. Molengraaf, Delft, Holland.

La Geologie du Maroc, by L. E. Gentil, Paris, France.

Petroleum on Bondoc Peninsula, Tayabas Province, Philippines, by W. E. Pratt, Manila, P. I.

On the Old Red Sandstone Series of Northwestern Spitzbergen, by Olaf Holtedahl, Christiania, Norway.

The Forty-first Parallel Survey, Argentine, by Bailey Willis.

Sills and Laccoliths Illustrating Petrogenesis, by R. A. Daly, Cambridge, U.S.A.

Fractional Crystallization the Prime Factor in the Differentiation of Rock Magmas, by Alfred Harker, Cambridge, England.

Some examples of magmatic differentiation and their bearing on the problem of petrographical provinces, by Jos. P. Iddings, Washington, U.S.A.

The Volcanic Cycles in Sardinia, by Henry S. Washington, Washington, U.S.A.

Variations in Composition of Pelitic Sediments in relation to magmatic differentiation, by Wm. H. Hobbs, Ann Arbor, U.S.A.

A Classification of the Eruptive Rocks of Italy, by Venturino Sabatini, Italy.

Le Commencement et la fin de la Periode Glaciare, by N. O. Holst, Jemshogsby, Sweden.

Glacial und Interglazial in Norddeutschland, by W. Wolff, Berlin, Germany.

Early Pleistocene Glaciation in the Rocky Mountains of Glacier National Park, Montana, by Wm. C. Alden.

About fifty delegates to the Geologists' Congress visited Hamilton this afternoon. They were taken to Grimsby where they examined fossils in the ravine. On their return they were entertained at the Hamilton Club to dinner. C. R. McCullough, president.

Controller Morris extended a cordial welcome on behalf of the city, and H. B. Witton proposed the toast to the guests, which was responded to by Dr. Zeubrey, T. Tolmachov, A. Bigot, Prof. Cushing and W. A. Parks of Toronto.

**SCIENTISTS SWELTER
IN "LAND OF SNOWS"**

Few Geologists Endorsing Kipling's Vision of Canada

ALL PRAISING DOMINION

Scenes of Cordial Camaraderie
Characterize Sittings

Social and Scientific Blended in Gatherings of Yesterday Afternoon —
Presentation to "Guide" and His
Good Wife—Night at the Island.

"We should have the seat of Empire in Canada and put a Governor in the British Isles," said Prof. Cadman of Birmingham, Eng., yesterday afternoon to The Globe during a lull in the afternoon session of the Geological Congress. The speaker was full of admiration for everything that he had seen in the Dominion, and was unstinted in his praises. The extent, the resources, the virility of Canadians had impressed him immensely. The professor, who is engaged by the Admiralty as an expert in the matter of fuels for the navy, will leave immediately the Congress is over for India, where he will carry out investigations in the oil deposits. Mr. Bedford McNeil, the Director of the Institute of Mining and Metallurgy, is more impressed than ever with "the brilliance of Canadians" since he has returned from the Forcupine and Cobalt trip. Mr. McNeil, who is more interested in silver and gold than anything else ("So are we all," was the chorus of the little group), is greatly impressed with the north lands, although he could not imagine why the silver mines follow the railways rather than the opposite. It was in this little group of bright-eyed men that some delightful geological stories were let loose. A professor was lecturing to a group of students upon different strata, and to illustrate he drew a number of curves upon the blackboard, and remarked: "Gentlemen, if all these lines were strata—" A burst of laughter followed from the students, and it was some time before the professor realized his innocent pun.

In a little village some of the inhabitants started a natural history club and one evening a gentleman brought in some bones and gravely informed the gathering that he had found them in the rear of his garden. The village idiot, Smith, got up and remarked that the bones were those of a donkey that had been buried many years ago when he owned the property. "I am very sorry that I have disturbed the family vault of the Smiths," was the unexpected rejoinder. And so it went on.

Globe, Aug. 9-1913.

Toronto News- Aug. 9-1913.

Celebrate a Wedding.

During the afternoon a surprise was sprung upon Mr. W. R. Rogers, who had accompanied the Cobalt-Porcupine-Sudbury party as guide, by the presentation of a silver teapot to himself and wife, and a bouquet of roses to Mrs. Rogers. Mr. Charles McDermott, the Secretary of the Institute of Mining and Metallurgy, London, made the presentation in a delightful little speech. Mr. McDermott said he had been commanded by Mrs. Tyrrell (and, of course, he couldn't refuse, even Mr. Tyrrell had to obey when thus commanded) to present the teapot to Mr. Rogers.

"I suppose that I have to do this because I was the most useless of the party," said Mr. McDermott, amid laughter. "I have much pleasure in presenting this teapot to you; it is supposed to be made of silver," he remarked amid loud laughter, "and I trust that when Mrs. Rogers and yourself are having tea together it will remind you of friends scattered to the four corners of the earth." Mrs. Rogers was presented with a bouquet of roses, and Mr. Rogers made an appropriate speech in reply.

Not My Lady of the Snows.

Some of the visitors did not bargain for the warm weather they have experienced in Canada, and some of them felt the weather yesterday very much. An Englishman clad in rather warm-looking clothes, carrying a rain coat, remarked, "Bah Jove, it's warm," and everybody agreed with him. Dr. Tadasu Hiki of Kioto, standing in the corridor of the University, said that he had been listening all the afternoon to the discussions and had a headache. "But I take a tea and refresh," said he with a smile. The ladies were much blessed yesterday when they brought around cold lemon water and refreshing tea with many little delicacies.

Last night the geologists were the guests of the Royal Canadian Yacht Club and were conveyed in special launches to the Island. The visitors enjoyed themselves thoroughly and were delighted with the position and appearance of the club grounds.

IN OLDEN DAYS ONTARIO WAS BURIED IN ICE

It Was Twenty-five Thousand Years Ago, Explains Prof. Coleman

LAKE HAS REACHED RESPECTABLE AGE

Toronto Island is Apparently the Offspring of Scarborough Bluffs

That ice covered the country about Lake Ontario 25,000 years ago, and that the lake itself is 8,000 years old, were among the statements made by Prof. A. P. Coleman, of Toronto University, before the International Geological Congress.

Among the number of important papers read at the session on the topic "To what extent was the Ice Age broken by interglacial periods?" Prof. Coleman's was the most interesting in its reference to local conditions. He declared that between the two great ice ages on the North American continent, there was a long period in which Toronto enjoyed a climate as warm as Southern Ohio, and that it was only long after this period and at the end of the second ice age that the present topography of Lake Ontario came into being.

Building Up the Island.

The time required to build up Toronto Island was the first step in the proof. Scarborough Bluffs is worn away at the estimated rate of 1.62 feet per annum, and the sediment is still drifting to the west and building up Toronto Island. But before the Island, due in formation to the retreat of the Bluffs, began its existence, a great promontory of 13,000 feet extended from Victoria Point to the present Cliffs at Scarborough. Computing this subsequent retreat at 1.62 feet per annum, it must have taken 8,000 years before the water began to wash away the promontory. During the last 13 years 220 acres of land have been added to the Island and it has been computed that with its present 320,000,000 cubic yards of sand, it took almost 8,000 years for the Island formation. The figures are thus checked with comparative accuracy.

The Interglacial Problem.

Mr. G. W. Lamplugh, F.R.S., of St. Albans, England, read a paper on the interglacial problem in the British Isles. He criticized the interpretation of the British drift deposits as being the product of alternating periods of glaciation and complete deglaciation.

He showed that the idea had first been entertained to explain the presence of sands and gravels among the boulder clays and that it had been believed that the finding of fragmentary marine shells in many places had established the existence of an interglacial period in Great Britain.

It is now, however, he stated, generally admitted that the deposits came from ice streams and show only mar-

ginal fluctuations, the ice moving inland more or less obliquely from the present sea basins. He concluded by declaring that all evidence had not yet been found on the subject.

Rock Production.

The production of rocks at various epochs coming from the same parent reservoir of rock-magma, was explained in a paper by Mr. Alfred Harker, St. John's College, Cambridge, as a differentiation due to crystallization with a lowering of melting points of the subterranean liquid together with temporary local fusion.

Other papers included those of Messrs. Keidel, Argentine; Molengraaf, Holland; Gentil, France; Pratt, Philippines; Høltedahl, Norway; Daly, Idings, Washington; and Hobbs, U. S. A.; Sabatini, Italy; and Wolff, Berlin; the second topic for papers being the differentiation of igneous magmas.

At the end of the afternoon session, tea was served in the Quadrangle, among the visitors being Mayor Hocken and Mrs. Hocken. In the evening a great many Congress delegates accepted the invitation of Commodore Aemilius Jarvis to spend the evening at the Royal Canadian Yacht Club.

Other papers at the general meeting were given on cognate subjects by Messrs. Chamberlin (U.S.A.), Steinmann (Germany), Krusch (Germany), Høltedahl (Norway), and Ulrich (U.S.A.)

Earth Disturbances.

At the sectional meeting this morning on the topic of tectonics and earth disturbances, M. Th. Dahlblom, of Falun, Sweden, read a paper on the "angle of pull," namely the angle between the perpendicular and the slope made by the wedging power of gravity on the sides of a steep mountain or steep wall of a mine. From the standpoint of the mining geologist this is an important subject and of the papers which followed those by Mr. Donald F. Macdonald, of the Isthmian Canal Commission, and Mr. Ernest Howe, Newport, U.S.A., took up the problem from the geological point of view. Reference was made in both papers to the landslide on the Culebra Cut of the Panama Canal, Mr. Macdonald maintaining that the term angle used by Dahlblom could not in any sense be applied to the measure of the excavation deformations which manifested themselves under certain conditions.

In the Culebra Cut, the causes of deformation were stated to be the softness of the rock formations weakened in addition by faulting, the abundance of ground-water, the liquid shale beds, and the presence of chloritic particles in the volcanic clay rocks. The immediate cause was the oversteepness of the slopes, where the banks were high and the rocks weak. The strained condition of the slopes is at present being remedied by reducing the steepness to a much greater extent than if the formation had not been loosened and weakened by deformative movements. In any case the weakest rock encountered will, according to a carefully prepared table, govern the slope for that excavation.

Factors in Land Slides.

Mr. Howe, in his paper, emphasized the geological factors in land slides. While continued blasting, earthquakes, frost and water-saturation were immediate or external causes of landslides and sinking of ground above mines, the main causes were in the structural and physical condition of the rocks. If the geological condition is satisfactory, landslides are unlikely to occur merely from external disturbances.

While the attendance at the conferences was good this morning, the absence of a great many could be accounted for by the fact that excursions had been run to Moraines, north of Toronto, where the party inspected the glacial and fluvio-glacial deposits. Another excursion known as B6, is leaving this evening for Muskoka, not for geological purposes, but in order that the party may enjoy a pleasant week-end among the lakes. The excursion to Madoc will return early Monday morning.

Afternoon Programme.

At 2.30 this afternoon a series of nine papers on miscellaneous subjects, economical and chemical, will be read and the delegates will attend at 4 o'clock a garden party given by Mr. and Mrs. D. A. Dunlop in Rosedale. This evening Mr. C. Y. Warman will give an illustrated lecture on Western Canada.

Toronto News, Aug. 9-1913.

LIMITATIONS OF GEOLOGIC PERIOD HERE

Mapped Out to Congress by Mr. Charles Schuchert, of Yale University

SCIENTISTS TALK ON MANY SUBJECTS

Many of the Visitors Are Away on Excursions—Going to Muskoka

Important factors in the establishment of geological systems were discussed in the various papers read this morning at the International Geological Congress, one of the most interesting being that of Mr. Charles Schuchert, of Yale University, who dealt with the method in which he had mapped out the limitations of the geologic periods in North America. Starting with the idea of cycles of earth movements, sea invasion, land emergency and of organic evolution, the reader reviewed the history of the principles of geological chronology, summarized the present methods and concluded by giving what he called the "new geological time table for North America," based on his own palaeontological method.

The table consists of the list of the periods ranging from Cambrian to Cenozoic with the local strata all over the continent, showing the number of square miles and percentage submerged with the statement of the submerged percentage in 1910.

Star Weekly, Aug. 9-1913.

CAREFUL PREPARATIONS IMPRESS GEOLOGISTS

Visitors Consider That the Canadians Are Wonderful Organizers.

Preparations for the twelfth session of the International Geological Congress have occupied the whole of the past year. A paid staff with a secretary was appointed to manage the work and this has been added to as the date for the Congress approached.

Nearly the whole geological staff at Ottawa have been told off to assist this staff, and are here at the Toronto University Buildings. The staff of the Ontario Bureau of Mines is co-operating, as are many independent mining engineers both in Canada and the United States, who have written guide books, pamphlets, and so forth. The foreign members regard Canadians as wonderful organizers. No Congress was ever handled on the scale that this one has been. The Dominion and Provincial Governments have recognized what older countries do not—the tremendous advertising value of the Congress to the country it visits. Consequently the Canadian Government has co-operated wholeheartedly with the committee and nothing has been left undone to show the country to the world's geological representatives.

Tea for Geological Delegates.

The Ladies' Committee of the Geological Congress was at home at tea in the University quadrangle yesterday afternoon when about two hundred people were present, among whom were present the Mayor of Toronto and Mrs. Hocken and many distinguished people. Tea was served from a rose-decked table in a large scarlet and white marquee. A presentation was made to Mr. W. R. Rogers, who personally conducted the party to Cobalt, and the beautiful silver tea pot presented by Mrs. J. B. Tyrrell was an appreciation of the trouble he had taken for the party in his charge. The tea pot was suitably inscribed, and a bouquet of pink roses was given to Mrs. Rogers at the same time. The girls assisting at the tea were Miss Mary McLennan, of Stratford; Miss Gibson, Miss Moffatt, Miss Nairn, Miss Reid, Miss Arnoldi, Miss M. Arnoldi, Ottawa; Miss Squair and Miss Tyrrell. In the evening a great many of the members of the Congress went to the band concert at the Yacht Club on the invitation of the Commodore, Mr. Aemilius Jarvis.

Star. Aug. 9 - 1913.

Geological Congress Tea

The Ladies' Committee of the International Geological Congress entertained about two hundred guests at a tea in the University quadrangle yesterday afternoon. Tea was served from a tea table, arranged with roses, on a large scarlet and white marquee on the lawn. During the afternoon, a suitably inscribed silver teapot was presented to Mr. W. R. Rogers, who personally conducted the party to Cobalt, and a bouquet of pink roses to Mrs. Rogers. The presentations were made by Mrs. J. B. Tyrrell.

The assistants at tea included Miss Mary McLennan, Stratford, Miss Gibson, Miss Moffatt, Miss Reid, Miss Nairn, Miss Arnoldi, Miss M. Arnoldi, Ottawa, Miss Squair, and Miss Tyrrell. In the evening a large number of the congress members were guests of Mr. Aemilius Jarvis, Commodore of the Yacht Club, at the Band concert.

Geological Congress Luncheon

The ladies' committee of the 12th International Geological Congress were the hosts of a most enjoyable luncheon yesterday. The guests were received by Mrs. Adams, Miss F. B. Tyrrell, and Miss Coleman, at the entrance to the Speaker's chambers. Luncheon was served in the members' diningroom upstairs, the long tables being gracefully arranged with pink Killarney roses, and ferns in silver vases. Seated at the table at the top of the room were Lady Aylesworth, Mrs. A. Meredith, Mrs. Hocken, Mrs. Strahan, Mrs. Bedford McNeil, Mrs. Kemp, Lady McRoberts, Mrs. Winchell, Miss Grutterink, Miss F. Bascom, Mrs. Charlton, Mrs. Fernor, Mrs. Whitman Cross, Mrs. F. Adams, Mrs. Coleman, Mrs. Arnoldi, Mrs. Tyrrell, Miss Frech. After the luncheon speeches were given by Mrs. Adams, Mrs. Tyrrell, and Mrs. Strahan. Mrs. Adams was wearing pearl grey silk, with real lace, and black and cherry hat. Mrs. Tyrrell was in royal blue and white with large hat, flower wreathed; and Mrs. Strahan was wearing peacock blue silk with lace scarf and rose toque.

After the luncheon, a group photograph was taken on the steps of the Parliament buildings.

Mrs. David Dunlap is giving a garden party this afternoon in honor of the International Geological Congress.

THE COST OF LIVING
IS AFFECTING JAPAN

Japanese Delegate Will Not Discuss the California Problem.

FORTY YEARS AT NAVY

Building Battleships in Japan Has Developed Many Industries.

S. Kozu, delegate from the Department of Education in the Imperial University at Tokio, Japan, refused to be drawn into any discussion of the Japanese land question in California, through which State he passed on his way to Washington and Montreal before coming here.

"It is just a question of morality," he said, "a question of doing or not doing the right thing. That is all I know about that."

"What are your impressions of what you have seen of Canada?"

"Well, I notice when I am up north with the excursion that the trees and grasses are much like those we have in Japan, especially the little white birch trees. But the outcropping rocks were so different. They were all new to me. I was most greatly interested to learn of them."

Studying Volcanoes.

"How long will you be away from Japan?"

"Three years," with a suggestion of a sigh, "I spend the rest of this year in United States and then go on to Europe. I am studying volcanic rocks. You see, we have many volcanoes in Japan."

"May what you learn have any practical bearing on practical things in Japan?"

"Oh, no. I am interested only from the petrological point of view."

Cost Of Living Increasing.

"What about the cost of living in your country?" asked The Star. "We understand that conditions are such that your employers of labor have not now the same advantage in cheap labor that they had formerly, and that costs of production in Japan, aside from raw material costs, are becoming more nearly like costs in Europe and America."

"I do not know for sure," replied Mr. Kozu, "but I think you are right. The cost of living has indeed risen in my country ever since the Japanese-Russian war. From the time the war ended the cost of labor has been higher, and rising slowly, but steadily. The cost of rice, and the fee for houses has gone up. We have to pay for more fighting men and more battleships."

"You can still produce certain lines of goods cheaper than we can."

"Yes. But it grows, more expensive."

Building Battleships.

"How long has it taken your country to learn to build her own battleships?"

"How long? Oh yes! Why we built our own first battleship of steel about about forty years ago. Of course it

may not have been a very good one but we have been learning. We have now two big docks for battleships, besides a great many for commercial ships. We build our own vessels except some which we have not room ourselves to build."

"What effect has the building of your navy at home had upon your industries?"

"Oh that has been a good effect. It has perhaps made labor higher and of course it adds to our taxes. But then we spend the money in Japan and so it is not really lost. The steel business in my country has grown and, with it have grown other related industries owing to the spending of such large sums on ships built in Japan."

An Educational Course.

Mr. Kozu described the educational course through which he had passed. He entered the compulsory State Primary school at seven, and studied there for six years, being taught reading, writing, geography, music, flower-work, elementary physics, and chemistry, and physical exercises. At thirteen he entered the usual 5-year course in the "Middle" school. At 18 he entered the 3-year course at "High" school. At 21 he began his four years at the University at Tokio, and then took 5 years more of post graduate work. A total of 23 years at school.

AMAZED AT ABSENCE
OF ELECTRIC SMELTERS

Visiting Mining Engineers Surprised That Dr. Haanel's Process Is Not Used.

CANADA LED THE WAY

Ores, Market, and Water-Power Here, But are Not Developed.

"You may not use my name," said a certain European geologist and practical metallurgist to The Star, "but you may say that Swedish, German, and French engineers and mining men are surprised to find in Canada no traces of electric smelting—a process which Canada practically introduced to the world, thanks to the researches of certain of her scientists."

Haanel's Experiments.

"It was a Canadian, Dr. Eugene Haanel, director of your Geological Survey at Ottawa, who conducted the experiments and made the reports upon which the European engineers afterward based their electric smelting practice. Largely owing to your Dr. Haanel the refractory iron ore deposits of Switzerland have been made commercially valuable—just as your refractory ores in Central Canada would be if you had electric smelters. Since Dr. Haanel's report 160 electric furnaces have been constructed and are in operation in Switzerland. Yet Canada, which seems in all other things so progressive, lags behind."

Ontario Ores Not Used.

Geologists explain that the magnetite ores so far discovered in Ontario and Quebec are for the most part so sulphurous that they cannot be treated successfully in the blast furnace. Consequently the vast quantities of iron ore which Ontario possesses lie unused. The electric furnace is the

one and only means of treating this sulphurous matter. In order to prove that an electric furnace could be designed which would smelt the ore at a commercially sound cost of production, Dr. Haanel secured an appropriation from the Ontario Parliament and carried on extensive experiments at Sault Ste. Marie.

Ontario's Opportunity.

"His reports on these experiments," said the geologist, "were eagerly read by European scientists, with the results above mentioned. Yet to-day, despite the market waiting, the ore at hand and the unbounded water power at hand to develop the electricity, Canada, the pioneer in electric furnace treatment of refractory ores, has not one."

Star. Aug. 9 - 1913.

LINGUISTIC MELEE
AT THE CONGRESS

Delegates Use Different Languages With Cheerful Abandon.

IMPORTANT PAPERS

Member of the Executive Staff Breaks Down From Overwork.

The male delegates to the Geological Congress spread into three centres at lunch time. One group dines at the University residence, one at Annesley Hall, and one at Convocation Hall.

Proceedings take place in three languages, used with cheerful abandon. A bearded gentleman, who is engaged in research work upon the petroleum fields of Russia, will talk learnedly in French. A tall lean Scotsman will ask questions in what he considers English. A geological engineer from Chli will take up the discussion in German, and throughout it all the three little Jap experts listen with grave attention and take notes. They are citizens of the world, despite their very evident race and nativity.

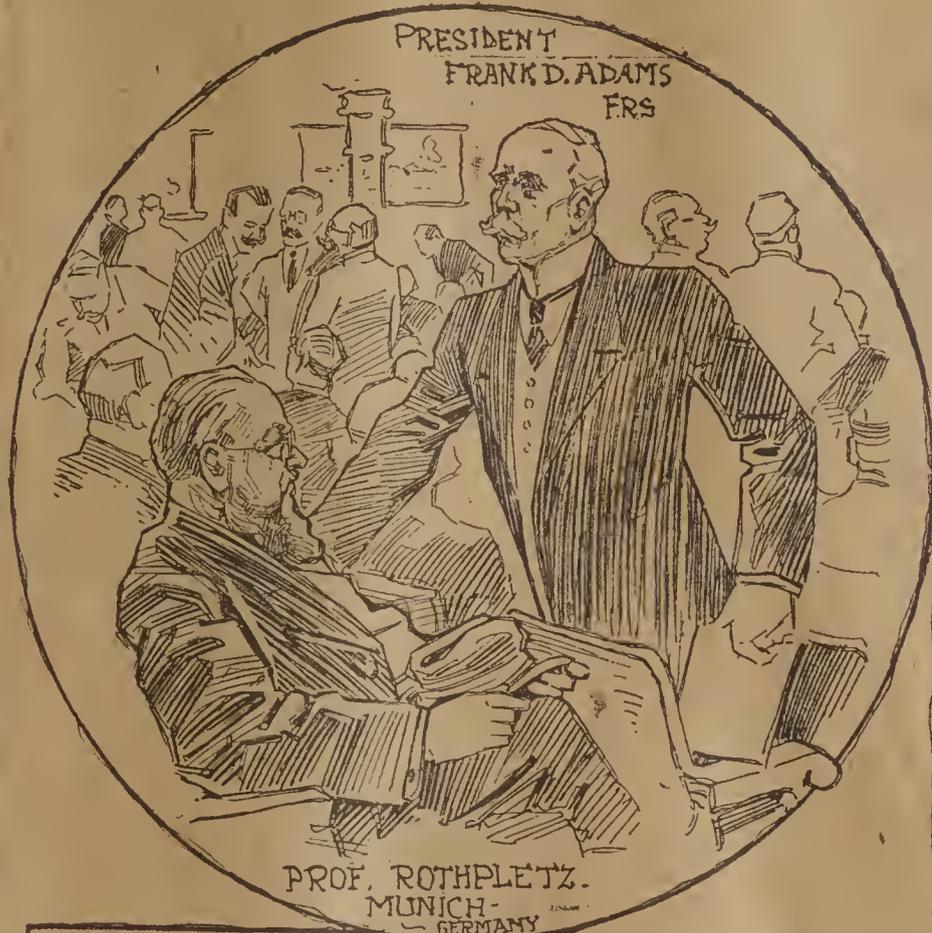
"This morning's program dealt with new explorations," explained General Secretary Brock. "This afternoon's program is divided into two sections. The first one deals with foreign matter found in the igneous magmas. This is of great technical interest, and of considerable economic importance, as it deals with those phenomena with which are associated the location of valuable minerals. Igneous magmas are of course the once molten rock mass comprising the original crust of the earth. Foreign substances found in this magmas are often of mineralogical interest, and of value to the world."

Mr. P. M. Roy of the secretarial staff came up from Montreal, but has not been able to report for duty. He has been very hard at work for the past month since the Congress has been in Canada, and on arriving in Toronto, took sick and broke down.

Daily Star. Aug. 9-1913.

Star Weekly. Aug. 9-1913.

DISTINGUISHED DELEGATES AT THE INTERNATIONAL GEOLOGICAL CONGRESS NOW IN SESSION, SKETCHED BY MR. GRAY OF THE STAR

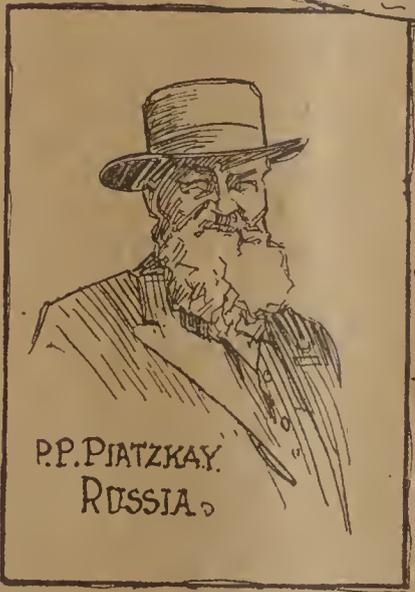


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WAS "TITANIC" BERG ON PEAK OF ATLANTIS?

Geologist Recalls Story of Old
Continent Beyond Pillars
of Hercules.

ROMANCE OF GEOLOGY

May Explain Many Mysterious
Disappearances of Ships
on the Atlantic.

The report of a derelict on the spot where the Titanic is judged to have gone down interests some of the geologists.

"It recalls the old story of Atlantis—the legend that Pliny preserves—a continent upon which civilization had developed but which was submerged by the Atlantic Ocean. In the early days of the semi-historical period ruins of cities were supposed to have been visible in the sea below the surface some distance outside the Pillars of Hercules.

A Geological Probability.

There is a certain substance of geological probability in the Atlantis fable. We know that there is a great plateau in the Atlantic, raised far above what appears to be the normal bed of the ocean. It is possible that Atlantis was a continent truly enough at one period. Land has been rising above and below sea level ever since geological history began. There is nothing unreconcilable about the Atlantis legend and science.

The Mysterious Derelict.

"And now comes this report of a stationary derelict where the Titanic sank. The reports say that the wreckage appeared as the bow of a vessel pointing upwards, and fixed as though moored by her cable to a rock in the bed of the ocean. It is not impossible that a shallow spot exists in the Atlantic at that place. A mountain peak of Atlantis which has escaped the charts, and which has caused many a mysterious disappearance on the Atlantic.

A Submerged Peak.

"It would not necessarily mean that the rock was so near the surface that ships would strike in passing over. But icebergs might catch there and hold until they melted free and drifted on south. The Titanic struck ice, broke in two, and sank, bow up. It is not known whether her anchors were put out or not. But it is interesting to speculate whether this derelict which reports say seems to be the bow of a ship pointing up, with a year's growth of seaweeds clinging to it, may not be the bow of the Titanic freed from the engines and other gear which sunk it, rising from the dead to the surface of the sea by reason of its air-tight chambers, which remained intact, and clinging to a submerged peak of lost Atlantis. That is imagination for you," laughed the scientist. "Geology is not without romance, you know."

WILL INVESTIGATE THE PLEASURES OF MUSKOKA

A Party of Geologists Off to the Popular Summer Resort.

THE GLACIAL SUMMER

Others to Examine Fluvio-Glacial Deposits of North York.

To-day the Geological Congress are indulging in week-end geological excursions. The first one was local. At 9.30 a party of about 30 left on the Metropolitan cars to visit the glacial and fluvio-glacial deposits to the north of the city. Rain could not dampen the ardor of a single leading geologist. "Rain or shine" is the excursion motto of the congress. When the strenuous open-air life of a prospecting geologist in the uncivilized places of the earth is considered, it would be surprising indeed in a summer shower should keep their congress under cover, when an excursion to see such interesting geological phenomena as the glacial clay, and boulders of Muddy York and its environs is planned. Some of these men have come all the way round the world to take part in this program. Rain will not stop them now.

Off to Muskoka.

At 11.50 to-night about 50 ladies and gentlemen of Europe, Asia, Africa, Oceania, and North and South America go aboard the Muskoka Night Express and retire into the luxurious Pullman berths. At 6.15 to-morrow morning they may wake up and look out at Muskoka Wharf and the lumber piles. Leaving by steamer at 7 o'clock Sunday morning the party breakfasts on board and goes sailing up the famous Muskoka Lakes, to which tourists come from afar every summer. Muskoka is now at the very height of its season, and the geologists will see the way we live in Canada in holiday time, under the best auspices. The day will be spent cruising through Lakes Rosseau and Joseph. The party may catch the train for Toronto at 7.30, getting back at 11.50 p.m. Sunday night, or stay over and come home Monday.

Discussing Fossils.

The business program of the congress to-day began at 9 a.m. with the usual council meeting. The general meeting opened at 10 o'clock in the Physics Building, the topic of discussion for the morning being "The Physical and Faunal Characteristics of the Palaeozoic Seas, with reference to the value of the recurrence of seas in establishing geological systems." The idea of this discussion was to determine more clearly how to recognize different layers in the world's rock by the fossils found between. This subject is being continued this afternoon in the Thermo-dynamics Building.

A garden party invitation is extended to the Congress by Mrs. David A. Danlap at 93 Highlands avenue, Rosedale, for 4 o'clock this afternoon.

The Glacial Summer.

That there was a period of warm weather during the glacial period was the text of several of the papers read before the Geological Congress yesterday afternoon. The "Sangamon"

period is the term applied to this warm inter-glacial season by geological students of the Middle Western States, where the traces of the beginning and the end of the interglacial summer are well marked. The States of Nebraska and Minnesota, Kansas, and Illinois, were mentioned particularly as showing moraines, where the glacial drifts had advanced and receded. The period of the first glaciers was set at 240,000 years ago, and of the last at from 40,000 to 25,000 years ago. This Sangamon period of the Middle West was said to apply very probably to the district about Toronto and Lake Ontario.

Daily Star. Aug. 9-1913.

"FOREIGN" DELEGATES INCLUDE CANADIANS

Sir Thomas Holland of Manchester Was Born in Canada.

DR. BELL OF ALMONTE New Zealand and the States Have Representatives Who "Come Back" Here.

Canadians, educated for the most part in Toronto or McGill, have gone abroad, made their mark in the mining world, in the universities and geological departments of foreign Governments, and have been appointed as representatives of their adopted countries to the present Geological Congress in this country of their nativity. Such cases are not many, but they are none the less interesting.

Sir Thomas a Canadian.

Sir Thomas Holland, delegate of the Manchester Literary and Philosophical Society, is a Canadian. Sir Thomas,

though born in this country, was educated in England. He has been director of the Geological Survey of India, but is now a professor in Manchester. He is a delegate representing also of the Institution of Mining and Metallurgy, London, of the Institute of Mining Engineers, London, and of the Asiatic Society of Bengal, Calcutta.

An Almonte Delegate.

Dr. Bell is a name familiar to Ontario surveyors. He made the early maps of the New Ontario rivers and canoe routes for the Dominion Government. They have been the basis of the exploration work carried on since by the Provincial Survey branch. His nephew, Dr. James M. Bell, is the delegate from the Wellington Philosophical Society, Wellington, New Zealand. Dr. Bell's "home" address is "Old Burre-side," Almonte, Ontario. But nowadays he is the State geologist of New Zealand.

Dr. J. E. Wolff, of the university museum, Cambridge, Massachusetts, is the delegate for Harvard University. He is a Canadian, born, and bred, being at one time a High school boy in Montreal.

And There Are Others.

Dr. Andrew C. Lawson represents the University of California, and the Le Conte Club, Berkley, California. Once Dr. Lawson was very much at home in the halls of Toronto University's beautiful Norman building, and the less beautiful ones of the old School of Science. Toronto University is his Alma Mater.

George F. Kay is the State Geologist of Iowa, U. S. A. now, and comes here as a delegate in that capacity. But he was a student at Toronto University once, and graduated from there.

George N. Morang is a Canadian, but he represents the Government of Guatemala at this congress.

H. Hickson, of Mexico, who sent a paper of technical interest for presentation to the congress, is another member who is known in Canada. He is not Canadian-born, but he was engaged as metallurgist for some years by the Canadian Copper Company at Copper Cliff, near Sudbury.

S. G. Lloyd of the University of Albany, assistant professor of chemistry, graduated at Toronto. He is here at the congress as a delegate.

Elwood S. Moore, professor of geology at State College, Pennsylvania, is another Toronto graduate present.

Consular Agent a Delegate.

George N. Morang, the Toronto publisher, is the consular agent for Guatemala, the little Central American Republic, which has also appointed him as its delegate to this congress.

Another Canadian member of the congress is James Douglas, the multi-millionaire of Arizona. He represents the American Institution of Mining Engineers, but he graduated at Queen's University, Kingston, to which and to McGill University, of Montreal, he has made large donations.

J. B. Porter, who is professor of mining engineering at McGill University, represents the Mining Engineers of London, England.

R. W. Brock, the general secretary of the congress, is the director of the Canadian Geological Survey, Ottawa. He is the appointed delegate to this congress of the Naturalist Society, Naples, Italy.

Dr. J. M. Clarke, of Albany, head of the Geological Survey of New York State, and director of the State's Department of Education, was once a member of the Canadian Geological Survey. He still belongs to the Royal Society of Canada.

Dr. R. A. Daly, who comes from Harvard, graduated from Victoria University, in Cobourg, the year before the college was moved to Toronto. Dr. Daly's chief work has been a geological survey of the 49th parallel, the boundary line between Canada and the United States.

D. F. Macdonald, the geologist of the Panama Canal Commission and their delegate to the congress, is a graduate of Washington University, but a native of Nova Scotia.

Dr. Adams of Montreal, the president of the society, represents as delegate to the congress the Royal Society of London, in addition to his Canadian affiliations.

Dr. W. L. Goodwin, director of the School of Mines, Kingston, represents the Institution of Mining Engineers.



The geologists had an interesting time assembling their baggage at the University buildings.

The Men of Pick and Hammer

Their Knowledge Is of Rocks, Not Human Nature, and Their Greatest Problems are Bewildering to the Lay Mind.

The layman, the man who knows nothing about geology, finds himself in a strange world when he ventures among the restless crowd of geologists. Their interests are different, of course. Their language is different—even that of the English-speaking, and their ways of regarding life and the world are different. They are not purely academic; there is a tinge of the engineer's intense practicality about them. They are not merely technical. They are human enough for jokes and friendships, but they live in a world apart, like a brotherhood of old priests; they have their sacred interests.

In fact this geology seems to be more or less of a religion. Men make sacrifices for it, and spend their lives in its service. They have a literature of heroes—of whom the layman has never heard, and never will hear, perhaps. Their God is knowledge, and they serve him with hammer and tongs and knapsack—and life.

Ignorant of Human Nature.

One is especially impressed with the simplicity of most of these men in regard to ordinary affairs of life. They understand rocks, but are fairly ignorant of human nature. They could expose a fake mining proposition—if they saw the property—but you could very likely sell them stock in a fake patent medicine scheme. They are intensely knowing in their own specialty, but beyond that they are as little children. Even another branch of their own profession does not always interest them. The specialist on precious metals is at sea when the discussion turns on coal or iron ore. The economic geologist, as the mining man is called, knows little about the more abstract work of the profession. Geology is seemingly so great a subject that armies of intelligent men could be poured into it, and each single army absorbed in the effort to break down some one problem out of the thousands of problems which the study offers.

No Bluff and Exaggeration.

The absence of bluff and exaggeration among these men is at once apparent, and in contrast with the greater part of the business world. To these men life is too short for faking, for over-reaching, for "four-flushing." Science soon finds out the bluffer for it is an inexorable master, and even so small a thing as one inaccuracy, one token of weakness or incompetence, is rewarded with ignominy. The men whose names have endured in this scientific world must indeed be men. They get credit only for the irreducible minimum they have produced. Theirs is no false halo.

Professor Kraus.

"Look here," said a Canadian geologist to a reporter, "there's a man you ought to write about—Kraus over there, Professor of Mineralogy in the Michigan State University at Ann Arbor. He's one of the ablest mineralogists in the world."

"What has he done?"

"Done? He has produced a great deal of original work."

"But what kind of original work? What was there about it that makes him so remarkable a man?"

"Ach!"—there is German in this certain Canadian—"Do you not understand! Research! Experiments! Observations!"

"But what has he proven or disproven? How has he added to the sum of useful knowledge in the world?"

"How can we tell it is useful yet? He is a great worker no less."

"But for example, can you explain to the layman any one thing that Professor Kraus has done—that I can put in words?"

A Mystifying Subject.

"Well—let me see. He is to-day working on a very big subject—a great thing. He is studying the change of the angles of crystals under the influence of heat."

"The—"

"The change of the angles of crystals under the influence of heat—you see—the behaviour of the—"

The reporter wrote the words carefully.

"And what application might that have to everyday life?"

"None."

"But—"

"No. None. You see, the information he secures may never be of any use, but then again it may. We can't exactly tell at present, and at all events it is a big question that must be cleared up so he—Kraus—is doing it."

Later The Star met Prof. Kraus.

"Would you speak about your work?" asked the reporter.

"I think not, thank you," with just a tinge of coldness.

"What can we say that it is?"

"Oh—if you must say anything—just say it is the behaviour of the optical properties of crystals under temperature."

"Dot's it!" chimed in the German-Canadian geologist. "But get it right: It is the—"

What can a layman do but marvel?

An Authority on Ores.

Professor Krusch, of the University of Berlin, is the author, in connection with Vogt and Beischlag, of a work on ore deposits which is said to be the ablest ever written. "What use is that?" asks the lay mind. Just this much. This work describes most of the great ore deposits in the world and the associated rocks. This knowledge would never in the world be of use to a layman because he would not know one kind of rock from another, but it tells the mining man that when he sees certain rocks in certain conditions he may find certain kinds of ore in that region.

Professor Krusch has also written a work on "The Evaluation of Ore Deposits," that means, where a body of ore has been discovered, the evaluator can form some idea of its depth and extent underground by reading the signs of the rock formation and by the use of scientific instruments for the purpose. Prof. Krusch is a pleasant-spoken man of forty or thereabout. He speaks English fluently—but refuses to be quoted.

Work Their Recreation.

"What sport, what recreation, have any of these men?" asked The Star of one geologist.

"None. Their sport and recreation is their work. They have no hobbies but their study. Some, of course, are explorers, but that is work, not play. They are nothing but geologists. They are constant servants of their science."

Professor Dahlblom of Falun, Sweden, has specialized to some extent on a curious little instrument called the magnetometer. He has designed a pocket magnetometer, which mining men say is of great service.

This complicated thought apparently simple device is used to determine the depth below the surface of ore bodies. That is to say: suppose there are showings of magnetite ore in one field and other showings half a mile away. Without this instrument or excavations, no one can even guess whether the earth between the two outcroppings conceals a solid body of ore, or how deep through such a body might be. But the magnetometer responds to the magnetic influence of the ore in a corresponding degree to the depth of the ore. The greater the depth, the greater the magnetic influence. The instrument betrays iron under a ploughed field and shows engineers which way new ore bodies lie. It requires skilled men to use it, and make the calculations.

Star Weekly. Aug. 9-1913.

AN ARTIST'S IMPRESSIONS OF PROMINENT GEOLOGISTS.

PROF. B WEIGAND, OF GERMANY.
AS HE APPEARS WHEN BUSY WITH HIS HAMMER.



GEOLOGY SWAMPS LAYMEN

GLACIERS ARE SO REPOSEFUL.

Easy Course in Evolution is Provided for Beginners in the New Museum—Among the Broadbrows.

You can get all the members of the Geological Congress in the meetings for part of the time, and part of them for all the time, but unless they were asleep you certainly couldn't get all of them for all the time. There were three fallen badly from geological grace this morning, and they sat in the second row from the back and looked at picture post cards while the enthusiastic French lecturer waved his wand to and fro over the map. The map looked like three very long layers of raspberry pie with cream on top. As the lecturer evidently could speak French, German and English he had an accent so opaque that every once in a while you would make a bet with yourself as to which of the three he really was using.

THEY REALLY LIKE IT.

Our respect for the magnitude of the human brain has dwindled at times, but never again. Rows and rows of men sat silently in the Physics building this morning and understood all the man with the pointer said to them. They must have understood, because at one point when he closed the book from which he had been reading, they applauded vehemently. The things on the map evidently represented the sheets with which the earth is covered. He mentioned the word sheet as much as eleven times and each time pointed to a different spot on the pie. He spoke of sediments and bases of limestone and strata, but he read most of it very rapidly, so the laity had a very poor show and counted the number of bald men in the front row and wondered amazedly at the size of the heads of some of these scientists. Now and again the silence was broken by some one suddenly remembering a man he was to meet in Building 25 at this time precisely. He would rise hurriedly and tip toe out with the anxious expression of one who had just been having the time of his life and hated like sin to go out, but he couldn't keep the other fellow waiting.

After listening for some twenty minutes, we heard him say "Now we come to the Glacial Period, 10,001 B. C." We were getting on, of course, but in the interests of our job we thought it wiser to leave and call back some time later to see how things were coming along. It makes one feel fearfully old somehow, but then outside in the campus were little blades of young green grass still coming up and not yet turned to stone.

DON'T LIKE TO TALK MUCH.

They are a most modest and intent aggregation of men, these deep foreheaded geologists. They won't talk unless they have something to say, and they don't want to waste the things they have to say on people who wouldn't know a Stromatoporeid from a piece of 1913 paving stone. We took our lives in our hands and stopped a gigantic German scientist who was coming full steam ahead over the campus in the direction of the lecture. He was the real thing in brain power. His head was mighty and looked as if it could learn and learn forever without ever getting a headache. We knew he was heading straight for the front row never to leave it until the last pearl of wisdom had fallen.

"Have you met the Turkish visitor who is expected?" we quavered.

"No, I have not."

Interval of embarrassed silence.

"This is your first visit to Canada is it not?"

"Jah, it is."

"I suppose you haven't formed any extensive impressions of it yet?"

"It is warm."

"Are you joining any of the excursions after the Congress?"

"I'm going to Alaska."

"Well, there are lots of volcanoes up there. There's a new one just opened up business recently we hear—"

"Jah. I thank you. Good morning," and the big professor was gone.

SHORT COURSE IN EVOLUTION.

The best place to catch them is on the top floor of the new museum on Bloor street. Here you have them in their own atmospheric setting and they blossom forth cordially. It is much easier to follow than a lecture too, for the average intellect. You go out to the furthest end of the east gallery and see little black specks on white cards and you are off on your journey of evolution. These little pin points of soot are *Orbulina Universala*, but we aren't just sure if they're the first of man there was or not. You can see the pin heads blossom out into stones with wrinkles on top. Then the stones have holes in and way up towards the end they have backbones buried in them. After that it's a mere matter of time to long bipeds in hobble skirts and others in tan button oxfords.

"That thing looks like a porcupine, doesn't it?" we asked our guide.

"That's a *platecarpus coryphaeus*," was the stern answer. What a marvellous thing is the English language.

NIAGARA FALLS WERE MADE

IN THE TWINKLING OF AN EYE.

Another Geological Solution for Their Existence—Will be Visited by Conference Next Week.

Niagara Falls, the baby wonder of the North American continent, is to be visited and studied by the geologists during the early part of next week.

"Is it true that the Falls are the youngest geological wonder we have?" one of these visitors was asked by The Telegram.

"Yes," he replied, "they date from after the Ice Age and are probably but ten thousand years old." Ten or fifteen thousand years in the study of Geology is just a Saturday afternoon stroll; but the story of the formation of the Falls, as told by the rocks is very interesting.

THE ICE AGE.

Many thousands of years ago a great ice barrier left its icy, Arctic home and swept down over this continent as far as the present state of Ohio. When this great wall of frozen Arctic snow and ice reached what we now know as the Great Lakes they did not present the broad expanse that we boast of to-day.

This great chisel of nature, however, was to form many new water courses and lakes, and when the glacier past the lakes they were gouged out to tremendous depths and buried.

Ages past and the south winds drove the intruder back year by year. When the Great Lakes were passed on the northward journey these vast pits were left filled with masses of ice.

Poor Lake Erie was not dealt kindly with in this lake manufacture for it was left a puny little pond that did not extend much further eastward than the present city of Buffalo.

Lake Ontario was a magnificent stretch of water, probably one of the best in the chain of lakes. Pride goes before a fall, however, and soon the tremendous level of Ontario was to fall and Erie was to expand in all directions.

NO ST. LAWRENCE THEN.

The valleys of the St. Lawrence and the Ottawa were choked with ice and the waters of old Lake Ontario sought an outlet through the valley of the Mohawk, down the Hudson River to the sea. Scarborough Bluffs and Wells Hill were beaches on the north shore of this grand old lake while the waters came right to the top of the Hamilton Mountain and Queenston Heights on the south shore. Away into the present State of New York the water stretched and the old barrier extending east from Lewiston marks its southern limit.

There was no Lake St. Clair and the waters of Lake Michigan, Superior and Huron did not gain entrance to Lake Erie, but escaped by way of the Valley of the Trent to the sea.

A limp little stream flowed down from old Lake Erie and entered Lake Ontario just back of the village of Queenston.

Such then was the picture of these wonderful inland seas after the ice age.

GREATER CHANGES YET.

But the old earth was restless, every now and again great mud shifts would occur. Sometimes they would fill up small lakes and valleys and some times they would even close rivers.

Century after century of the sun's rays beating down on the ice choked St. Lawrence made an impression. After a time the waters of old Lake Ontario trickled over the ice and the scene changed.

This little stream was the infant St. Lawrence. Year by year it grew until it lowered the lake level and the waters no longer sought the sea via the Hudson. Each year the waters fell until the old shores of Lake Ontario were left far inland. The little stream from old Lake Erie increased slightly in violence and its course may be traced from the present Niagara whirlpool. This is the course it took when it entered Lake Ontario before the birth of Niagara Falls.

BIRTH OF THE FALLS.

All these changes took thousands of years to complete. The formation of Niagara Falls was but the twinkling of an eye.

A great mud drift closed the Valley of the Trent and thus cut off the old way of escape for the waters of the upper lakes. Foot by foot the levels of these lakes increased until the pent up water followed the course of all pent up water. It burst through the walls.

Down it dashed toward little Lake Erie, forming Lake and River St. Clair in its mad rush. There was no room for the frenzied torrent in Lake Erie. The water spread out over all the flat country and kept rising. Lake Erie, under the awful pressure, allowed the gathering waters to rush toward the north. Not by the old channel, however, but by the new.

On the mad wall of water rushed until it reached the cliff at Queenston. Here it tumbled down and Niagara Falls was formed. Year after year the torrent of water has cut its channel back from Queenston until the present location has been reached and the geologists tell us that two thousand more years will be consumed ere the Falls reach Lake Erie.

This is but one of the many interesting stories carried about by the Geologists. They are not all musty old scientists as many persons suppose.

GEOLOGISTS AMONG THE ICE

AMERICA IS VERY OLD.

Ice Left This Part of Continent 25,000 Years Ago—Got a Little Left—Social Side of Congress.

"Full steam ahead!" appeared to be the slogan at the Geological Congress yesterday, and a mountain of work was removed, without faith—geologists apparently believing in the efficacy of works. The feature of the afternoon session was a paper by Prof. A. P. Coleman, of Toronto University, who spoke on "An Estimate of Post-glacial and Inter-glacial Time in North America." Toronto Island, he said, had been formed by the erosion of a Scarborough promontory. It had grown during the lifetime of Lake Ontario.

LAKE 8,000 YEARS OLD.

The wearing away of the Scarborough cliffs is estimated at 1.62 feet per annum. These figures are the result of fifty years' observation. As the great promontory was composed of about 13,000 feet, the time taken to destroy it can be figured by dividing by 1.62, which makes the time about 8,000 years.

To check these figures the rate at which the Island has been built up was estimated, this being done by noticing the amount of sand deposited per year. Since records have been kept within the last thirteen years, about 22 acres have been added. As the Island contains approximately 320,000,000 cubic yards of sand, by dividing by the annual accumulation it works out at about 7,600 years.

From calculations made, it is estimated that the ice left 24,000 years ago. The basin of Lake Ontario has been growing deeper, and the land has been rising to the north-east. Slides were shown of the Toronto district.

SHORE RISING.

Since the Iroquois Lake period the north-western shore of the lake has been gradually rising. In inter-glacial times there was a lake at Toronto, which must have had some dam or other than ice at its end, and the same rise and fall of this part is apparent, so that the inter-glacial age is estimated at three times that of the post-glacial. Professor Coleman showed illustrations of specimens of the plants and animals obtained in the inter-glacial beds at the Don Valley brick-yards. About two-thirds of these, chiefly leaves and shells, and all petrified, show that the flora and fauna were approximately the same as those to the south of Lake Erie to-day.

ICE ACCUMULATION.

In a paper on "The Sangamon Inter-glacial Stage in Minnesota," Mr. Warren Upham, D.Sc., of St. Paul, Minn., said that throughout the long glacial period of growth, culmination and decline of the North American and European ice-sheets, the climate responsible for the snowfall and ice accumulation fluctuated to such an extent that the boundaries of the continental glaciation were alternately extended and checked or drawn back.

A "talk" on volcanic cycles in Sardinia was delivered by Henry S. Washington, of Washington, D. C.

FOSSILS AT HAMILTON.

Yesterday's excursions to Grimsby, Hamilton and Madoc were well patronized by the scientists. At the two former places the following formations were observed: Queenston, Cataract, Medina, Clinton, Rochester and Lockport strata. From Grimsby the party proceeded to Hamilton, where they noted the thinning out of the Rochester, Clinton and Medina strata.

Lockport and Cataract fossils were collected. After observations were made the Hamilton club entertained the visitors to dinner. The Madoc excursion provided the geologists with an opportunity to study important areas of pre-Cambrian rocks.

A PRESENTATION.

The social life of the Congress is not being neglected. A marquee has been erected in University College quadrangle, and yesterday afternoon tea was served, Mayor Hocken and Mrs. Hocken being present, in addition to many members of the University faculty. During this social event an informal presentation was made to Mr. W. R. Rogers, of the Bureau of Mines, who was in charge of the Sudbury-Cobalt expedition, of a silver teapot, made of Cobalt silver.

DINED IN 25 LANGUAGES.

"We had a pleasant banquet last night," said Mr. Charles McDermid, secretary of the Institution of Mining and Metallurgy, of London, England, to The Telegram this morning. Mr. Frank Adams, president of the congress, gave an international dinner at the York Club. One man from each of twenty-five countries being invited.

Mr. McDermid has been in Canada before, and as his position throws him well in touch with European mining conditions he has been a great help to some of the delegates from inland Europe.

"It was very amusing to see the jolt some of these men got when they struck Canada," he said. "Many of them had not the slightest idea of what the country was like, and those that took the trouble to find out, were in many cases supplied with unreliable information."

"How would you account for these learned men not having some general idea with all the attention that is being given Canada in Europe these days?" he was asked.

"Many of these men are so interested in their sciences that industrial and other expansion is not thought of. I know a case where a small party of Frenchmen here expected to find Canada a land of forest and snow with all the houses palisaded against the Indians and game in abundance right within reach."

The Woman About Town

We must apologize to a certain member of the Geological Congress for thinking some very, very horrid things about him. It all came about when we asked one of the Canadian delegation what he thought of geology as a profession for women. "Many of them have distinguished themselves in it," said he, "particularly as teachers or in microscopic work, but they are at a disadvantage when it comes to the field work. They cannot rough it."

We laughed at him just here and asked what about Miss Mary M. Vaux of Bryn Mawr, whom the paper of two or three days ago declared had reached the very tip of magnificent old Mont Robson's peak. Then he smiled, the smile people use when they mention Dr. Cook and his northern trip. "I do not think she did it," said he, "in fact, I have my doubts about the men." At this we grew very warm and wanted to abuse him as a disparager of feminine effort un-

less it were confined to a cooking stove at a temperature of eighty degrees: But we thought he would just say "suffragette" under his breath the way some of the mean men do these days, so we forbore. It's hard enough to have lost the respect of the office boy owing to our advanced views without being found out by the public. But to return to our apology, we have been watching the Philadelphia papers so as to confront him with a full account of the lady's exploits. But alas! this is the lady's story:

"Feeling just like Doctor Cook today."

With this exclamation, uttered in a fine characteristic of her vigorous nature, Miss Mary M. Vaux explained to her friends in Bryn Mawr that she must not be given all the credit of having scaled Mount Robson.

Arriving home yesterday noon from her trip to the Canadian Rockies, where, it was said, that she, with a party of explorers, had conquered the ice-clad mountains. Miss Vaux protested that she had only seen the party make the start up the peak.

"I only wish I could claim the distinction of having compassed Mount Robson," said Miss Vaux. "When I start climbing I'm a sport, and nothing would have suited me better than to have undertaken that ascent with the party."

"The Bryn Mawr woman, whose winter home is at 1715 Arch street, went on to state that the week she left the camp near Vancouver, B.C., where she had been enjoying a summer vacation, a party of six men planned to ascend Mount Robson. Three were to go only half-way up, carrying provisions for the others, who expected to claim the honor of being the first human beings to reach the snowy heights.

"The three men who hoped to accomplish the venture were Deputy Minister Scott of British Columbia; Captain McCarthy and a Swiss guide. What distance the party has reached, Miss Vaux had not learned yesterday, but the stories sent to the newspapers by correspondents in Vancouver of the conquest of the mountain peak, 13,070 feet above sea, were to her a huge delight," she said.

No more interesting place can be found in Toronto just now than the University buildings and throughout the entire Queen's Park. Citizens who do not come in touch with the members of the Congress will miss one of the most delightful opportunities of their lives. From the grey-bearded savants and explorers to the little red-coated public school cadets, who are of such valuable aid to the visitors, the whole place is just full of thrills. And how those miniature Tommy Atkins' are enjoying themselves! The night of the reception, about half-past eight, we passed two of them in the hall, standing proudly erect like the two good little soldiers they were. At eleven o'clock we passed them again. They were on one chair, the little fair-haired fellow had his cheek almost on his arm, and he looked as if he wished his mother was tucking him up. The black-haired one's head was up, but his eyes were droopy.

"Tired out, how long have you been on duty?" we asked. "Since eight this morning," piped a weary voice, "but it's going to be different to-morrow, they're going to change the guard at two."

"Wish you were home?" asked we. "You bet you we don't," said the black-haired one. "This is the finest fun I've had listenin' to those fellows talk. Say, they know a heap, and they've been everywhere. Across every river and up every mountain. They're just like living geographers."

So we left Canada's youngest soldiers. And the dusky-haired one had a look like the boy who has just got a book on Indians out of the library.

That night of August sixth was a night of thrills for us, too. For from nine to half past eleven we prowled Queen's Park between University College and Annesley Hall, hunting down our prey in the shape of feminine members of the Congress. And right here we may say that Queen's Park is not a very appealing place for a lone female around the magic hour of twelve. In fact hitherto it has been one of the few places that we preferred not to linger in. But when a newspaper woman feels that she's got a real story at the end of a trip, there are not very many places from which you can keep her. Is it any wonder that so many people consider us such hardened wretches that they do not want to talk to us at all at all.

We may just say that we got our story and we got a thrill, as a sort of reward for valor. Just as we were at the darkest, loneliest part of the park, and we began to feel like we did when at the age of six they would read "Little Orphan Annie," to us, we heard a strange sound. It drew nearer. Never had we heard a more joyous note. It was positively unearthly. Never, even at a Mendelssohn concert had we been so thrilled. For a moment we thought we had just awakened after dying of fright. But then we remembered we were a newspaper person and would likely have been delivered at the other place. Then we came to and looked. We saw a man! He was an Italian who looked as if he might belong to a banana wagon. Across him was slung a guitar. And how he played! Played for the joy of the playing! Played like the press agents say their stars do. But—we just stayed rooted to the spot. Music brought back the tinkle of an exquisite Sothern and Marlowe Venetian scene. Around us the lovely verdure of Queen's Park in midsummer and we became enchanted. Then remembering the lady geologists and our pay envelope we fled.

GEOLOGISTS IN CONGRESS AT TORONTO

Learned Problems Were Debated at Yesterday's Session

TORONTO, Aug. 8—The congress settled down to its stride to day. As an example of the erudite nature of the problems debated to-day's program may be cited.

Section 1, Topic No. 3. "Differentiation in Igneous Magmas."

Section 3, Topic No. 6. "To what extent was the ice age broken by interglacial periods?"

The meetings were held in various class rooms of the University and were well attended and raptly listened to. For the most part it was the visitors who were the best listeners, the Canadian men of science being content to drop in for a few minutes at some of the sittings and walk out again. Many were able to give some assistance to Mr. Stanley Leck and his staff. This assistance was badly needed. The strain has been tremendous, as the visitors were strangers in a strange land and had to be taken care of accordingly, their baggage checked and their laundry sent to the right place. All this fell on the heads of the executive and the local committee till they worked twenty hours a day and worried the rest.

EASILY IDENTIFIED.

The members are scattered all over Toronto and can be easily distinguished by their hutton with its Latin inscription, their name, plate and number.

The congress is being entertained as lavishly as they themselves will permit. The Toronto Ladies committee had marquees erected in the University grounds yesterday. To-day they took possession of the Speakers' Chambers in the Parliament Buildings and tendered a luncheon to their international visitors there. In the meantime automobiles drive up before the main building of the University and whisk away parties to study the rocks around Hamilton, Scarborough, and sundry other places in the vicinity of Toronto. The others go to the lectures, for it must be understood at once that this is the most businesslike and earnest convention that ever assembled in this city of conventions. They have come to acquire knowledge and they are not to be deterred therefrom by the hospitality of the Queen City.

Saturday will be another hard day's work but on Sunday there will be rest.

So popular was the Cobalt trip that the next excursion which will arrive about Aug. 20th. in Cobalt will be quite as representative and quite as numerous.

The visitors are working hard and enjoying themselves thoroughly.

The garden party given by Mr. and Mrs. Dunlap on Saturday was a tremendous success, and the company of geologists and friends stayed until long after the time on the invitation, which is a proof of the party having been appreciated. The beautiful grounds were looking even better than usual from the morning's rain, and the lawn, terraces, etc., were like green velvet, and the herbageous borders edged with marigolds were very lovely, flowers of all sorts, making a riot of color. Mr. and Mrs. Dunlap received on the terrace near the front of the house. The hostess, who is a great favorite, looked handsome in a French gown of gold satin with deep hem of white satin, with real lace tulle, a platinum and diamond necklace and earrings, and a large black lace hat with white Brussels lace across the crown, inset with medallions of pink velvet roses, and a strap under the chin of black velvet. Also receiving were Mrs. J. B. Tyrrell, who always has a nice word for everybody, and who looked very well in a Dresden nunon gown over white satin, with little puffings of pale blue satin, a wide brimmed black hat with blue velvet and flowers, and a necklace of gold nuggets, from the Klondyke, with the added interest of having been washed out by herself; Mrs. Adams, wife of the president of the Geological Society, from Montreal, who wore a very handsome draped gown of deep blue crepe broche, and straw hat with gold and blue feathers and a wreath of yellow cowslips and velvet forget-me-nots; Mrs. Parks, who wore black satin with lace and pale blue satin and a black hat with willow plumes. Tea was dispensed from a large marquee on the east side of the spacious lawn, the long table decorated with many silver bowls and vases of pink lilies, gladioli and ferns. The men of the 48th Highlanders' band brightened the lower terrace with their uniforms, and during the afternoon the band, headed by the pipers, Master Moffatt Dunlap in kilts, sporran and all the rest of the smartest Highland dress, marched round the lawn, playing the most delightful music. A few of the hundreds present were: Dr. Adams, Dr. A. P. Coleman, Miss Coleman, Prof. Parks, Mr. J. B. Tyrrell, Mr. and Mrs. John Murray Clark, the latter wearing a very handsome white gown, trimmed with real lace and diamond and pearl ornaments; Dr. and Mrs. C. Vey Holman, Penn, the latter wearing a black gown the lace bodice over white lace, and a small black hat and pearl ornaments; the president of Toronto University, M. Shikusuke Kozu, Dr. A. H. Phillips, Princeton; Mr. and Mrs. F. R. C. Reed, Cambridge; Dr. Kwong Yung Kwang, Dr. Strachan, England; Mr. Bedford MacNeill, Mrs. MacNeill, in a gown of flowered chiffon over satin; Dr. and Mrs. Kemp (England), the latter in King's blue crepe de chine and a black hat; Dr. and Mrs. Matthews (St. John, N.B.), the latter in black silk and a black bonnet with tulle and tiny yellow roses; Mr. and Mrs. John King, Mr. Claude Fox, Mrs. Fox, in a very handsome gown of real lace and blue satin with hat to match; Mr. and Mrs. Harton Walker, Mr. and Mrs. Eby, Mr. Fudger and Miss Martha Fudger, Madame Hoffman, in a frock of Valenciennes lace over pale pink and a white Napoleon hat; Miss Hoffman, in white; Mrs. Gerhard Heintzman, looking very well after her trip abroad, Mrs. Bascom, Mrs. Palm, Sir Henry Miers, Mr. and Mrs. Ferrier, Mr. A. G. Charleton, Mrs. Charleton, in mauve with white Brussels lace on the bodice and a small black hat; Dr. Caddell (Scotland), Mrs. Arthur Meredith, Mr. and Mrs. Fermer, the latter very pretty in dark blue; Prof. Keys, Mr. A. E. T. Haultain, Mrs. Haultain, in white and blue with Panama hat; Sir Thomas Holland, Indian Survey; Mr. and Mrs. James Rolph, Sir Alex. McRobert, Lady McRobert, in a draped gown of raspberry crepe and a white hat with blue; Dr. and Mrs. Baker, Prof. Harker

(Cambridge), Mrs. Pirso (U. S.), black and white silk with hat to match; Prof. Walker, (India); Mrs. Leckie, grey moire, with real lace and a white hat; Dr. and Mrs. Loudon, Mr. Dockray, Mrs. Gordon, black silk and white lace and a hat to match; Mr. and Mrs. Ferrier, Miss Ferrier, Dr. and Mrs. Quenzel, Dr. and Mrs. Patterson, Mr. W. J. McWhinney, M. and Madame La Croix, the latter in grey blue satin with chiffon bodice over magnificent old point and brown straw hat with natural ostrich feathers; Dr. Meyer, Mrs. Nalrn, blue gauze over white satin, hat faced with grey velvet and grey and white willow feathers; Mr. and Mrs. Parsons, Mr. Borroughs, Mr. Lamb, Mr. Cole, Dr. Goodwin, Miss Elliott in a gown of white crepe and lace and a white hat with blue velvet; Mr. Moffatt, Mrs. Moffatt, in black and white and a small hat with black and white plumes; Mr. and Mrs. Wilton Eddis, Mrs. Arnoldi, Miss Arnoldi, Miss Arnoldi (Ottawa), Mr. and Mrs. Goodwin Gibson, Miss Ethelyn Gibson, Miss Mary McLennan (Strathroy), Mrs. Squah, Mrs. Cross, Miss Adams, Mr. and Mrs. James Allen.

Summary World. Aug. 10th 1913.

Dr. Strachan, London, director of the British geological survey, and Mrs. Strachan, are the guests of Mr. and Mrs. J. B. Tyrrell, Walmer road. Mr. Bedford McNeill, London, president of the Institute of Mining and Metallurgy, and Mrs. McNeill; Dr. Kemp, Columbia University, N. Y., the most distinguished geologist of the United States, are also the guests of Mr. and Mrs. Tyrrell.

The city reception to the International Geological Congress will take place in the city hall on Monday night at 8 o'clock.

The Hon. Sir Charles Fitzpatrick, Ottawa, and his secretary, Mr. Lawrence Bcaudry, are at the King Edward.

Among the entertainments given last week for individual members of the geological congress were dinners by Mr. and Mrs. J. B. Tyrrell and Prof. and Mrs. Parks. Tomorrow Mrs. Arthur Meredith is giving a dinner at Cralgleigh, and Mrs. Arnoldi a luncheon at the Ladies' Club.

News. Aug. 11-1913.

**THE CITY HALL
A FAIRY BOWER**

**Big Bell Decorated for Reception
to the Visiting Geologists**

The City Hall will be en fete tonight for the reception to the delegates to the International Geological Congress at 8.30 o'clock. A staff of men was busy all morning removing palms, shrubs and flowers from the Exhibition Grounds to the municipal buildings. All the corridors will be banked with palms, while the Council Chamber will be hidden in greenery. The aldermanic chairs have all been removed from the sanctum sanctorum, leaving the whole enclosure free for the reception of the visitors by the Mayor and Mrs. Hocken.

Two orchestras have been engaged for the evening, while light refreshments will be served to the delegates. The great building should really be a very pleasing sight when Toronto does honor to her distinguished guests. There will be no speeches.

**GEOLOGISTS STUDY
CULEBRA PROBLEM**

Scientist of Isthmian Canal
Commission Addresses
Congress.

STOPPING LANDSLIDES

Slopes Must be Graded at a
Lower Angle Than
in the Past.

Revisions of the present theories regarding geological time was the important subject which occupied one large section of the Geological Congress at their Saturday sessions, and a number of papers dealing with various factors on which the present time theories are based were heard at both morning and afternoon meetings. The other sections of the congress dealt with a great variety of subjects, among the most interesting of which was one by D. F. MacDonald, geologist of the Isthmian Canal Commission, dealing with the causes and remedy of landslides, such as that of the Culebra Cut at Panama, his paper being entitled "Excavation Deformations."

Mr. Charles Schuchert, of Yale University, dealt with the limitations of geological periods in North America in a particularly interesting paper. Pointing out that there are cycles of earth movements, invasions by the seas, emergence of the land, wearing down of the rocks and the filling up of valleys with sediment, all of which help in determining the periods of geologic time, the speaker declared that even with a century and a half of contributions from the nations, much still remains before an accurate geological time-table can be prepared.

A review of the gradual light thrown upon the subject as theory after theory had to be modified in the light of increasing knowledge followed, and in concluding his paper Mr. Schuchert called attention to the importance of taking into account the periodic and rhythmic motions which certain "dynamic" regions of the earth's surface undergo when the questions of geological time is being considered. This motion he considers is at the basis of all such time determination.

A number of other papers dealing with related matters were heard from Messrs. Chamberlin (U.S.A.), Frech and Stelmann (Germany), Holtedahl (Norway), and Ulrich (U.S.A.).

The Culebra Problem.

In dealing with his subject of "Excavation Deformations," Mr. MacDonald showed that the result of excavating on a scale such as that of the Culebra Cut, with the substitution of

the weak atmospheric pressure for that of the greater pressure of the material excavated, is to cause a number of different strains or stresses, and not merely the angle of pull commonly considered the only force to be reckoned with in making an excavation.

After calling attention to the two kinds of excavations—those caused by nature, as stream erosions, etc., and those of man—Mr. MacDonald dealt with the various factors leading to deformations, such as the crushing strength of the masses of material above; the strength of the material depending on the jointing, bedding and fault conditions; the physical and chemical character of the rock units; the amount and character of the ground water; and earth tremors from factors. These in their relation to Culebra Cut were dealt with, and as explanation of the complicated cause of the landslide.

In conclusion, the speaker showed the necessity of grading the slopes at a lower angle than formerly, while he pointed out the danger of allowing nature to find the required angle by means of further landslides, since if this happened the complicated stresses would have the result of pushing up the bottom of the cut.

Landslides and Sinking.

"Landslides and the Sinking of Grounds Above Mines" was dealt with by Mr. Ernest Howes, of Newport, U.S.A., who went into the geological factors of these slides, which while apparently due to external causes, in reality have their origin in the structure and physical character of the rocks.

Papers on a number of more or less local topics were heard at the afternoon session of section 1, these being grouped under the heading "Economic and Chemical." Of these the more interesting were: "The Occurrences of Petroleum and Natural Gas in the Mid-continent Field," by Charles N. Gould, Oklahoma City; "Natural Gas in Transylvania," by Jules de Szadeezky, Kolosvar, Hungary; "The Geological Occurrences of Precious Stones on the American Continent," by George F. Kunz; and "The Plasticity of Rock Crystals and the Manner in Which They are Affected by Temperature," by L. Milch, Germany. The last paper, though delivered in German, proved highly interesting to the audience, and was illustrated by experiments showing how the crystals can be bent at a low temperature.

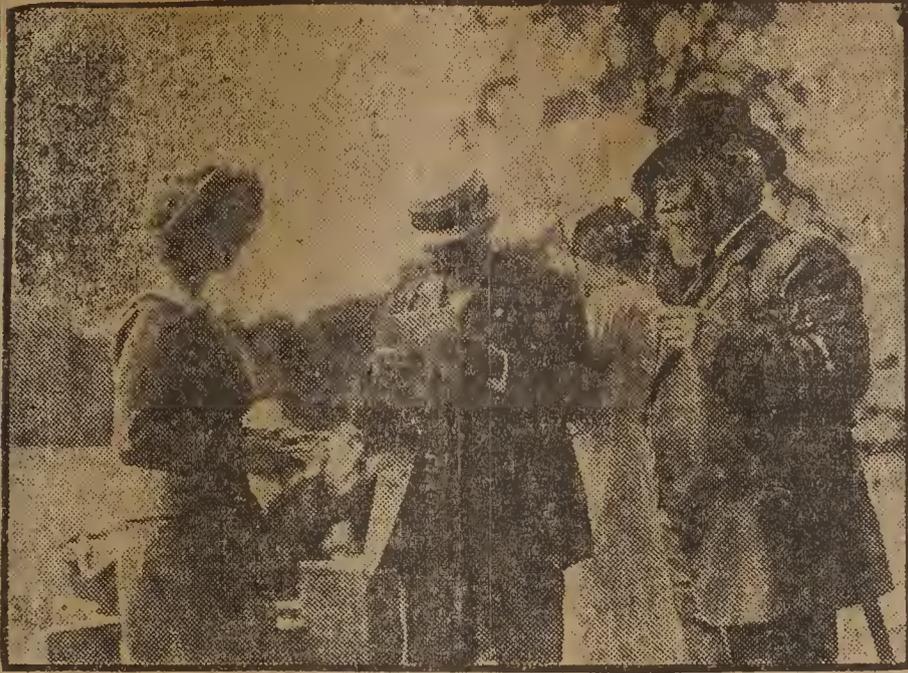
The attendance on Saturday was not quite up to the usual standard, but this was owing to the fact that excursions had been run to view the moraines north of Toronto, illustrating the glacial and fluvo-glacial deposits.

At the close of the afternoon sessions many of the delegates were entertained at a garden party given by Mrs. D. A. Dunlap, of Rosedale, in their honor.

Owing to the non-arrival of the lecturer, Mr. Cy. Warman, the illustrated lecture planned for the evening was not held. It will probably be given some night of this week.

An excursion for recreation purposes only was run to Muskoka on Saturday night, where many of the delegates enjoyed a pleasant weekend.

**THE ENTENTE CORDIALE
AT THE GEOLOGICAL CONGRESS**



On the left is Mademoiselle Termier, daughter of Professor P. M. Termier, Directeur du Service de la Carte Geologique, de la France, who stands next to her reading a letter from home. On the right is Prof. Theodosius Tshernyschew, Academie Imperiale des Sciences, of St. Petersburg. Both of these gentlemen are to receive the degree of LL.D. from the University of Toronto next Thursday.

**INTEREST IN CANADA
DOMINATES GEOLOGISTS**

Much Concerned With Structure and Natural Resources of Dominion

**HIGHLAND PIPERS
MAKE GREAT HIT**

"Very Funny Music," Exclaims Distinguished Vienna Delegate

After all the papers have been read and discussed upon subjects wide as time in their purport at the Geological Congress, the thing that will interest Canadians most as a nation is, "What do these men think of Canada? What impressions will they carry away? What, apart from the study of geology as a science, will they say of the resources of Canada?" The man most qualified to pass an opinion upon this subject is probably Mr. John McLeish, B.A., of Ottawa. Mr. McLeish, who compiles annually the statistics bearing upon the mineral production of Canada and is in the Dominion Department of Mines, is a most unassuming man who speaks in the subdued voice of one who would rather think than talk. In

the lounge room of the University a large space is devoted to the resources of the Dominion, where one can get any information upon any subject that requires a hammer and pick, drill or explosive. Mr. McLeish, when asked as to the extent and variety of the inquiries made at the table, said that the members of the Congress seemed eager to receive information upon all the resources of Canada, and especially as to the nickel, silver, mica, coal and asbestos production of the Dominion.

Interest in North Ontario.

"Since the return of the excursion from the north a great deal of interest has been manifested by mining engineers in the Sudbury district. These men were tremendously impressed with the north lands, and the interest is growing. Another excursion leaves at the conclusion of the Congress for the Cobalt-Porcupine-Sudbury trip."

Interest in Canada, said Mr. McLeish, has been general. Maps, charts, books and reports covering the Dominion have been asked for on all sides. The Publicity Bureau of British Columbia has a lot of literature bearing upon that Province, and it is freely asked for. The excursions going west will be well filled, and one of them will visit Cobalt on the way back.

Prof. Miller's Book.

A book which came off the press only last week by Dr. Willet G. Miller is causing much interest. This deals with the Cobalt-nickel arsenide and silver deposits of Timiskaming. Another recent book is that of "Nickel Industry," with special reference to the Sudbury region, by Prof. A. P. Coleman.

Some beautiful photos of the Mt. Robson glacier in the lounge room are attracting much attention. One of the most remarkable is that showing the head of the falls at Rainbow Canyon, Moose River. The formation

there is mainly quartzite and will prove of great interest to the excursionists. The Emperor Falls, Grand Fork River and the Mt. Robson glacier have been reproduced in a remarkable manner.

Altogether the demand for literature is one of the most gratifying features of the Congress, and the Department of Mines and the Provincial Bureau of Mines are to be congratulated for their display and the benefits which are bound to result.

"Funny Music" of Pipers.

Saturday's heat was greatly felt by the visiting geologists, and they nearly all forsook the lecture rooms and sought the shadiest and coolest places possible. The garden party given by Mr. and Mrs. Dunlap of 93 Highlands avenue, Rosedale, was a delightful affair, inasmuch as the chief attraction, "The Highland Pipers," proved to be such a source of unceasing interest to the foreign visitors. The Band of the 48th Highlanders was also in attendance, although it was their kilts which seemed to prove the greatest attraction. But the pipers, oh! The visitors seemed to be hypnotized with them. They crowded on the top of the terrace, from where they could get a splendid view of them, and gazed and gazed. "It is very funny music," said one of the most distinguished visitors; "always the same," and being from one of the most musical cities in the world, Vienna, his comment should carry some weight. But the "Kilties' funny music"! What next? To add to the full weight of woe a vivacious lady came forward and asked the gentleman: "Do they remind you of the band playing Hungarian dances?" With a broad smile, "Oh, no no!" was the vehement reply, "but (thank goodness for that "but") they are very picturesque." Then he rubbed it in again. "I am told that every Scotsman glows when he hears them," he remarked with a shrug of his shoulders.

Had Their Picture Taken.

The Kilties had to stand up and be photographed more than once, and a bright-eyed Belgian, who secured a snap, was as pleased as if he had found an anticline. The party was a great success, about five hundred being present all told. One gentleman who sat in the quadrangle and watched the cricket match between St. Barnabas and Toronto got up after the conclusion of the St. Barnabas innings and remarked: "I will never watch another cricket match." A lynx-eyed German in the course of conversation remarked that Toronto "is a very industrious and beautiful city." Dr. Tchernichew of Russia, who was present at the last Congress at Stockholm, said that the weather "is as warm there in the day as in Toronto, but the nights were delightfully cool."

A Canadian Paper.

The papers read on Saturday had among them some notable contributions to science, but the weather kept depleting the lecture rooms of their inmates as the afternoon wore on. An interesting paper was given by Mr. M. F. Connor, chemist of the Mines Branch, Department of Mines, on "Some Notes on Rock Analysis." "In the determination of iron by the sulphuretted hydrogen method," said Mr. Connor, "it was formerly the method to have considerable free sulphuric acid in the sulphate solution of the iron and alumina oxides when sulphuretted hydrogen gas was passed through it to reduce the ferric sulphate. I found it difficult to obtain complete reduction by this method, although every precaution was taken. Knowing that some reduction processes—that is, titanium by zinc in acid solution—are best accomplished when the solution becomes nearly neutral, I successfully applied the same principle in the reduction of iron as follows: Excess of ammonia was added

to the sulphuric acid solution of the iron and alumina oxides, and after neutralizing with sulphuric acid about 2 c. c. of dilute sulphuric acid was added in excess. In this way the iron was speedily and completely reduced."

Another interesting paper was given by Dr. C. N. Gould of Oklahoma City upon the "Occurrence of Petroleum and Natural Gas in the Mid-Continent Field." The capacity of gas wells of the mid-continent field varies up to 50,000,000 cubic feet per day. A well recently drilled to a depth of less than 700 feet in the new field of Loco, Stephens county, southwestern Oklahoma, is producing 25,000,000 cubic feet of gas per day.

Many Technical Papers.

Other papers included the following:

The Problems of Teutonic Experiments, by W. Paulcke, Karlsruhe, Germany.

The Relations of Seismic Disturbances in the Philippines to Geologic Structure, by M. S. Maso and Warren D. Smith, Manila, P. I.

The Angle of Shear, by Th. Dahlblom, Falun, Sweden.

Excavation Deformations, by D. McDonald, Panama.

Landslides and the Sinking of Ground Above Mines, by Ernest Howe, Newport, U.S.A.

Natural Gas in Transylvania, by Jules de Szadeczky, Kolosvar, Hungary.

The Geological Occurrences of Precious Stones on the American Continent, by Geo. F. Kunz.

Über die Plastizität des Steinsalzes und ihre Abhängigkeit von der Temperatur, by L. Milch, Germany.

On a new Area of Nepheline Rocks, by P. Quensel, Upsala, Spain.

A Physico-Chemical Contribution to the Study of Dolomitization, by R. C. Wallace, Winnipeg, Canada.

How Geologists Spent Sunday.

"I am making what the French call a 'reconnaissance,'" said Dr. Emil Tietze, who was walking up Yonge street yesterday. "You see, there is such a crowd here on week-days that this is a splendid opportunity to find out the places in your city." The doctor is rapidly learning the layout of the city, and when told that a certain place was on Adelaide street east replied: "Oh, yes, I know where Adelaide street is." "I see you are getting the skyscraper habit here," said the doctor, looking at the C.P.R. building and when told that there was a limit placed upon the height of buildings he smiled and said it was "a good thing." Quite a large number of the geologists left for Muskoka Saturday night to spend the week end and many of them were to be seen over at the Island. The University was of necessity open yesterday and quite a few made use of the lounge room, having a nice easy time after the strenuous days of the past week. A large number went out in automobiles sight-seeing, and many attended service, St. Michael's Cathedral claiming quite a number.

Forsook His Science for the Auld Pipes

He was a braw Hielan' mon, and the lure of the bagpipes was upon him. Yet he was a geologist, and looked as if a stalactite would interest him more than the "skirl." He listened with admiration as the pipers played, and his fingers went a-clutching and his feet went tap-tap-tap to the music. Away to the Hielands they took him with an impetuous rush, back to the days when as a lad he was wont to play in the evening—and then everything broke down before the insistent call. He made a rush to one of the pipers, all but snatched the instrument, and the next moment the astonished geologists saw a respectable man of science with a bagpipe under his arm playing for dear life—and the best of it all was that he could play.

"And wild and high the Camerons' gathering rose,
The war note of Lochiel which Albyn's hills
Have heard, and heard too have her Saxon foes;
How in the noon of night the pibroch thrills
Savage and shrill, but with the breath which fills
Their mountain pipes so fill the mountaineers
With the fierce native daring that instills
The stirring memories of a thousand years,
And Evan's, Donald's fame rings in each clansman's ears."

In the midst of the above announcements reported to the general meeting by President Adams after the session of Council, occurred a request that eminent geologists should sign their letters. One absent-minded scientist had accepted with many thanks an invitation to the banquet at the Armories on Wednesday next, but had omitted his signature. Hence the request.

An Extra Session.

Although the scientific papers were booked on the programme for this afternoon an extra session followed the business meeting this morning, at which Dr. L. Milch of Germany conducted some interesting chemical experiments illustrating the plasticity of rock salt and its dependency on temperature.

As a prelude to his illustrated lecture this afternoon on Patagonia, Dr. Bailey Willis described the conditions under which his survey of the country east of the Andes is going on. His commission from the Argentine Department of Public Works had arisen from his diagnosis of the Argentine as containing no artesian water. At first he was sent out to study the arid regions of Patagonia, but later the survey developed into a general investigation, topographical, geographical and economic, with reference to fixture, settlement of the country.

Covers Large Area.

"The survey covers," said Dr. Willis, "some 20,000 square miles, and our report will be published by authority both in English and Spanish. We are dealing with a part of South America which is geologically practically unknown, and topographically is little better known."

Speaking on the formation of Patagonia, Dr. Willis declared that the upper stratum was early tertiary covering what may be a prepalaeozoic foundation, and that the age of the Andes is about the same as that of the Sierra Nevada. He attributed the presence of great interior basins to the unequal warping of the earth in the process of elevation.

"It might seem strange to you," he continued, "to live 5,000 miles above the sea, but we think of it as a flat plane. First there is the plateau sloping at the coast towards the ocean, then the pre-Andean depression and again the mountains, which are on an average 70 miles across. The streams that flow west through the Andes, causing international disputes between the Argentine and Chili as to boundaries, can probably be attributed to glacial erosion."

Sectional Meetings.

This afternoon two sectional meetings are being held, dealing with the influence of depth on the character of metalliferous deposits, papers being read by Messrs. J. F. Kemp, New York; Paul Krush, Berlin; W. H. Emmons, Minneapolis; L. L. Fermor, Calcutta; Paul F. Fanning, Manila, and Malcolm MacLaren, London. At the other sectional meeting, miscellaneous papers are being read, and a third and extra session left over from Saturday.

An excursion was run this morning to Orillia, and another leaves tonight for Belmont Lake, where visits will be made to the iron and gold mines.

This evening the civic reception will be held at the City Hall at 8.30 u.m.

No Sessions To-morrow.

There will be no sessions to-morrow, for the programme has five excursions booked, to Credit River, Don Valley, Scarboro Heights and two excursions to Niagara Falls. In addition to this, special excursions will run to-morrow on the application of ten or more members.

Mr. and Mrs. Dunlap's Garden Party.

One of the most perfectly appointed entertainments given here this season was the garden party in honor of the delegates attending the Geological Congress given by Mr. and Mrs. D. A. Dunlap at their beautiful home in Rosedale, which is most delightfully situated, overlooking the second ravine. The scene was one of the prettiest imaginable from the Glen road bridge on approaching the house, the pretty light gowns of the ladies on the terraced lawn, the beautiful beds of flowers and the scarlet uniforms of the 48th Highlanders' Band stationed on the lower terrace forming a very brilliant scene. Mr. and Mrs. Dunlap received the guests at the entrance to the house, the latter looking very handsome in a beautiful gown of soft white liberty satin, with coat of cream rose point lace lined with palest primrose, pearl and diamond ornaments and black shirred lace hat, with crown of cream Brussels lace and hand painted pale pink roses applied, a small bunch of French flowers resting under the brim. Mrs. Adams, wife of the president of the society, and Mrs. J. B. Tyrrell received with Mrs. Dunlap, the former in sapphire blue crepe broche and hat with gold and blue feathers. Mrs. Tyrrell wearing pale blue flowered ninon and black hat with wreath of French flowers and white osprey. The lovely home was thrown open to the guests and refreshments were served in a large marquee erected on the east end of the lawn, where the tables were bright with scarlet gladioli. It was most entertaining to listen to the many different tongues being spoken and to notice the many interesting looking visitors with their different manners and gesticulations in speaking, all appearing to be charmed with Canada and Canadians. Among the guests were noticed: Dr. Adams, Mr. and Mrs. A. G. Charleton, of London, England; Mr. and Mrs. Murray, Mrs. M. Rawlinson, Mrs. Watts, Mrs. A. T. Reynolds, Miss Arnoldi, Mr. Alex. Smith, Mr. O. Scott, Mr. T. Dockray, Mr. and Mrs. Murray Clark, Miss Towner, Miss Elliot, Mr. and Mrs. Haultain, Mrs. Harton Walker, Madame Hoffman, Miss McLellan, Mrs. F. C. Williams, Mr. and Mrs. Bedford McNeill, Mr. and Mrs. McEvoy, Mrs. Gerhard Heintzman, Mr. and Mrs. Strachan, Miss Bascom, Miss Gruterink, Dr. A. P. Coleman, Miss Coleman, Prof. Parks, Mr. J. B. Tyrrell, Dr. and Mrs. C. Vey Holman, Penn.; M. Shikusuke Kozu, Dr. A. H. Phillips, Princeton; Mr. and Mrs. F. R. C. Reed, Cambridge; Dr. Kwong Yung Kwang, Dr. Strachan, England; Mr. Bedford MacNeill, Mrs. MacNeill, Dr. and Mrs. Kemp, England; Dr. and Mrs. Matthews, St. John, N.B.; Mr. and Mrs. John King, Mr. Claude Fox, Mrs. Fox, Mr. and Mrs. Eby, Mr. Fudger and Miss Martha Fudger, Mrs. Bascom, Mrs. Palm, Sir Henry Miers, Mr. and Mrs. Ferrier, Dr. Caddell, Scotland; Mrs. Arthur Meredith, Mr. and Mrs. Ferrier, Prof. Keys, Sir Thomas Holland, Indian Survey; Mr. and Mrs. James Rolph, Sir Alex. McRobert, Lady McRobert, Dr. and Mrs. Baker, Prof. Harker, Cambridge; Mrs. Pirso, U. S.; Prof. Walker, India; Mrs. Leckie, Dr. and Mrs. Loudon, Mrs. Gordon, Miss Ferrier, Dr. and Mrs. Quenzel, Dr. and Mrs. Patterson, Mr. W. J. McWhinney, M. and Madame La Croix, Mr. and Mrs. Parsons, Mr. Borroughs, Mr. Lamb, Mr. Cole, Dr. Goodwin, Miss Elliott, Prof. Walker (India), Mrs. Leckie, grey moire with real lace, and a white hat; Dr. and Mrs. Loudon, Mr. Dockray, Mrs. Gordon, Mrs. Bascom, Mrs. Palm, Sir Henry Miers, Mr. and Mrs. Ferrier, Mr. A. G. Charlton, Mrs. Charleton, Sir Thomas Holland (Indian Survey), Mr. and Mrs. James Rolph, Sir Alex. McRobert, Lady McRobert, in a draped gown of raspberry crepe, and white hat with blue; Dr. and Mrs. Baker, Prof. Harker (Cambridge), Mrs. Pirso (U.S.), the president of Toronto University, M. Shikusuke Kozu, Dr. A. H. Phillips, Princeton; Mr. and Mrs. F.R. C. Reed, Cambridge; Dr. Kwong Yung Kwang; Dr. Strachan, England; Mr. Bedford MacNeill, Mrs. MacNeill, in a gown of flowered chiffon over satin; Dr. and Mrs. Kemp (England), the latter in King's blue crepe de chine and a black hat; Dr. and Mrs. Matthews (St. John, N.B.) and many others.

Mrs. Dunlop's Garden Party

The president and members of the International Geological Congress were the guests of honor on Saturday afternoon of Mr. and Mrs. David Dunlop at a delightful garden party held at the latter's charming home in Rosedale. The grounds were looking particularly fresh and green after the morning's rain, and a large marquee was arranged on the velvety lawn. Delightful music was rendered by the 48th Highlanders' Band, who made a bright spot of color on the lower terrace, and during the afternoon marched around the lawn playing brilliantly. They were headed by the pipers in all their bravery of kilts, plaid, and sporran. Mr. and Mrs. Dunlop received their guests, who numbered several hundreds, on the terrace near the house. Mrs. Dunlop was wearing a Paris gown of cream satin veiled in ivory ninon and lace, a drooping hat of black lace and tulle with Dresden crown and soft black ties, and a necklace of platinum and diamonds. Mrs. J. B. Tyrrell also received, wearing a gown of Dresden ninon over white satin, with wide-brimmed hat of black with blue velvet and flowers, and a necklace of Kiondyke gold nuggets. Mrs. Adams, wife of the president of the Geological Survey, was wearing a draped gown of deep blue crepe broche, and straw hat with blue and gold feathers, and yellow and blue flower wreath. Mrs. Parks was gowned in black satin with lace, with touches of blue, and a black hat with French plumes. Tea was dispensed from the large marquee, where the long table was charmingly arranged with silver bowls and vases, holding pink lilies, gladioli, and ferns. Many lovely yellow marigolds, glistening from the borders of the terrace, added to the beauty of the picture. Among the guests were: Dr. Adams, Dr. A. P. Coleman, Miss Coleman, Prof. Parks, Mr. J. B. Tyrrell, Mr. and Mrs. John Murray Clark, the latter in white with real lace, and pearl and diamond ornaments; Dr. and Mrs. C. Vey Holman, Penn., the latter in black over white lace, and black hat and pearl ornaments; Miss Hoffman, Mrs. Gerhard Heintzman, Dr. Caddell (Scotland), Mrs. Arthur Meredith, Mr. and Mrs. Ferrier, Prof. Keys, Mr. A. E. T. Haultain, Mrs. Haultain, Mr. and Mrs. John King, Mr. Claude Fox, Mrs. Fox, in a very handsome gown of real lace and blue satin, with hat to match; Mr. and Mrs. Harton Walker, Mr. and Mrs. Eby, Mr. Fudger and Miss Martha Fudger, Madame Hoffman, Dr. Meyer, Mrs. Nairn, Mr. and Mrs. Wilton Eddis, Mrs. Arnoldi, Miss Arnoldi, Miss Arnoldi (Ottawa), Mr. and Mrs. Goodwin Gibson, Miss Ethelyn Gibson, Miss Mary McLennan (Strathroy), Mrs. Squair, Mrs. Cross, Miss Adams, Mr. and Mrs. James Allen, Mr. Moffatt, Mrs. Moffatt, Mr. and Mrs. Ferrier, Miss Ferrier, Dr. and Mrs. Quenzel, Dr. and Mrs. Patterson, Mr. W. J. McWhinney, M. and Madame La Croix, Mr. and Mrs. Parsons, Mr. Borroughs, Mr. Lamb, Mr. Cole, Dr. Goodwin, Miss Elliott, Prof. Walker (India), Mrs. Leckie, grey moire with real lace, and a white hat; Dr. and Mrs. Loudon, Mr. Dockray, Mrs. Gordon, Mrs. Bascom, Mrs. Palm, Sir Henry Miers, Mr. and Mrs. Ferrier, Mr. A. G. Charlton, Mrs. Charleton, Sir Thomas Holland (Indian Survey), Mr. and Mrs. James Rolph, Sir Alex. McRobert, Lady McRobert, in a draped gown of raspberry crepe, and white hat with blue; Dr. and Mrs. Baker, Prof. Harker (Cambridge), Mrs. Pirso (U.S.), the president of Toronto University, M. Shikusuke Kozu, Dr. A. H. Phillips, Princeton; Mr. and Mrs. F.R. C. Reed, Cambridge; Dr. Kwong Yung Kwang; Dr. Strachan, England; Mr. Bedford MacNeill, Mrs. MacNeill, in a gown of flowered chiffon over satin; Dr. and Mrs. Kemp (England), the latter in King's blue crepe de chine and a black hat; Dr. and Mrs. Matthews (St. John, N.B.) and many others.

News. Aug. 11-1913.

NO SESSIONS OF CONGRESS ON TUESDAY

Numerous Excursions Are on Programme of the Visiting Geologists

INVITATIONS FOR NEXT GATHERING

A Request to the Eminent Scientists That They Sign Their Letters

This morning's session of the International Geological Congress was taken up chiefly with the reports of committees, the announcement that formal invitations for the meeting of Congress after the next one at Brussels, Belgium, had been received from Spain and the Argentine Republic, and the statement that the Spendiaroff Prize had been awarded to Mr. Emile Argand, Paris, for his thesis on "The Sheet of Overthrown Rocks on the Western Alps." It has also been decided that the question of iron-ore resources from an economic point of view shall be restudied for the next Congress.

HOSTESS OF GEOLOGISTS



MRS. DAVID DUNLOP.

She and Mr. Dunlop entertained members of the Geological Congress in the beautiful grounds of their home on Saturday. Their little son is shown in the picture.

'TIS 200,000,000 YEARS OLD SAYS DR. UHLRIC OF EARTH

Of Course, Some Modest Geologists Make Age as Little as 75,000,000 Years—Oldest Part of World Is Around Lake of the Woods.

HOW SCIENTISTS CALCULATE THE WORLD'S AGE

"How old is the earth? Well, some say one thing and some another. Some say seven hundred and fifty million years and some say seventy-five million. I'm inclined to think it's more like two hundred million myself."

Thus did Professor Uhlric, an American delegate to the Geological Congress, inform The Star this morning. "So, of course," he added, "you can see there's room for choice."

"How do you make these calculations?" asked the reporter. "Can it be explained to the lay mind?"

"It can be. That is what our universities are trying so hard to do. There are many different ways of reckoning, just as there are many different conclusions arrived at."

"But what is the chief one?"

"Well, the one which is most employed might be explained in some such way as this: We have observed the rate at which certain kinds of rock are deposited on the ocean floor, limestone for example. We have an idea of all the sedimentary rock in the world and of the length of time it must have taken to deposit it there. So we

take the aggregate thickness of the several beds and add up the rate."

"What is the general result of this computation?"

"Some say 75,000,000 years, but I am more inclined to put it at 200,000,000."

"What are the other methods like?"

"Like! I couldn't begin to discuss them, except—well, there is one that is based on the depositions of radium. But—with a shrug "that is metaphysical—impossible to describe."

"You see," pointing to the map of Canada hanging on the wall of the room, "we have a pretty difficult task to make calculations like these you speak of. See Hudson's Bay there, for example. The sea covers that area at present, but there may have been a time when it was dry land and there may have been another big sea, say—here!" pointing at British Columbia.

"How could you tell?"

"By the sedimentary rocks which must have been formed under water."

"Which do you call the oldest part of the earth?"

"We don't know. But the oldest to my knowledge is around your Lake of the Woods and the Laurentian Mountains."

MANY EXCURSIONS FOR THE GEOLOGISTS

Parties Will Investigate Interesting Formations in the Neighborhood of Toronto.

THE SOCIAL SIDE ALSO

Besides the regular business of Council, and the general meetings held every day, the following interesting items await upon the program of the geologists assembled in Toronto at their twelfth international congress:

On Tuesday also one party will leave Toronto by the Niagara boat for the Falls, while another will go to view the Don Valley brick yards and the pleistocene fossils; and still another will go to Scarborough Heights and view the "Iroquois beach" deposits.

A fourth excursionist party on Tuesday will go to the Forks of the Credit by train to see the cataract sandstone and the peculiar silurian formation. Lunch will be served by the Caledon Trout Club.

On Wednesday evening at 8.30, a banquet to the visiting delegates and members is to be tendered by the president and Executive Council on behalf of Canada at the Armouries on University avenue. Two excursions besides the business program have been arranged for Wednesday, one to Streetsville to see the coral reefs, and the Richmond strata, and another to

see the clay and sand deposits near Toronto, including the Don Valley brick and the Swansea sand.

On Thursday the Congress session in Toronto comes to a close. After the close of business, a special convocation of the University of Toronto will confer honorary degrees upon a number of the members at 4 o'clock, and at 4.30 the Board of University Governors held a garden party in the quadrangle of the main building in honor of the delegates.

GEOLOGISTS ENJOYED KILTIES

AMUSED AT PIPERS.

Foreign Delegates to Congress Worked Hard on Saturday and Enjoyed a Garden Party at Rosedale.

Notable contributions to science were included in many papers read at the Geological Congress on Saturday. An interesting paper was given by Mr. M. F. Connor, chemist of the Mines branch, Department of Mines, on "Some Notes on Rock Analysis." In the determination of iron, said Mr. Connor, by the sulphuretted hydrogen method, it was formerly, the method to have considerable free sulphuric acid in the sulphate solution of the iron and alumina oxides when sulphuretted hydrogen gas was passed through it to reduce the ferric sulphate. He found it difficult to obtain complete reduction by this method. Knowing that some reduction processes—that is, titanium by zinc in acid solution—are best accomplished when the solution becomes nearly neutral, he successfully applied the same principle in the reduction of iron as follows: Excess of ammonia was added to the sulphuric acid solution on the iron and alumina oxides, and after neutralizing with sulphuric acid about 2 c. c. of dilute sulphuric acid was added in excess. In this way the iron was speedily and completely reduced.

CAPACITY OF GAS WELLS.

Dr. C. N. Gould, Oklahoma City, read a paper on "Occurrences of Petroleum and Natural Gas in the Mid-Continent Field." The capacity of gas wells of the mid-continent field varies up to 50,000,000 cubic feet per day. A well recently drilled to a depth of less than 700 feet in the new field of Loco, Stephens county, southwestern Oklahoma, is producing 25,000,000 cubic feet of gas per day.

SOME HEAVY READING.

During Saturday's sessions the following papers were read:

The Problems of Teutonic Experiments, by W. Paulcke, Karlsruhe, Germany.

The Relations of Seismic Disturbances in the Philippines to Geologic Structure, by M. S. Maso and Warren D. Smith, Manila, P. I.

The Angle of Shear by Th. Dahlblom, Falun, Sweden.

Excavation Deformations, by D. McDonald, Panama.

Landslides and the Sinking of Ground Above Mines, by Ernest Howe, Newport, U. S. A.

Natural Gas in Transylvania, by Jules de Szadeczky, Kolosvar, Hungary.

The Geological Occurrences of Precious Stones on the American Continent, by Geo. F. Kunz.

Über die Plastizität des Steinsalzes und ihre Abhängigkeit von der Temperatur, by L. Milch, Germany.

On a new Area of Nepheline Rocks by P. Quensel, Upsala, Spain.

A Physico-Chemical Contribution to the Study of Dolomitization by R. C. Wallace, Winnipeg, Canada.

AMUSED AT PIPERS.

The garden party given by Mr. and Mrs. Dunlap, of 93 Highlands avenue, Rosedale, was a great success. The attendance was large, and the "Hieland Pipers" afforded the foreign delegates a great deal of entertainment. The band of the 48th Highlanders was in attendance throughout the afternoon.

1,000 TO MEET "GEOLOGS."

Civic Reception to Be a Big Affair—"No Speeches" the Feature.

The passenger elevator at the James street entrance to the City Hall was kept busy carrying more than human freight to-day. Palms, plants, shrubs, and flowers were being sent to the Council Chamber and the corridors in readiness for the civic reception to be tendered the delegates to the International Geological Conference. Music will be dispensed by one of the city's best orchestras, and refreshments will be served during the evening at a buffet conveniently located on the ground floor of the hall. Mayor Hocken will receive the delegates in behalf of the city and members of council will also be introduced. There will be no speeches. Invitations have been issued to a number of citizens and their wives and upwards of a thousand people are expected at the reception.

FROM COUNCIL.

Emile Argan Named for Great Prize
—Belgium Next, Spain or the Argentine After That.

LOST—About one hundred and seventy-five geologists. If they are found, kindly direct them to the Physics Building, Toronto University.

This is were they were supposed to be this morning; but alas—they were not. Instead some forty members did their best to spread out over the theatre and make the building imagine it was crowded. This meeting was to hear the report of the Council and the International Committees.

The audience was small and the reports were likewise for they just covered three matters of business.

It was definitely decided to hold the next convention in Brussels, Belgium, during the summer of 1917. Two invitations, one from the Spanish Government and the other from the rulers of the Argentine Republic were read for the meeting of 1921. Both these invitations were referred to the Brussels Committee. Spain appeared to be the favorite place and the invitation was lengthy; setting forth the good things in store for the Congress should they accept.

GREAT PRIZE.

Emile Argand, France, has been named worthy of receiving the Spendiarioff prize. This will give him the sum of \$400 when he next takes a trip to Gay Paree.

This prize is donated to the congress by a Russian family whose son died while on one of the congress excursions to the Ural Mountains. It is presented for the most interesting paper prepared since the meeting of the last general assembly.

The subject chosen by Emile Argand was "The Overthrusts of the Eastern Alps," and his essay was written in 1911.

"These overthrusts are very interesting phases of mountain geology," said one of the officials to The Telegram. There is a fine specimen in the Rocky Mountains just outside of Banff. They appear to be caused by sea pressure crushing the heated earth surface up in a heap and in the case of our Banff overthrust the entire mountain has been shoved seven miles out of its original place. The same thing is noticed in the Alps and has been given much study of late."

The third report was that of passing on a suggestion for a great work to the next council. Dr. Hobbs, of Washington, proposed that a great work be prepared dealing with the "Fracture Systems of the Earth's Crust." A learned gentleman, sitting next to The Telegram, converted this into human English.

"The many great valleys about the earth," he said, "have been caused by the earth drying and cooling, similar to a wet bed of clay, under the sun's rays. Dr. Hobbs wants a great investigation into this; but we have been so busy with our excursions and our coal reports that we cannot give the matter attention until 1917."

THE MISSING BAND.

There was a long list of papers and lectures on the board for this morning's meeting.

"Is Dr. — ready with his paper?" asked the president. He was on the missing list. "Is Prof. — here?" He was not.

"May we have paper No. 3?" Silence.



NO COAL IN FIFTY YEARS IN THE UNITED STATES.

Interesting Deduction From Report to Geological Congress — World's Supply of Fuel Summed Up.

Some interesting facts were given in the paper on the world's coal supply read by Mr. Leon Dominian to the Geological Congress. The facts are the result of an international survey carefully carried out, besides estimating the quantity of coal the quality of the fuel in each district was examined, and the total report is a three volume one of some 1,200 quarto pages.

China has the bulk of the visible supply of the world, estimated at 1,500,000,000,000 tons. The other countries stand as follows:—

Country.	Area of Coal Fields in Square Miles.	Estimated Quantity of coal in Billion Tons.
Austria	2,000	30
Belgium	500	20
Canada	70,000	100
France	3,000	30
Germany	2,000	165
Great Britain	1,200	180
Japan	6,000	25
Spain	5,000	5

MINING BELOW ZERO.

Among interesting statements made is that Asia Minor has good coal supplies untouched and imports coal from Britain. The furthest north settlement of the white man, Advent Bay, Spitzbergen, is due to the fact that coal is found there. It is 300 feet above sea level and 200 miners dig it out for an American company. The town has an electric car line and is known as Longyear City.

According to the statement of employees, a remarkable feature of oper-

ation in these Arctic regions is that the coal mine is entirely white on account of the ice crystals which cover the working walls. The perpetually frost-covered underground workings present an exceedingly decorative appearance, so that the miners endowed with a little imagination may fancy themselves at work in halls the walls of which have been studded with sparkling gems.

SUPPLY IN THE U.S.

In the United States the occurrence of coal is wide and varied. All grades from peat to anthracite, through lignitic and bituminous varieties, have been discovered. The eastern half of the country has been particularly favored. In the west the great natural regions determined by the Rocky Mountains and Northern Great Plains also contain vast reserves.

Over 550,000,000 tons of coal were mined in the different States of the Union in 1912. This quantity exceeded the 1911 yield by about 50,000,000 tons. These figures give a fair idea of the marvelous increase of consumption. It is on comparing them with the 7,000,000 tons produced in 1850, however, that we are able to judge how pertinently our present-day requirements lead us to inquire whether we are to face a future shortage or not.

EXHAUSTED IN 50 YEARS.

The area of the more accessible coal fields of the country is about 327,000 square miles. The quantity of coal in store within their extent was estimated to amount to nearly 2,000 billion tons. These figures will probably be increased when the final results of the congress are known. Taking this quantity as a basis, however, and provided the rate of increase that has held for the last fifty years be maintained, we are confronted with the fact that the supply of easily available coal will be exhausted before the middle of the next century.

QUIET DAY FOR THE VISITORS

GEOLOGISTS' SUNDAY.

Appeared to Appreciate Rest From Recent Rush—Many Take in Excursions.

Yesterday afternoon afforded a pleasant opportunity for the visiting geologists to shelve their favorite study and stroll about the city, comparing our architecture with that of the old world.

The Muskoka excursion which left shortly before midnight on Saturday reduced the number in the city. However, there were still sufficient numbers to make a fair showing in the university lounge-room and to represent their body in several churches about the city.

St. Michael's Cathedral claimed a large share of the worshippers.

NOT OUR ROCKS.

A small excursion left on the Metropolitan Railway on Saturday noon for the purpose of seeing the results of glacier action above the old north shore of Lake Ontario.

The remains of this old body and Scarboro' Bluffs formed the topic of discussion for a few of those in the lounge-room yesterday. The result of this little trip brought out the fact that all rocks and stones lying immediately to the north of our city—and even farther—do not belong to us.

The excursion conductor did not wish to imply that Toronto had stolen these stones to supply building material for this rapidly expanding city. Rather that they had been swept down before the ice barrier which covered most of this continent ages ago.

An excursion left this morning for Orillia at eight o'clock.

Much interest is being shown in the great excursion to-morrow to Niagara Falls.

And so some seventeen names were called out and all were among the temporarily lost. Things looked pretty blue for a time, but the day was saved.

THE IMPROMPTU SPEAKER.

The president looked over the sea of vacant seats and away up in one corner he spied his old friend Bailey Willis.

"Could Mr. Willis give us a short talk for a few minutes?" he inquired. He could and he would. As the gentleman named walked up the aisle two elderly members of the congress put their heads together.

"There's a man who can talk," said one. "His father was N. P. Willis, the poet. He has inherited his father's ability."

The speaker was a good prophet, for it would be difficult to find a more interesting talk—and all made on the spur of the moment without map, note or preparation.

Mr. Willis afterwards gave his card to The Telegram. He is at present Chief of the Hydrographic Survey of the Argentine Republic. He went to that southern empire some few years ago for the Smithsonian Institute. At that time the Minister of Public Works was trying to find artesian water for the arid lands of eastern Argentina. Mr. Willis dropped him a tip of applied geology and told him that if he drilled to the centre of the earth at that point he would still strike dryness.

The Minister appointed him director of a survey which was to study the geology of the Argentine, in an attempt to locate water of this nature, but after a short time the survey was disbanded. "The reason was simple," said the speaker, "for there is no water there."

SHOULD HAVE TRIED FRENCH.

"After our water survey was disbanded we reorganized to make maps of great tracts of land that were almost unknown," said the speaker, "and I have been authorized to make my report public in two languages: Spanish and English.

"The minister told me that if the report were published in Spanish only, it would die; but if published in English also it would live. And he was an Argentine himself. This is a powerful example of the might of our tongue."

A PRESENTATION.

Prof. Milch, in his very best German, told of a series of experiments he had been making to determine the action of crystals under heat. He produced a black frame lined with velvet, on which were glued little crystal-like masses. A close inspection showed that they were crystals of rock salt and bent to letters which read: "12th International Geological Congress, Toronto, 1913." This frame is to be presented to Dr. Adams, president of the General Congress.

"I hope we have a better turn-out for the afternoon lectures," said a worried-looking individual as he left the hall.

"Oh, well," replied his comrade. "if the worst comes to the worst, I'll come and be an audience for your paper."

GEOLOGISTS WILL MEET IN BELGIUM

Brussels Selected as Next Centre by International Conference.

FOND OF EXCURSIONS

Many of the Delegates Visit Muskoka and Other Places of Interest.

Many were the bids made yesterday for the next International Geological Congress, which is to be held in 1917. Invitations were extended by Belgium, Argentine Republic, Chili and Spain, and these were all considered by the council yesterday when they met to choose between the countries. The highest bidder turned out to be Belgium, but it was only after a good deal of discussion that the council decided to accept the invitation. The meetings will be held in Brussels, the capital. In 1920 it is likely that the congress will be held in the Argentine Republic, and in 1924, Madrid, Spain, will have her turn.

As the sessions of the congress draw to a close the attendance at the meetings shows signs of falling off. In the past two days, many impromptu out-of-town trips have been arranged, and a trip to most of the geologists is a bigger lure than a lecture.

Trip to Muskoka.

The trip to Muskoka, which was held on Sunday, was one of the most successful yet held. G. G. S. Lindsey of Toronto was in charge of the jaunt, and more than 60 geologists were in the party. All day Sunday they toured the Muskoka Lakes, and it was early yesterday morning before they returned to the city.

Yesterday morning at 8 o'clock 15 members took the trip to Orillia. In charge of W. A. Johnston of the Geological Survey of Canada.

The lecture room was crowded to the doors during the afternoon to hear the economic addresses on the subject of the "Influence of Depth on the Character of Metalliferous Deposits." Six authorities gave addresses which were of great interest to the mining men. The lecturers treated different phases of the subject, and, as in religious discussions, they were compelled to agree to disagree. The lecturers were J. F. Kemp of New York; Paul Krusch of Berlin, Germany; W. H. Emmons, Minneapolis; L. L. Fermorg Calcutta, India; Paul F. Fanning, Manila, and Malcolm Maclaren of London, England.

At 5 o'clock, Dr. W. F. Hume, director of the geological survey of Egypt, gave an illustrated lecture on the scenery of the Egyptian desert, oases, cataract and mountain wildernesses. The slides illustrated the occasion and origin of the desert erosion forms and were of great interest.

Another illustrated lecture, perhaps the most entertaining lecture that has been given at the congress, was one given directly after lunch by Cy Warman of the Grand Trunk Pacific Railway. The illustrated slides dealt with scenery along the transcontinental line, and particularly with the scenery in the mountains in British Columbia in the vicinity of the Yellowhead Pass and the Skeena River.

This lecture was of special interest to the members who intend to leave on Thursday evening for the coast.

More than 200 geologists intend to take the trip, and the majority of them were present at the illustrated lecture. Two special trains will carry the party across the continent, and the trains will travel over the C. P. R., G. T. P. and C. N. R. lines. When the party reach Victoria some of them will leave on a trip thru the Yukon, while the remainder of the party will return to Toronto. It is expected that they will be back by September 7.

ALL NATIONALITIES ATTEND RECEPTION

A Study in Manners of all Nations at Brilliant Civic Reception to Geologists.

The city hall took on a festive appearance last night when a civic reception was held in honor of the geologists who were attending the international congress in the city. The receptions in honor of the hydro-electric and the Duke and Duchess of Connaught caused bigger rushes than the one last night held in honor of the geologists, but never before in the history of the city hall has there been such a number of nationalities represented.

Mayor Hocken and Mrs. Hocken, who extended the official civic welcome, had a difficult task before them for the representatives of every nationality represented had a different manner of returning the salutation. Those from the United States, Great Britain and the British colonies extended the usual curt greeting of the Anglo-Saxon, but with the Spaniards the style changed, while the polished Russians and Hungarians almost touched the floor in their sweeping bows. Passing out from the council chamber, which was banked with flowers, the guests divided into little groups, listening to the music of the two orchestras, and conversing.

Among the citizens who attended the reception were members of the city council, former Mayors Urquhart and Oliver and their families, Controller T. L. Church, chairman of the reception committee; J. W. Somers, secretary of the reception committee, and the following members of the Toronto committee: Prof. A. P. Coleman, W. E. Ferrier, Gerhard Heintzman, Prof. T. L. Walker, R. E. Horo, B.A., W. H. McNairn, Prof. W. A. Parks, James McEvoy, A. G. Burrows, W. G. Miller, Provincial Geologist A. L. Parsons, A. B. Willmott, Percy Hopkins, G. G. S. Lindsay, K.C., and Aid. Rydng.

At the civic reception to the geologists last night in the city hall, His Worship the Mayor of Toronto and Mrs. Hocken received in the council chamber, on the steps of the throne. Mrs. Hocken looked very handsome in blush rose satin, draped with pale gray nylon, and real lace with diamond ornaments. Her bouquet of the most exquisite orchids was a masterpiece from the civic hothouses, being composed of at least a dozen or more varieties of the most beautiful flowers, from sprays of the thickest "jewelled" orchid to a very large one like purple velvet, the whole surrounded with fine maiden hair fern.

The board of governors of the University of Toronto have issued invitations to a garden party in honor of the International Geological Congress in the university quadrangle on Thursday, the 14th inst., from 4.30 to 6 o'clock.

NIAGARA GORGE FIXES THE GEOLOGICAL TIME

Geologists Calculate Dates From the Wearing of the Rocks.

GEOLOGICAL PICNICS

Four out-of-town excursions to-day took most of the delegates to the International Geological Congress away from the central rendezvous at Toronto University. Dr. Coleman took a party of 56 members out to see the inter-glacial evidence in the clay deposits of the Don Valley and at the brick works. In the afternoon this same party went to Scarboro to see the glacial and inter-glacial effects visible in the famous cliffs of Scarboro Heights.

A third party, under Dr. Parks of Toronto University, went to Credit Forks at 7.20 to see the formations there, and the fossils in the rock exposed at the quarries and by the river. Special interest attaches to this district owing to the discovery there about a year and a half ago of a new geological formation. It has been called the Cataract formation. Dr. Parks of Toronto and Dr. Schuchert of Yale are responsible for the distinguishing of the Cataract formation from others, and both of these gentlemen went to the Forks to-day.

Two parties went to Niagara Falls, one on the boat at 7.30 and another on the 9 o'clock boat. The geology of Niagara Gorge and of the falls is particularly interesting to visitors, as it has been featured in geological text books for a generation or more. It presents a regular sedimentary series to plain view—limestone, sandstone, and shales. The wearing back of the gorge from Queenston to the falls in their present situation is universally regarded by geologists as one of the authoritative gauges of the passage of time in a geological sense.

SPANISH GEOLOGISTS DINED BY THEIR CONSUL

Delights of the Island Revealed to Distinguished Visitors.

Chevalier J. Enoch Thompson, Spanish Consul, entertained the three delegates of the Spanish Government attending the Geological Congress to dinner at the Royal Canadian Yacht Club at the Island last evening. Sr. Pablo Fabreda is professor of geology at the School of Engineers and mines at Madrid. Sr. Enrique Dupuy de Lome is a son of the former Spanish Ambassador to the United States. He is a mining engineer. Sr. Augustin Martin Y. Bertran de Lis, besides the Spanish Government, represents the Spanish Institute of Geology and the Royal Geographical Society of Madrid.

To meet these distinguished gentlemen, Chevalier Thompson invited Rear-Commodore C. A. B. Brown, of the Yacht Club; D. R. Albertini, the Cuban Consul; Mr. G. Frank Wilson, Mr. F. I. Fox, Mr. J. E. Atkinson, and F. M. Bell-Smith. The Spanish visitors were delighted with Toronto Island. One of them maintained his geological enthusiasm throughout, and tapped his hammer on the stone blocks of the breakwater with great interest.

COMBINES GEOLOGY WITH SOCIAL STUDY

Swedish Socialist, Attending the Conference Here Tells of the Work Abroad.

WAR WAS AVERTED Will Visit Various Socialistic Organizations in Canada and the States.

Professor H. Backstrom of Sweden, one of the geological delegates upon whom was conferred the degree of LL.D., by McGill University recently, is one of the most prominent figures among these now attending the conference in Toronto. He brings to the conference not only the interest of a geologist, but also the desire to learn something of social science. Yesterday afternoon he spent some time with Mr. James Simpson gathering information with reference to the development of the labor movement in Canada, both political and industrial. His interest in the labor problem has been lifelong and as one of the foremost leaders in the Socialist movement in Sweden he has been elected to the Swedish Upper House, similar to the Senate of Canada, and the House of Lords in England.

Dr. Backstrom manifests a keen interest in the political activities of the workers in Canada, and was anxious to learn what progress the Socialists were making to place men in the Municipal Councils, Provincial Legislatures, and Federal Parliament. He stated that in the Senate of Sweden he was among a very strong Conservative wing of the Parliamentarians, but in the Lower House the Socialists, Radicals, and Liberals are very strong and are making their influence upon the national life. He referred to the bitterness between Norway and Sweden a few years ago, when the treaty between the two countries was broken by Norway.

Prevented a War.

"At that time the ruling class in the two countries were very anxious to have a war," he said, "but the Socialists, and many of the Radicals and Liberals, were strongly opposed to a resort to arms. The ruling class realized that they could not depend upon the great mass of the people who had no sympathy with war, and there was no war. It was chiefly the influence of the Socialists that prevented the two nations going to war."

Dr. Backstrom is keenly interested in the question of immigration and is informing himself on the various means employed in Canada to citizenize the thousands of immigrants from other countries. He thinks this is one of the big problems that Canada has to grapple with and that considerable work will have to be done to develop a sturdy Canadianism among those from foreign countries who have to learn the English language and become informed about the countries, institutions, and laws. He has been so favorably impressed with what he has seen of Canada that he stated his preference for this country as his home land, if Sweden was no longer a place where he wished to live.

To Visit Socialists Elsewhere.

Dr. Backstrom will travel through Western Canada after the conference, and will not only interest himself in the geological problems of the West, but will meet a number of the prominent Socialists and Labor leaders with a view to gathering information about the spread of Socialist thought and development of organization in that part of Canada.

Civic Reception to Geologists

A most brilliant affair was the civic reception held last evening in the City Hall in honor of the visiting geologists. His Worship the Mayor and Mrs. Hocken received the guests in the council chambers, on the steps of the throne. Mrs. Hocken was gowned in pale rose satin, veiled in pearl grey net, with real lace and diamonds, and carried an exquisite bouquet of orchids, a triumph in flowers from the civic hothouses, all varieties of these wonderful blooms being represented, and gracefully combined with maiden hair fern. Representatives of all nationalities were present, and the evening proved most interesting. From the council chamber the guests wended their way to other parts of the hall, which had been handsomely arranged for the occasion. Two orchestras provided delightful music. A buffet supper was served in the corridor, many beautiful flowers being used in the decorations, both on the tables and the rooms.

Among those present were members of the City Council, former Mayors Urquhart and Oliver and their families, Controller T. L. Church, chairman of the reception committee; J. W. Somers, secretary of the reception committee, and the following members of the Toronto committee: Prof. A. P. Coleman, W. F. Ferrier, Gerhard Heintzman, Prof. T. L. Walker, R. E. Hore, B.A., W. H. McNairn, Prof. W. A. Parks, James McEvoy, A. G. Burrows, W. G. Miller, Provincial Geologist A. L. Parsons, A. B. Willmott, Percy Hopkins, G. G. S. Lindsay, K.C., and Ald. Ryding.

Dr. Adams' Dinner Party

The following were guests at a dinner party given at the York Club by Dr. Frank D. Adams, president of the International Geological Congress: Mr. G. G. S. Lindsey, K.C., vice-president Canadian Mining Institute; Mr. D. R. Wilkie, president of the Imperial Bank; Mr. Bedford McNeil, London; Prof. Steinmann, Bonn, Germany, Koniglich Preussische Rheinische Friederich-Wilhelms Universitat; Mr. McDermid, London; Mr. Arnold Hague, Washington; Mr. Whitman Cross, Washington; Mr. Idings, Washington; Mr. Pirsson, Yale University, United States; Dr. Keidel, Argentine Republic, University Nationale de Buenos Aires; Dr. G. Otis Smith, United States Geological Survey; Dr. Sederholm, Geological Survey of Finland; Dr. Molengraaff, Holland, Gouvernement des Pays-Bas; Dr. M. Inouye, Geological Survey of Japan; Dr. W. Vernadsky, St. Petersburg, Government of Russia; Dr. W. F. Hume, Geological Survey of Egypt; Dr. G. A. L. Cole, Royal Irish Academy, Ireland; Dr. John Horne, the University, Aberdeen, Scotland; Dr. Termier, Directeur du Service de la Carte Geologique de la France; Dr. Aubrey Strahan, Geological Society of London, London; Dr. Frank D. Adams, McGill University, Montreal; Dr. P. Krusch, Konigl Preussische Geologische Landesanstalt, Berlin; Dr. de Margerie, Societe de Geographie, Paris; Prof. A. Rothpletz, Koniglich Bayerische Ludwig-Maximilians Universitat, Munchen, Germany; President Falconer of the University of Toronto.

TYPICAL GEOLOGISTS ARE NOT WEALTHY MEN

Many of Them Professors in Universities on Moderate Salaries.

HUNDREDS OF LETTERS

And Fifteen Months' Work to Prepare for the Congress.

A full list of the geological societies in the world has been published by the congress, and their lists of members are now on file. This exhaustively covers the whole world, and is the result of a 15 months' work on the part of the correspondence staff. The number of geologists in the world is shown to total at over 18,000, while the mining engineers number 126,000.

The first circulars were sent out in May, 1912, in English and in French. The English circulars went to all English-speaking countries, and accounted for half of the total. The other countries were all circularized in French, the official language of the congress. Follow-up circulars were sent out in February, May, and June of this year. The resulting lists were printed and a copy mailed back to each society for correction. The revised lists are now on file, and the staff is proud of their thoroughness.

Governments Contributed.

The \$75,000 fund for the general expenses of the Congress was collected by public and private subscriptions. The Dominion Government gave \$25,000 in cash and a guarantee, the Ontario Government \$7,000, Quebec \$5,000, British Columbia \$5,000, Nova Scotia \$2,500. The Coniagas Mine of Cobalt donated \$1,000. The Canadian Copper Company \$500, the Mond Nickel Company \$500, the Hollinger of Porcupine \$500, the Le Roy No. 2 of Roseland headed a long list of \$50 contributions.

Average Cost \$400.

The average personal cost to the delegates from Europe would approximate \$400. If a geological visitor from say Paris, France, were to have taken in all the excursions possible, as well as the ten days in Toronto, and including the Yukon trip, his outlay would reach \$1,200. If he brought his wife along, as some of the delegates did, the cost would be double, or more. The Western trip to Victoria costs 200 per head. The Yukon excursion, for which a special steamer has been chartered and upon which 50 members have been booked, costs \$400. The return Atlantic passage costs \$200. Other excursions, and travelers' expenses, bring up the total to well over \$1,000 for those who take in everything possible on the programme.

Geologists Not Wealthy.

Geologists as a class are not reputed as a wealthy lot. Comfortable describes their situation better. A few of the mining engineers are wealthy where they have embraced finance as well as geology. But the typical geologist is an academic person, with a professorship in a university yielding him an assurance of an income for life. He works hard, he travels a great deal,

and he endures strange and trying climates and foods with philosophic cheerfulness. But as a rule he is not rich.

Collecting Specimens.

Nearly all the visiting geologists have made extensive Canadian collections on this trip. They are being carefully boxed and shipped home to all parts of the world. In one of the forwarding companies there is a store room full of such boxes, awaiting final instructions.

THE CLIMATE OF TORONTO FORMERLY MUCH MILDER

So Geologists Say After Examining Fossils in Don Valley.

The 62 members of Dr. Coleman's party to the Don Valley this morning spent an interesting three hours in a remarkable section. The glacial deposits visible in the brick yard workings are unique, in that no such plainly marked records have been found elsewhere in Canada. The fossil remains of the interglacial portion of the deposits prove that Toronto at no great time in the geological past enjoyed a climate similar to that in Southern Pennsylvania and Ohio, having been very much warmer. This genial climatic condition developed, according to the records preserved to geologists in the clay of the Don Valley between periods of extreme glaciation.

News. Aug. 12-1913.

Dinner at York Club.

The following were guests at a dinner party given at the York Club by Dr. Frank D. Adams, President of the International Geological Congress: Mr. G. G. S. Lindsey, K.C., Vice-President Canadian Mining Institute; Mr. D. R. Wilkie, President of the Imperial Bank; Mr. Bedford McNeil, London; Prof. Steinmann, Bonn, Germany, Koniglich Preussische Rheinische Friederich-Wilhelms Universitat; Mr. McDermid, London; Mr. Arnold Hague, Washington; Mr. Whitman Cross, Washington; Mr. Idings, Washington; Mr. Pirsson, Yale University, United States; Dr. Keidel, Argentine Republic, University Nationale de Buenos Aires; Dr. G. Otis Smith, United States Geological Survey; Dr. Sederholm, Geological Survey of Finland; Dr. Molengraaf, Holland, Gouvernement des Pays-Bas; Dr. M. Inouye, Geological Survey of Japan; Dr. W. Vernadsky, St. Petersburg, Government of Russia; Dr. W. F. Hume, Geological Survey of Egypt; Dr. G. A. L. Cole, Royal Irish Academy, Ireland; Dr. John Horne, the University, Aberdeen, Scotland; Dr. Termier, Directeur du Service de la Carte Geologique de la France; Dr. Aubrey Strahan, Geological Society of London, London; Dr. Frank D. Adams, McGill University, Montreal; Dr. P. Krusch, Konigl Preussische Geologische Landesanstalt, Berlin; Dr. de Margerie, Societe de Geographie, Paris; Prof. A. Rothpletz, Koniglich Bayerische Ludwig-Maximilians Universitat, Munchen, Germany; President Falconer of the University of Toronto.

GEOLOGISTS STUDY NATURE FIRST HAND

Excursions Into the Country
Form Chief Part of Rest
of Programme.

MEET NEXT IN BELGIUM

Members Were Guests of
Mayor at Reception in
City Hall.

The great gathering of geologists who have been meeting in Toronto now for the better part of a week divide their work into two parts, each in its way as important as the other, having given four days to exchanging views and absorbing information of geological construction and its significance in widely separated parts of the world, gathered by scientists of all races, the members of the congress are now preparing to leave the confining walls of the University Buildings and conduct their further investigations in the open. Only one more day will be given over to lectures, the rest of the time between now and the closing of the congress on Thursday being devoted to excursions to various surrounding points of geologic interest in the province.

The congress yesterday, in addition to listening to a number of interesting papers, including one by M. Emile Argand, of Paris, the recipient of the Spendaroff prize, and another by Dr. I. J. Kemp, professor of geology at Columbia University, fixed upon the meeting place for the next congress, accepting the invitation of the Government of Belgium to meet in Brussels in 1917. For the 1921 congress invitations have been received from Spain and Argentina.

The geologists wound up the day by visiting the City Hall, where they were formally welcomed by Mayor Hocken and the City Council.

Overthrusts of the Alps.

M. Emile Argand, of Paris, the recipient of the Spendaroff Prize, the gift of a Russian family whose son died while with an excursion to the Ural Mountains organized by the congress, spoke on "The Overthrusts of the Eastern Alps." One important matter to be discussed at the Brussels congress in 1917 is the proposal of Dr. Hobbs, of Washington, that a great work be prepared on the subject of "The Fracture Systems of the Earth's Crust." Many of the lectures scheduled for this morning had to be passed, owing to the absence of the lecturers.

The afternoon session gave a better showing, and large audiences were present to hear the addresses of the various speakers. Perhaps the most interesting of these, from a geological point of view, was that of Dr. J. J. Kemp, professor of geology at Colum-

bia University, U.S.A., on "The Influence of Depth on the Character of Metalliferous Deposits." He dwelt especially upon the effect of increasing depth upon those geological conditions which influence the precipitation of ores, and referred, as instances of deep boring, to the mines of Keweenaw Point, Lake Superior, where several shafts exceed a depth of 5,000 feet, as well as to those of Minas Geraes, Brazil. The deepest borings, said Dr. Kemp, had either copper or gold as their objective, but precipitation was most favorable at a depth of 2,000 to 4,000 feet. A point of great interest was the extent of enrichment in regard to depth, but secondary enrichment was limited to a short stretch below the ground-water.

On Metal Formations.

Other papers were read by Professor W. Harvey Emmons, of the University of Minnesota, U.S.A., on "The Mineral Composition of Primary Ore as a Factor Determining the Vertical Range of Metals Deposited by Secondary Processes"; by Dr. L. Leigh Fermor, of the Geological Survey of India, on "The Formation in Depth of Oxidized Ores and of Secondary Limestones"; and by Professor Paul Krusch, of the Royal Geological Institute, Berlin, Germany, on "Primary and Secondary Ores, with Special Relation to the Colloid and Heavy Metal Ores."

The last-named gentleman, though speaking in German, was listened to with marked attention, and his audience unanimously endorsed the proposal of the chairman that he be allowed five minutes longer than the allotted time.

In the second section Professor Bailey Willis gave an interesting address on his discoveries during a survey in Argentina.

Received at City Hall.

At half-past eight the members and their ladies began to arrive at the City Hall to attend a reception given to them by the Mayor and City Council of Toronto. His Worship and Mrs. Hocken received their guests in the Council Chamber amid a profusion of palms and flowers, the names being announced by Professor Coleman, of Toronto University. Music was provided in the hall by two excellent bands, and, after the reception, refreshments were served. The company numbered over 500. Each member of the congress has been presented with a special copy of "Toronto of To-day," with an illuminated title-page bearing the legend "To commemorate the 12th International Geological Congress, 1913, Toronto, Canada."

Study Glacial Beaches.

A large number of the members left Toronto by the 8.05 a.m. Grand Trunk train yesterday on an excursion to Orillia, with the object of studying the post-glacial beaches in the old strand line of Algonquin Lake, as well as some interesting features of post-glacial drainage.

Another large party took the 10.30 p.m. C.P.R. train for Belmont Lake, which will be reached by carriage from Havelock. Should time permit visits will be made to iron and gold mines in the vicinity.

To-day excursions have been arranged to Niagara Falls, the Don Valley, Scarborough Heights and Credit River. At the Don Valley the members will be afforded facilities for the collection of Pleistocene fossils from the Toronto interglacial formation, while at Scarborough Heights they will have an opportunity to see Iroquois beach deposits, and a beautiful section of the Pleistocene, in which four distinct sheets of till are exposed. The feature of interest at Credit River will be the scenery, while the Forks are famous as the site of former extensive quarrying of the Cataract sandstone. The region abounds with specimens typical of the formation.

CIVIC RECEPTION TO GEOLOGISTS

All Nationalities Were Represented at the
Civic Reception for the Geological
Society

Never before was such a cosmopolitan gathering held, or more successful reception given, in the City Hall than the one of last evening at the City Hall by the Mayor and City Council in honor of the Geological Congress. The guests, from all parts of the world, expressed great interest and pleasure on seeing the beautiful corridors, paintings and decorations of the building. The Mayor and Mrs. Hocken received the guests in the Council Chamber, the spacious room lending itself to the artistic decorations of ferns and palms, among which twinkled myriads of tiny lights. Mrs. Hocken was handsomely gowned in pale pink brocaded satin with a gracefully draped tunic of pale grey ninon and real lace. She wore diamond and pearl ornaments and carried a beautiful bouquet of orchids of many varieties.

The main corridors were decorated in the same way as the Council Chamber with the addition of a great many large box trees. The handsome marble staircases and stately windows were banked with numbers of palms, ferns and tropical plants.

A dainty buffet supper was served at the west end of the main corridor from tables made lovely with summer flowers and softly shaded candles.

The two splendid orchestras, one of which played upstairs, were admirably conducted by Mr. Oswald Roberts. The reception committee were Mr. J. W. Somers, Mr. T. L. Church, Prof. Coleman, Mr. W. F. Ferrier, Mr. Gerhard Heintzman, Prof. T. L. Walker, Mr. R. E. Hore, B.A., Mr. W. H. McNairn, Prof. W. A. Parks, Mr. James McEvoy, Mr. A. G. Burrows, Mr. W. G. Miller, Mr. A. L. Parsons, Mr. A. B. Willmott, Mr. Percy Hopkins, Mr. G. G. S. Lindrey, K.C., and Ald. Ryding.

A few of the many guests present were: Mr. and Mrs. Gerhard Heintzman, the latter in a becoming gown of sapphire blue satin with an overdress of black lace and a sapphire and diamond pendant; Miss Cornelia Heintzman, in pale pink satin with pearls; Mr. and Mrs. Otto Palm, the latter wearing a gown of cerise velvet; Mr. and Mrs. J. C. Murray, the latter in a white chiffon gown embroidered in pink; Mr. and Mrs. Wenchell of Minneapolis, Mrs. Wenchell wore one of the most stunning gowns at the reception, white brocaded chiffon over palest pink charmeuse, handsomely trimmed with pearls. Another striking gown of black charmeuse with an overdress of hand-painted chiffon, was worn by Mrs. Frech, wife of Professor Frech; Mrs. Walter Ferrier, in blue satin with real lace; Miss Dorothy Ferrier looked handsome in

cerise satin; Miss Elizabeth Gregory of Boston, looked pretty in white with a tunic of silver; Miss Anna Rathgen of Germany, wore a becoming gown of black satin. Mr. and Mrs. Fermor, from India, the latter in palest pink with diamante trimming; Mr. and Mrs. Quensel, the latter looking charming in a gown of black satin and real lace; Madam Hoffmann, in black with sequins.

Others were: Mr. and Mrs. McNeil, Mr. and Mrs. Holtedahl, Prof. and Mrs. Parks, Mr. and Mrs. Morley Wickett, Alderman and Mrs. McBrien, Prof. and Mrs. J. Murray Clark, Mr. and Mrs. Urquhart, Miss Urquhart, Lieut.-Col. and Mrs. Belcher, Mr. and Mrs. David Keys, Prof. de Sjadecgky, Prof. Adolf Schenk, Prof. Molengraeff, Dr. Otto Welter, Dr. Hans Stille, Prof. Lessing, Mr. Henry Gooderham, Mr. Bernard Hobson, Dr. Mellor, Mr. Armand Renier, Mr. Bockelton Williams, Mr. Andre Defline, Mr. John Ashworth, Dr. Hugo Luck of Leipzig, Mr. Paul Weiss, Dr. Wilhelm Paulcke, Mr. G. W. Grabham, Khartoum, Mr. Leon Dominian of New York, Mr. Paul Zode of Brussels, Prof. J. E. Wordman of New York, Dr. E. D. Hoey of New York, Mr. S. C. Nicholas of England, Dr. E. J. Jehu, Dr. Guinsberg, Dr. Clemens Libling of Muenchen, Mr. W. H. M. Cadell, Mr. S. Kogn of Washington, Mr. A. R. Riches, Mr. G. W. Grabham, Dr. Spragern, Mr. R. H. Hocken, Prof. Grenville Cole of Ireland, Mr. Oswald N. Scott, Mr. John G. Rothemel, Mr. M. Emmanuel de Margerie of France, Mr. Collier Cobb of U. S. A., Mr. Nevin M. Feuneman, Mr. Alfred A. Brooks of U. S. A., Mr. H. Foster Bain of California, Mr. B. K. Emerson of Mass., Mr. Alfred Ely Day of Syria, Dr. Serafino Cerulli Irelli, Prof. Dr. E. Stolley, Herr Hans Feilmann of Germany, Mr. Kohlmann, Mr. W. Shirley Bayley of U. S. A., Sir Henry A. Miers of England, Dr. Frederick Leslie Ransome, Mr. A. E. Kitson, Dr. Evans, Mr. Charles McDermid of England, Dr. Chas. R. Keyes, Mr. Arthur Gray Leonard of U. S. A., Controller Foster, Mr. R. W. Brock, Mr. Olaf Anderson of U. S. A., Controller T. L. Church, Mr. W. E. Simpson of Mexico, Mr. Stephen Vivian, Mr. William Fleet Robertson of Victoria, B.C., Mr. Wm. J. Dick of Ottawa, Prof. Dr. Gustav Steinmann of Bonn, Mr. W. H. McNarn, Dr. Richard Lachmann, M. Jean Morel, Mr. Edward Schoch, Mr. F. Imhoff of Germany, Mr. James McEvoy, Dr. Theodore G. Skonephos, Mr. G. G. S. Lindrey, Dr. Miller, Mr. Teodoro Stores of Mexico.

see other side of this paper.

GEOLOGISTS AT YORK CLUB.

The following were the guests at dinner at the York Club of Dr. Frank D. Adams, president of International Geological Congress:—Mr. G. G. S. Lindsey, K.C., vice-president, Canadian Mining Inst.; Col. D. R. Wilkie, president of the Imperial Bank; Mr. Bedford McNeil, London; Prof. Steinmann, Bonn, Germany, Koniglich Preussische Rheinische Friedrich-Wilhelms Universitat; Mr. McDermid, London; Mr. Arnold Haguc, Washington; Mr. Whitman Cross, Washington; Mr. Iddings, Washington; Mr. Pirsson, Yale University, U.S.A.; Dr. Keldel, Argentine Republic, Universite Nationale de Buenos Aires; Dr. G. Otis Smith, United States Geological Survey; Dr. Sederholm, Geological Survey of Finland; Dr. Molengraaff, Holland, Government des Pays-Bas; Dr. M. Inouye, Geological Survey of Japan; Dr. W. Vernadsky, St. Petersburg, Government of Russia; Dr. W. F. Hume, Geological Survey of Egypt; Dr. G. A. L. Cole, Royal Irish Academy, Ireland; Dr. John Horne, the University, Aberdeen, Scotland; Dr. Tornier, Directeur du Service de la Carte Geologique de la France; Dr. Aubrey Strahan, Geological Society of London, London; Dr. Frank D. Adams, McGill University, Montreal; Dr. P. Krasch, Zeliglich Konigl Breussische Geologische, Landesanstalt Berlin; Dr. de Margerie, Societe de Geographic, Paris; Prof. A. Rothplottz, Koniglich Bayerische Ludwig-Maximilians Universitat, Germany; President Falconer, president of the University of Toronto.

PICTURES IN DEMAND.

Many of the visitors were deeply interested in the growth of our city as depicted in the oil paintings of the upper hallway. They stood about these canvases in groups, amazed that a city like Toronto should present such a changing skyline and extent in so few years.

Controller T. L. Church, K.C., was chairman of the reception committee, while J. W. Somers acted as secretary. The committee was composed of Professor A. P. Coleman, W. F. Ferrier, Gerhard Heintzman, Professor Walker, R. E. Hore, B.A., W. H. McNairn, Professor Parks, James McEvoy, A. G. Burrows, Professor Miller, A. L. Parsons, Professor Willmot, Percy Hopkins, G. G. S. Lindsay, Alderman Ryding, D. Weismiller, and O. Palm.

There were 325 present. Among the well-known citizens were former Mayors Joseph Oliver and Thomas Urquhart, Mrs. and Misses Heintzman, Ald. Burgess, Ald. Wickett, R. C. Hocken and Mrs. Hocken.

The Mayor requested that all the cards be saved for him, with the names of the visitors.

Globe. Aug. 12-1913.

EXCHANGING GREETINGS AT GEOLOGICAL CONGRESS



Sir Henry H. Miers of the University of London and Prof. Whitman Cross of the United States Geological Survey.

**MEET IN BELGIUM
FOUR YEARS HENCE**

Geologists Determine the Location of Next International Congress

**PLACE OF GATHERING
TO BE IN BRUSSELS**

Elaborate Civic Reception in City Hall Attended by Four Hundred Guests

At the meeting of the Council of the Twelfth International Geological Congress, under the Presidency of Dr. Adams, the invitation of Belgium to hold the next Congress there was yesterday accepted, and the date fixed is 1917. There were several contenders for the honor, but, in view of the fact that Belgium had waived their right last time in favor of Canada, there was not much doubt as to the choice. Another factor was the expense to the European delegates in having to visit this continent too often. An invitation from the Argentine Republic was received for the 1920 Congress. The Director of the Geological Survey of Chili supported the invitation and suggested that the Congress do not stop at the boundary, but cross over the Andes to that country and the Pacific coast. An invitation was also received from Spain for the 1920.

Mr. A. Renier of Belgium, asked as to the location of the Congress in Belgium, replied that beyond all doubt it would be Brussels.

Studying Strata.

There were more interesting papers yesterday, if one might judge by the attendance, and more discussion than on any day since the Congress started. A fascinating address was that given by Dr. W. Paulcke, professor of geology at Karlsruhe, who gave accounts of experiments made in his laboratory showing the manner in which different strata were forced in forming thrusts. The doctor carried out his experiments with different materials on a section two metres long by one metre broad, under a pressure of 3,300 pounds. The results shown on the canvas by means of magnificently colored slides were a distinct surprise to those present. Sections of the Alps which were shown revealed the fact that the doctor had obtained the same results by his experiments as obtained in the huge mountains of Switzerland. Mr. H. M. Cadell, at the close of Dr. Paulcke's address, congratulated the doctor upon the remarkable results which he had obtained, and remarked that "children are fond of making mudpies and geologists are fond of making experiments." It is interesting to note that the doctor has published a book upon his experiments.

Nile and St. Lawrence.

The lecture room in Building 35 was filled to capacity when Dr. W. F. Hume, Director of the Geological Survey of Egypt, commenced his lecture upon Egypt. Egypt was not a country of sand, as was commonly thought, and not an absolute waste. A large portion of the country was covered with limestone and was the inhospitable portion, but the regions where the oases are to be found are covered with sandstone. "What is your conception of the Nile?" asked the lecturer. "I find that a great many think it a flat country. The actual Nile valley is a ravine bordered with cliffs from 1,200 to 1,800 feet above the surface of the Nile." The slides thrown on the screen revealed this in

a complete manner to the audience. The speaker made humorous references to the Nile as compared to the St. Lawrence. "I used to think of the mighty Nile and speak of the mighty Nile, but I have an uncomfortable feeling now when I think of the Nile after having seen the St. Lawrence." (Laughter.) The speaker's address was tinged with humor all through, and he was frequently applauded, and at the end he was given quite an ovation. Geologists certainly appreciate humor.

Some Subjects of Study.

In Room 8 the attendance all through the afternoon was splendid, and there were some fine discussions after each of the papers. The following were some of the papers, the paper by Mr. W. H. Emmons being one which met with a cordial reception: A contribution to the metallogeny of the Philippine Islands, by Paul F. Fanning, Manila, P.I.

The persistence of ore in depth, by Malcolm Maclaren, London, England.

The influence of depth on the character of metalliferous deposits, by J. F. Kemp, New York, U.S.A.

Primare und sekundare Erze unter besonderer Berucksichtigung der "Gel" und der Schwermetallreichen Erze, by Paul Krusch, Berlin, Germany.

The mineral composition of primary ore as a factor determining the vertical range of metals deposited by secondary processes, by W. H. Emmons, Minneapolis, U.S.A.

On the formation in depth of oxidized ores and of secondary limestones, by L. L. Fermor, Calcutta, India.

Toronto's Civic Reception.
Last night the geologists were tendered a civic reception at the City Hall. The Mayor and Mrs. Hocken received the guests in the Council chamber, and the place had been transformed into a fairy bower. The ferns, red flowers and electric lights made a delightful setting in the chamber. About four hundred guests were present, and the main entrance has seldom seen such an animated sight as was presented last night. The place was seething with vitality, and the grace and deference of the Europeans added a touch to the scene which made it look like a court for the propagation of good manners. Music of a delightful nature was provided by two orchestras, hidden one in the lower east side and the other in the second western gallery. The guests thoroughly enjoyed their evenings, and some handsome gowns were in evidence.

Telegram. Aug. 12-1913.

WELCOMED OUR VISITORS

AT CITY HALL.

325 Persons Accept Hospitality of Toronto—Flowers and Music Transform Civic Corridor into Fairyland.

What's in a name? Ask Mayor Hocken. Last night he stood up in the flower-banked council chamber of the City Hall and extended the official civic welcome to 200 of the visiting scientists.

It might not have been so bad if they had come upon him under country classifications; he then might have had a chance to get his bearings. But they entered the reception rectangle distinctly cosmopolitan. Even Professor Coleman, who was endeavoring to pronounce the names in English, was quite warm when the last of the guests had passed.

But what odds? It is all over now, and every person enjoyed themselves. The main corridor of our City Hall is an ideal spot for a reception.

FLOWERS AND MUSIC.

A great transformation had come over the main corridor. Instead of the hardwood counters and the long line of receivers of customs, banks of flowers and palms filled the corners, and from the leaves twinkled tiny electric lights. Behind all two orchestras were concealed. The guests entered the Board of Control room, giving two cards to the clerks. The names were then written on slips of paper, and the proud bearer entered the council chamber. He slowly moved forward in the line until he came to Professor Coleman, who announced him. The Mayor and Mrs. Hocken then shook them warmly by the hand, and the guest passed out to the corridor.

WITH THE GEOLOGISTS

By BEN HUGHES.

Fortunately for the Executive, the Twelfth International Geological Congress is now running more on its own momentum. But the strain has been terrific. Handicapped by strange usages and unfamiliar languages, many of the European delegates have to be taken care of from the locating of their partoular section of research to the disposal of their laundry. The local committee working at Toronto have not had more than four hours' rest for the past two weeks. The Secretary, Mr. W. Stanley Lecky, will require several weeks of rest cure after the event, and one of his assistants went home to bed Friday night quite broken down. Because the machinery of organization does not whirl and blank no labor is apparent, but the very perfection of the arrangements has required many night hours of unstinted and unselfish work.

It is only on occasions such as these that Canadians and Americans realize what vile linguists they are. Frequently from the buttonhole of the insular English flutter the Gallic blue or the Teuton yellow; but the resident on this continent sports the solitary red of Anglo-Saxon brotherhood. He "doesn't have" to talk any other language but English; and he doesn't. Once in a while he is able to realize his comparative lack of

education; the Congress is illuminative in that direction.

Within its own kingdom of erudition, science is essentially democratic. The list of delegations and members of the International Geological Congress gives name and number, sometimes the institution with which the delegate is connected—and that is all. Take, for instance, this entry among the names of the eminent men from Sweden:

"Government of Sweden, Stockholm, S. A. H. Sjorgen, 449." To all intents and purposes Mr. Sjorgen, a man of middle age, with broad, flat shoulders and the steady blue eye, is just an ordinary mining engineer and geologist. It would be unfair to say that it is his hobby to be a professional man because he takes his profession far more seriously than many who have to make their living by the agitation of their brain cells. But as a matter of fact he is a millionaire—in pounds sterling, not dollars. When the eleventh session of the International Congress was held in Stockholm he gave the delegates a banquet which cost a thousand pounds. Most of the delegates do not know to this day who their host was. He has also the distinction of being a cousin of the Nobel whose father invented dynamite, and presents annually to Rudyard Kipling and other pacifists a few thousand pounds for their aid and comfort in stopping war.

The Congress is the kaleidoseope of geological research.

motor launches were covered, one of them having also a closed-in cabin for the steersman. The third was smaller, having the long raking flush deck forward, which suggests great speed. Each of these modern craft was loaded down with human freight. Men were to be seen from stem to stern of the covered boats, and women were ensconced on the counter and the taffrail. In the smallest and most rakish-looking the forward deck was bare, save for a shock-haired youth with an open-necked shirt and sun-burned arms, who emerged from the forward hatch at regular intervals with a lalling dipper in his hand. Aft of the forward bulkhead, men sat three in a row in dining-room chairs to the number of thirteen, under the open sky.

Curious Natives.

While curious natives on the forepeak of the high-bluff shore gazed downward at the pitching vessels riding at anchor with their bows pointing upwards half out of water at one moment, and their propeller and a third of their stern keel showing out, clear of the waves the moment after, a curious activity seemed to be going on within the crowded bulwarks. Each vessel carried a tiny "dinghy" trailing astern like a puppy dog on a rope.

On the two larger vessels preparations were evidently under way to send landing parties ashore through the breakers.

Daring Scientists.

The blue cliffs stood silent, stern, and forbidding, their noble features tipped with gold from the declining sun. The stratification seams marked themselves out clear and distinct as frowns on a forehead. The great rollers of Lake Ontario hissed as they passed the launches, and then roared wrathfully as they dashed against the base of the Heights. But the shore parties persisted. They put off in their tiny cockleshells. To the amazement of those who watched from shore, high up on the edge of the cliffs, two of these in one of the little boats were women. Such is the daring of science, such the enthusiasm of engendered by geology, and Professor Coleman of Toronto University.

For this was a party of some 64 of the world's foremost men of science, members of the International Geological Congress, assembled here from all the world. They had come to see the natural wonders of the "Dutch Church," and hear Professor Coleman, of whom they had so long known and held in such geological respect, expound upon the lessons to be learned in the well-nigh changeless clay of Scarborough Bluffs. Having come so far, at such expense, is it any wonder that now, within 100 yards of the world-famous cliff they should brave the rest, and venture in rowboats where the gas-line experts of the yachts would not dare to go? Some half-dozen or more, including two ladies, piled into the little tenders and in a moment were dashing towards the shore on the crest of a huge roller.

Plans altered.

In parenthesis it may be mentioned that certain of this daring shore party, including the two intrepid ladies, had decided to explore the land route to Toronto via Kingston road, and the radial line. They were not sea sick—their active geological minds, ever restlessly exploring and researching, craved for variety. They had studied the shore line, including the imported credit valley rocks of the Island breakwater, the sands of the prehistoric Iroquois Lake, and the glacial clay with its inter-glacial stratified deposits, from over the gun-wales of the launches on the trip down. They had seen the route from Yonge street wharf through the East-ern gap, and down along the coast of Fisherman's Island, and the Beaches.

They had seen the smiling summer city among the trees down at Kew, and they observed the sandy slopes of Victoria Park and the remarkable grass terraces on Sir Henry Pellatt's summer home. And then this bold Roman profile of Scarborough thrust itself out from the green shore line, the blue nose tipped and flushed by the western sun. They had coasted along the cliffs at a respectful distance out from the breakers, they had marked the lines of the strata in the clay that record the four inter-glacial periods of the Toronto region, they had seen the margin of prehistoric Lake Iroquois preserved by the sand dunes. They had observed how the water lapped up to the base of the frowning cliff and that the beach, owing to high water, is this year submerged. And now at last they had come to the Dutch Church—and they observed what to the naked eye looked like a place to land!

From the south-east, the waves were piling up higher than ever, with nothing to break their sweep from Oswego to Scarborough Heights. Evidently, science could best be served by going ashore, while yet there was time and opportunity. That cliff could not be studied in detail from the crowded cabin of a tossing motor yacht, one hundred yards from the fascinating shore.

Venturesome Ladies.

So the more venturesome of that horde of scientific adventurers leaped into the tossing rowboats. Two lady geologists also leaped and were safely caught. Women, nowadays, will go wherever men will go, in the interests of science or anything else.

Breathlessly, the crowd on the high foreland looked down at the twinkling skiff in the breakers, with suspense, those who remained watched the tiny craft approach the great blue and gold barrier of glacial and interglacial clay, rising 150 feet straight up out of the lake to the sky line. They saw the first boat heading for a nick in the stupendous bluff, where an ancient watercourse had worn a path down from above. There was just a glimpse of shingle, hardly enough to stand on, clear of the water. Elsewhere, the water dashed right against the very feet and shins of the cliff. First one and then the other of the little boats heading for this dry spot of beach, were caught by the huge rollers and hurled ashore. The instant the bows grated on the sand, men leaped out. The waves behind broke over the boat, and engulfed the feet of those who had so boldly leaped ashore. But in the next instant, while the wave was receding for a second rush at the shore, the ladies were lifted out and the boats dragged up on the strip of shingle. It was all done in a moment—scientifically done, by geologists of note, and by hardy Canadian boatmen from Devins' and Hicks' boathouses, at the mouth of the Humber. Of the party, nearly all had wet feet.

Some had been overtaken in their seats, and were wetter than others—but all were counted safe. And seasickness could no longer interfere with mental concentration.

The large party who had been left at Yonge street dock, because there was not enough room in the launches, had arrived by trolley car, and stood now upon the wooden steps of the goat path that climbed precariously down from the sky line above. Those in the launches out beyond the white comb of the breakers, thought that the cliff sent forth to sea, an echo of congratulatory cheers.

Climbing the Hill.

The shore party now slowly climbed the breakneck stairs to examine at close range the four different inter-lying strata marking the four different interglacial periods as shown by the face of the cliff. When they reached the top they gazed with interest to the horizon. They saw modern Lake Ontario spreading out under a south-east breeze. Then they looked earnestly north in search of the ancient shore

continued on next page.

Chinese Geologist Arrived "In Bond"

When it so pleases, the immigration law is no respecter of persons—or attainments. China's distinguished delegate to the Geological Congress is Professor Parkin Wong of Canton, member of the Washington Embassy and of the Cornell Cosmopolitan Club. Prof. Wong's passport was sent to Bridgeburg, while the Celestial scientist sought to cross at Niagara Falls. There he was halted by the Canadian immigration authorities. It was only after some difficulty that the situation was finally explained and the learned geologist was sent through to Toronto "in bond," arriving Sunday morning.

Star. Aug. 13-1913. SEASICK GEOLOGISTS BRAVE THE ROLLERS OF LAKE ONTARIO

Party of Delegates Investigate
the Clay Cliffs of
Scarboro.

EXCITING ADVENTURES
AMONGST BREAKERS

Three Motor Boats Crowded
With Venturesome
Scientists.

THE OLD DUTCH CHURCH

Many Preferred the Electric Rail-
way for the Return
Trip.

While long rolling waves piled up from the south-east and dashed against the sheer clay cliffs with the roar of an ocean on a rock-bound coast, a fleet of three motorboats crowded with men and women might have been seen anchored in the offing at Scarborough Heights yesterday afternoon at four o'clock. Two of these

line of Lake Iroquois, and the line of the radial railway. Meanwhile the hardy Canadian boatmen from Humber Bay put off again in their skiffs and returned to the anchored launches.

With swelling hearts the scientists gazed on the noble Scarborough Bluff and native architecture of the Dutch Church for perhaps the last time. They had come so far, and now, after only a few minutes' acquaintance, at a range of 100 yards, they were leaving, it might be, forever! Anchors were tripped, the engines were started, and the launches slowly turned away. The cliffs receded, the sands of prehistoric Iroquois Lake faded, the beaches glided by, Fisherman's Island passed, and the boats turned again at evening into the Eastern Gap, with the purple profile of the city of church spires, chimneys, and water tanks forming the northern horizon. And once within the harbor calm, science asserted itself.

"It astonishes me," observed the American professor from a college in Beyrout, on the coast of Syria, where there is no smoke, "it astonishes me why a city like Toronto does not insist on smoke consumers."

VISITED SCARBORO, FALLS, AND CREDIT.

Geologists Do Not Agree on the Origin of Credit Formation.

PROF. PARKS' THEORY

Caledon Club Proves Hospitable — Falls Made the Visitors Forget Geology.

At the Geological Congress this morning most of the members were still arguing about the things they had seen on the various excursions which were made yesterday. One party had gone to Scarborough Bluffs, another to the Don Valley, another to the Forks of the Credit, and a fourth to Niagara Falls.

The Niagara Falls party was under the guidance of Professor Coleman, of the University. Those who were interested in the geology of the region left on the 7.30 boat in the morning, and spent some time along the gorge route on the American side, examining the formation there. There was considerable discussion over the various theories advanced to explain the origin of the formation. The greater number of members, however, ignored geology and became for the time being, ordinary human beings with an eye for the grandeur of the mere scenic objects. These crossed on the 9 o'clock boat, and proceeded direct to the falls, going up the gorge on one side of the river and down on the other side. Many of them donned rubber coats and went under the falls and out the Maid of the Mist. They returned by late boats, weary, but still awestruck at the beauty of the great falls.

At Forks of the Credit.

The party to the Forks of the Credit was headed by Dr. W. A. Parks, of the University. There were about 25 left on the 7.30 C. P. R. train, returning at 9.20, having been entertained meanwhile at the Caledon Club.

Interest on this excursion centred in the theory advanced by Dr. Parks and Professor Schuchert, of Yale University, that the formation known as the Cataract seems to indicate an invasion from a Western ocean which has lapped over the strait which divides this country from the vicinity of New York. It is, the geologists say, a question as to the movements of the seas.

Prof. Urie, of Washington, rejected the Parks-Schuchert theory, and a discussion of interest to geologists ensued. Some of the party refused to pursue science for the day, and remained in the comfortable quarters of the Caledon Club, whose officers afterward came in for the heartiest thanks from the party for their hospitality.

This morning certain technical papers are still being read, but the program approaches an end, and tomorrow will see the conclusion of the congress.

The Scarborough Heights Party.

A representative of the university was in charge of the party of 64 who went in launches to Scarborough Heights yesterday afternoon. A larger number of members turned up at Yonge street dock than had registered for the trip, and consequently had not been provided for. The three launches were filled to capacity. About thirty of those who could not find room aboard journeyed to Scarborough by street car.

The leader of the party described the interglacial layers of the cliff, as visible from the boats to one group. Prof. Kay, of Iowa, a graduate of Toronto University, performed a like service for the smaller boat; and Mr. H. L. Kerr, of the university mine at Cobalt, looked after the duties of guide for the third. Stratified sands, gravels, and clays are interlain by unstratified glacial clays. Four glacial drifts are visible above the lake level, with interglacial beds between. The lake was very rough, and landing extremely difficult.

Water Was Quite Rough.

The party in the main contented itself with viewing the cliffs from some distance out in the lake. Two small rowboats, which made a landing, left two of the ladies and several of the others on shore, but they were wet somewhat by the breakers in making the landing.

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GEOLOGISTS VISIT

POINTS OF INTEREST Parties Spent Day in Don Valley and at Niagara Falls.

SESSION HELD TO-DAY Congress Closes Thursday With Special Convocation at the University.

Some geologists deserted Toronto yesterday, practically the whole gathering of delegates leaving the city on the various excursions to points of interest arranged by the congress.

In the morning a party of 60, under the guidance of Professor Coleman, spent three hours in the Don Valley, where they inspected the interglacial evidences in the clay deposits, proceeding after lunch to see the glacial and interglacial effects in the cliffs of Scarborough Heights.

Another party left at 7.20 a.m. for Credit River to inspect the fossils in the rock exposed at the quarries and by the river. This party was conducted by Dr. Parks, of Toronto Uni-

BANQUET AT ARMORIES TONIGHT IN HONOR OF THE GEOLOGISTS

Elaborate Preparations Have Been Made to Entertain Distinguished Visitors—Hon. Louis Coderre Will Represent Dominion Government — Numerous Trips Were Made Yesterday.

Canada's appreciation of the visit paid to the Dominion and Toronto by the geologists who chose the Queen City as the meeting place for their 12th international congress, will take the form of a farewell banquet, which will be held in the armories tonight.

Yesterday was excursion day, and therefore a day of pleasure for most of the foreign geologists. For the Canadian geologists, however, it was a day of business, not pleasure. About 600 guests are expected to attend the banquet in the armories tonight.

On decorations alone—decorations in this sense including orchestra, etc.—\$1500 has been spent on the armories. To the man in the street this sum may seem extravagant, if he forgets to think of the advertising that Canada has got thru the congress. The government, however, has not forgotten that it is in debt to the congress and tonight it will make a payment on the debt.

Coderre to Speak.

Hon. Louis Coderre, bilingualist, and possibly trilingualist, has been entrusted to represent the Dominion Government, while Hon. W. H. Hearst, minister of lands, forests and mines, will represent Ontario. The banquet will be almost strictly a geological affair, and all the invited guests are geological fiends. The list of speakers is not yet complete, but it is already so large that a time limit of three minutes has been adopted. It is expected that 100 women will be present, most of whom are wives of the visiting geologists.

The following will sit at the head table: Col. Peuchen, Capt. Machin, M.L.A., Kenora; Dr. Keidel, D. A. Dunlap, Dr. Szadetzky, Rev. Dr. Cameron, Dr. Backstrom, Dr. A. E. Barlow, Dr. George Otis Smith, W. D. Matthews, A. Renier, President Falconer, Dr. Inoyze (Japan), Hon. Col. Mason, Dr. Tchernyschen, Hon. W. H. Hearst, Dr. Chamberlin, Hon. Charles Devlin, Dr. Steinman, R. W. Brock, Dr. Tietze, Dr. Frank D. Adams, president; Dr. Aubrey Strahan, Sir Edmund Osler, Prof. P. Termier, Hon. Louis Coderre, Dr. Sjogren, Sir Henry Pellatt, Mayor Hocken, W. T. Hume, W. G. Miller, L. Baldacci, Col. D. R. Wilkie, Dr. Maier, J. L. Englehart, Dr. Mollenfratt, G. G. S. Lindsey, Dr. Lederholm, Rev. Dr.

Carman, Dr. Wrong, Col. J. A. Currie, Dr. Mellor, Col. Campbell MacDonald, Visited Niagara Falls.

No less than five trips were made by the geologists yesterday. Up bright and early, a party of 100 left on the 7.30 o'clock boat for Niagara Falls and one hour and a half later they were followed by a second party, the members of which have an antipathy for early rising. This party was even larger than the one on the first boat, but never caught up to the early birds. The view of the falls from the Canadian side made the geologists catch their breath and they lingered on the brink of the precipice for more than an hour. Some of them then took a trip in the Maid of the Mist, after which they returned to Queenston by the gorge route on the American side. Up Credit Valley.

Another trip which was popular with the geologists was the excursion to the Credit River. At 7.20 a.m. the party left Union Station and the forenoon was spent in examining the Silurian strata at the forks of the river. At 1 o'clock the party were taken in motor cars to the Caledon Trout Club, where luncheon was served, and after luncheon the trip to Caledon East was continued. The party arrived at the Union Station on the return about 10.30, and many bags of rock were hauled off the train by the scientists.

Trips which were shorter and less fatiguing than those already mentioned, tho no less pleasureable, were those made in the morning to the Don Valley Brick Yards, and in the afternoon to Scarborough Heights by boat. Many prehistoric fossils were collected both in the Don Valley and at Scarborough.

Today Constable Christie of Toronto University will conduct two parties on a tour of the university buildings and the new museum. Constable Christie says that the visiting university professors, and particularly those from Germany, the land of universities, find it hard to believe that Toronto University has so many up-to-date buildings. As they move from one building to another they manifest their surprise in the same old question: "Is this a university building, too?" Constable Christie replies, "Yes, this is another," and then they enter to investigate. The physics building and the new hydraulic building seem to carry off the honors in point of size and equipment.

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versity, and accompanied by Dr. Schuchert, of Yale, both these gentlemen being responsible for the distinguishing of the cataract formation, the new geological formation discovered there about 18 months ago.

There were also two excursions to Niagara Falls by the 7.30 and 9 o'clock boats. A point of the deepest interest studied by the visitors was the wearing away of the Gorge from Queenston to the Falls as they stand at present, which is regarded by geologists as one of the authoritative gauges of the passage of time in a geological sense.

Under the guidance of Professor Deschamps, the geologists who remained in Toronto made a complete

tour of Toronto University, and spent several hours in examining the various buildings. Others visited the new Royal Ontario Museum at the corner of Bloor Street and Avenue Road, which is not yet open to the public, and expressed their admiration for the arrangement of the exhibits and the convenient plan of the building.

Congress in Session To-day.

To-day the delegates will hold a number of sessions, at which several noted members will read papers. On Thursday the congress will close up its work. For the final day the programme includes a special convocation at the university, at which degrees will be conferred upon seven members, including Willet G. Miller, of Ontario; Aubrey Strachan, of the English and

continued on page 69 →

Welsh Geological Survey; P. M. Termier, director of the geological service of France; Thomas Chrowder Chamberlain, University of Chicago; Richard Beck, of the Konigliche Sächsischen Bergakademie, German; J. J. Sederholm, director of the Geological Commission of Finland, and Theodosius Tshernyschew, of the Academie Imperiale des Sciences, St. Petersburg.

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COST OF CONGRESS TO TOTAL \$75,000

Various Provincial Governments Augmented Substantial Federal Grant

EXCURSION DAY
FOR THE SCIENTISTS

Yesterday's Outings Produced Some Very Human Experiences

There were many disappointed geologists yesterday at the Yonge street wharf. When Prof. Coleman gave his address before the Congress the other day upon the "Interglacial Periods" as pertaining to the Toronto district, he impressed all the visitors with his illuminating talk, and the opportunity to visit the district which he had described was eagerly looked forward to by the geologists. The consequence was that the excursion, which had been originally planned for fifty, to visit the Bluffs at Scarborough, and for which accommodation for that number had been reserved, proved totally inadequate, and as many were left behind on the wharf. The occasion brought forth a demonstration of unselfishness on the part of those who had registered and who were perfectly willing to give up their places to those who had not registered. Many ladies who had not registered were simply made to take places in the three launches provided, and eventually the excursion left nearly an hour late. The remainder immediately left for Scarborough by street car.

Neptune Bested Scientists.

The trip down was made in good time, although the smallest of the three launches had a rough time in the rolling waters of the lake. The voyage was most enjoyable in spite of the tossing, and many exchanges were bandied about concerning sailing capabilities. "I would hate anything to happen," said one gentleman in the big launch. "They have such splendid meals at Queen's Hall," he added, amid laughter. "Alas! although a geologist may be a hardened specimen of humanity in many ways, Father Neptune has but to bestir himself and the best of them feel it; consequently—but let the veil be drawn; who has not suffered some time or the other?"

One Exciting Upset.

On arrival at the "Dutch Church" the skippers of the launches deemed it advisable not to land on account of the heavy breakers, but one lady, who had proved a poor sailor, pleaded to be put ashore, and, in company with another lady and two gentlemen, set out through the heavy waters for land. One lady reached dry, but the other three people got a trifle wet when a big wave bowled the boat over and deposited them in the water. The excursion did not land.

Fortunately there were men in the two launches other than the one in which Prof. Coleman was who could explain the district, and the various deposits were pointed out by these scientists. The party returned about 6.30 very pleased with their experience. Another big party left for Credit River. This trip was of especial interest to those familiar with the Silurian, as it shows the total absence of the Rochester and Medina strata exposed in the section at Grimsby and in the gorge of the Niagara River. The party had an enjoyable time, and were entertained to luncheon at the home of the Caledon Trout Club. The other excursions were to the Don Valley and Niagara Falls.

Party at Royal Muskoka.

"These excursions are one of the most enjoyable features of the Congress," said one of the delegates from Africa. "You meet with such a variety of opinions that it is most refreshing." In the party which left for Muskoka on Saturday there were four Germans, two Frenchmen, 19 Englishmen, twelve from the United States, two from Belgium, seven from Canada, one from Holland, three from Sweden, two from Mexico and one from Russia. A most enjoyable time was spent by the party at the Royal Muskoka Hotel.

A Splendid Exhibit.

The exhibits collected at the Royal Ontario Museum are attracting a great deal of attention. The specimen of the "Platicarpus Corphacus" is one which brings forth much comment. To the lay mind the fact that such a specimen belongs to the Jurassic period may not mean much, but when he is told that the age may be anything from eight to twelve million years he moves his eyebrows. There is a magnificent specimen of the "Pseudastacus Pustulosus Munat" from Solenhafen, Bavaria. This is a medium between a crustacean and a bird. It looks for all the world like a lobster, but it has a pair of big wings which are shown almost to perfection. It is probably one of the first of living animals. The specimens of native gold from Porcupine are splendid examples. The different periods with most of their peculiarities are illustrated by fine exhibits, and a specimen of the Eocene period with two fishes are without flaw, every bone showing out clearly.

Cost of the Congress.

The cost of the Congress, estimated at \$75,000, was made up principally of the following amounts:

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The Dominion Government gave \$25,000 in cash and a guarantee; the Ontario Government, \$7,000; Quebec, \$5,000; British Columbia, \$5,000; Nova Scotia, \$2,500. The Coniagas Mine of Cobalt donated \$1,000, the Canadian Copper Company \$500, the Mond Nickel Company \$500, the Hollinger of Porcupine \$500. Some 350 smaller amounts make up the rest of the total.

Cobalt Nugget. Aug. 13 - 1913.

THIRTEEN NATIONS WILL BE REPRESENTED

Geologists Second Visit to North— An International Party

The post-Congress visit of distinguished geologists will arrive in Cobalt from Sudbury on Aug. 20. It will take precisely the same course as the Pre-Congress excursions and promises to be quite as representative.

Last Saturday the list of those who wish to be members of this excursion had reached a total of 45 from no less than thirteen kingdoms and principalities of the world. As men of science will continue to pour in from all quarters of the globe till almost the last day of the Congress, the list is almost certain to be considerably larger than that.

The party will again be under the direction of Dr. W. G. Miller, Provincial Geologist for Ontario, assisted by Mr. C. W. Knight, Assistant Geologist for Ontario, and Mr. A. G. Burrows, also of the Ontario Geological Survey. Mr. A. A. Cole will make all the local arrangements again with the officers of the Cobalt branch of the Canadian Mining Institute.

The provisional list of members on the A6 excursion made up to Aug. 9th is as follows:

Delegates from:

Canada—J. A. Dresser, J. Stansfield, G. C. Mackenzie, P. E. Hopkins, J. W. Evans, G. W. Miller, A. G. Burrows, A. A. Cole, C. W. Knight, J. C. Watson, T. Corkill, L. H. Cole.

Russia—W. Vernadsky, Gouvernement De Russe; R. Archinow, Academie Imperial de Science, St. Petersburg; P. Soustchinsky, J. Samiljoff, Institut Afronomique, Moscow; M. Lubockinsky, C. Visonte, J. Sederholm.

U. S. A.—E. Howe, W. C. Bucher, A. G. Leonard, North Dakota Geological Survey; H. B. Pattin, Colorado School of Mines; C. H. Smith, Princeton University, Princeton; Mrs. Smith; J. E. Woodman, New York Academy of Science, New York; E. Leighton, School of Mines of the University of Pittsburg; W. L. Bailey.

Switzerland—P. Geijer.

Germany—R. Beck, Deutsche Reichsregierung; P. Krusch, Konigl Preus-

sches Ministerium fur Handel und Gewerbe, Berlin; M. Belowsky; H. Lachmann, E. Lindemann, A. Bergat, Deutsche Minerlagische Gesellschaft, Jena.

England—H. L. Bowman, University of Oxford, Oxford; G. M. Part.

Spain—E. Dupuis de Lome, Instituto Geologico de Espana, Madrid; A. M. Bertran de Lis, Instituto Geologico de Espana, Madrid.

Bulgaria—G. Bontchew.

South Africa—E. R. Schoch.

Norway—S. Foslie, Universitets Regia Frediciana, Christiania.

France—P. Pruvost, Societe Geologique du Nord, Lille; A. Defline.

Italy—A. Grimaldi.

Japan—T. Hiki.

Where it is not so indicated on the list, the scientist named is a member but not a delegate from any institute.

Yet another excursion would have passed through Cobalt and Porcupine in September if the National Transcontinental railway had been opened. When the excursion began to be mapped out eighteen months ago it was hoped that a service would have been started between Winnipeg and Cochrane by this time. But as with most other undertakings of the same vast character the Transcontinental is behind schedule.

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Both Registered
as Men of Letters

It was on the former Geological visit to Cobalt, and the party were lounging around the office of the hotel. A man came in and registered and put the letters M. E. after his name. An old miner addressed the new arrival, and after some conversation found out that the letters did not stand for the usual "Mining Engineer," but for "Mining Expert."

"I have had a lot of experience in digging," said the new arrival.

"I think I have had more than you," retorted the old man. "I used to dig graves." And he promptly went and put the mystic letters after his own name on the register.

FIVE DISTINGUISHED GEOLOGISTS WHO ON THURSDAY WILL RECEIVE THE DEGREE OF DOCTOR OF LAWS, HONORIS CAUSA, AT THE UNIVERSITY



PROF. TSHERNYSCHEW
RUSSIA



PROF. BECK
GERMANY



PROF. CHAMBERLAIN
UNITED STATES

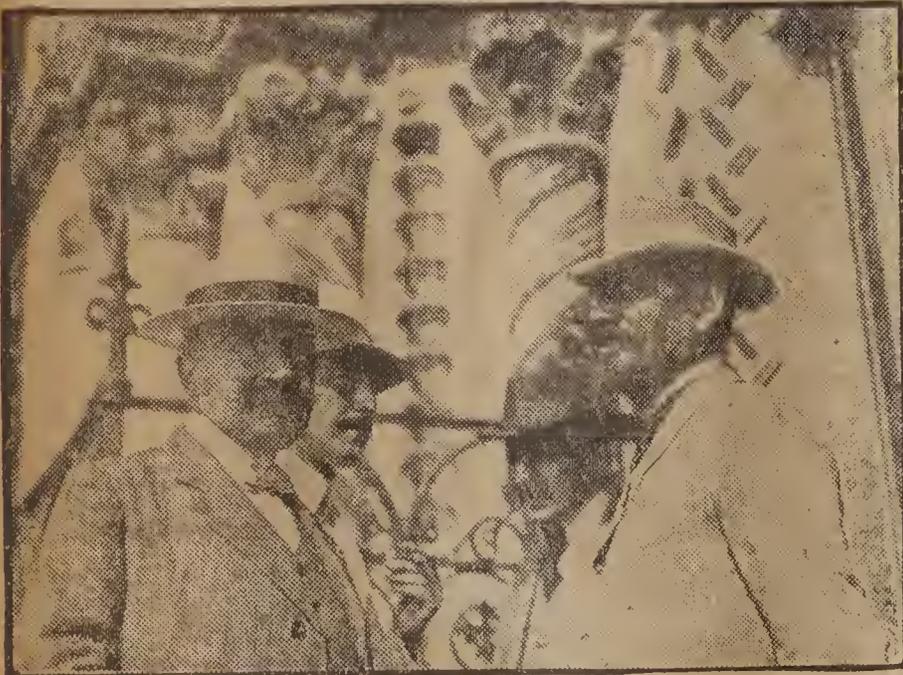


PROF. TERMIER
FRANCE

MEN OF SEVEN COUNTRIES WILL RECEIVE HONORARY DEGREE.

Seven geologists will receive the honorary degree at special convocation. These include Willet G. Miller of Ontario, Aubrey Strachan of the English and Welsh Geological Survey, P. M. Termier, director of the geological service of France; Thomas Chamberlain, University of Chicago; Richard Beck, rector of the Konigliche Sachsische Bergakademie, Germany; J. J. Sederholm, director of the Geological Commission, Finland, and Theodosius Tshernyschew of the Academie Imperiale des Sciences, St. Petersburg.

WHERE FRANCE AND GERMANY CLASP HANDS



M. Pierre Termier, Service de la Carte, Geologique de France, and Herr G. Steinmann, Delegate of the German Government, at the Geological Congress.

World - Aug. 14-1913. GEOLOGICAL HONORS.

Fortunately the university affords a means for doing some honor to prominent men of science who visit Ontario, the such honors cannot be bestowed indiscriminately, or the conferring of degrees would defeat its own object. Indeed, criticism is often directed against the selections made at the annual convocations. No mistake has been made in the selection of the gentlemen upon whom the university will confer, honoris causa, degrees this afternoon. The list could easily be extended from the ranks of the eminent visiting geologists, but all are representative men who have been singled out to bear the compliments thus indirectly paid to their colleagues.

The seven wise men are not of Greece but of seven other representative nations. Great Britain, France,

United States, Germany, Finland, Russia, and Canada, being represented in the honor roll. Mr. Aubrey Strachan, F.R.S., is assistant director of the Geological Survey of England and Wales. M. Termier is directeur du service de la Carte Geologique de la France. Prof. Chamberlain has attained prominence for his novel theories of the origin of the planetary systems. Prof. Saderhohn is director of the Finland survey and a specialist in archaic rocks. Our own Dr. Willett G. Miller is the man who put the alt in Cobalt, and worthily represents Canadian science. Messrs. Richard Beck and Theodosius Tshernyschew are equally representative of Germany and Russia.

The occasion is one of the most interesting in the academic annals of the city, and there should be a brilliant gathering this afternoon at Convocation Hall.



PROF. SEDERHOLM
FINLAND

World - Aug. 14-1913.

Mr. G. G. S. Lindsey, K.C.



The Chairman of the Coal Reserves Committee, which was responsible for the monograph, "The Coal Resources of the World." Also Chairman of Finance and Transportation Committees

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GEOLOGISTS PLAN FOR NEXT MEETING

World's Agricultural Resources to Be Discussed at Belgium Conference.

CANADIAN ORGANIZERS

Delegates Pay Tribute to Our Business Methods—Don Valley Deposits.

For the next four years the geologists of Belgium, the country which will have the International Geological Congress in 1917, will spend their time in preparing a chart and atlas of the agricultural resources of the world. This decision was arrived at yesterday when the council met to consider the question of a topic for discussion in 1917.

Some of the foreign geologists who are at present in Canada, consider that the study of agricultural deposits of the world is the most important branch of geology and by far the most important branch yet to be investigated. Owing to the fact that large territories of agricultural land have been discovered within the last ten years in Canada, South Africa and Australia, there is as yet no accurate compilation of the agricultural resources of the world, and the council was of the opinion that this would form a very suitable subject for discussion at the next congress.

Another reason for the decision to investigate the world's agricultural resources is the attention at present being directed by political economists all over the world to the high cost of living. The geologists believe that if they can collect full details on the grain growing land resources of the world, the march from the cities to the land will be strengthened and the price of food commodities will be kept closer to the earth.

Another Topic. Another topic that will be discussed in 1917 will be the nitrate, phosphate and soda deposits of the world. As these three chemical compounds form the basis of all fertilizers, the research to be conducted by the scientists will be of great importance to the subject of agriculture.

Besides these topics the Belgium Council will be at liberty to consider two others which were suggested by the council. These are the world's copper deposits and petroleum resources.

All day yesterday the Belgian delegates were busy studying the method employed in carrying out the program of the present congress.

R. W. Brock, general secretary of the Canadian Council, states that many of the foreign geologists have complimented the executive officers of the Canadian Council on the organization of the congress.

"They seem to think that Canadians cannot be beaten as organizers," said Mr. Brock.

In referring to the trip taken to the Don Valley on Tuesday, Dr. Horne of the Scotch Geological Survey, stated that the glacial and late deposits that are to be seen in the Don Valley are the finest in the world. "The excursion to the Don Valley alone was worth a trip across the Atlantic," he said.

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LADY GEOLOGISTS PAID VISIT TO WOMEN'S ART ASSOCIATION

Large Studios in Jarvis Street Building Were Plethoric With Samples of Home and Foreign Workmanship — Fine Specimens of Indian Basketry Attracted Visitors.

A number of the ladies attached to the party of geologists now in town visited the headquarters of the Women's Art Association, on Jarvis street, yesterday. The large studios were plethoric with various samples of home and foreign make along the lines in which the members of the society employ themselves, and evidences of superior skill were everywhere apparent.

The stores and studio are in charge of Miss Stewart.

Later, Mrs. Dignam, president of the association from the beginning until the present, took The World's representative on a tour of inspection of the many delightful things displayed on the walls and in the cases, and gave some interesting particulars as to the origin of the work of the association.

"We are 27 years in existence," said Mrs. Dignam, "and we are the only society in any way like to ourselves who have a home in Toronto, a home for ourselves and a place to which we can welcome others. This we never fail to do. We have welcomed and introduced into Canada English, Scotch, Dutch, American and Canadian artists who have come to us. We have also employed them as teachers, and in this way helped to broaden our knowledge and assist in building up the highest form of patriotism."

As the president spoke she was handling some of the dainty laces lying on a case near. "Here," she said, "are laces made by our own people." Crocheting, fine enough to be a marvel; Mantese, beautiful in design, pointe, duchess, antique, punta-in-aria, macrame—all were shown. Macrame, it was explained, goes back to the time of the Egyptians, knotted lace being prior to all others.

Then there was basketry. Beautiful and far beyond anything one could conceive of, judging from the specimens usually seen in the stores. The weave of the baskets was so close as to defy even a ray of sunlight, and so firm and durable as easily to last a lifetime, even of the length of the allotted three-score-and-ten. These different specimens were mostly of Indian manufacture from Alaska, Queen Charlotte Island and the Fraser and Columbia Rivers.

Delight to the Eye.

Canadian home-spuns in many shades and colors, and of various textures, were a delight to the eye. From Quebec there were immense plaids that might be used as quilts, portieres or rugs. Soft greens blended beautifully with white and scarlet; others in blue, brown and white. "Rose" and coral, with tufting in the same shade, or with a contrasting color, were most attractive. Heredity was shown in the plaids, accounted for by Mrs. Dignam thru the great mixture of Scotch and French in Quebec.

Costume lengths, all hand-spun and made from the pure wool, came in for special comment. One in golden brown with raised lines of tufting, was especially charming. They will last for

years and the possessor of one of those Canadian homespun costumes might well be envied.

Glazed pottery, mostly in green, is another pet stock of the Women's Art. Jugs, vases, cases of various sizes, are each and all in their high polish and pretty shading a delight to the artistic eye.

Book-binding in leather, wood carving and the making and designing of different articles of jewelry, are other lines illustrating the art of Canada's women. Among these was a beautiful pendant in hammered silver in which a big turquoise is set. This with the chain to which it is attached, are the work of Miss Lindsay. Another neck ornament in purple enamel and stones was done by Mrs. Robert Sinclair. A silver crucifix, a salt cellar and spoon in the same metal and a coral head set in deep yellow gold, were among the wonderful things handled and admired by The World during the tour of the rooms.

Cease to Be Art.

"Will these things ever have a high commercial value?" was a rather thoughtless interrogation, which received from Mrs. Dignam the answer, "when things become commercialized they cease to be art."

The association has interchange with the kindred endeavors of the Duchess of Sutherland, and some of the Scotch home spun wools in green, violets and soft blues are now in the assortment on Jarvis. A collection for the National Exhibition is now being prepared and an opportunity will be given then to see the latest in the enterprises of this most valuable and persevering institution.

From the branch in Toronto, there have sprung up others in Hamilton, St. Thomas, Peterboro, Owen Sound, Edmonton, and Mrs. Dignam has many kind words for those children that have come from the parent stem.

Lectures, musicales and clubs for the various departments, teas for the members, are all part of the curriculum in the winter months.

The association gave to the ceramic world of the Dominion, an impetus unprecedented, when it set itself the task of making the famous historic set which now has place in the hall of Haddo House. The paintings of historic scenes and places, flowers and game, were two years in being produced, the selections and artists being from all over Canada. The china background was white and gold Doultton, and when completed, the set was bought at the artist's prices by the senate and house of commons, and presented to Lady Aberdeen.

Association's Aims.

To quote from a short historical sketch of the society by Miss Florence Deeks: "The purpose of the association is not commercial, but thru the awakening of public intelligence upon the subject of art, its aim is to stir artistic impulse, educate artistic ability, promote artistic growth and produce artistic accomplishment, a condition which is being surely attained by the united and persevering efforts of its members, by labor and constancy."

The large tent in the armorics last night for the banquet of the International Geological Congress was very effectively lined with a forest of cedar trees, and the numerous tables, which accommodated 500 people, were lovely with brass bowls of scarlet gladioli and yellow asters alternately, brass candlesticks shaded with gold on all the tables, except the long table at the top of the marquee, which was arranged with silver and orchids in silver bowls. A few of the beautiful gowns worn were: The president's wife, Mrs. Frank D. Adams (Montreal), a very handsome gown of white satin with embroideries of black grey and silver and a cerise girdle; Madame Oederre, in black with diamonds; Mrs. Hocken was in white satin draped with Dresden ninon and lace, diamond ornaments and magnificent purple orchids on her corsage; Mrs. J. D. Tyrrell, a beautiful gown of white satin, embroidered with cornflowers and silver; Mrs. David Dunkap, a Parisian gown of Brussels lace, draped over white and silver brocade, opal and diamond necklace and earrings, corsage bouquet of pink roses; Lady McRoberts, very handsome in white satin draped with black gauze, a deep hem of coral satin, which was also introduced on the bodice, very beautiful necklace and earrings of diamonds; Mrs. Coleman, black with crimson, rose embroidered panels, real lace scarf; Mrs. Bedford MacNeill (London), pink chiffon over crepe de chine, pearl ornaments; Mrs. Strahan (London), grey brocade with old Brussels point lace and antique necklace and ornaments of amethysts; Mrs. Fernor, India, black satin with tunic of white lace, corsage bouquet of red roses; Mrs. Charlton (London), black over white satin, with black velvet, carbuncle and diamond earrings, bandeau of antique pearls on black velvet; Miss Addison, pale blue and silver; Mrs. Peck, white satin draped with real lace, trimmed black velvet and pearls, pearl ornaments; Mrs. Whitman, Cross, in a very effective gown of black and white lace, with diamond ornaments; Mrs. C. V. Holman (Maine), very handsome in black lace, satin and jet, with magnificent diamonds; Miss Rathgin, green chiffon over white satin; Mrs. and Miss Stephenson, both in black satin; Mrs. Haultain wore a white gown; Mrs. McEvoy, mauve satin with real lace; Mrs. Parks, royal blue, veiled with black chiffon and a corsage bouquet of lilies; Mrs. Arnoldi, black lace and ninon, with pearls; Mrs. Matthews, black silk and real lace; Mrs. Haltedahl, blue silk; Mrs. J. F. Kemp, lavender charmeuse; Miss Mary McLennan (Stratford), green satin draped with black; Mrs. L. Walker, in black; Mrs. J. A. Macdonald, white brocade with gold and crystal lace; Mrs. Moranit, pale blue satin with gold and silver embroideries; Mrs. Arthur Day (Washington), palest pink chiffon over white satin, with silver embroideries; Mrs. Murray Clarke, a French gown of white Dresden chiffon veiled with gray, pearl ornaments, a corsage bouquet of pink roses and roses in her hair; Mrs. W. F. Ferrier wore a gown of midnight blue broche crepe de chine with real lace and ornaments of opals and diamonds; Miss Ferrier was in beauty satin, and Miss Neville wore apricot flowered chiffon over satin.

The university garden party in honor of the International Geological Congress takes place this afternoon in the quadrangle from 4.30 to 6 o'clock.

Some distinguished memcoers of the International Geological Congress who attended the excursion to Royal Muskoka Hotel. Muskoka Lakes: F. French, Germany; Mrs. Frech; S. McL. Gardner, Glasgow; R. P. D. Graham, McGill University, Montreal; M. J. Goldman, Johns Hopkins University, Baltimore; Miss Goldman; Miss A. Grutterink, Holland; P. J. Holden, professor geology and mineralogy, Virginia; E. C. Hovey, American Museum of Natural History, New York City; J. P. Howley, director geological survey of St. John's, Newfoundland; Mark Hurl, Glasgow; J. M. Hurl, Glasgow; B. Hobson, Sheffield; A. Keith, U. S. geological survey, Washington; R. Lachmann, Breslau, Germany; H. M. Lutman-Johnson, Petworth, England; L. Michalon, Paris, France; Bedford MacNeill, president Institution Mining and Metallurgy, London, England.

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The Geological Banquet

Not since the supper of the great R. C. Y. C. ball in honor of their Royal Highnesses the Duke and Duchess of Connaught in the Armories, has there been seen such a charming and brilliant effect as that of the banquet given by the President and Executive Committee of the Twelfth Geological Congress last night in the Armories. The great space at the east end was taken up by a large marquee, with the walls banked with tall evergreens, the floor covered with soft green carpet, on which were numbers of small tables seating ten and twelve, and a long head table for the President and the most distinguished guests, who were called by name by Mr. Leckie in splendid voice, each passing rapidly into their seats, others following in perfectly arranged order to their own tables. The whole effect was of brilliant red, the decorations being centres of magnificent gladioli, with red and silver and gold (quite appropriate) shaded lights. The menu, an excellent one in every respect, was in large size, tied with deep blue. The toast of "His Majesty the King" was proposed by the President, who could be heard in all parts; "H. R. H. the Duke of Connaught, Governor-General, and the Duchess of Connaught," brought a few words gracefully expressed by Hon. Mr. Coderre, Minister of Mines. "The Lieutenant-Governor of Ontario" followed, and the delightful entertainment was a most happy close to the past week of happy and interesting meetings, both scientific and personal. Mrs. Adams was most kind in her greetings to all who have had the privilege of knowing the popular wife of the kindly and dignified President.

"LONG LIVE CANADA" WAS TOAST OF GEOLOGISTS AT BIG BANQUET

Delegates to International Conference Entertained at Armories—Scientists Show That They Can Appreciate Pleasures of Festal Board—All Pleased With the Dominion.

When science flings by the robes of her asceticism and turns for relief to the courts of festivity, then indeed does life flow in free and pleasant channels. So with the world's Geological Congress turning last evening from the strain and din of the convention hall to the banqueting board, the whole spirit of the occasion was one of pastime. Books were abandoned; research forgotten. For an evening the earth turned on its axis and the secrets of its crust lay unprobed.

A Notable Spectacle.

In many senses it was a soul-stirring picture to watch—that of a sea of thinking faces glowing in the pleasures of international good fellowship. Faces burned brown beneath the winds and suns of every clime and wrinkled with intellectual devotion to the pursuit of a splendid study, alike were cleared of signs of a week's application, and merriment reigned instead. Minds focused for life from a score of different standpoints upon one great scientific goal turned as quickly to the joys the night could bring forth.

The spirit of enthusiasm which thrills a large congregation at any such period was heightened by the international nature of the assembly. It was literally "hands round the world," and the fact that 500 delegates gathered in from all corners of the globe and irrespective of creed or prejudice, should find a mutual pleasure contributed unusual zest.

Learned Discussion.

Floating up from different sections of the arena could be distinguished snatches of learned conversation on occasion, but the whole merged into that pleasing jargon of voices, clinking of china and ripple of laughter which is peculiar alone to the delights of the festive board.

Here, as one aptly described it, sitting in Canada "upon the geological backbone of the world" representatives of all her serious-minded students were holding seasonable converse.

The addresses in general were interpretative of the great store of knowledge bound up usually in technical terms. Some were epigrammatic and lit with sparkle and humor.

All were interesting and appreciated to the last degree. Every voice and every tongue blended in the accented shout: "Long Live Canada."

In Divers Tongues.

Many-tongued were the speeches delivered, and yet they all harmonized in the expressions of good-fellowship and international peace.

In responding to the toast to His Royal Highness the Duke of Connaught, Governor-General of Canada, Hon. Louis Coderre, minister of mines, for the Dominion, expressed his regret at the unavoidable absence of the Duke of Connaught, and expressed his thanks at the sympathy voiced by the foreign scientists for the Duchess of Connaught in her illness.

He presumed that if the Duke of Connaught had been present he would have been pleased to have the opportunity to congratulate Canada on the successful congress that had been held.

The World's Peace.

In concluding, he predicted that the fruit of the congress would be revealed in the effort made by all nations to preserve the peace of the world.

"The fruit which this congress will leave behind it," said Mr. Coderre, "will be for the glory, the peace, and the welfare not only of Canada but of the whole world."

When Mr. Coderre sat down Mr. Black sang "Oh Canada" in English, and Hon. W. H. Hearst then rose to reply to the toast to "The Lieutenant-Governor of Ontario," Sir John Gibson, who was busy celebrating the centennial in Hamilton. Mr. Hearst explained the Canadian constitution to the foreign geologists, and after paying his hearers many compliments he turned his thought to Ontario and her unbounded resources.

"In Ontario," said the minister, "we feel that there is a great field for research—that no place holds greater rewards for the seeker after truth than our own Province of Ontario. The doors of the Province of Ontario will ever be open to you, and on behalf of the province I wish you a happy time during the remainder of your congress."

Quebec's Resources.

Hon. Charles Devlin, minister of colonization, mines and fisheries for Quebec, said that it was the first time he ever attempted a speech in French in Toronto, and then went on to show "en Francals" that Quebec's mineral resources were as world-renowned as those of Ontario. He was confident that the geologists had not been disappointed in their visit to Canada, and in closing expressed the regret that the next visit to Canada would likely be kept back for years.

After Mr. Devlin came Dr. Frank D. Adams, the president of the congress, with three brilliant speeches, the best in English and the other two in French and German. In English he glorified Canada as the "paradise for geologists."

There were virgin fields in this country for every branch of geological research, and the rocks of the Dominion contained every constituent member of the geological column. The adequate study of the subject would occupy the present generations and many of the generations which would follow the present tribe. The monograph prepared on coal resources of the world showed that the United States was first in this line; but, better than that, it showed that Canada occupied the proud position of being second, and a fighting second, at that.

Our Silver Camp.

Besides coal, the Dominion had the greatest silver camp, in Cobalt, and some of the greatest copper camps. He referred to the annual immigration of 300,000, which, he said, was double the immigration of the United States in her palmiest days, and concluded by prophesying that the future development of the country would be greater than the imagination of the biggest optimist in the country.

Possibly the most wholesome speech of the whole evening was that of G. G. S. Lindsay, K.C., of the coal resources committee. Mr. Lindsay responded to the toast to the visiting delegates and members, and was most happy in his remarks. After opening with a humorous reference to Prof. Coleman of the "coal age," he

dealt with the subject which was dear to the hearts of all those present—the subject of geology.

A Century Ago.

One hundred years ago the science was just beginning to walk, but today it boasted a voluminous literature and a brilliant assembly of the clever men of the world. At the banquet 46 different countries were represented, he said, and never before had so many men and women of high distinction been gathered on this continent.

"To these," he said, "this toast is proposed. Your attendance here tonight shows the international importance of Canada. Canada is now a nation, and she has opened her heart and her resources to you."

All Responded.

Mr. Lindsay then called upon representatives of the different countries to reply to the toast, and among those who responded were Dr. Aubrey Strahan of London, England; Dr. Steinman of Germany, Dr. Termier of France, Dr. Tlesze of Austria, Dr. Chogran of Sweden, Dr. Renier of Belgium, Dr. Fermer of India, Dr. Tchernyschen of Russia and Prof. Chamberlin of the United States. The different speakers spoke in their mother tongues, and also in English, and it was after one o'clock this morning before they ended in their extolation of Canada.

Geologists Guests Of German Consul

German Members of Congress Entertained by J. Henry Peters.

The German Consul, Mr. J. Henry Peters, entertained at luncheon the German delegates to the International Geological Congress in the beautiful banquet hall of the German Club, 41 Isabella Street. Present were the Drs. Andree, Beck, Belowsky, Bergeat, Boeck, Flischer, Frech and wife, from Breslau; Guerlich, Haniel, Kayser, Keidel, from Buenos Ayres; Krusch, Lachmann, Lueck, Mayer, from Santiago, Chili; Milch, Mitscherlich, Paulecke, Pompeckj, Miss Rathgen, Riedel, Schenk, Schulze, Geheimrat Steinmann, Stille, Stollev, Tilmann, Weigand, Weise, Welter, Wolff. Among the local guests were: H. Greeff, Gerh. Heintzmann, Emil Nerlich, Otto Palm, Dr. A. C. Redderoth, F. Schnauffer, H. Simmers, Dr. Vogt, D. Weismiller, F. W. Weiss, Carl Zeidler and others.

The luncheon was a very jovial affair. Short addresses were made by Herr Geheimrat Steinmann, of Bonn, president of the delegation; Mr. Peters, the Consul, and Mr. Emil Nerlich, president of the German Club.

After luncheon a picture was taken of the party grouped in front of the club-house.

DELEGATES DINED

German Scientists Entertained at Deutscher Verein

Under the two flags of Great Britain and Germany, the German delegates to the Geological Congress were entertained at dinner yesterday at the Deutscher Verein on Isabella street, by Mr. J. Henry Peters, the German Consul. Following the national custom the speech-making was informal, and an exchange of compliments was the chief feature of the gathering. Professor Steinmann replying to the welcome of the Consul by expressing the hope that Canada would see the geologists again. Some fifty guests were at dinner, including over twenty prominent German citizens of Toronto. The menu was replete with the various dishes which make Germany renowned.

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ARMORIES HELD NOTABLE ASSEMBLY

Five Hundred Geologists Attend Official Banquet of the Congress.

DISTINGUISHED GUESTS

Delegates Prepare for Wind-up of the Twelfth International Congress.

Brains enough to do the whole world's thinking and not develop a headache were collected at one long table within a tent in the Toronto Armories last evening. It was the official banquet in connection with the 12th International Geological Congress, now in session here, and there were present, to use the words of the chairman, five hundred men, the most eminent savants of an eminent science, whose like was never before seen in this city, and a gathering probably never surpassed in any city. Apart from the noted geologists at the high table, the party included, among other distinguished Canadians, the Ministers of Mines of the Dominion and of two provinces, and the president of the largest university in the country. There were many women in the assembly.

There were over a score of speeches made during the evening in several different languages. Some of the orations were light and frothy, others were technical and abstruse, but most of them followed a safe middle path between the two extremes.

Dr. Frank D. Adams, the president of the congress, who acted as chairman and toastmaster, welcomed the visiting delegates in English, French and German.

He sketched the attractions of Canada from the geologist's point of view, mentioning in particular her vast coal deposits and the nickel and silver mines in Northern Ontario. The study of Canada's minerals, he said, would occupy the attention of generations of geologists yet unknown.

Responds for the Duke.

Hon. Louis Coderre, Federal Secretary of State and Minister of Mines, spoke to the toast of the Governor-General in the absence of the Duke of Connaught. In paying a tribute to his Royal Highness Mr. Coderre said that the Duke had "stepped away from the foot of the throne to bring Royalty in contact with the people of Canada." The Minister referred appreciatively to the Duke's arduous task in personally visiting every part of the Dominion, and voiced the gratitude of Canadians at the convalescence of the Duchess.

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Hon. W. H. Hearst, Minister of Lands, Forests and Mines for Ontario, briefly explained, for the visitors' benefit, the division of responsibility between the Federal and Provincial Governments. Referring to Ontario's position in the sphere of geology, he remarked, "I feel that in this province nature has hidden some of her greatest treasures; that no place in the world holds a greater reward for the faithful seeker after the truth."

Hon. Chas. Devlin, Minister of Colonization, Mines and Fisheries for Quebec, spoke for his province in a witty speech in French, the first in that tongue, he said, which he had had an opportunity to deliver in Toronto.

An Influence for Peace.

The toast of the visiting delegates was proposed by G. G. S. Lindsey, K.C., who remarked that he had been selected for that duty as a "junior specimen of the age interglacial, in preference to the old fossils," because, he supposed, "youths rush in where old men fear to tread." Mr. Lindsey said he had a great respect for the earth on account of its venerable age; it was a good old earth, full of information, and full of rocks. The delegates, in his view, came to Canada not only as preachers of geology, but as preachers of the gospel of peace. "These meetings and their like," he said, "are what make for universal peace," and for that reason he hoped they would come again some day, for the gospel of peace was the greatest of all gospels.

Those who were called on to speak in behalf of the visiting delegates included:—Dr. Aubrey Strachan, Great Britain; Dr. Steinman, Germany; Dr. Termier, France; Dr. Tietze, Austria, past president of the congress; Dr. Sjoegren, Sweden; Dr. Renier, Belgium; Dr. Fermor, India; Dr. Baldacci, Italy; Dr. Inouye, Japan; Professor Chamberlain, United States. Each of these gentlemen made a brief speech, four or five languages being employed by them.

The banquet was held in a large tent within the main hall of the Armouries, the interior being brilliantly lighted and decorated with evergreens massed along the walls. Music was furnished by the band of the 10th Royal Grenadiers, which played in the gallery at the other end of the Armouries. The novel feature of the proceedings was the neralding of the several toasts by a bugler stationed behind the president's chair. Several baritone selections were rendered during the evening by James Cuyler Black.

The announcement was made by Dr. Adams that Dr. W. G. Miller, who will receive the degree of doctor of laws from the University of Toronto, is shortly to be presented with a portrait of himself as a token of appreciation from the mining men of Ontario.

Reassembled for Lectures.

Refreshed by their various excursions on Tuesday, the delegates to the congress reassembled yesterday morning at the University Buildings for the continuance of the series of lectures. At 9 o'clock there was a meeting of the council in the main building, when the Belgian delegates were made acquainted with some of the details of management, in view of the next meeting in Brussels in 1917. The principal topics to be discussed at the next session will probably be "The Nitrate, Phosphate and Soda Deposits of the World," "The World's Copper Deposits," and "Our Petroleum Resources."

Yesterday's lectures dealt exclusively with the pre-Cambrian period, the morning's programme embracing addresses by Mr. J. J. Sederholm, of Helsingfors, Finland, on the "Different Types of Pre-Cambrian Unconformities"; by Mr. Grenville Cole, Dublin, Ireland, on "Illustrations of the Formation of Composite Gneisses and Amphibolites in North-west Ireland," and by Mr. G. F. Matthew, St. John, N.B., on the "Cambrian and Pre-Cambrian in the Maritime Provinces of Canada."

In the afternoon the proceedings were opened by Dr. Strahan, Assistant Director of the Geological Survey of Great Britain, who read a paper on "The Subdivisions and Correlation of the Pre-Cambrian Rocks of the British Isles." Professor Andrew Lawson, of the University of California, followed with an elaborate address advocating "A Standard Scale for the Pre-Cambrian Rocks of North America." Sir T. H. Holland, of Manchester, England, spoke on geological formations in India in their correlation to those of other parts of the world, including Canada, Professor Coleman, of Toronto University, following with a paper on "The Sudbury Series and Its Bearing on Pre-Cambrian Classification."

A general discussion on the whole subject followed.

Inspected Clay Deposits.

Two excursions were on yesterday's programme of arrangements, one at 8 a.m. to Streetsville by the C.P.R., and the other at 2 p.m. to inspect the clay deposits near Toronto.

To-day the session will be brought to a close at a general meeting at 10 a.m.

At four o'clock there will be a special convocation of the University of Toronto, for the conferring of honorary degrees, to be followed by a garden party, given by the Board of Governors of the University of Toronto, in honor of the congress.

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BIG MEN OF SCIENCE TO TOUR CANADA

Big Excursion of Geologists Will Go Through West

OTHERS TO VISIT COBALT

Chairman Lindsey of Transportation Committee Has Arranged a Splendid Schedule — Yesterday's Discussions.

Those who were fortunate enough to be present yesterday afternoon at the Physics building when "The Subdivision, Correlation and Terminology of the Pre-Cambrian Period" came under discussion will never forget the interesting debate which followed the reading of the papers.

The room was well filled and everybody was on tiptoe with anticipation. It proved to be a case of diamond cut diamond; it was thrust and parry all the while, and the humor

brought out provoked much merriment. However, the scientific side was listened to with a silence which was remarkable. If the fate of all the nations had been trembling in the balance there could not have been more tension.

Would Cast Old Word Aside.

The discussion was mainly as to the names to be applied to the various divisions of Pre-Cambrian rocks in the North American continent, and considerable debate took place as to the use of the word Laurentian. Dr. A. C. Lawson of the University of California said: "We have discovered what Laurentian means and now want to throw it overboard. All I am claiming for is a classification of the geological system; I do not care for the name, but I do care for the interpretation which the scheme implies."

The importance of the break in the form at the top of the Huronian was emphasized by Dr. Lawson, who explained it by the Eparchean interval. This point was taken up by Dr. Leith of Wisconsin.

Dr. Coleman of Toronto pointed out that the name Laurentian might well be retained for the granites intruded throughout the Sudbury series, but clearly older than the Huronian. Dr. Leith was not inclined to accept the Couchiching series as necessarily older than the Keewatin. The discussion was participated in by Dr. Sederholm of Finland; Dr. Barlow, McGill University; Sir T. H. Gollard of the Asiatic Society of Bengal; Prof. G. A. J. Cole; Dr. Horne, Scotland, and Mr. L. Fermor of the Government of India. Dr. A. Strachan of the Geological Survey of Great Britain was Chairman. It was an enjoyable afternoon, and the various speakers met with hearty applause as they drove home their arguments.

Mr. Lindsey's Good Work.

Mr. G. G. S. Lindsey, K. C., the Chairman of the Transportation Committee, has good reason to be proud of himself. The big C-1 excursion which leaves for the west to-night is composed of a wonderful body of women and men. Of the 115 members, Austria has 3, Argentine 1, Belgium 2, Canada 24, France 10, Germany 17, Great Britain 9, Greece 1; Hungary 1, Indo-China 2, Italy 3, Netherlands 1, Russia 8, Sweden 4, United States 24. The leader is the President, Dr. F. D. Adams; Associate Leader, J. B. Tyrrell; Secretary, J. McLelsh, Chief of the Division of Mineral Resources and Statistics, Ottawa. The other excursions to Cobalt and the west are almost filled up, and the members are looking forward to a good time.

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GEOLOGISTS ARE 'GRATEFUL.'

Resolution of Thanks to the Contributors to Congress.

At the meeting of the International Geological Congress to-day a resolution was passed expressing the thanks of the congress to the various Governments, the City of Toronto, the University of Toronto, and the various contributors for the assistance and entertainment afforded them in their meetings here. Special acknowledgment was made of the work of President Adams and Secretary R. W. Brock.

CONGRESS HAS CONCLUDED ITS DISCUSSIONS

After Closing Social Functions Scientists Will Leave on Excursions

With loudly applauded resolutions of thanks to all those who had made the gathering a success, the Twelfth International Geological Congress closed its final meeting this morning, and after the conferring of degrees at Convocation and the garden party this afternoon, the Congress will disperse until it meets four years hence in Brussels. This evening the first excursions leave for the Canadian West.

In moving the resolutions, Mr. G. O. Smith declared that as a member of the largest delegation to the Congress and coming from the United States, Canada's nearest neighbor, he could share the glory of the Dominion in entertaining so distinguished a body. "Some have greatness thrust upon us, others are born great," he said, "and I was born within five miles of the Canadian line."

Gratitude was expressed in the motion to the Duke of Connaught for extending his patronage, to the Federal and Provincial Governments, the City of Toronto, the University, the colleges, and all those who had contributed to the success and comfort of the Congress. Special gratitude was due to President Adams and General-Secretary Brock.

M. Regnier, in a neat speech, thanked the Congress for accepting Belgium's invitation and asked for the co-operation of the members in making the gathering of 1917 a success.

Chart of the World.

Among the reports adopted by the general meeting this morning were those of the glacial commission and the commission which has outlined the plans for the new chart of the world, with the apportionment of countries to various geographers. Following the lead of the zoological societies, the new rules for pleaeontological nomenclature will be adopted, and the geographical lexicon is to be re-edited for the next Congress. Mr. R. W. Brock has been made a member of the committee. In addition, international committees will be formed for the purpose of correlating Pre-Cambrian formations and drafting constitutional by-laws for the Congress.

BANQUET TO GEOLOGISTS

Armouries the Scene of Brilliant Gathering—Over Forty Countries Represented by Delegates—Many Handsome Gowns Worn by the Ladies

Celebrating an entente cordiale of over forty countries which, said Hon. Louis Coderre, Federal Minister of Mines, would make for "the glory, the peace and the welfare, not only of Canada, but of the whole world," the Twelfth International Geological Congress was entertained at the banquet given last night at the Armouries by the President and Executive Committee on behalf of Canada.

Seven hundred and fifty covers had been laid for the guests, and the good fellowship which prevailed from half past eight until one o'clock this morning revealed the excellence of humanity which underlies one of the most "technical" sciences in the world. From East and West and South they had come, from laboratories and the great fields, and there was not a single national or scientific prejudice to mar the happiness of the evening. The speeches made were complimentary in the extreme, but the sincerity of the remarks was undoubted. Canadians, who were present, will not easily forget the gathering which has prefaced the beginning of the end, when the geologists are about to leave Toronto for the Western excursions and a subsequent dispersion to the four corners of the earth.

H.R.H. the Duke of Connaught was represented by Hon. Louis Coderre, and the Lieutenant-Governor of Ontario by Hon. W. H. Hearst. The Ministers expressed regret at the unavoidable absence of His Majesty's representatives, Hon. Louis Coderre declaring that he was sure it would have given the Duke great pleasure to have been present and thanking the foreign delegates for their expressions of sympathy at the illness of the Duchess.

Ontario did not want for champions, when it came to the geological eulogies of the evening. While Hon. Charles Devlin, lauded the resources of Quebec, Ontario was upheld by Mr. Hearst as one of the greatest fields of research in the world. Canada, declared Dr. Frank Adams in his Presidential speech, was the very paradise of geologists. Speaking of the future of the Dominion, he declared that immigration to this country, now 300,000 annually, was greater in proportion to its population than it ever was in the United States. He concluded by mentioning that the miners of Ontario were presenting Dr. W. G. Miller with a portrait of himself in oils, in recognition of his services, and that the University of Toronto was conferring upon him the degree of LL.D.

Response to the toasts to British and foreign delegates was made by Dr. Aubrey Strahan, of England; Dr. Steinman, of German; Dr. Ternier, of France; Dr. Tieze, of Austria; Dr. Chagran of Sweden; Dr. Renler, of Belgium; Dr. Fermor, of India; Dr. Tchernyschef, of Russia, and Prof. Chamberlin, of the United States.

The banquet was held in a large tent which had been erected in the building, and was lined with cedar trees. The tables looked very lovely with bowls of scarlet gladioli and yellow asters arranged alternately with gold shaded candles between.

Among the lovely gowns worn were those of: The president's wife, Mrs. Frank D. Adams of Montreal, a very handsome gown of white satin with embroideries of black, grey and silver and a cerise girdle; Mrs. Arnoldi, in black lace and ninon, with pearls;

Mrs. Matthews, black silk and real lace; Mrs. Haltedahl, blue silk; Mrs. J. F. Kemp, lavender charmeuse; Miss Mary McLennan of Stratford, green satin draped with black; Mrs. T. L. Walker, in black; Mrs. J. A. Macdonald, white brocade with gold and crystal lace; Mrs. Murray Clarke very handsome in a French gown

of white Dresden chiffon veiled with gray, pearl ornaments, a corsage bouquet of pink roses and roses in her hair, Mrs. W. F. Ferrier wore a gown of midnight blue broche crepe de chine with real lace and ornaments of opals and diamonds; Miss Ferrier was in beauty satin; Miss Neville wore apricot flowered chiffon over satin; Madame Coderre, in black with diamonds, Mrs. David Dunlap, a Parisian gown of Brussels lace, draped over white and silver brocade, opal and diamond necklace and earrings, corsage bouquet of pink roses; Mrs. J. D. Tyrrell, a beautiful gown of white satin, embroidered with cornflowers and silver; Mrs. Hocken was in white satin draped with Dresden ninon and lace, diamond ornaments and magnificent purple orchids on her corsage; Lady McRoberts, very handsome in white satin draped with black gauze, a deep hem of coral satin, which was also introduced on the bodice, very beautiful necklace and earrings of diamonds; Mrs. Morant, pale blue satin with gold and silver embroideries; Mrs. Arthur Day, of Washington, palest pink chiffon over white satin, with silver embroideries; Mrs. Coleman, black with crimson, rose embroidered panels, real lace scarf; Mrs. Bedford MacNeil, of London, pink chiffon over crepe de chine, pearl ornaments; Mrs. Strahan of London, grey brocade with old Brussels point lace and antique necklace and ornaments of amethysts; Mrs. C. V. Hoiman, of Maine, very handsome in black lace, satin and jet, with magnificent diamonds; Miss Rathgin, green chiffon over white satin; Mrs. and Miss Stephenson, both in black satin; Mrs. Haultain wore a white gown; Mrs. McEvoy, mauve satin with real lace; Mrs. Parks, royal blue, veiled with black chiffon and a corsage bouquet of lilies; Mrs. Fermor, of India, black satin with tunic of white lace, corsage bouquet of red roses; Mrs. Charlton, of London, black over white satin, with black velvet, carbuncle and diamond earrings, bandeau of antique pearls on black velvet; Miss Addison, pale blue and silver; Mrs. Peck, white satin draped with real lace, trimmed black velvet and pearls, pearl ornaments; Mrs. Whitman Cross, in a very effective gown of black and white lace with diamond ornaments.

Geological Congress



Above—Prof. Fairchild, President University of Rochester, and Prof. Kay, Iowa State Geologist. Below—Prof. J. D. Howell, F.R.G.S., Director of the Geological Survey, Newfoundland.

Globe. Aug. 14-1913.

NO NOISY FLAG-FLAPPING, BUT ENTWINED EMBLEMS

Practical Evidence of the Entente Cordiale Between Briton and Teuton at Unique Dinner in Toronto Yesterday

It didn't seem to sound like that terrible bogey of "menace," and "peril," and "emergency" with which politicians are wont to frighten our loyal and peaceful Canadian citizenship. It was a noteworthy and happy gathering of distinguished Germans in Canada's Mecca of jingoism—an intermingling of Anglo-Saxon and Teuton in cordial camaraderie under the entwined flags of King George and the Kaiser Wilhelm.

If they had not previously felt perfectly at home in Toronto, the German delegates to the International Geological Congress realized complete relaxation yesterday, when some thirty or more of them sat down to a complimentary dinner tendered by the German Consul, Mr. J. Henry Peters, at Deutscher Verein, the German club on Isabella street. In addition to the delegates upwards of twenty prominent German citizens of Toronto were present.

No one was there who could not speak the language of the Fatherland. From the moment when the guests fled into the well-appointed dining-room until they left it, three hours later, visitors and hosts became completely absorbed in the discussion of matters pertaining to old Fatherland.

The menu provided was in true German style, and it was not to be wondered at if, for some, it was the best-relished meal enjoyed since leaving home. There were, of course, the characteristic rye bread, Limburger cheese, fish eggs, and the inevitable German brew, besides numberless little dainties only a German chef can provide.

In keeping with the German custom there was very little speech-making after the repast, but the speakers, referring to the pleasure it gave them to meet their scientific brethren under the British flag, emphasized the cordial relations existing between Great Britain and Germany to-day. The German Consul briefly bade his company welcome, and expressed the hope that they would return again to this country. Professor Steinmann, replying for the German geologists, assured all present that their visit to Canada would indeed be a memorable one in the lives of all the delegates. Just before rising, Mr. Emil Nerlich, President of the Deutscher Verein, expressed his happiness at having such a distinguished company dine at his club.

The delegates included two ladies, Fraulein Rathgen, who recently made a tour of exploration in Egypt, and Mrs. Frech, who was present with her husband, Professor Frech of Breslau.

AT BIG BANQUET MEN OF NATIONS WERE ASSEMBLED

A Brilliant Spectacle When 500
Geologists Assemble at
Armories.

SPEAKERS IN MANY
LANGUAGES HEARD

Representatives of the Various
Governments Express Appreciation of the Congress.

MANY LADIES PRESENT

Wars and Rumors of Wars
Had No Place
There.

Under a canopy of canvas within the castle walls of Toronto's military armories, there met last night at the banquet tables envoys from practically the entire civilized world in a feast of fellowship. War, war-cries, and the rumors of war might never have existed so far as was evidenced by the international gathering last night. It was one great full international chord of harmony. Men of Germany, Japan, France, China, England, Austria, the United States, Italy, India, Canada, the Philippines, and goodness knows where else, met in the spirit of unity.

Many Ladies Present.

Nearly 500 delegates, members, and friends, were marshaled in the armories. When about 9 o'clock Secretary Leekie gave the word—"Dinner is served," many ladies, all in full dress, some from far countries, others well known in the social circles of Toronto, relieved the sombre black and white circles at the tables, and the scientific solidarity of the conversation.

Inside the great marquee the scene was one of light and brilliance. About 50 tables were spread over the floor. At the south end a long table extended the full width, and here were seated some of the men whose names are known to geologists and mining engineers the world over, as authoritative. Here, too, were seated the Hon. Louis Coderre, representing the Governor-General and the Government of Canada, Hon. Mr. Charles Devlin, Minister of Mines and Fisheries for Quebec, Hon. W. H. Hearst, Minister of Lands, Forests, and Mines, for Ontario, Mayor Hocken of Toronto, President Falconer of Toronto University, and many others of distinction at home as well as abroad.

A Beautiful Scene.

The great tent was walled in by cedars, and lit by pendant electric globes. Hanging baskets of flowers descended also from the canvas roof, while all the tables bore masses of gladioli and golden glow. A trumpeter in a red uniform stood behind President Adams' chair to signal when each

announcement was to be made. The Grenadier Band played grand opera music in the west gallery. The banquet was probably one of the best managed and brisked in its interest of those ever held here, and its international character was unique.

Representatives of Canada.

Hon. Louis Coderre spoke in English.

Referring to the future of the country, he said that her Royal Highness was recovered. In the near future the royal couple will be again in our midst. And were it possible for them to visit Toronto at this moment, I am confident that nowhere could they be sheltered more than in the hearts of the distinguished visitors here to-night.

Mr. James Black, who interspersed the speeches at certain intervals with vocal solos in English, French, Italian, and German, followed here with an enthusiastic rendering of "O Canada."

Mr. Hearst referred to the 400,000 square miles of territory in Canada, an area, he said, 7 or 8 times that of England and Wales.

Hon. Charles Devlin, of Quebec, told the delegates that he did not understand their language and he did not suppose they would understand his (French-Canadian). However, when he spoke in French he was highly applauded. He said the reception to the congress in Canada represented the sentiment of the people of Canada.

A Presidential Welcome.

When the delegates from all the world met in Toronto for the first time, President Adams. "We have here one of the most distinguished gatherings in geological science. Canada is a paradise for geologists. The wealth of our material embarrasses us. We have every constituent developed from the Archean and the Pleistocene to the great sedimentary column representing every aeon in the history of time."

Dr. Adams then modestly referred to our mineral resources. Our immigration at the rate of 300,000 a year was one of the great world-movements of the people, and exceeded the rate per head of established population set by the United States in its greatest period by three times.

"Our earnest hope is that you will carry home with you pleasant memories of Canada, and will retain of your visit."

Dr. Adams then made remarks in French and English to the light of the Toronto meeting, and in general addressed the delegates in German. Dr. Adams then said that it was stated that Professor Miller, who was to be honored by the University degree Doctor of Law to-day, was to have an oil portrait of himself presented by the mining men of Canada.

A Capable Organizer.

Mr. G. G. S. Lindsey, K.C., chairman of the local finance committee, who made himself not only extremely useful as an organizer, but popular as well through the course of this Congress, followed.

"Youths rush in where fossils fear to tread," he said, disclaiming any other right to speak for Toronto geologists.

"It's a good old earth," said Mr. Lindsey, "full of information, full of interest, and full of rocks."

Geology as a science was about 100 years old. The most of its history had been written in the last 50 years, and the men and women who had written the most of it were mostly all present before and beside him.

"We have learned to love you," declared Mr. Lindsey. "We are all students of nature, and one touch of nature makes the whole world kin. Until we meet again in Belgium for the advancement of science and the world's peace, we wish you peace and goodwill," concluded Mr. Lindsey.

Speakers in Other Languages.

Dr. Steinmann, of Germany, then followed in German. Dr. Ternier spoke in French for the geologists of France. Dr. Tietze spoke in German for Austria. Mr. Chamberlain, of Chicago, dean of American geologists, spoke for the United States.

"On behalf of your nearest neighbor I bring to you greetings and congratulations," he said. "You represent in Canada the Alpha and Omega of geology. You are the cornerstone of the world and a large part of the foundation. You have had a steady geological growth with the least possible amount of cataclysm commensurate with the great development. You are the great exemplification of continental glaciation, that period of trial of what was good and the elimination of what was weak preparatory to the new future. If geology brings us any message that is great and inspiring to mankind, it is one of destined greatness of future for the human race."

"In that great future we look to this nation as one of the great nations yet to come."

The Canadian Problem.

Dr. Strahan, of London, said that one language would suffice to express his sentiments—English.

"It did not impress me so much that Canada was ten times as big as the British Isles," he said smiling. "The Atlantic ocean is bigger than either. The big thing here is your problem. You have half a continent and your problems are of cosmic importance. At home we are at the parochial stage. The big things have been done. What impresses me is the important work Canadian geologists have done in deciphering the geology of your great territory."

Dr. Strahan said that more money was being wasted in England exploring in impossible places for coal than would pay for a National Survey and a pension for its deserving officers.

"This is the message," concluded the distinguished Britisher, "that I shall take home to my confreres: I find in Canada enormous resources awaiting development. I find capable geologists in the East as well as in the West, investigating those resources."

Dr. Fernow said that India had only heretofore developed gold and iron. She was going ahead now and would catch up to Canada.

A Toast from Italy.

The Venerable Professor Carlo de Steppeni of Florence spoke for Italy of the land of Columbus and Cabot and Vespucci.

"In the names of Italy and Rome, propose the toast of Canada, the land of youth, enthusiasm, strength, and execution," cried the aged Italian scientist.

Mr. Inouye, of Japan, said the congress was drawing civilized nations together into closer relation. "Japan has made great progress, and we hope with your assistance we may be able to fulfill our duties towards mankind," concluded Mr. Inouye. "Let me again express our hearty thanks for the hospitality of the Canadian people.—Banzai!"

The Swedish speaker likened Canada to Sweden, as the greater counterpart of his own country.

Geologists Stimulated.

"It is stimulating for European geologists to witness the conquest of the New World by the Anglo-Saxon race, co-operating with the foremost races of the international world," he said. "We have a slowly-budding intention to bridge the sea from Spitzbergen to Greenland and from Greenland to the north-eastern shore of Canada."

"The work of this congress will prove of everlasting benefit to science," concluded Dr. Backstrom.

Dr. Tchernyschew spoke in French in behalf of Russia.

Mr. McDermott secretary of the Institute of Metallurgy, replied for the ladies.

"We thank you," he said, amidst laughing applause.

The international gathering then sang "God Save the King" in the traditional loyal style of Britain and British America.

The Geological Banquet

One of the most charming and brilliant events of the season was the banquet given by the president and Executive Committee of the International Geological Congress in the armories last night. A large marquee had been formed into a perfect cedar forest, with softly carpeted floor of green, and inside this bower were placed numbers of small tables, seating ten and twelve, with the long table of honor for the president and the most distinguished guests. The decorations were very beautiful, consisting of brass bowls filled with scarlet gladioli and yellow asters alternately, and brass candles shaded in gold on the smaller tables, while the long table was arranged with silver and silver bowls holding orchids, carrying out most effectively the color scheme of red, gold, and silver. The large toast list included the toast of "His Majesty the King," proposed by the president; to "H. R. H. the Duke of Connaught, Governor-General, and the Duchess of Connaught," responded to by Hon. Mr. Coderre, Minister of Mines; "The Lieutenant-Governor of Ontario," and others. Among the many lovely gowns worn were: The president's wife, Mrs. Frank D. Adams (Montreal), a very handsome gown of white satin with embroideries of black, grey, and silver, and a centre girdle; Madame Coderre, in black with diamonds; Mrs. Hocken was in white satin draped with Dresden tulle and lace, diamond ornaments, and magnificent purple orchids on her corsage; Mrs. J. D. Tyrrell, a beautiful gown of white satin, embroidered with cornflowers and silver; Mrs. David Dunlap, a Parisian gown of Brussels lace, draped over white and silver brocade, opal and diamond necklace and earrings, corsage bouquet of pink roses; Lady McRoberts, very handsome in white satin draped with black gauze, a deep hem of coral satin, which was also introduced on the bodice, very beautiful necklace and earrings of diamonds; Mrs. Coleman, black with crimson, rose embroidered panels, real lace scarf; Mrs. Bedford MacNeill (London), pink chiffon over crepe de chine, pearl ornaments; Mrs. Strahan (London), grey brocade with old Brussels point lace and antique necklace and ornaments of amethysts; Mrs. Fernow, India, black satin with tunic of white lace, corsage bouquet of red roses; Mrs. Charlton (London), black over white satin, with black velvet, carbuncle and diamond earrings, bandeau of antique pearls on black velvet; Miss Addison, pale blue and silver; Mrs. Peck, white satin draped with real lace, trimmed black velvet and pearls, pearl ornaments; Mrs. Whittman Cross, in a very effective gown of black and white lace, with diamond ornaments; Mrs. C. V. Holman (Maine), very handsome in black lace, satin, and jet, with magnificent diamonds; Miss Rathgen, green chiffon over white satin; Mrs. and Miss Stephenson, both in black satin; Mrs. Haultain wore a white gown; Mrs. McEvoy, mauve satin with real lace; Mrs. Parks, royal blue, veiled with black chiffon and a corsage bouquet of lilies; Mrs. Arnoldi, black lace and tulle, with pearls; Mrs. Matthews, black silk and real lace; Mrs. Halldahl, blue silk; Mrs. J. F. Kemp, lavender charmeuse; Miss Mary McLennan (Stratford), green satin draped with black; Mrs. T. L. Walker, in black; Mrs. J. A. Macdonald, white brocade with gold and crystal lace; Mrs. Morant, pale blue satin with gold and silver embroideries; Mrs. Arthur Day (Washington), palest pink chiffon over white satin, with silver embroideries; Mrs. Murray Clarke, a French gown of white Dresden chiffon veiled with grey, pearl ornaments, a corsage bouquet of pink roses and roses in her hair; Mrs. W. F. Ferrier wore a gown of midnight blue brocade crepe de chine with real lace and ornaments of opals and diamonds; Miss Ferrier was in beauty satin, and Miss Neville wore apricot flowered chiffon over satin.

CEDARS OF LEBANON ARE ALMOST EXTINCT

Professor Day of Beirut Tells
of His Experiences in
Palestine.

A BENEVOLENT DESPOT

The Only Remedy by Which to
Control the Religious
Fanatics.

One of the many interesting personalities at this Geological Conference is Professor A. E. Day of Syria. Originally from Illinois, he has been attached to a Protestant lay missionary college near Beirut for a number of years. The far-famed cedars of Lebanon are within the district of his activities.

"There is one grove," he said, "that is apparently very old. Whether it really existed in Bible times or not I do not know. It is protected by the village which owns it, and a watchman is kept there day and night. The goats in that country eat everything, and would otherwise destroy the young trees. The cutting of wood is strictly regulated. By this care the grove itself is preserved, but it does not spread in area. There are two or three other lesser groves of younger trees. Otherwise the far-famed Cedars of Lebanon from which Solomon secured the timbers for his temple at Jerusalem are no more."

Climate Changing.

Professor Day thinks that the climate of Syria and the whole region of the Holy Land is changing.

"Back from the anti-Lebanon range," he said, "comes the desert. Here the population, of course, is now very scant. The wild Bedouin Arabs are a source of danger to those who live on the border of the desert, and that may be one reason for the loneliness of the region. But there seems to be a traceable line beyond which rainfall is insufficient to maintain vegetation in the present era. At one time, however, this was not the case. All along the region of this boundary of the rainfall are the ruins of ancient stone cities."

Syria itself and the Lebanon hills especially enjoys a fairly pleasant climate, according to the professor.

"Summer temperatures do not often exceed 85," said he. "I wear the same clothes there as here. In the mountains of Lebanon the air is clear and keen. On the plain it is humid. In the cities it is not bad. Damascus streets are, many of them, roofed over and it is really very cool and pleasant to stroll through the arcades of the Damascus bazar and observe the life and activity."

Terrible Taxation.

"The Turkish Government of Syria as elsewhere discourages development by over-taxation. When an enterprise is starting the tax collectors swoop down and put such a burden upon it as to crush the infant industry. There is no lumber in the country—flooring of marble slabs being cheaper than the imported American tongue-and-groove boards. A sort of green oak is imported from Asia Minor for firewood. This wood is cut while the tree is small, and it is then allowed to grow up again. Charcoal is made

from it. In winter the buildings are not usually heated. A family will gather around a charcoal brazier, but that is all. Even in the college we do not heat all the rooms. The temperature in winter runs at about 40 to 60. There is an interval of three weeks or so of beautiful clear sunny weather in mid-winter. Otherwise the winter is raw and damp. The country is fertile, but rocky. The soil is held on the hills by terraces and stone walls. There is little or no grass as in this country. The Jordan is a muddy stream and the Dead Sea is so salty one cannot sink above the chest. The source of the Jordan is in the fountains in the Lebanon Mountains, where clear cold water bursts out of the rocks. These fountains are in turn fed by the melting snow glaciers at the summits."

A Virile People.

The whole land has once been heavily forested, Professor Day thinks. Re-forestation has decreased the rainfall, and such rain as comes in the wet season runs off quickly and has largely denuded the hills of soil. Stones and sterility have resulted, and the population in the mountainous parts live meagrely on the goats, who in turn live on the scanty sustenance found amid the rocks. In the plains oranges and grapes grow well and with dates may be had for more than half the year. Wheat is also grown. The people are fairly virile and healthy. An Abbeylan youth at the college runs a mile in good time, while another student does 100 yards in 10 7-5 seconds. Soccer football is the favorite game played at the mission college.

Religious Fanatics.

"Varying fanatical sects and religions make it almost a despair to expect that some day popular government will be introduced," said Professor Day. "The Moslems will not cooperate with other sects as equals. A benevolent despotism would be the ideal form of government there."

Bombarded Beirut.

Professor Day was in Beirut when the Italian warships shelled the Turkish gunboats in the harbor, and incidentally destroyed part of the town and killed about sixty citizens.

"They fired from out at the sea about three miles," he relates. "They did not seem to be particular about the range, and most of their shells landed in the town. Finally the Turkish gunboats were sunk, but by this time many of the terrified citizens had fled for the open country. Troughs broke into the arsenal and stole military rifles. They killed a number of people they suspected of being Italians. The Turkish soldiers rounded them up, however, and by noon next day had all the rifles back and the town quieted."

Professor Day has grown to prefer Syria to Illinois, and would be sorry were he not going back there.

DEGREES GIVEN AT UNIVERSITY TO GEOLOGISTS

Interesting Ceremony Performed
This Afternoon in Con-
vocation Hall.

SEVEN MEN BECOME LL.D.'S HONORIS CAUSA

Chancellor Sir William Meredith
Presides for the
Occasion.

TORONTO MAN IN THE LIST

Many Ladies Give a Lively Inter-
est to the Event—March
Across Campus.

The old University of Toronto gathered unto herself all her array of dignitaries, donned her solemn clothing and such small touches of color as she permits herself, and bestowed upon seven distinguished scholars the degree of LL.D. this afternoon in Convocation Hall. A sunny day with just a film of haze over the trees in the park made a perfect setting for the little procession of solemn men of learning that moved across the campus into the cool shadow of the big stone-pillared building and into Convocation.

Presently from a dozen different directions across the campus came the ladies of the University circle—spots of bright color, pink parasols, white gowns, and moderately-worldly hats. They, too, were swallowed up by the doors of the hall. Limousines rolled up the drive, touring cars—and a press photographer set up his weather-worn apparatus to record the scene upon his plates.

Within, the organ of Convocation Hall discoursed of words and feelings under the hands of a solemn organist. Slow crescendoes, and dreamy diminuendoes swelled and retreated over the heads of the audience, pushing out all thoughts of the vulgar world beating itself against the walls outside, preparing the mind for the ceremony of the University, the conferring of the degrees.

The organ stopped and with a scuffling and creaking of doors the black-gowned procession entered. First the President, Dr. Falkner and Chancellor Sir William Meredith. Then the men about to receive the degree: Dr. R. Beck of Berlin, presented by Dean Fernow; Prof. Chamberlain of the University of Chicago, by Professor Coleman; Dr. W. G. Miller, Geologist for the Ontario Bureau of Mines, by Professor DeLury; Dr. Sederholm of Finland, by Professor Walker; Dr. Strachan, Director of the British Geological Survey, by President Falkner; Dr. Termier of Paris, by Professor Dechamps; and Dr. Tschermyschew, by Professor Parks.

The simple but impressive ceremony was soon over. After prayers, the Dean Fernow rose with Dr. Beck, and in a short address in German presented his nominee. The latter then stepped forward, and was received by the hand of the Chancellor. He then passed over to the Roll of Convocation, and signed it. The others followed the same course. The gathering afterward attended the garden party in the quadrangle.

GERMANY'S LADY DELEGATE CAME TO TORONTO ALONE

Sees Nothing Remarkable About Traveling a Long Distance Unattended.

The only lady delegate to the Geological Congress from Germany is Fraulein Anna Maria Ellsabeth Rathgen. Quite young—she is still in her student days at the University of Bonn am Rhein, in Germany—she is already a traveler of wide experience. She is paying her first visit to this continent. Before reaching Toronto she made a trip through Nova Scotia and New Brunswick, and she is now about to start for the Rockies. She has visited practically every European country, and speaks the language of most of them fluently. English she speaks with remarkable ease and accuracy. She has also visited South Africa. So it will readily be seen what an intrepid traveler she is. For she came to this country unaccompanied by friends—"though I find it easy to make friends on a trip," she told The Star. And small wonder, for she is as unaffected as she is capable.

"I was rather surprised," she said to The Star, in the course of a chat, "to meet so many people in this country who seemed to think it odd that a girl should come all the way from Germany by herself to attend a congress. I thought that in these days—and particularly on this continent—there would be considered nothing remarkable in that. I left Germany in last June, and am not returning there till next April."

Referring to her work at Bonn University, Fraulein Rathgen said that she was a pupil of the noted geologist, Prof. Steinmann, and was engaged in museum work.

"This is my first congress," she added, "and I am naturally delighted with everything. But I fear that I have too much neglected the scientific for the social side of it. So much has been done for us in Toronto that I seem to have been literally swimming in amusement during the past week. What are my impressions of Toronto? Well, generally, that it is everything that is charming. But I never forget that, when one visits a place for so short a time, one can only obtain a very superficial idea of the place itself—on an occasion such as this, when one is a guest and is treated with so much consideration, one sees, perhaps, only the best side. I should add that I am very fond of mountaineering, and have done work in the mountains of Greece and Switzerland and France, as well as in those of my own land."

News. Aug. 14-1913.



Star, Aug. 14-1913.

Star, Aug. 14-1913.

Telegram, Aug 14-77
1913

Women at the Congress

Fair Visitors Delighted With the Way in Which They Have Been Entertained While in Toronto—Some Noted Lady Geologists.

Specially written for The Star.
"There are many women at the congress, but few of us are really working geologists. For instance, I come because my husband comes, and a very delightful time we have had here."
Thus spoke Madame Lacroix, the wife of the renowned scientist Dr. Alfred Lacroix, professor of mineralogy in the French Natural History Museum, and one of the most distinguished of the French representatives at the congress, to The Star. But some of Madame Lacroix's compatriots at the congress say that her natural modesty causes her to rate herself too humbly. They assert that her knowledge of geology is very far from being the merely superficial knowledge which the wife of so distinguished a scientist as Doctor Lacroix can hardly help acquiring, but that, on the contrary, she has for long been of the greatest practical assistance to her husband in his researches.

Speaks in French.

Madame Lacroix speaks little English. In the purest of Parisian French she expressed to The Star her delight in the congress and her gratitude for the arrangements made for the comfort of the visitors.

"Our hosts have been too good," she impulsively exclaimed, "and what a magnificent city is your Toronto. This is my first congress outside Paris, and I am quite looking forward to attending another. I shall be desolated at leaving this fine city and all the kind friends we have made here."

Equally ardent in praise of Toronto and of the congress and all that appertains to it was charming Mademoiselle M. M. Termier, another of the French visitors, and daughter of M. Termier, director of the French Geological Survey, who is a leading light at the congress. Mlle. Termier like Madame Lacroix, disclaimed any right to be regarded as a geologist, although she told The Star that she took a very keen interest in the science.

Lady McRobert is one of the ladies who are themselves practical geologists. She has earned considerable scientific distinction at the London College of Science. During the congress Lady McRobert, who is extremely pleasant and unassuming—the very reverse of the blue-stocking type—has become very popular with her fellow-members. She is the second wife of Sir Alexander McRobert, who, though not himself a geologist, is yet a scientist of high reputation, having adopted chemistry and experimental physics as his branches. He is managing director of the Cawnpore Woolen Mills, and has a wide acquaintance with India. Lady McRobert is an American by birth, being a daughter of William Hunter Workman, of Worcester, Massachusetts, the famous explorer and topographical authority.

One of the most notable of the women figures is the little lady Doctor of Philosophy from Rotterdam—Alide Gutterink. Micro-chemistry is Dr. Gutterink's special branch of study, the crystals obtained from minerals being the especial objects of her attention in their connection with chemical work. She is a very interesting personality, and one need not talk long with her to discover how well abreast of modern thought the ladies of the Netherlands must be if there are many of them like her.

Two Lady Professors.

Another of the most distinguished of the lady visitors is Miss Florence Bascom, professor of geology at Bryn Mawr College. Both as author and as professor she enjoys a very enviable position among the geologists of the United States. Equally distinguished is Miss C. A. Raisin, of Bedford College, London. Miss Raisin represents the famous London Linnean Society, which, it was interesting to learn, possesses the manuscripts of many of Linnaeus' publications.

Not a little of the smoothness with which the arrangements for the comfort of the visiting ladies have worked, has been due, as many of them told The Star, to the thoughtfulness and tact of Madame Hoffmann, the graceful and winning little lady who receives them in the main building upstairs. She speaks something like eight languages, so that wherever a new-comer may hail from, she at once feels at home with Madame.

Star, Aug. 14-1913.

CONGRESS OVER, COST A MILLION IS THE ESTIMATE

Prof. Parks Outlines for The Star the Work It Accomplished.

GEOLOGISTS LEAVE FOR ENDS OF EARTH

Fourteen Thousand Pages Were Printed for the Congress Guide Books Alone.

GOVERNMENTS PAY MUCH

Visitors Were of a Class Whose Knowledge of Canada Will Benefit Dominion.

At noon to-day one of the greatest conventions ever held in Canada, and in some ways, the most important held anywhere in the world this year, came to an official end. The Twelfth Geological Congress goes down in scientific history.

The conferring of degrees at Convocation Hall this afternoon and the official farewell garden party are the last courtesies Toronto can show one of the most distinguished, erudite, and urbane gatherings that ever entered her gates. Four years hence the next congress meets in Belgium. After that Tibet or Peru or Afghanistan, for all anyone can tell now.

Congress Cost a Million.

This congress has cost, not \$75,000, as was glibly estimated at one time, but close to a million dollars. Seventy-five thousand dollars might cover the actual outlay of cash by the Canadian committee, but in addition to this there was the printing of 14,000 pages of geological guide-books to Canada, paid for by the Dominion and Provincial Governments; the printing of the huge monograph on the Coal Resources of the World, a work so great that it could only be undertaken under a guarantee by the Ottawa Government; the time of the expensive scientific men devoted to preparing such work; the two years devoted by the Geological Survey at Ottawa, and the Ontario Bureau of Mines in collecting the data for the guide-books—not mere Baedeker, but veritable handbooks of geology along 12,000 miles of Canadian railways, to say nothing of the cost of the long and expensive excursions and the cost of board and lodging and incidentals for the visitors.

Dr. Parks' Summarizes Work.

"The meetings," said Dr. W. C. Parks of the University this morning, "have been a great success—of course. The total registration was over 900—close to 1,000, and the total attendance here was 450.

"The congress served, scientifically speaking, three distinct ends. The first, and most important, of these was the series of excursions. Something like thirty-three were arranged so as to exhibit the geology of practically all of Canada that is readily accessible by rail. The guide books printed specially for these excursions total about 14,000 pages, and include hundreds of maps. We have been working for three years on them—the committee, the Bureau of Mines for Ontario, and the Geological Survey of the Dominion. These guide books are practically a text book, up-to-the-minute, of the geology of Canada. From a commercial side, these excursions must benefit the mining industry of Canada, and the other industries as well. They offered a splendid exhibition of Canada's national resources of all kinds. The type of men at this congress are such as to profit by what they have thus been shown, and are men who can disseminate the information about Canada very widely.

Standardizing Geological Terms.

"In the second place come the scientific meetings and discussions. In that connection there were a number of standing committees which have been appointed to report on certain subjects of international scientific importance, such as the correlation of the results of the different geological surveys held by the different Governments of the world. Part of the work of such committees is to standardize the nomenclature and the methods of observation and description employed by geologists in different countries.

In the third place, the congress undertakes each time some one big piece of work. This year it was the monograph on the coal resources of the world, published in three large quarto volumes with a map. This publication was guaranteed against loss by the Dominion Government.

GEOLOGS. LOOK HOMEWARD

TWELFTH SESSION ENDED.

Garden Party This Afternoon and Special Convocation at University to Confer Degrees.

The twelfth session of the International Geological Congress is over. If you have any suggestions or reports to make you will have to take it to Belgium in 1917. The council which has guided this congress to success arose this morning a disbanded body. The two delegates from Belgium are now the big men for the remainder of the day.

Nearly every steamship line that is or ever was has an agent or some literature up at the University this morning, explaining the best method for the delegates to return home. "There is just one way to get home in comfort," they seem to say, "and that is by the line I represent."

There is one man in this city who at last can enter into the feeling of the late J. P. Morgan. This man is the photographer who made the large group photo of the delegates yesterday. He has opened a temporary office on the University steps, and he has the delegates around him like a swarm of bees—all desiring one or more prints mailed to his home. This is a cash in advance deal, and from the appearance of the business about noon the photographer will have to sit up all night to count his money.

MANY THANKS.

Some final business was cleared up this morning and at the conclusion Mr. G. O. Smith, director of the United States Geological Survey, read a motion of thanks. It was addressed to the Duke of Connaught, the citizens of Toronto and Canada, the Provincial Governments and the Dominion body, the Governors and directors of the University, and to President Adams and Secretary Brock.

The motion was composed of flowery language and loud applause thundered through the theatre at its finish.

It is a strange thing that, although these people all have so many different ways of doing things, they all clap their hands and cheer in exact unison.

MORE COMMITTEES.

The council adopted a resolution of Dr. Sagerholm, Denmark, which will be a request for all governments to take an active interest in the study of the Pre-Cambrian or the oldest rocks on the earth. Much valuable work has been done by the Governments of Canada and the United States, but it is desired to spread the work out to all continents.

The Governors of the University bestowed honorary degrees upon seven of the visitors. Those on the list for these honors are:—Aubrey Strachan, Wales; P. M. Termier, France; Thos. Chrowder, Chicago; Richard Beck, Germany; J. J. Sederholm, Finland; Theodosius Tshernyschew, Russia; Willot G. Millar, Toronto. At the close of this special convocation the Governors will tender the delegates a garden party. The numbers will be diminished, however, for many left for distant points on the early afternoon trains.

BANQUET FOR THE CONGRESS

WILL TOUR CANADA.

Visitors to Geological Congress Entertained at Armories and by German Consul—Concludes To-day.

Five hundred of the world's leading geologists, who with the Ministers of Mines from two provinces and other distinguished Canadians, were present at the banquet in the Armories last night, made up an assembly unique in the history of Toronto. Over a score of speeches were made and as each speaker was allowed to use what language he pleased, more than the King's English was used. Dr. Frank D. Adams, the president of the Congress, who presided, welcomed the visiting delegates in English, French and German.

"You have come," said he, "to a very paradise of geologists. Wealth and materials embrace us on every side. Our nickel mines are among the finest in the world, and the coal monograph shows that our mineral deposits are among the richest in the world. In the great unknown north, you will see a country in the making. Our only hope is that the foundations in this land into which immigrants are pouring from every country in Europe, will be well and truly laid and that you will carry back to your countries our good wishes for them."

REPLIED FOR THE DUKE.

Replying to the toast of the Governor-General, Hon. Louis Coderre, the Secretary of State, voiced the feeling of gratification that one so closely connected with the Crown had come to represent His Majesty in the Dominion. Tribute was also paid not only to His Excellency's interest in every part of the country, but also to the keen interest he took in science, and the visit of the Geological Congress to Canada. Gratification was expressed at the recovery of the Duchess from her recent serious illness.

Hon. Chas Devlin, Minister of Mines of Quebec, spoke in French for his province, and Hon. W. H. Hearst responded on behalf of the Lieut-Governor of Ontario.

"In this province," he said, "nature has hidden some of her greatest treasures. No place in the world holds greater rewards for the faithful seeker after truth."

APOSTLES OF PEACE.

"We welcome you to Canada not only as teachers of geology," said G. S. Lindsay, K.C., in proposing the toast of the visiting delegates, "but as preachers of the gospel of peace.

"These meetings and their like are what make for universal peace, and for that reason we hope that you will come again some day. For the gospel of peace is the greatest of all gospels."

The toast was responded to by Dr. Steinmann, of Germany, Dr. Tietze of Austria, Dr. Termier of France, Dr. Strachan of Great Britain, Prof. Renier of Belgium, Mr. Fermor of India, and others. The visitors were given permission to speak in their own tongues, and four or five languages were used by them in their replies.

GERMAN CONSUL'S DINNER.

If they had not previously felt at home, the thirty German delegates to the Geological Congress did yesterday, when with upwards of twenty of the German citizens of Toronto they were the guests of the German Consul, Mr. J. Henry Peters, at dinner in the German Club on Isabella street. The menu provided was in true German style and included many little dainties which only a German chef can prepare.

In keeping with the German custom there was very little speech-making after the repast, but the speakers, referring to the pleasure it gave them to meet their scientific brethren under the British flag, emphasized the cordial relations existing between Great Britain and Germany to-day. The German consul briefly bade his company welcome, and expressed the hope that they would return again to this country. Professor Steinhilber, replying for the German geologists assured all present that their visit to Canada would indeed be a memorable one in the lives of all the delegates. Just before rising, Mr. Emil Nerlich, President of the Deutscher Verein, expressed his happiness at having such a distinguished company dine at his club.

The delegates included two ladies, Fraulein Rathgen, who recently made a tour of exploration in Egypt, and Mrs. Frech, who was present with her husband, Professor Frech, of Breslau.

THE PRE-CAMBRIAN PERIOD.

An interesting debate followed the reading of the papers on "The Sub-division, Co-relation and Terminology of the Pre-Cambrian Period" at the session of the Congress yesterday afternoon. The discussion was mainly as to the names to be applied to the various divisions of Pre-Cambrian rocks in North America; and opinions as to the use of the term Laurentian in describing some of these differed widely.

Dr. Coleman, of Toronto, pointed out that the name Laurentian might well be retained for the granites intruded throughout the Sudbury series, but clearly older than the Huronian.

Those reading papers were, Dr. Strachan, of the Geological Survey of Great Britain; Prof. Andrew Lawson, of the University of California; Sir T. H. Holland, of Manchester, England; and Prof. Coleman, of Toronto.

The discussion was participated in by Dr. Sederholm of Finland; Dr. Barlow, McGill University; Sir T. H. Golland of the Asiatic Society of Bengal; Prof. G. A. J. Cole; Dr. Horne, Scotland, and Mr. L. Fermor of the Government of India. Dr. A. Strachan of the Geological Survey of Great Britain was chairman. It was an enjoyable afternoon, and the various speakers met with hearty applause as they drove home their arguments.

A general meeting at 10 o'clock this morning will bring the congress to a close, and the conferring of honorary degrees by the University this afternoon will be followed by a garden party given to the delegates by the Board of Governors of the University.

TO SEE THE TREASURES.

The big excursion for the west which leaves to-night under the guidance of Dr. Adams, J. B. Tyrrell and J. McLeish, will take 115 of the delegates and large parties will go to Cobalt and other places of interest to students of geology.

G. G. S. Lindsay, K. C., who was the Editor of the Monograph of "The Coal Resources of the World," is chairman of the Transportation Committee which has made all the arrangements for the different excursions.

AGRICULTURE AT NEXT CONGRESS

Monograph Will Deal With the Resources of the World, at Belgium

When the Thirteenth International Geological Congress meets in Belgium four years hence, the monograph to be presented will deal with the agricultural resources of the world, following the decision of the Council. Other topics for discussion will include the nitrate, phosphate and soda deposits, and the copper and petroleum resources of the world.

Owing to the discovery of vast and important agricultural areas in Canada, Australia and South Africa within the last ten years, the hope is expressed that with a complete compilation of resources by 1917, new districts may be added to those already known, from which the world may be supplied with grain.

Many of the foreign delegates have complimented the Canadian committees on their organization, and the Belgium geologists are even now making preparations for the next great congress in Brussels.

Globe. Aug. 5-1913.

The garden party given by the Board of Governors of the University of Toronto yesterday after the interesting function of conferring of degrees in honor of the Geological Congress was the last gathering given to meet those very charming and interesting delegates. The President and the Chancellor, in full robes of office, received the hundreds of guests as they poured into the quadrangle. The music of the band added greatly to the pleasure of the afternoon, and many were the greeting "good-byes" and "au revoirs" said as a large number of the delegates left last night and this morning, many gentlemen and ladies being in travelling dress. Refreshments were served in a big marquee. A few present to meet the distinguished guests were: Hon. J. K. Kerr and Mrs. Kerr, the Hon. the Attorney-General, Mr. and Mrs. J. W. Langmuir, Mr. and Mrs. Graham Crawford, Mr. and Mrs. David Dunlap, Mr. D. R. Wilkie, Mr. and Mrs. Trees, Miss Nairn, Mrs. Heaven, Dr. and Mrs. J. A. Macdonald, Mr. and Mrs. Morang, Mrs. Mink, Mr. F. Arnold, K.C., Miss Arnold, Mr. and Mrs. W. D. Gwynne, Colonel and Mrs. Sweny, the Miss Masten, Rev. Mr. Brydges and Mrs. Brydges (N.Y.), Mr. and Mrs. F. Glackmeyer, Mr. and Miss Godwin, Miss Culpepper (Virginia), Dr. and Mrs. Eaton, Mrs. Scott, Miss Phillips, Miss MacMurchy, Miss MacCallum, Miss Porte, Miss Helen Merrill, Mr. and Mrs. Murray Clark, Mrs. and Miss Tyrrell, Mrs. Parks, Miss M. McLennan, Mr. and Mrs. Nerlich, Mr. and Mrs. Gerhard Heintzman, Miss Gwen Cayley, Miss Addison, Mr. and Mrs. J. Falconbridge, Dr. and Mrs. Vogt and others.

VISITING SCIENTISTS SECURE NEW HONORS

Brilliant and Impressive Scenes at Convocation Hall

A MESSAGE FROM GERMANY

Closing Day of Geologists' Congress Was One of Many Functions — An International Committee Was Formed.

It was a perfect valedictory—the last day of the International Geological Congress. A momentous resolution was introduced at the meeting of the Council in the morning, the University of Toronto conferred the degree of LL.D. upon six of the geologists, and the garden party, which terminated the day, was a joyous sweet, tinged with regret that so soon they were to part.

At the meeting of the Council held in the morning the General Secretary, Mr. R. W. Brock, introduced a resolution to the following effect:—"That a small international committee, consisting of not more than eight persons who have had actual experience on the Executive Committees of the various sessions of the Congress, be appointed to consider the question of a permanent constitution and by-laws, and to submit, if possible, a proposal thereon at the next session of the Congress."

This motion, which was carried, was mooted on account of the fact that the International Geological Congress, since its inception in 1878, has no permanent constitution and no permanent rules to guide it, and members join only for the session which they attend. Dr. Sederholm of Finland made a notable suggestion to the effect that the Geological Surveys of the different countries be asked to confer together notably with regard to the correlation of pre-Cambrian. An opportunity for geologists to spend some time in each other's fields was also recommended. Congratulatory messages were sent to Prof. G. Capellini of the Bologna University, and Edward Suess, F.R.S., two of the world's most famous geologists.

Scene at Convocation Hall.

The platform of Convocation Hall presented a brilliant spectacle during the conferring of the degree of LL.D. upon the various recipients. The hoods and gowns of the Chancellor, the President, and the various celebrities present made a charming picture, while the beautiful colors in the ladies' dresses combined to form a kaleidoscope of scintillating effects. Chancellor Sir William Meredith presided, and the first to be introduced was Dr. R. Beck of Friburg, Germany, who was presented by Prof. T. L. Walker of Toronto. The recipient was one who had done great things in geology, his book on "Ore Deposits" being considered one of the leading works.

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German Tribute to Canada.

Dr. Beck, in thanking the University of Toronto for the honor, said: "We German geologists are very proud and happy that one of us should have been honored in this way. Manyfold are the relations between the Canadian geologists and their German colleagues. They began years ago when Herman Credner, my highly honored and I regret to say recently deceased teacher, travelled in the region of the great lakes. He received great encouragement and impetus from Logan and Dawson to undertake a critical investigation of the, at that time, little known Archean of Germany. More recently we have been especially indebted to the Canadian geologists for their highly fruitful contributions in the field of economic geology. I have particularly in mind men whose names are associated with the investigations of Sudbury and Cobalt and of so many other districts. It is in this special field of geology that my own school, the Mining Academy of Freiberg, has taken such a leading part for the past one hundred and fifty years. I feel that, as its representative, this high honor has been conferred on me. I desire to express my heartiest thanks and keen appreciation, and I hope that in the future the German universities and the University of Toronto will continue in the co-operation for the advancement of science."

Other New "Doctors."

Prof. A. P. Coleman next presented Dr. T. C. Chamberlin of the United States, who declared "I shall esteem it as the highest honor I have." Prof. De Lury presented Mr. W. G. Miller, the Provincial Geologist, whose "skill sagacity and finesse have made the department famous." Dean Fernow presented Mr. J. J. Sederholm of Finland, "the profoundest student and interpreter of pre-Cambrian; where others have guessed, he has demonstrated." Dr. Sederholm in returning thanks said that he had been taught much by his colleagues in Canada and he was glad to be a Doctor of Laws in the country of Canada which he had learned to love. It was a country which had shown much kindness to the Finnish people who have made it their fatherland.

President Falconer next presented Dr. A. Strahan in a lightly humorous vein, and the new Doctor returned his thanks for the pleasant message which he had to deliver to the Geological Society of London on his return. Prof. De Champ presented M. Pierre Ternier of France, and W. A. Parks presented Dr. T. Tschernyschew of Russia.

The assemblage moved across the south campus to the quadrangle where a garden party was given. Chancellor Sir William Meredith and President Falconer received the guests as they entered, and for nearly two hours the lawn was a blaze of colors as the brilliant hoods of the men mingled with and moved among the none the less brilliant dresses of the ladies. Refreshments were served in two large marquees and music was rendered by the 12th York Band. It was a time of bidding "good-bye" and "bon voyage" and "until we meet again."

Scotch music on the terrace during the afternoon. A large marquee on the north side of the lawn accommodated the tea-tables, which were gay with scarlet gladioli. The members of the congress and their conferees in town had become so friendly that they were loth to say good-by, but many of them left for Vancouver, Montreal and various places last night, and many were the appointments made to meet in London at no very distant date. A few of those present were: Dr. and Mrs. Frank Adams, Montreal; Mrs. Kerr, Mr. and Mrs. David Dunlap, Mr. and Mrs. Carlton, London; Mr. and Mrs. Graham Campbell, Dr. and Mrs. Ham, Dr. and Mrs. Vogt, Miss Garrett, Miss McLellan, Stratford; Mrs. Sweeney, Mrs. Thorburn, Mrs. and Miss Cross, Rev. Ralph Bridges and Mrs. Bridges, New York; Miss Helen Merrill, Miss Brodigan, Mr. and Mrs. Tyndall, Dr. and Mrs. Strahan, London; Miss Marjorie McMurchy, Mr. and Mrs. Gerhard Helntzman, Mrs. Willie Gwynne, Monsieur de Camps, Dr. and Mrs. Adams, Mr. and Mrs. Murray Clark, Mrs. Macklem, Hon. J. J. Foy, Mr. and Mrs. Bedford McNeil, Dr. and Mrs. Powell, Mr. Frank Arnold, Miss Fair, McColl, Mr. and Mrs. Matthews, New Brunswick; Dr. and Mrs. Harley Smith, Mr. and Mrs. Bascom, Prof. Keys, Mrs. Palm, Dr. Corelli, Miss Addison, Mrs. Arthur Peplar, Mr. and Mrs. Roche, Mrs. Pierson, New Haven; Mr. and Mrs. Freck, Germany; Mr. Kennedy, Miss Nairn, Dr. and Mrs. J. A. Macdonald, Mr. Goulding, Hon. W. H. Hearst, Prof. Raultke, Mrs. Morse, Dr. Zuber, Dr. Laing, Dr. Stolling, Prof. and Mrs. Riener, Dr. Beck, Dr. and Mrs. Parks, Mr. and Mrs. Derward, London; Mrs. and Miss Heaven, Mr. Geo. Lindsay, Mr. Zaber Poland, Mr. John King, Mlle. Ternier, M. Ternier, Dr. Riedel, Miss Coleman, Mr. and Mrs. Stanley Leckie, Mr. T. H. Plummer, Mr. John Ashworth, Mr. D. R. Wilkie, Mr. and Mrs. Glackmeyer, M. Hoffman, Mr. and Mrs. J. D. Tyrrell.

The first of the geologists to be presented to the Chancellor, Sir William Meredith, was Dr. Richard Beck of Frieburg, Germany. He was introduced by Professor Walker, and addressed the gathering in his native tongue. Dr. Pierre Ternier of the Geological Society of France was presented by Prof. De Champ, and Prof. Th. Tschernyschew of St. Petersburg received his presentation from Prof. Parks.

Warm words of praise for the work done by the University of Toronto were spoken by Prof. T. C. Chamberlain, of the University of Chicago, who was proposed by Prof. Coleman. He said that Canada's chief university, like all other institutions of learning, had to be judged from its fruits, and its faculty had moulded so many men of thought, purpose and lofty ideals among his acquaintances that he felt especially proud to receive the degree conferred upon him.

Dr. J. J. Sederholm of Finland was presented by Dean Fernow, who described the geologist from northern Europe as a man who had earned fame by the brilliant proofs advanced by him regarding points at which other geologists had only been able to guess. Dr. Sederholm told of the inspiration which he had received from Canada. He found that the country was not only possessed of great natural beauty and splendid political liberty, but it was also the home of growing culture. His own country was known as the "Little Canada of Europe," because it had very much the same geological formation as the Dominion. Dr. Sederholm offered thanks to all Canadians for the kindness shown by them to the sons of Finland who had left the Fatherland to make their home in an adopted country.

Among those who received degrees was one Canadian, Dr. W. G. Miller, the Provincial geologist. He was presented by Prof. De Lury, who was a class-mate of Dr. Miller in his student days at the University of Toronto. President Falconer presented Dr. Aubrey Strahan of England, one of the best known geologists of the Mother Country, being president of the Geological Society of London and the Geological Survey of England and Wales.

The Congress Closes.

The International Geological Congress concluded its labors yesterday. The members assembled at 10 o'clock in general meeting, and, after the transaction of some final business, Mr. G. O. Smith, director of the United States Geological Survey, read a motion of thanks addressed to the Duke of Connaught, the citizens of Toronto and Canada, the Provincial Governments and the Dominion body, the governors and directors of the university, and to President Adams and Secretary Brock, which was received with loud applause. Dr. Sagerholm, a Danish representative, proposed a resolution that all Governments be requested to take an active interest in the study of the pre-Cambrian, the oldest rocks on earth. While admitting that much valuable work had been done by the Governments of Canada and the United States, the resolution aimed at spreading the work over all continents. The resolution was adopted.

Half-past 4 was the hour set for the garden party given by the governors of the University of Toronto in honor of the members of the congress, but it was close upon 5 o'clock when Sir William Meredith, Chancellor of the university, arrived in the quadrangle, arrayed in his official robes, and preceded by the mace. He was quickly followed by the brilliant company that had attended convocation, a large proportion of whom were ladies. Numbers of the members had already left the city by the afternoon trains, but, despite these defections, close on 700 ladies and gentlemen came in answer to the governors' invitation. There was no formal recep-

tion, the occasion being taken more as an opportunity for the bidding of farewells and for the congratulation of the recipients of degrees, who showed their appreciation of the honor done them by wearing their new gowns and hoods. These gentlemen formed the subject of two excellent photographic groups taken on the ground. Music was provided by the band of the 12th York Rangers, which at intervals played appropriate selections, including many of the national airs of the fatherlands of the numerous visitors. In the intervals of conversation light refreshments were served.

Among the distinguished guests present were noticed: Sir William Meredith, Chancellor of Toronto University; Prof. R. A. Falconer, president of the University of Toronto; Prof. Willet G. Miller, geologist for the Province of Ontario; Prof. A. P. Coleman, University of Toronto; Prof. W. A. Parks, department of geology, University of Toronto; Mayor Hocken and Mrs. Hocken.

Star. Aug. 15-1913.

University Garden Party

At the close of the ceremony of conferring degrees in Convocation Hall yesterday afternoon the chancellor, Sir William Meredith, and the president, Dr. Falconer, with the mace carried in front of them, led the way to the university quadrangle, where they received their guests, whom they had invited to the garden party held in honor of the Geological Congress. During the afternoon delightful music was played by the band of the 12th York Rangers, stationed on the terrace. A tinge of sadness was added to the pleasure by the necessary good-byes, for many of the delegates were leaving in the morning, and will take with them happy memories of kind friends in Toronto. Tea was dispensed from tables, decked with gay scarlet gladiolas, in a large marquee on the north side of the lawn. A few of those present were: Dr. and Mrs. Frank Adams, Montreal; Mrs. Kerr, Mr. and Mrs. David Dunlap, Mr. and Mrs. Carlton, London; Mr. and Mrs. Graham Campbell, Dr. and Mrs. Ham, Dr. and Mrs. Vogt, Miss Garrett, Miss McLellan, Stratford; Mrs. Sweeney, Mrs. Thorburn, Mrs. and Miss Cross, Rev. Ralph Bridges and Mrs. Bridges, New York; Miss Helen Merrill, Miss Brodigan, Mr. and Mrs. Tyndall, Dr. and Mrs. Strahan, London; Miss Marjorie McMurchy, Mr. and Mrs. Gerhard Helntzman, Mrs. Willie Gwynne, Monsieur de Camps, Dr. and Mrs. Adams, Mr. and Mrs. Murray Clark, Mrs. Macklem, Hon. J. J. Foy, Mr. and Mrs. Bedford McNeil, Dr. and Mrs. Powell, Hon. K. Kerr and Mrs. Kerr, the Hon. the Attorney-General, Mr. and Mrs. J. W. Langmuir, Mr. and Mrs. Graham Crawford, Mr. Frank Arnold, Miss Fair, McColl, Mr. and Mrs. Matthews, New Brunswick; Dr. and Mrs. Harley Smith, Mr. and Mrs. Bascom, Prof. Keys, Mrs. Arthur Peplar, Mr. and Mrs. Roche, Mrs. Pierson, New Haven; Mr. and Mrs. Freck, Germany; Mr. Kennedy, Miss Nairn, Dr. and Mrs. J. A. Macdonald, Mr. Goulding, Hon. W. H. Hearst, Prof. Raultke, Mrs. Morse, Dr. Zuber, Dr. Laing, Dr. Stolling, Professor and Mrs. Riener, Dr. Beck, Dr. and Mrs. Parks, Mr. and Mrs. Derward, London; Mrs. and Miss Heaven, Mr. George Lindsay, Mr. Zaber, Poland; Mr. John King, Mlle. Ternier, M. Ternier, Dr. Riedel, Miss Coleman, Mr. and Mrs. Stanley Leckie, Mr. T. H. Plummer, Mr. John Ashworth, Mr. D. R. Wilkie, Mr. and Mrs. Glackmeyer, M. Hoffman, Mr. and Mrs. J. D. Tyrrell, and many others.

Mail & Empire. Aug: 15 1913.

SEVEN GEOLOGISTS RECEIVE DEGREES

Honor Conferred by University of Toronto on Visiting Scientists.

FIVE WERE EUROPEANS

One Canadian in the Group Presented at the Special Convocation.

Seven of the famous geologists, whose names are household words, at least in families interested in the study of the earth's interior, received the honorary degree of doctor of laws of the University of Toronto at a special Convocation held yesterday afternoon. There was an imposing gathering in the Convocation Hall, when the members of the faculty united in doing honor to the men who have devoted their lives to the study of the history and composition of the world on which the members of humanity live out their puny existences.

World. Aug. 15-1913

After the ceremony of conferring degrees in Convocation Hall yesterday afternoon, at the university, the Chancellor, Sir William Meredith and the president, Dr. Falconer, with the mace carried in front of them, headed the procession to the quadrangle, where they received the guests invited to a garden party in honor of the International Geological Congress, by the board of governors of the University of Toronto. The band of the 12th York Rangers played the most delightful

BADE GOOD-BYE TO SCIENTISTS

Most of the Visitors Are Now
Speeding on Their Way to
Pacific Coast

DEGREES CONFERRED

Carried Away Many Friendships
and Much of Ontario's
Crust

With the conferring of honorary LL.D. degrees at Convocation Hall yesterday afternoon and the pleasant garden party that followed, Toronto bade an official au revoir to the visiting geologists, most of whom left last night for Winnipeg and the Pacific Coast.

During the day the indefatigable secretary of the Congress, Mr. W. Stanley Lecky, could be seen in the tonneaus of automobiles, speeding parting guests to the station, giving final directions and rushing back to see what more could be done for the comfort of the visitors. Well provided with knapsacks, kit-bags and sticks that looked suspiciously like alpenstocks, geologists were standing in little groups waiting for the signal for the departure, and when the end came at the Union Station, there were many vigorous hand-shakes, much doffing of hats and, it is whispered, touching farewells with Toronto's fair sex. Since the coming of the Congress it has been generally agreed that geologists are less engrossed in rocks and fossils alone than was popularly believed.

Took Many Specimens.

If the geologists carried away many friendships, they did more. They carried away a considerable portion of Ontario's crust and packed the specimens of rock freely collected during the excursions as carefully as though they had been gems of the first water.

In fact, Dr. Sederholm of Finland, remarked that the geologists had obtained a far better knowledge of prehistoric geology since their visit to Canada than ever before.

Following is the list of visiting geologists who were made LL. D.'s at Convocation, with their sponsors: Dr. R. Beck, of Frieberg, Germany, presented by Prof. T. L. Walker, of Toronto; Dr. T. C. Chamberlin, of the United States, by Prof. A. P. Coleman; Mr. W. G. Miller, Provincial Geologist, by Prof. De Lury; Dr. J. J. Sederholm, of Finland, by Dean Fernow; Dr. A. Strahan, of London, England, by President Falconer; M. Ternier, of France, by Prof. De Champ, and Dr. T. Tschernyschef of Russia, by Dr. W. A. Parks. The Chancellor of the University, Sir William Meredith, presided, and conferred the degrees.

University Garden Party.

The last gathering to meet the very interesting and charming geological delegates who have been among us for the past week, was the garden party given by the Board of Governors of the University of Toronto yesterday afternoon in the Quadrangle.

Sir William Meredith and the president, Dr. Falconer, with the mace carried in front of them, headed the procession to the quadrangle, where they received the guests. The band of the 12th York Rangers played the most delightful Scotch music on the terrace during the afternoon. A large marquee on the north side of the lawn accommodated the tea tables, which were gay with scarlet gladioli. The members of the congress and their confreres in town had become so friendly that they were loth to say good-bye, but many of them left for Vancouver, Montreal and various places last night.

Among those present were: Mrs. Macklem, Hon. J. J. Foy, Mr. and Mrs. Bedford McNeil, Dr. and Mrs. Powell, Mr. Frank Arnoldi, Miss Fair McColl, Mr. and Mrs. Matthews, New Brunswick; Dr. and Mrs. Harley Smith, Mr. and Mrs. Bascom, Prof. Keys, Mrs. Palm, Dr. Corelli, Miss Allison, Mr. and Mrs. Derwood, London; Mrs. and Miss Heaven, Mr. George Lindsay, Mr. Zaber Poland, Mr. John King, Mlle. Ternier, M. Ternier, Dr. Riedel, Miss Coleman, Mr. and Mrs. Stanley Leckie, Miss Helen Merrill, Miss Brodigan, Mr. and Mrs. Tyndall, Dr. and Mrs. Strahan, London; Miss Marjorie McMurchy, Mr. and Mrs. Gerhard Heintzman, Mrs. Willie Gwynne, Monsieur de Camps, Dr. and Mrs. Adams, Mr. and Mrs. Murray Clark, Dr. and Mrs. Frank Adams, Montreal; Mrs. Kerr, Mr. and Mrs. David Dunlap, Mr. and Mrs. Carlton, London; Mr. and Mrs. Graham Campbell, Dr. and Mrs. Ham, Dr. and Mrs. Vogt, Miss Garrett, Miss McLellan, Stratford; Mrs. Sweeny, Mrs. Thorburn, Mrs. and Miss Cross, Rev. Ralph Bridges and Mrs. Bridges, New York; Mr. T. H. Plummer, Mr. John Ashworth, Mr. D. R. Wilkie, Mr. and Mrs. Glackmeyer, M. Hoffman, Mr. and Mrs. J. D. Tyrrell, Mrs. Arthur Pellar, Mr. and Mrs. Roche, Mrs. Pierson, New Haven; Mr. and Mrs. Freck, Germany; Mr. Kennedy, Miss Nairn, Dr. and Mrs. J. A. Macdonald, Mr. Goulding, Hon. W. H. Hearst, Prof. Raultke, Mrs. Morse, Dr. Zuber, Dr. Liang, Dr. Stolling, Prof. and Mrs. Riener, Dr. Beck, Dr. and Mrs. Parks.

Star. Aug. 15-1913.

GEOLOGISTS TO VISIT THE PACIFIC COAST

Some to the Klondyke and
Others to Prince
Rupert.

PLAN A NEW MAP

Extremely Useful Ore Is Molybdenite—Exhibit Attracts
Attention.

About 200 members of the Geological Congress under the leadership of President Dr. Adams will assemble in Victoria, B. C., on August 26, when the two transcontinental excursions which leave to-night meet again. One

party of 107 goes by the C. P. R.'s main line, the other by the Crow's Nest Pass, so as to include an inspection of the coal fields. At Victoria two parties will be made up to sail north. Forty or fifty will take the "Queen McQuinnie," an absolutely new C. P. R. steamer, and run up the coast to Yakutat, and the Malispensa glaciers, where the great icebergs of the North Pacific are formed. This party having a special boat will visit places not usually visited and impossible to the ordinary tourist. They will see Mount Elias and the glaciers of the Coast Range. It was this feature of the congress that induced the leading distinguished geologists from abroad to attend the present congress. At Skagway the party will take the White Horse Railway to White Horse and descend the Yukon River to Dawson. Here they will inspect the gold fields of the Klondyke, where \$25,000,000 in placer gold have been washed out. This party will arrive back in Vancouver September 22, and return East by the Grand Trunk Pacific and Canadian Northern.

To Visit Prince Rupert.

Another Pacific coast party will take in Prince Rupert and the Skeena River, returning to Vancouver September 2. Of those who do not go West about 50 will go north and tour the New Ontario mineral fields, including Sudbury, Cobalt, and Porcupine. Dr. Miller is the leader in charge of this excursion. It includes a formidable international list of distinguished geologists. Their train leaves to-night at 9.30.

The program includes a trip on Lake Temiskaming next Wednesday, and on Saturday the 23rd, a voyage to Bear Island on Lake Temagami. The party returns to Toronto on August 24.

The delegates return to their homes, whether Honolulu, or Paris, or the Philippines as individuals. They book their passages on their own hook, and the various committees of arrangements thankfully disband.

Heat in Mines.

The three commissions reported to the Congress this morning included one on glaciation and one on the question of increased temperature at depth. Heat increases after a certain depth, but the ratio varies in different parts of the world. In the Comstock lode in Nevada the miners had to stop at 3,500 feet. In the Tamaree Copper Mine in the Houghton district of Michigan, Lake Superior, the deepest mine in the world, the temperature is not so great at 5,200 feet. Information covering all the available facts is being gathered, and will be reported to the Congress when it meets in Belgium. The average rate of increased heat per foot of descent will be figured out.

New Geological Map.

The commission appointed to consider the question of a geological map of the world reported in favor of the step, and the work will be proceeded with. The scale fixed upon was one to five million, which would make a good large wall map. Many countries have had a thorough geological survey, and maps have been prepared on a large scale. These will be generalized and reduced to the uniform scale for incorporation in the complete map. Some of the continents have been fairly well done, but Africa is largely blank, and so is the interior of Asia.

Mr. Grabbam, who is here at the Congress, has been working in the Soudan, and Dr. Hume, who gave a remarkable paper upon his work, has been working at a geological map of Egypt. In the South African States

many men are working, including Rogers and Mellor. The French are mapping Algeria, but there is a vast territory which will have to be mapped merely by the reports of travelers and their notes along the line of travel. Similarly with the Asian interior. All the available information is to be gathered up, however, and reduced to scale for incorporation in a complete geological map of the world as known to date. It will be printed in Berlin.

Permanent Organization.

A commission was appointed to consider the question of preserving a permanent organization as a nucleus for the different congresses. Heretofore each congress has worked out its own scheme and its own organization entirely. The Canadian committee engaged Dr. Quensel of Sweden to help out on the present occasion, he having been a secretary during the Swedish congress. The question of having a continuity of staff will be considered and reported upon at Belgium in 1917.

It is understood that the monograph desired by the Belgians at their congress will concern copper, of which Belgium controls deposits in the Congo. It is possible that one of the excursions will take the delegates interested to the Congo Free State. Belgium herself has little rock to show the geologists, though she has some great coal mines, possessing the 3rd largest coal reserves in Europe.

A Useful Ore.

An exhibit of molybdenite specimens from Maine attracted attention in East Hall at the geological congress this morning. Only three or four metals are rarer than molybdenite, the silvery, bluish-grey mineral found in certain granite and quartz formations in Maine and Canada, and in North Australia. It is found also in Japan, where it is said to be used in connection with the manufacture of Japan's secret smokeless gunpowder. In America its chief use is in the manufacture of high-speed tool steel, armor plate, and vault door steel, as it imparts a self-hardening quality to steel. A vault door, for instance, made with "molybdenum" becomes more burglar-proof as the years go by. A strange process goes on in the steel composite during its whole life, after cooling, causing it to continually harden.

Molybdenite is also used as a mordant in silk dying to make certain delicate shades fast. But more important still is its use as a filament base in the so-called Tungsten electric lamp. It is also used in Germany to produce a certain yellow leather. It is a disinfectant when used in dyeing plushes, and so forth, being a germicide, and valuable accordingly as a protection to cushions in railway cars. It imparts fire-proofing qualities to fabrics also.

The two largest commercial deposits in the world are those at Catharine Hill, Maine, owned by Mr. C. Vey Holman, a delegate to the present Geological Congress, and one at Indian Peninsula, Lake Abitibi, owned by M. J. O'Brien of Cobalt.

Molybdenite is worth about \$675 per ton. It is quarried out of the hills where it occurs.

Star? Aug. 15 - 1913.

SIX OF SEVEN DISTINGUISHED GEOLOGISTS WHO RECEIVED HONORARY DEGREE OF LL.D. AT THE UNIVERSITY



HONORARY DEGREE MEN.

From left to right these men are: Professor Sederholm of Finland; Professor Tschermyschew of Russia; Professor R. Beck of Germany; Professor Chamberlain of the University of Chicago; Professor Termier of Paris; and Professor Miller of the Ontario Bureau of Mines. Dr. Strahan was not able to wait to have his photo taken.

The lower picture shows the chancellor, Sir William Meredith, and President Falconer of the University crossing the campus to Convocation Hall.

Telegram. Aug. 15 - 1913.

NEW HONORS FOR DELEGATES

SEVEN LL.D.'S.

Prof. W. G. Miller Among Geologists on Whom 'Varsity Conferred Degrees—Farewell Garden Party.

Varsity yesterday afternoon witnessed the final gathering of the International Geological Congress. Sir William Meredith, chancellor of the university, presided at the special convocation in the afternoon, when the honorary degree of LL.D. was conferred on seven of the delegates.

The first to be honored was Dr. R. Beck, of Freiburg, Germany, who was presented by Dr. T. L. Walker.

In his reply, Dr. Beck spoke in a very happy vein of the cordial relations existing between geologists in Canada and Germany and of the fruitful contributions of the Canadian scientists in the field of economic geology in which his own university has been practically interested for one hundred and fifty years.

Dr. T. C. Chamberlain, of the United States; Prof. W. G. Miller, of Toronto; J. J. Sederholm, of Finland; Dr. A. Strahan, of Manchester; Dr. Termier of France; and Dr. T. Tschernyschew, of Russia, were the other delegates honored.

THE GARDEN PARTY.

The 700 delegates present had an opportunity of bidding good-bye at the garden party in the quadrangle, which followed the conferring of degrees. The chancellor and President Falconer received the guests. Refreshments were served and music was rendered by the band of the 12th York Rangers.

Cobalt Nugget.
Aug. 15 - 1913.

SIX GEOLOGISTS

GET DEGREES

Concluding Ceremonies at International Congress

TORONTO, August 15—The University of Toronto conferred degrees on visiting geologists yesterday.

The organ stopped and with a scuffling and creaking of doors the black-gowned procession entered Convocation Hall. First the President Dr. Falconer and Chancellor Sir William Meredith. Then the men about to receive the degree: Dr. R. Beck of Berlin, presented by Dean Fernow; Prof. Chamberlain of the University of Chicago, by Professor Coleman; Dr. W. G. Miller, Geologist for the Ontario Bureau of Mines, by Prof. DeLury; Dr. Sederholm of Finland, by Professor Walker; Dr. Strahan, Director of the British Geological Survey, by President Falconer; Dr. Termier of Paris, by Professor Dechamps; and Dr. Tschermyschew, by Professor Parks.

The simple but impressive ceremony was soon over. After prayers, the Dean Fernow rose with Dr. Beck and in a short address in German, presented his nominee. The latter then stepped forward and was received by the hand of the Chancellor. He then passed over to the Roll of Convocation, and signed it. The others followed the same course. The gathering afterward attended the garden party in the quadrangle.

Canadian Mining Journal. Aug. 15. 1913.

Reception Appreciated by Geologists.

As indicative of the appreciation the geologists felt for the treatment they received at the hands of the local committee and the Cobalt mine owners, the following letter received by the committee speaks for itself:

"We, the undersigned members of the Twelfth International Geological Congress, wish hereby to tender and express to the local committee members, Messrs. E. V. Neelands, A. A. Cole, B. Neilly, Fraser Reid and Chas. Watson, our hearty appreciation and thanks for the thoughtfulness, hospitality and executive ability which have made so remarkably effective and delightful our visit to Cobalt, under the leadership of Dr. Miller, the godfather of the district. We beg to express also to the managements of the Coniagas, Crown Reserve, Beaver and Timiskaming mines and of the Nipissing high grade mill, and to the ladies, our appreciation of the cordial reception, worthy of so uniquely prosperous a mining district."

Garden Party Ends Congress

Interesting Tales of Women's Progress Were Unfolded by Its Women Delegates.

Never has Varsity's quadrangle had a more distinguished gathering than that of yesterday afternoon's garden party given by the university in honor of the Geological Congress. As the last function of a crowded week of geology and joy it formed an ideal "au revoir" for the members and the many warm friends they have made in this city. Or perhaps it was "auf wiedersehen," uttered in the inspired tones of one from the Kaiser's land.

It has been a wonderful opportunity for Toronto women to come in touch with those from abroad directly concerned with foreign progress, to hear of what they are doing and of being assured that we can feel justly proud of our achievements. One heard more than a rumble that women were up and doing in an endeavor to claim a part in all the world's work. While chatting to Fraulein Anna Rathgen, of Bonn, we enquired if there was still much feeling against the university girl in Germany, she said:

"Oh, they are getting over that, and women are going in for many things. We have many women physicians and though our women are not allowed to practise law, many are studying it to get ready for their admittance, which they believe will come soon. But, again, many are taking the course to aid them in sociological work."

But to us the greatest surprise was the bright little Dr. Alide Grutterink, of Rotterdam, with her revelations of what strides her countrywomen were making. Somehow or other suffrage societies in a land where the women are famous for their prowess as scrub ladies somewhat startled. So recent was the marriage of Miss Inez Millholland to Eugene Boissevain of Amsterdam that the first query we put to Dr. Grutterink was as to whether she knew the Boissevain family.

"Why, everyone knows them," declared she. "His sister, Dr. Mia Boissevain, was the president of the women who organized the exhibition called "Woman from 1813 to 1916," which was opened in Amsterdam in May and will not close until October."

As most people know, the year 1913 is an important one for Holland. It was the year of the Peace Palace opening and also the centenary of Ho'land in regaining its independence from French rule. Many Dutch women felt that Amsterdam, as the capital, should have a special exhibition to show the social and intellectual position of women since 1813.

So led by Dr. Mia Boissevain, in the incredibly short time of fourteen months they organized, arranged and completed the present wonderful picture of Dutch women's progress. Money was raised by private subscription and the city of Amsterdam gave the land on the outskirts of the city on which the buildings were erected. It is now paying for itself and will close free of debt. Women of every creed and station have worked together. So successful have been their efforts that women from Russia, Germany and Italy have been inspired to go and do likewise. The exposition is divided into two parts. One shows a middle class house of a hundred years ago with all its quaint furnishings and accessories. In it is an enormous kitchen where all the cooking for the house was done and where the provisions were kept.

All the rooms are filled with treasures that would delight the eye of an antique collector. One of the floors is covered with an old rug made of many pieces of gray cloth from the dresses of the vrows. The walls are covered with fine old prints, miniatures and pastels. In the dining-room the table is laid for a christening dinner. On it are two interesting old soup tureens of that time actually fitted with a hot water arrangement to keep the contents from getting cold. Here, too, is a basin inserted in the sideboard where the good housewife always washed her silver and glass, never leaving it to the servants. This custom, it appears, is still in vogue to-day in many a Dutch home.

But the kitchen is the place of delight for true housewives. Tiled walls, a marble floor, an old fireplace, with a small oven at the side; the usual row of old blue plates ranged on the shelf above it and many copper and brass utensils on racks around the walls. At the right of the front door is the provision room which was used in place of a cellar. And the good old Dutch housewife did not run to a corner grocery when she wanted a meal. In the provision room were rows of hams hanging from the beams, barrels of flour and sugar, bottles of preserves and wines, and jars of butter. In the music room, upstairs, is a figure of a lady dressed in 1813 attire sitting at an old-fashioned spinnet. Another in the costume of a nurse was found in the old-fashioned bedroom.

Other rooms show the accomplishments women of that time possessed in the arts, literature, sports, their special work among the poor and sick and as guardians of almshouses and orphanages.

It gives an idea of the woman of the working class in the country as well as in the town, the home industries are shown, how women were overworked as seamstresses and diamond workers and how some women trudged in treadmills like horses.

Women's other professions, as shop-girls, servants, school mistresses and midwives lend their gay or sad note.

In one room was seen women in philanthropy. There are cases of old letters, books of rules and by-laws, Bibles and photographs of directresses in their quaint costumes. Cases of small models in costumes worn by inmates of almshouses or hospitals or workhouses are found in this room, and more old prints relating to this subject.

In another room is seen woman in church life, cases of hymn books, poems, books by celebrated women authors of that time and costumes of the different religions, societies and more fine old prints.

Then, too, are found women in medicine and in nursing, models of old hospitals, furnished as at that time; prints of nurses in different costumes and two fine oil paintings of well known hospitals.

Naturally, the 1913 building is modern, and very much larger than the one just described. The work displayed is not all done by women, but by any one interested in woman's progress. But the poster and the mural decorations in the vestibule were painted by women.

Here the weary could rest and listen to a very spirited band, composed of sixteen women and led by one.

Along the outside of this building were many booths and shops, showing the woman druggist, hootblack, dress-maker, photographer, maker of fancy work, cakes and candy.

The most interesting of these, and presided over by a great enthusiast, displays the Dutch Girl Scout. Here are small models of the girls, in their special costumes, going through their different evolutions, all made by the girls themselves. Seventy of this organization came from Amsterdam alone, are of all classes and beliefs, and they work winter and summer.

Passing into the building, it is said, one's breath is taken away by the number and extent of the exhibits. Many pages would be required adequately to describe them, and it is said women came here again and again to study and profit by what they had never seen or dreamed of before. All honor to the Dutch women for this great display!

Then there is a room devoted to the suffrage cause hung with flags of the countries which have granted the suffrage. All sorts of suffrage literature is here on view, also.

Then there are exhibits showing women toilers at work under the actually had conditions of real life. Next are shown improved conditions in canning factories, and a sample of the new, airy, well-lighted sewing room where girls and women have short working hours and good pay. The latter is organized by a prominent society which insists on these improved conditions.

Another section shows women in business, as telephone or telegraph operators, as a postmistress, or as a stenographer. The tuberculosis exhibit was exhaustive in every particular, and photographs showing how women and even little children become deformed by certain kinds of sweatshop work were not pleasant to look at.

The Child's Welfare Exhibit filled room after room. Here the ignorant peasant can learn how to feed, dress and care for the body of her child. The charts, photographs, statistics, models, plans, appliances could not adequately be described here. The blind child, the feeble minded, the abnormal, the crippled, each had its particular exhibit. An ideal nursery, fully equipped; the first aid to the injured; many books dealing with all these subjects, were shown. Still further on is seen woman's work in drama, painting and sculpture.

Surely our Toronto Exhibition authorities could have gained inspiration from this splendid showing of Dutch women.

CORNELIA.

THE Geological Congress is now in session in Toronto. Delegates from all over the world gathered on Wednesday evening, Aug. 6, at the University. They were welcomed by Hon. W. H. Hearst, Minister of Lands, Forests and Mines for Ontario, and Prof. A. P. Coleman, head of the geological department in the University of Toronto, who is chairman of the local committee. President Falconer also welcomed the delegates.

The congress is one of the most profoundly interesting that ever came to Canada; distinguished among the many scientific congresses that have gathered in Canadian cities for learning, character and experience. From a standpoint of natural resources and practical significance, it is perhaps the most important congress ever convened in Canada. In a land whose mining developments are among the most remarkable in the world, and a city which for ten years has been a metropolis of miners, delegates have come from every land upon earth where there is anything resembling a mine. They come from the Anglo-Egyptian Sudan, Argentine Republic, Australia, Austro-Hungary, Belgium, the British Isles, British West Africa, British West Indies, Bulgaria, Canada, Chili, China, Colombia, Denmark, Egypt, France, Germany, Greece, Guatemala, Hawaiian Islands, India, Indo-China, Italy, Japan, Mexico, the Netherlands, Newfoundland, New Zealand, Norway, Peru, Philippine Islands, Portugal, Roumania, Finland, Spain, Sweden, Switzerland, Tunis, Turkey, Union of South Africa, the United States and Venezuela.

On Thursday the Hon. Charles Fitzpatrick took the chair and delivered an address of welcome. The address on behalf of the Dominion of Canada was delivered by Acting Premier Hon. Mr. Perley. The congress will be in session until August 16, but many of the delegates will remain in Canada for several weeks. Many of them will travel in various parts of the country where mining developments have taken place. That is, they will probably visit every province in the Dominion. In Winnipeg they will find as many languages as are spoken by the congress itself. It will be the first time that at least half the delegates have seen this country. The advertisement which Canada will be sure to get from so cosmopolitan and distinguished an aggregation will probably do more good than a great deal of the railway and immigration literature now being sent out.

Star Weekly, Aug. 16-1913.

The City Hall was the scene of a brilliant gathering on Monday evening when a civic reception was held in honor of the geologists who were attending the international congress in the city. His Worship the Mayor of Toronto and Mrs. Hocken received in the council chamber, on the steps of the throne. Mrs. Hocken looked very handsome in blush rose satin, draped with pale grey ninon, and real lace with diamond ornaments. Her bouquet of the most exquisite orchids was a masterpiece from the civic hot-houses, being composed of at least a dozen or more varieties of the most beautiful flowers, from sprays of the tiniest "jewelled" orchid to a very large one like purple velvet, the whole surrounded with fine maidenhair fern.

The whole affair proved intensely interesting, as never before in the City Hall's history, have there been so many nationalities represented. Passing out from the council chamber, which was banked with flowers, the guests divided into little groups, listening to the music of the two orchestras, and conversing. A buffet supper was served later in the evening from flower decked tables arranged in the corridor.

INTERNATIONAL GEOLOGICAL CONGRESS

SUDBURY-COBALT-PORCUPINE EXCURSION.

On Wednesday evening, July 23rd, 45 members of the Congress left Toronto on a special C. P. R. train to visit the mining districts of Northern Ontario. The excursion was very well arranged, and, from start to finish, proved very interesting. Some of the places visited have become widely known, both on account of their commercial importance and on account of their scientific interest. The structure and origin of the ore deposits has proven an attractive subject to many geologists, and it was a pleasure much appreciated by the visitors to have the characteristic features of the several deposits pointed out to them by men who have made a special study of the several districts.

All over the world the Sudbury deposits are referred to as the most notable example of that particular type of ore deposits supposed to be the result of magmatic differentiation. It was therefore of special interest to have the features of these deposits pointed out by Dr.

southeastward, giving a section across the eruptive. It was easily seen that the rock becomes, towards the upper and inner edge, lighter coloured and more siliceous. At the outer lower edge it is a dark gray, fine norite. This gradually changes to a coarser-grained rock containing less pyroxene and more reddish feldspar and micropegmatite. At the top it is quite red and siliceous and granite-like in appearance.

Below the nickel-bearing eruptive the rocks are much brecciated. In the vicinity of Sudbury several outcrops were visited and the "crush conglomerate" examined. Prof. Coleman, in calling attention to these outcrops, stated that this is characteristic of the foot-wall rocks all the way around the nickel range. Apparently the intrusion of the norite mass has been accompanied by very extensive crushing of the underlying rocks.

The Inner Basin.—Above the nickel-bearing eruptive there is a fine grained siliceous rock, which Dr.



AT WINDY LAKE, SUDBURY DISTRICT

A. W. G. Wilson, Ottawa; W. G. Miller, Toronto; A. C. Lane, Tufts College; Bedford McNeill, London; A. P. Coleman, Toronto; J. B. Tyrrell, Toronto; P. P. Piatnizky, Russia; Jules Szadeczy, Hungary; A. G. Charleton, London; A. G. B. Wilbraham, London; G. W. Grabham, Khartoum, Africa; A. G. Burrows, Toronto.

A. P. Coleman, who has made several years study of the deposits and has long contended that the ore bodies have been formed by segregation of the sulphides from a molten magma which was chiefly composed of the constituents of norite—the rock in which the ore occurs.

The members found little difficulty in finding hand specimens which show apparently secondary deposition of sulphides, especially of chalcopyrite; but as has already been mentioned by exponents of the magmatic theory, this secondary deposition is of minor importance, as the localization of the ore bodies seems to have depended on phenomena of much greater magnitude. The secondary deposits may easily have been formed by local changes within the original massive ore bodies and the neighbouring rock.

The Sudbury Norite.—Prof. Coleman first took the party to outcrops near Sudbury and pointed out several exposures of the Sudbury series—McKim graywacke and Ramsay lake quartzite—and the overlying conglomerate. Then, going to Windy lake on the C. P. R. Railway, the rocks which underlie the nickel bearing eruptive were seen. The railway was followed

Coleman says is characteristic of the whole basin. Outcrops of this material were examined and it was found difficult to distinguish between the acid edge of the micropegmatite and what Dr. Coleman believes to be fused conglomerate.

Dr. Coleman stated that unaltered conglomerate and micropegmatite are not found in contact, but that in going from the overlying, Trout lake, conglomerate towards the eruptive there is always noted a gradual change from a distinctly fragmental rock to a fine-grained hard rock, which cannot be readily distinguished from felsitic igneous rocks. The change is so gradual that the conclusion reached is that the eruptive has intruded the conglomerate and was at a high enough temperature to alter it very extensively before solidifying.

Above the conglomerate is a dark coloured siliceous rock known as the Onaping tuff. Good exposures of this were examined at Onaping falls. At Onwatin lake outcrops of the overlying Onwatin slate were examined. It was found by several of the party that these rocks are specially productive of red raspberries. Asked as to the possibility of the Trout lake conglom-

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see other side of this paper ↓



NEAR WINDY LAKE, SUDBURY DISTRICT

C. W. Knight, Toronto ; P. Piatnizky, Russia ; J. B. Tyrreli, Toronto ; G. W. Grabham, Khartoum ; G. A. J. Cole, Dublin, Ireland.

erate, which overlies the nickel-bearing eruptive, and the basal conglomerate near Ramsay lake, being of the same age, Dr. Coleman replied that he considers this improbable. He stated that all around the inner basin the Trout lake conglomerate occurs and is always of the same character—a dark gray, hard conglomerate characterized by numerous pebbles of gray chert. He pointed out that the Ramsay lake conglomerate is quite different in appearance and composition and was probably not formed at the same time.

Having made examination of the several types of rock and of exposures which show their structural relations, visits were then made to the nickel mines.

Murray Mine.—The first mine visited was the Murray. This property, which is on the main line of the C. P. R., and was discovered by the building of the railroad, was worked several years ago; but has not been producing for ten years or more. During the past two years, however, the property has been systematically prospected by diamond drilling and excellent results obtained. According to Mr. Hitchcock, who is in charge of the drilling operations, holes are being put down vertically at intervals of 200 feet and several million tons of ore has been discovered. The deposits worked in the early days are said to have dipped at about 45 degrees; but the drilling indicates that the



AT SUDBURY

J. A. Dresser, Sault Ste Marie, Ont. ; G. Merciai, Pisa, Italy ; E. Mattiolo, Torino, Italy ; F. H. Forest, Rigaud, Quebec.

see other side of this paper ✓



DR. COLEMAN DESCRIBING STRUCTURAL FEATURES AT CREIGHTON MINE

Mr. and Mrs. J. B. Tyrrell, Toronto ; A. G. Charleton, London ; Miss Eubank, Toronto ; G. A. J. Cole, Ireland ; Dr. Coleman, Toronto ; O. F. Pfordte, Cairo, N. Y. ; G. Merciai, Italy ; A. E. Kitson, Gold Coast, West Africa ; C. W. Knight, Toronto ; S. Cerulli-Irelli, Italy.

formed an irregular chimney, which has been followed for 1,300 feet on an incline of 70 degrees to the east.

Canadian Copper Company's Smelter.—In the afternoon the guides took the party over the smelting plant and explained the process of treating the ore. This was described in detail in the August 1st issue of the Journal.

No. 3, or Frood Mine.—Leaving the smelter the party proceeded by train to Frood and examined the enormous outcrops of gossan at what is believed to be by far the largest nickel deposit yet discovered. According to Dr. Coleman, it is estimated to contain at least 35,000,000 tons of ore, and perhaps as much as 100,000,000 tons. From No. 3 the gossan-covered ridge extends

almost unbroken for a mile to the southwest and almost as far to the northeast, where the Stobie mine once produced more than 400,000 tons of ore.

The deposit is being developed from two shafts on the property of the Canadian Copper Company. On adjoining property the Mond Nickel Company is sinking a vertical shaft, which is expected to reach the ore at a depth of about 800 feet.

At No. 3 mine the deposit has been developed for some distance at the 200 and 300-foot-levels. At the 200-foot level ore is being stoped by widening out crosscuts on reaching the ore and gradually extending the stope by making a fan-shaped opening, as has been done at some of the other properties.



OPEN PIT, CREIGHTON MINE, CANADIAN COPPER COMPANY

Supt. Kaeding ; Fred Searls, Goldfield, Nevada ; F. L. Ransome, U.S.G.S., Washington, D.C.

Sudbury for a splendid reception were received with much applause.

Moose Mountain.—Saturday morning the party was taken over the Canadian Northern Railway to Moose Mountain. Here the iron ore deposits and associated rocks were examined. At No. 1 mine, which is worked largely as an open pit, the ore is magnetite more or less interbanded with hornblende and green epidote. At No. 2 mine the ore consists of interbanded magnetite and silica without hornblende or epidote.

The ore mined is crushed and then concentrated by magnetic separation. By this means a marketable product is obtained. Much of the ore runs only 35 to 40 per cent. iron; but by a simple treatment the grade is brought up to 60 per cent.

In the vicinity of the mines many interesting structural features are well exposed. In places the banded ore is cut by dikes of granite and by thin seams of epidote. Where the iron formation crosses the Vermilion river interesting crumplings and foldings of the banded ore were pointed out by Dr. Coleman. A variety of interesting small scale structural features, such as anticlines, synclines and faults were also seen in the old rocks.

Recently Mr. Lindeman of the Department of Mines has been studying the district and has prepared a magnetometric map of the iron formations. Copies of this map were received just in time for distribution to members of the excursion.

After visiting the outcrops and mines, the party was conducted through the concentration plant and the methods of magnetic separation and briquetting of the ore were explained.

The officers of the company then entertained at a luncheon in the schoolhouse. A good meal, nicely served by the ladies of the village, was followed by several happy speeches. After luncheon a start was made southward. At several points the train was stopped to allow examination of outcrops along the railway. At Garson lake several of the party showed more interest in the water than in the rocks, and by general consent a stop was made to permit of a more intimate acquaintance with the lake. Refreshed by a swim, the party was then taken to the Coniston roast yards and smelter.

At Coniston the Mond Nickel Company has recently constructed a very complete smelting plant for the treatment of nickel-copper ores, and much interest was shown in the methods of handling the ore and furnace products here. The officers of the company conducted parties through the plant and explained the processes. Several labour and heat-saving devices have been introduced in the new plant.

In the evening the party returned to Sudbury, and on Sunday afternoon the train pulled out for Cobalt and Porcupine.

(To be Continued.)

MARITIME PROVINCES EXCURSION.

Visit to the Sydney Coalfield.

Cape Breton Island, within the past few years, has been visited during the summer months by many associations and congresses, and bodies of persons joined together for some ostensibly educative purpose. These parties have curiously coincided with hot weather in other parts of the American continent, and it has been shrewdly surmised that a desire to feel the cool Atlantic breezes was not altogether unconnected with the

presence of these gatherings in Cape Breton, and there has been a feeling that business was sometimes interfered with unnecessarily in receiving and entertaining the visitors, for it is in the summer time that the coal mines and steel works are most busy, and interruptions are sufficiently numerous without further additions.

A pleasing exception, however, is the recent visit of a portion of the International Geological Congress to the Sydney coalfield. The geologists who composed this party were very evidently not on a junketing excursion, and the inspection of any undeveloped country by a discerning and well-informed party of specialists such as made up the Maritime Provinces excursion of the Geological Congress, cannot but be followed by an increasing interest in its resources and a more exact knowledge of its geological characteristics.

The Sydney trip commenced on Wednesday, the 23rd of July, with a visit to the Point Edward limestones, where the party inspected Limestone Point. Here the bedded limestones are seen dipping under the north-west arm of Sydney Harbour, and can be observed to disappear under the Millstone Grit on the other side of the arm. Several of the party evinced considerable interest in a curious appearance shown by weathered fragments of the limestone, the surface of the rock being covered by closely packed circular knobs showing a distinct concretionary structure. One learned gentleman remarked that the rock had "a curious botryoidal structure resembling sheep's brains." More may be heard of this, when the specimens reach Europe! An old quarry, known as Louisburg Quarry was next visited, which is said to have furnished lime for the French fortifications at Louisburg. Here numerous shell fossils were to be seen and further nodular specimens. The Nova Scotia Steel Company's quarries at Point Edward Post Office were then visited, where the full bench of the bedded limestone was exposed in working face. The limestone bed was covered with from ten to twenty feet of reddish drift, and in some places the top of the limestone was curiously water-worn.

Taking the ferry steamer at Leitches Creek, the party sailed down the Northwest Arm and landed at the Quarantine station on Point Edward, about on the axis of the anticline, which divides the two arms of Sydney Harbour. Here an exposure of black shale was visited that yielded a large number of small fossil fauna, particularly the minute fossil shell *Leaia*. One of the German geologists picked up from the underlying sandstones a fine specimen of a fish-spine about eight inches in length, and a compatriot was the proud possessor of a slab of sandstone showing a well defined cast of mud-cracks arranged in rough pentagons over its lower surface. The black-shale bed occurred just about breast-high, and in a favourable position for attack. An interesting photograph might have been had of some forty persons ranged in a continuous row vigorously attacking the crumbling shale with their hands, and all, apparently, well pleased with their finds.

From Point Edward the geologists proceeded to North Sydney, landing there and taking the tram-car to the point where the Millstone Grit, said to be here over 3,000 feet in thickness, gives place to the true Coal Measures. The party descended the cliffs and walked at the base as far as the outcrop of the Sydney Main Seam. Several members of the party preferred the highway to the rocky base of the cliffs, remarking that they had seen Millstone Grit before; but by the time coal-bearing measures were reached the

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CONGRESS PERSONALS



Dr. A. E. Barlow

Wladimir Loewinson-Lessing, of St. Petersburg, Russia, is one of Europe's leading geologists, and stands foremost among the Russians. He is an authority on rocks and the author of several papers.

John Walter Gregory is one of England's leading mining geologists. He was for some years professor of geology at the University of Melbourne and director of geological surveys of Victoria. He has studied the mining fields of several countries, and is the author of several papers on mining geology, including Mount Lyell mines, Victoria gold and tin fields, Ballarat gold field, South Rhodesian gold fields, etc.

Edward O. Ulrich, geologist, U. S. Geological Survey, is one of America's leading paleontologists. He has studied especially stratigraphy and invertebrate paleontology.

Walter Harvey Weed, consulting geologist and mining engineer, New York City, is one of the most prominent mining geologists in America. He has mapped several mining districts for the U. S. Geological Survey, and has contributed numerous articles on the origin of ore deposits. His writings include reports on geology of Mexico, coal of Montana, copper deposits of Butte, and copper mines of the world.

Waldemar Lindgren, professor of geology, Massachusetts Institute of Technology, is one of the foremost authorities on metalliferous deposits. He has made many valuable contributions to the literature on gold, silver and copper deposits, especially on the gold deposits of Colorado and California and the copper deposits of Clifton, Arizona.

Dr. Charles Kenneth Leith, professor of geology, University of Wisconsin, is a prominent authority on the geology of the iron districts of the United States. With Dr. Van Hise he has made careful study of the Lake Superior district, and has done much towards determining the structure of the ore deposits and their origin.

Dr. Frederick Leslie Ransome is chief geologist of the U. S. Geological Survey. He is a native of Greenwich,

Eng., and a graduate of California University. He has taught mineralogy at Harvard and geology at Chicago University. He joined the staff of the U.S.G.S. in 1897, and has written for the Survey several important works. His special studies have been the geology of gold, silver, lead, and copper deposits in Western United States.

William Herbert Hobbs, professor of geology, University of Michigan, makes a specialty of structural and dynamical geology and seismology. He has a reputation as a fault-finder. Dr. Hobbs has published numerous articles on mineralogy, petrography and geology, and is the author of books on earthquakes and general geology. He is an authority on the fracture systems of the earth's crust.

Dr. Charles Doolittle Walcott, Secretary of the Smithsonian Institution, Washington, D.C., ranks among the leading geologists of the world. He has made a special study of the oldest fossiliferous formations, and he has written numerous volumes on the stratigraphy and paleontology of the Paleozoic rocks. Dr. Walcott has done some very valuable work in the Canadian Rockies and has given remarkable descriptions of them. After being for several years on the staff of the U. S. Geological Survey, Dr. Walcott was appointed director of the survey in 1894. This position he held until 1902, when he joined the reclamation service. In 1907 he was appointed secretary of the Smithsonian Institution.

Louis V. Pirsson, professor of geology, Yale University, is one of the most prominent American geologists. He has described the geology of several of the districts of central Montana and of parts of New Hampshire. Dr. Pirsson has made a special study of rocks and rock minerals, and has published a text book on petrology.



Dr. Richard Beck



Dr. Waldemar Lindgren

Gold Mining Co. In 1895 he founded the firm of Charleton and Co., in partnership with F. W. Grey, reporting on mines of gold, copper, silver-lead, manganese and cobalt, in different parts of the world. In 1894 Mr. Arthur Dickinson joined the present firm, Charleton, Dickinson and Co., who acted as consulting engineers to the Cornish Consolidated Tin Mines, Ltd.; the Anglo-Spanish Copper Co., etc. Mr. Charleton is the author of numerous papers on mining, milling and mine accounting.

William Harvey Emmons is a native of Mexico, Mo. He was for several years on the staff of the Geological Department, University of Chicago. As geologist on the U. S. G. S. he studied and described many of the ore deposits of Nevada, Montana and Colorado.

Reginald Aldworth Daly, Professor of Geology, Massachusetts Institute of Technology, Boston, is a Canadian who ranks among the leading geologists of the United States. He has contributed many very important papers on the geology of igneous rocks and is regarded as a leading authority on the subject.

Dr. Edmund Otis Hovey, Curator of the American Museum of Natural History, has made a special study of volcanoes, meteorites and earthquakes. He has described the volcanoes of the Lesser Antilles and eruptions of Mount Pele, Martinique and the Soufriere, St. Vincent.

Alfred Harker, Fellow of St. John's College and Lecturer in Petrology, Cambridge, is well-known for his studies in petrology and for his text books on rocks. His work, "Petrology for Students" is in use in many colleges. Among his publications is an admirable work on the "Natural History of Igneous Rocks."

William Wallace Mein, Consulting Mining Engineer, New York, is well known in Ontario through his position as consulting engineer for the Dome Mines Co. and the Canada Exploration Co. Mr. Mein has held very important positions on the Rand, South Africa,

being general manager of French Rand Gold Mining Co., Crown Reef, Robinson, Robinson Central Deep, Ferreira, Village Main Reef, Village Deep, Turf Mines, City Deep, New Modderfontein and Modderfontein Extension. In Alaska also Mr. Mein held important posts, being consulting engineer to Alaska Treadwell Group of Mines, Douglas Island, Alaska.

Dr. Florence Bascom, Professor of Geology at Bryn Mawr, Pa., enjoys the distinction of being the most prominent woman geologist in America. For several years she has been a member of the staff of the United States Geological Survey, and has written a number of valuable works on general geology and on the geology of Pennsylvania. Miss Bascom is a regular attendant at the meetings and excursions of the several societies to which she belongs. She took part in the last meeting of the Geological Congress in Sweden.

Professor Joseph Barrell of Yale University, New Haven, is a prominent authority on the origin of rocks. Of late he has written several illuminating papers on the importance of land-formed sediments among the old formations. Professor Barrell was, in 1893-97, instructor in mining and metallurgy at Lehigh University. After practising for two years as a mining engineer, and spending three years as United States geologist in Montana, he was, in 1900, appointed Assistant Professor of Geology at Lehigh. In 1903 he received an appointment at Yale and became professor in 1908.

Dr. Heinrich Ries, Professor of Geology, Cornell University, is the foremost authority on clays. He has made many valuable contributions to our knowledge of the clays of America. Dr. Ries has been engaged by the U. S. Geological Survey and by the State Surveys of Michigan, Maryland, New Jersey, Texas, Wisconsin and Virginia to report on clays. Recently he has done similar work for the Canadian Geological Survey.



Horace V. Winchell

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INTERNATIONAL GEOLOGICAL CONGRESS
 OTTAWA - CANADA - 1913

Some of the members of the A. 1, A. 2, and A. 3 excursions visiting the Dominion Parliament Buildings at Ottawa.

only large bodies of students from the United States, but also from foreign countries. Prof. McLeod said he also wished to express the thanks of McGill for the brilliant courses of lectures he has delivered to her students.

Prof. Kemp said in reply that he certainly felt very much at home in a McGill audience, and in a McGill alumni. He spoke of the great part geology has played in progress, and he referred to the great work that McGill has done in this sphere. He recalled the labours of Sir William Dawson and Sir William Logan in the rocks of Ontario and Nova Scotia, of Prof. Harrington, of Dr. George Dawson, the intrepid explorer of Northern America, of the regiment of McGill graduates who have explored the north. Geologists turn to McGill from all over the world when they want knowledge of the interior of the earth, and seek it from Prof. Frank O. Adams. One member of the geological conference will carry back to his home deeply felt recollections of the significance of this day.

Dean Adams introduced Prof. Alfred Lacroix, member of the French Institute for the degree. He did much work in Guiana, Madagascar, Martinique after the volcanic eruption, where he was sent in a French battleship. His writings were numerous, and he was the most distinguished mineralogist of the present day.

In replying, Prof. Lacroix said he was deeply touched by the honour. He paid tribute to Canada as a fine country. He had been a student for twenty-five years. He spoke of the influence of McGill as high in promoting scientific research, and of the importance of the study of minerals in solving scientific problems, and the furthering of human progress.

Dean Adams said they were glad to have in Canada such a distinguished body of scientists from all the Seven Seas. He hoped they might go away well pleased with the Dominion, and he hoped that they would come back again to Canada for another geological conference. He also hoped that they would meet again before that date.

Canadian Mining Journal, Aug. 15, 1913.

Among those who visited the Quebec Asbestos mines on the A5 excursion this month were: Hans Arlt, Germany; Karl Boden, Germany; O. B. Boggild, Denmark; Leon H. Borgstrom, Finland; T. C. Denis, Canada; J. A. Dresser, Canada; L. L. Fermor, India; Mrs. L. L. Fermor, India; H. Frechette, Canada; S. McL. Gardner, Scotland; George Gurie, Germany; R. Harvie, England; R. E. Hore, Canadian Mining Journal; Jas. Howley, Newfoundland; Mark Hurl, Scotland; J. McG. Hurl, Scotland; J. P. Kruseh, Germany; Andrew Lawson, U.S.A.; A. Mailhot, Canada; Dr. C. Palache, U.S.A.; Dr. Fred Von Grote, Germany; O. A. Welter, Germany; E. Wigglesworth, U.S.A.; J. E. Wolff, U.S.A.; Berkey, U.S.A.; Bain, U.S.A.; P. Fabrega, Spain; C. Kido, Japan; R. B. Murray, England; Dr. Edgar Wherry, U.S.A.; H. B. Wallis, England; P. Zonde, Belgium; A. G. B. Wilbraham, England; B. Weigand, Germany. Mr. T. C. Denis, Superintendent of Mines for Quebec, and Mr. J. A. Dresser, geologist for the Lake Superior Corporation, were the leaders, and they made the excursion a very interesting one.

H. B. Wallis and A. G. B. Wilbraham, mining engineers of London, England, were members of the Sudbury-Cobalt-Porcupine excursion, and will go west to the Pacific Coast and up to the Yukon after the Toronto meeting.

Among the members of the A3 excursion who visited the Kirkland Lake gold fields last month were Bedford McNeill, president, and A. G. Charleton, past president, of the Institution of Mining and Metallurgy.

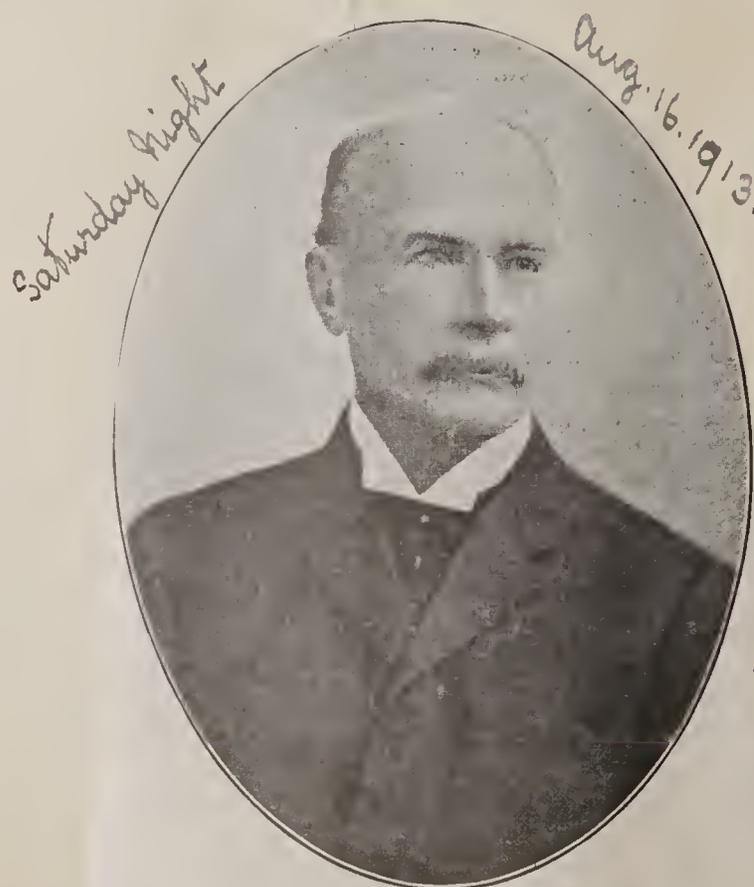
Dean Moyses, in the name of Principal Peterson, gave them a hearty welcome to McGill University. It is a young university, said he. It was founded in 1821 and in 1829 it began its work. It nearly perished, but the medical faculty, the doctors, kept it alive. Then came Sir William Dawson, a Scotchman. McGill is a Scotch university, many of its professors are Scotch, but the English professors do much to hold their own. So far as geology is concerned, McGill is the Mecca of geologists, and he cannot see why they should meet in Toronto. Canada was a country of boundless resources, and her universities were busy in turning out men to grapple with them. But they must not forget they have an arts faculty and turned out a Rhodes scholar, who won the blue ribbon of Oxford scholarship. He regretted that they had not received a civic welcome, and he hoped that when they came again they would receive one that would make up for the absence of one this time.

From the Convocation Hall adjournment was made to the Windsor Hotel, where the visitors were the guests of the Montreal reception committee to a luncheon. An orchestra played the national airs of the countries represented by the geologists.

Dr. Milton Hersey, in behalf of McGill, and Laval Universities, the local committee, and the various learned societies, conveyed their greetings to the party. Various so-called international conferences had been held in Canada at various times, but this was the first one held here worthy of the title, international.

Geologists, said Dr. Hersey, are the only persons who can go back to the earliest stages of the earth's history. This was a new country, only three hundred years old, but within a stone's throw of this hotel were rocks of the oldest geological formation.

Dean Adams, of the McGill Faculty of Applied Science, and president of the conference, thanked Dr. Hersey for the splendid reception. He then read off a list of no less than twelve excursions from Montreal, got up for the visitors. The majority go to Toronto and Niagara Falls, and leave at various times.



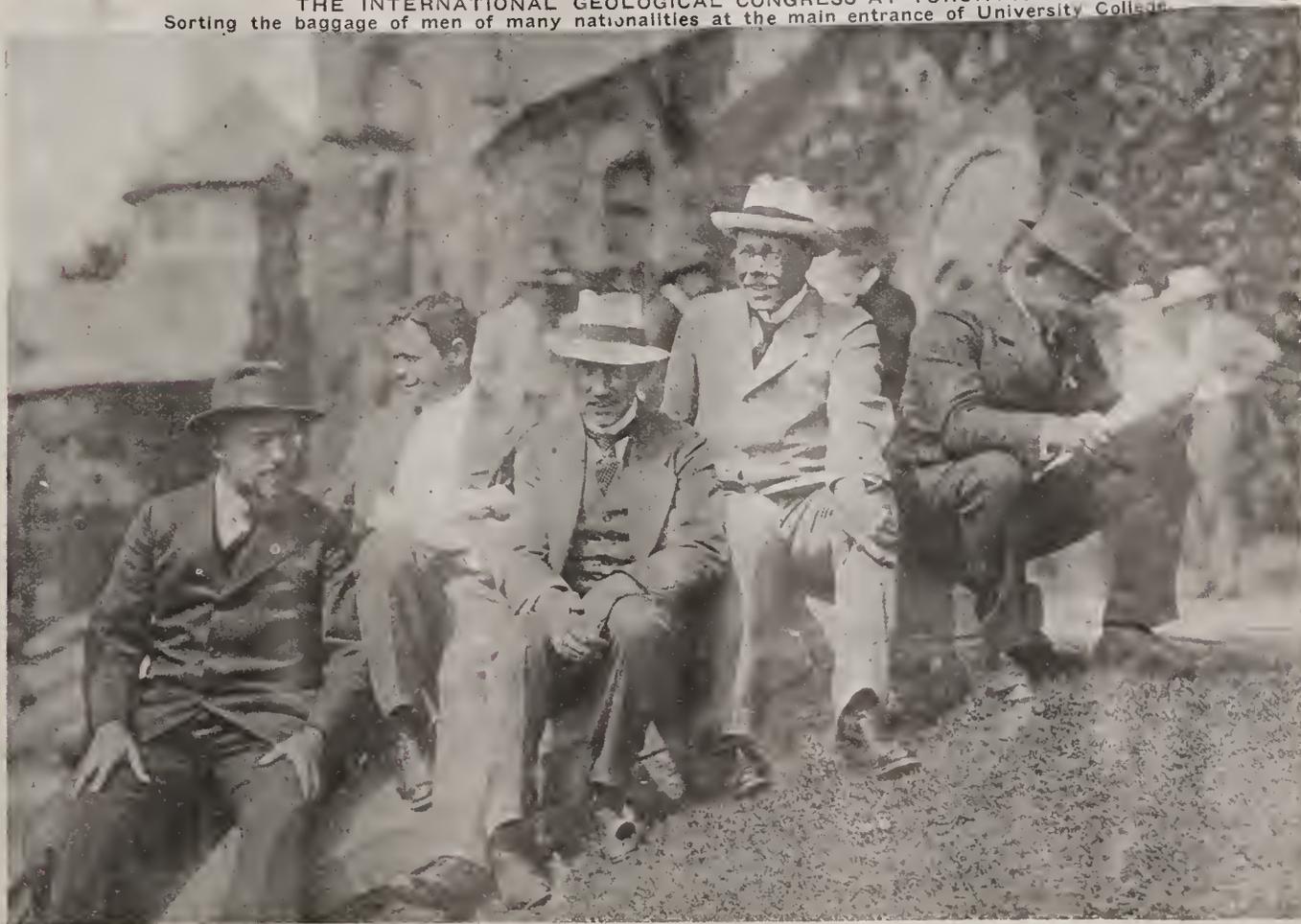
SIR CHARLES FITZPATRICK,

Who welcomed the International Geological Congress in his official capacity as Administrator of the Dominion of Canada.

Saturday Night. Aug. 16-1913.



THE INTERNATIONAL GEOLOGICAL CONGRESS AT TORONTO.
Sorting the baggage of men of many nationalities at the main entrance of University College.



GERMAN DELEGATES TO THE INTERNATIONAL GEOLOGICAL CONGRESS AT TORONTO,
Left to right.—Dr. Weber (Bonn University), Dr. Lachmann (Breslau), Dr. Mann (Bonn), Dr. Holnel (Bonn), Dr. Baden (Munich).

THE importance of such a gathering as the International Geological Congress, recently held at Toronto, could not be overestimated. Not only in its immense scope—for it is estimated that the native tongues of the various delegates embraced upwards of twenty-five languages, while many more countries were represented—rendered it important. The significant fact for all countries to consider, and especially young countries like Canada, is that everywhere the geologist is the pathfinder of wealth. His services mean more to the world's prosperity perhaps than those of any other man, except perhaps the scientific agriculturist, who succeeds in making two blades of grass grow where one grew before.

Some people, who rate knowledge cheaply, have no doubt been inclined to rate the geologist as a person chiefly employed in upsetting orthodox ideas as to the creation of the world. Undoubtedly the science of geology, which developed so rapidly in the nineteenth century, did contribute largely to dissipating the belief once generally accepted that the world was made in six days of twenty-four hours each, but it has also done much to inspire true religion by revealing to the imagination of mankind the inconceivable vastness on which the universe is planned. The old theological conception of a world a little over six thousand years old, is insignificant compared with the geologist's revelation of a world whose natural history stretches back through countless aeons of time. The geologist's contribution to the enlargement and illumination of the human mind is therefore in essence as great as that of the philosopher and the poet.

Moreover, in addition to the cultural effect of his services to humanity the geologist may lay claim to practical service, and it is no doubt the commercial aspect of his science that most appeals to the average man. As has been said he is the pathfinder of wealth. Seldom a wealthy man himself, he indicates—as surely as does the needle of the compass, the location of the north star—the sources of wealth. The practical man follows in his path, and makes fortunes out of his discoveries. With his science as a basic influence, great industries, great towns, and great accumulations of capital are built up. He knows where the gold, the silver, the coal, the iron, the copper—all the minerals which play an integral part in our civilization—are to be found. What Canada or the United States, or Australia or South Africa, or any of the younger nations which have grown to vast wealth within the memory of living man have owed to the science of geology who could estimate? What the older and stagnant empires, like those of Russia and China will yet owe to it who will venture to predict?

Globe. Aug. 16-1913.



GUESTS OF UNIVERSITY OF TORONTO.

The reception to the members of the Geological Congress and their friends was a distinguished gathering of men and women from all parts of the globe.



THE LATEST PORTRAIT OF SIR SANFORD FLEMING.

Though in his eighty-seventh year, the man who built the Intercolonial Railway, blazed the trail for the C.P.R. through the Rockies, and is the father of the Pacific cable, is hale, hearty, genial and simple.



THE BEST TRAVELLED MAN IN CANADA.

Professor W. R. Brock, Director of the Canadian Geological Survey, is regarded as the best authority upon the geological formation of the great mineral belt in southern B.C., and has served in various public capacities.

Cobalt Nugget. Aug. 16 - 1913.

TWO DAYS TO BE SPENT IN COBALT

Geologists Will Arrive in Silver Camp on Monday Morning

Owing to the very pronounced desire of the members of the first party of geologists to see more of the gold and silver sections of Northern Ontario Dr. Miller has entirely re-arranged the program for the C6 excursion. It will arrive here on Monday morning and two entire days will be spent here concluding with a reception at the Masonic Hall. One entire day will also be spent on Lake Timiskaming, as it was felt that a great deal more time could be used on the lake to advantage than was spent on the first trip and the party will depart for Poreupine on the night of Wednesday. Coming back the Alexo mine will be visited and also Kirkland Lake.

The itinerary is as follows:
 Aug. 18—(Monday)—Arrive Cobalt 4 a.m. Itinerary of former excursion will be closely followed.
 Aug. 19—(Tuesday)—Visiting the mines. At night a reception will be given to them by the Cobalt branch of the Canadian Mining Institute.
 Aug. 20.—All day on Lake Timiskaming. Leave at night for Poreupine.
 Aug. 21.—Arrive Poreupine. Spend day at Dome and Hollinger.
 Aug. 22.—Leave Timmins. Visiting Alexo nickel mine. Visit Swastika and Kirkland Lake.
 Aug. 23.—Trip down Timagami lake.

It is felt that the revised trip will be of increased usefulness to members of the party and will even more fully cover the territory here. The revision has been made as the experience of first trip dictated.

SCIENTIST STANDS BY STRONG 'WHITE' POLICY

Believes in Exclusion Laws in British Countries

EDUCATION IS BEST TEST

Colored Races Tend to Lower Moral and Industrial Fibre, Declares Director Kitson—Best for Both to Keep Apart.

"Yes, I am thoroughly in accord with the 'White Australia' policy," said Mr. A. E. Kitson, the Director of the Geological Survey of the Gold Coast. Mr. Kitson, who is one of the most traveled men at the Geological Congress, is eminently qualified to speak upon the subject of the colored races and the extent of the range of contact between the colored races and whites.

"Recently," said Mr. Kitson, "the Earl of Selborne, who is President of the Pretoria Diocesan Association, advised that native girls be trained to work as domestic servants, not only for their own sake but for the sake of the country. 'Doubtless you are aware,' said Lord Selborne, 'that in nearly all parts of Africa black men are employed as cooks, housemaids and nursemaids and the whole thing is utterly wrong.'"

"On the Guinea Coast, for instance," said Mr. Kitson, "when white men first went there they, of course, engaged black youths to do all their domestic duties for them, but latterly Europeans have taken their wives out there and these native youths are still doing duties which properly belong to native girls."

"What do you suggest as a remedy?"

"Naturally the employment of native girls for white women. There is something quite repugnant in the idea of a male youth looking after the clothes of white women, attending to baths and domestic duties. The Australian authorities are to be heartily commended for keeping out the colored miner and machinist coolies of any country. They not only reduce the wages of white men, but tend to lower the morale of a country. It will be a long time before equality in the matter of immigration can be granted to them."

"But would you preclude men such as we have had at our Congress from Asia?"

Education the Test.

"Certainly not. Any man who has been educated and who comes to bring and carry away useful information with him would and should be heartily welcomed not only as regards himself, but because in that way knowledge will be disseminated. The Australian policy of restricting colored immigrants is one that has been jibed at in many parts of the world, but I feel sure that the men in Australia understand the conditions around them and are doing the right thing."

"Can you give instances of ill-effects in the matter of allowing colored races to enter any part of Great Britain or the colonies?"

"I have seen and heard things in West Africa which should make Englishmen in particular very careful in allowing these men to enter English ports. Boys living on the Kru Coast are engaged by the steamship lines as firemen. They arrive in Liverpool with money in their pockets and they dress themselves in their best clothes and go ashore. What is the result? They return to the Coast with photos of English factory girls in their pockets, show letters they have received from them and boast of their conquests across the sea in the most objectionable way. It has besides a pernicious influence upon the attitude of the ignorant natives of the country towards the white people who govern them."

"Do you think Canada is likely to suffer in the West in the same way?"

"I came here by way of Australia and San Francisco, but from what I heard from reputable people in the West the conditions in British Columbia are in some respects worse than in Africa. You have there male Asiatic domestic servants who live in the same houses as the families do and mix freely with the white domestics."

Saturday Night, Aug. 16

For the past ten days the International Geological Congress, numbering over six hundred, have been in Toronto. Luncheons, dinners, garden-parties, and banquets have been daily en regle, and as this item goes to press, I hear the good-bye fete will take the form of a large garden-party in the quad, given on Thursday by the University Faculty. With the intermediate exercise of "tapping" on north Yonge street, also over in Hamilton, probably our "kindness" in entertaining the international visitors will not turn out to be one of the quality that "kills."

Conversation in many tongues was heard last Friday evening on the grounds of the Royal Canadian Yacht Club. A number of the visiting geologists were invited by Commodore Jarvis, to the band concert given by the Grenadiers, and in compliment to the visitors the different National Anthems were part of the programme. Everything came in for its quota of admiration, but most of all the young girls who for an hour danced in the upstairs dining-room, their beauty and grace impressing the foreigners—yes, and some of our middle-aged Torontonians, too.

Sunday World, Aug. 17-1913.

Some distinguished members of the International Geological Congress who attended the excursion to Royal Muskoka Hotel, Muskoka Lakes: F. French, Germany; Mrs. Frech; S. McL. Gardner, Glasgow; R. P. D. Graham, McGill University, Montreal; M. J. Goldman, Johns Hopkins University, Baltimore; Miss Goldman; Miss A. Grutterink, Holland; P. J. Holden, professor geology and mineralogy, Virginia; E. C. Hovey, American Museum of Natural History, New York City; J. P. Howley, director geological survey of St. John's, Newfoundland; Mark Hurl, Glasgow; J. M. Hurl, Glasgow; B. Iobson, Sheffield; A. Keith, U. S. geological survey, Washington; R. Lachmann, Breslau, Germany; H. M. Luttman-Johnson, Petworth, England; L. Michalon, Paris, France; Bedford McNeill, president Institution Mining and Metallurgy, London, England.

Mr. D. R. Wilkie gave a dinner at the York Club on Monday in honor of some members of the geological congress.

UNIVERSITY GARDEN PARTY.

After the ceremony of conferring degrees in Convocation Hall on Friday afternoon, at the university, the Chancellor, Sir William Meredith and the president, Dr. Falconer, with the mace carried in front of them, headed the procession to the quadrangle, where they received the guests invited to a garden party in honor of the International Geological Congress, by the board of governors of the University of Toronto. The band of the 12th York Rangers played the most delightful Scotch music on the terrace during the afternoon. A large marquee on the north side of the lawn accommodated the tea-tables, which were gay with scarlet gladioli. The members of the congress and their confreres in town had become so friendly that they were loth to say good-by, but many of them left for Vancouver, Montreal and various places last night, and many were the appointments made to meet in London at no very distant date. A few of those present were: Dr. and Mrs. Frank Adams, Montreal; Mrs. Kerr, Mr. and Mrs. David Dunlap, Mr. and Mrs. Carlton, London; Mr. and Mrs. Graham Campbell, Dr. and Mrs. Ham, Dr. and Mrs. Vogt, Miss Garrett, Miss McLellan, Stratford; Mrs. Sweeny, Mrs. Thorburn, Mrs. and Miss Cross, Rev. Ralph Bridges and Mrs. Bridges, New York; Miss Helen Merrill, Miss Brodigan, Mr. and Mrs. Tyndall, Dr. and Mrs. Strahan, London; Miss Marjorie McMurchy, Mr. and Mrs. Gerhard Heintzman, Mrs. Willic Gwynne, Monsieur de Camps, Dr. and Mrs. Adams, Mr and Mrs. Murray Clark, Mrs. Macklem, Hon. J. J. Foy, Mr. and Mrs. Bedford McNeil, Dr. and Mrs. Powell, Mr. Frank Arnoldi, Miss Fair, McColl, Mr. and Mrs. Matthews, New Brunswick; Dr. and Mrs. Harley Smith, Mr. and Mrs. Bascom, Prof. Keys, Mrs. Palm, Dr. Corelli, Miss Addison, Mrs. Arthur Peplar, Mr. and Mrs. Roche, Mr. and Mrs. Godwin, Miss Culpepper, Virginia; Mrs. Pierson, New Haven; Mr. and Mrs. Freck, Germany; Mr. Kennedy, Miss Nairn, Dr. and Mrs. J. A. Macdonald, Mr. Goulding, Hon. W. H. Hearst, Prof. Raultke, Mrs. Morse, Dr. Zuber, Dr. Laing, Dr. Stolling, Prof. and Mrs. Riener, Dr. Beck, Dr. and Mrs. Parks, Mr. and Mrs. Derward, London; Mrs. and Miss Heaven, Mr. Geo. Lindsay, Mr. Zaber Poland, Mr. John King, Mlle. Ternier, M. Ternier, Dr. Riedel, Miss Coleman, Mr. and Mrs. Stanley Leckie, Mr. T. H. Plummer, Mr. John Ashworth Mr. D. R. Wilkie, Mr. and Mrs. Glackmeyer, M. Hoffman, Mr. and Mrs. J. D. Tyrrell, Dr. and Mrs. Eaton, Miss Scott, Miss Phillips, Miss McCallum, Miss Porte, Mr. and Mrs. Nerlick, Miss Gwen Cayley, Mr. and Mrs. Jack Falconbridge, Mr. and Mrs. R. W. Brock, Ottawa; Dr. Alfred Barlow, Ottawa; Dr. Coleman, Miss Coleman, Mr. W. MacInnes, Mr. W. Stanley Lecky, Ottawa; Mr. J. Keidel, Argentine.

A. E. KITSON



Director of the Geological Survey of the Gold Coast.

Mail & Empire, Aug. 16-1913

Minister of Marine On Way From Yukon

New Strike of Placer Gold is Reported Undoubtedly Rich.

Skagway, Alaska, Aug. 15.—Hon. J. D. Hazen, Canadian Minister of Marine, arrived from the interior yesterday and sailed south to-night. He has received the following telegram from Geo. Black, Governor of the Yukon, Dawson City:—

"Dr. Cairns, Dominion Geologist, who has returned from White River and the Shushanna districts, reports that the new strike is undoubtedly rich. The known area is yet of necessity limited.

"Gold had been found on four creeks. The formation is good for the deposit of gold. The claims extend to the Canadian side. The Cairns party staked claims. I have approved the Customs proposal to expedite the movement of goods into the Shushanna, where they are greatly needed. I strongly advise against men going in without supplies."

Robert Huggel. Sep. 17
1913.



DR. FALCONER, President of Toronto University, who addressed the Canadian Club of Timiskaming last night.

THE DUNLAP ROSEDALE RESIDENCE AND GROUNDS DURING THE GARDEN PARTY GIVEN TO THE VISITING GEOLOGISTS.



MRS. CHARLETON, ONE OF THE PROMINENT WOMEN AT THE GEOLOGISTS' GARDEN PARTY.



MRS. D. A. DUNLAP AND HER LITTLE SON.

Our Visitors

The guides to the first excursion from the International Congress found such avidity for information about Timiskaming that our visitors who arrive to-day will stay two whole days in Cobalt, will employ another in studying the rocks round Lake Timiskaming, and will visit Kirkland Lake as well as Porcupine as the regular portion of their trip.

The alterations have been made owing to the experience of the wishes of the first excursionists. Science is a great unifier. Bulgaria has been crushed to the earth in defeat, yet that does not prevent a representative of King Ferdinand from visiting Canada. It is to be noticed, however, that representatives of none of the other warring Balkan allies are included in the trip.

There is quite a large contingent from Russia and Professor Hoki of Japan is also of the party. The party is not so pronouncedly Anglo-Saxon as the first and the yellow and green ribbons in the button holes, signifying that the wearers speaking German and French, will be much more prominent. There are very few Americans and only three Englishmen, but the Canadians have taken even greater advantage of it than of the trip preceding the Congress.

It is unfortunate that the excursions that should have returned from the west via the Transcontinental should have been obliged to go back without seeing the silver and gold sections of Northern Ontario.

The Hon. Frank Cochrane and the Hon. W. H. Hearst will indeed go over the Transcontinental to Winnipeg, but the line is scarcely in such shape yet as to receive a heavy train of Pullmans such as the geologists travel in.

RUSH REALLY STARTED FOR GOLD FIELDS

Dawson Anticipates Another Stampede—Crowded Steamers Leave for Diggings

NASUTLIN CARRIES ASSORTED CARGO

Women Join in Rush—Brandy and Whisky Consigned to the Roadhouses

The rush has really started for the White River and the Shushanna, according to the last issue of The Dawson Weekly News. Arrivals at Dawson from White Horse on August 1st, reported the steamer Vidette proceeding up the White with passengers and freight for the new strike. The Nasutlin was at the mouth of the river with the first full load of passengers and outfits to go from Dawson. All freight space on the lower deck was occupied, and a barge was pushed ahead on which were twenty poling boats, 13 horses, and numerous outfits, with standees in one portion for men. Thirty standees also were provided on the main deck of the steamer, and all state rooms were occupied.

Old Timers on Board.

The passengers included a good many old-time Dawsonites. One shipment of 40 tons of freight was going for men who have been in the camp for some time. The average outfit for others was 1,000 pounds. Those not taking horses had poling boats. The steamer will try to make the mouth of the Donjek, and to land the passengers there.

Many dogs and sleighs were also on the boat, indicating the preparations already being made for winter.

The freight is typical of that for all northern stampedes, and in the interior the boat looked like that of a steamer leaving Seattle in '97. Yukon stoves, picks, shovels, pans and the like were everywhere in evidence.

Beer, Brandy, Whiskey.

One outfit took several barrels of beer, some others had brandy, whiskey and goods for roadhouses. Only one man had candles. Two single women joined the stampede, and will hike for the diggings. One peculiar shipment was a barber chair, belonging to a stamper who will go prepared to shave the wild and woolly gold kings of the White and the Shushanna.

Dawson Alive Again.

Steamboat crews at Whitehorse had to load the Dawson, all the longshoremen having left for the new fields. Men of other crews have deserted and joined the mushers. The Yukon is alive again with golden rumors. Dawson City has taken on a new lease of life. The logical base of supplies, merchants and storekeepers are alive to the commercial value of the rush and are preparing for a record business.

Repeated warnings have been uttered by those fresh from the diggings against the danger of heading for the new fields without being well grub staked. It is made plain that grub cannot be laid down there save at heavy expense, and that little more can be done there this season by those now going in save to prospect.

GEOLOGISTS AND MINERS ARE OF SAME HOUSEHOLD

Worship Same God--the Everlasting Rocks...Addresses at Cobalt Mining Institute

Very notable were some of the speeches by the eminent German geologists at last night's reception by the Cobalt branch of the Canadian Mining Institute. In view of the fact that these scientists are chiefly studied in the ore deposits in Saxony most closely analogous to Cobalt, the comparisons are of great importance to the mining industry here. Although seriously handicapped by being obliged to speak in an alien tongue the German delegates most cheerfully and courteously spoke at some length in order to give Cobalt mining men the value of their great experience.

The main feature of the programme was an exhibition of vein photographs by Mr. A. A. Cole, with the aid of a lantern. These photographs are now recognized as unique in the history of mining photography and the visitors were most impressed with their excellence. They cover every feature of the ore deposits of the camp, show the different veins in the various formations and tell most graphically and simply the history of the ores of the camp. Mr. Cole also has figures with each photograph showing the number of ounces to the ton and the marvellous richness of the ore. At the end of his lecture he was warmly thanked.

Mr. E. V. Neelands, chairman of the Cobalt branch of the Canadian Mining Institute warmly welcomed the visitors. He said that men were naturally partial to their own kin and they felt that geologists and mining engineers belonged to the same family. They all worshipped the same household god, the everlasting rocks, although they specialized along different lines. Without the geologist the miner would be often at a loss and without the miner the geologists would not be able to make more than a superficial examination of the surface of the rocks. He then called upon Dr. Beck, of Freiberg, Germany, to give them the benefit of his experience in the Saxony fields in comparison with Cobalt.

Dr. Beck paid a high tribute to the excellence of the lantern slides of Mr. Cole. He then went on to say that the Saxony veins were very similar in many respects to the Cobalt deposits but they were not alike in all details.

In Germany the Cobalt ores were associated with large masses of granite which was not the case in Cobalt. The tin veins often changed into veins of galena with an important content of silver. In some cases it was possible to notice that the same vein contained tin at one end and galena and silver at the other. Cobalt ores were found in another class of veins above the surface of the granite masses. They had the same experience with the granite as some of the Cobalt mines had with the keewatin.

When the veins encountered it they contained little or no ore. The veins became poorer and poorer and could not be worked in the granite at all. In Schneeberg in their cobalt veins they had nicolite, cobalt and bismuth much as they had in the Cobalt camp, but they also had much barite which was not common in the ores in Canada. But he had been told by a mine manager that there was plenty of barite in the veins in an outlying camp, which would give another resemblance to the German ores. They also in Germany had many small veins and they were very rich. At the first discovery the German ores were perhaps as rich as those of Cobalt. The miners made a table of solid native silver and argentite and invited one of their princes to take lunch at their table. There were still some pieces of that famous table in the Museum at Dresden.

"Perhaps," concluded Dr. Beck, amidst laughter, "you will have an opportunity of making a table of silver for your king if he comes to Cobalt."

Dr. John Paul Kruseh, another famous authority on ore deposits, said that he had been much interested in the veins he had seen to-day inasmuch as they resembled the fields he was acquainted with. The principal difference he saw was that they principally had rock in Germany while in Canada they principally had ore. (laughter.)

Mr. Edward Rengers Schoch, manager of the Rooiberg Minerals Development Co., Transvaal, South Africa, said they heard a great deal about Cobalt in South Africa, but being an engineer he always liked to see for himself. Now he had seen and he must say that the reports had not been overstated, in fact they had been understated. As a mining engineer he was only an amateur geologist, but coming from a great mining field he had tried to compare conditions as regards management, efficiency and methods of work. And he could tell them that as the result of his experience he could say that the Canadian mining engineer could hold his own. The mines in Cobalt seemed safe, well regulated, and well run. From the purely financial point of view the Canadians had nothing to be ashamed of.

GEOLOGISTS TAKING NOTES

Distinguished Scientists Find Much to Interest Them Here

Today most of the 44 members of excursion C6 from the International Congress will visit mills and refining plants. They are all particularly anxious to see the Nipissing's high-grade and low grade mills, where some very interesting metallurgical problems have been worked out. Others, among them Dr. Beck of Freiberg, are too enthusiastic geologists to visit the mills, and they will make still more complete their collection of specimens.

This afternoon the whole party will be taken out to the Kerr Lake mines. Tonight an informal reception will be tendered to the visitors at the Masonic Hall. Mr. A. A. Cole will repeat his illustrated lecture on the veins of the camp, and it is hoped that some of the visitors will be prevailed upon to give some impressions of their visit to Canada.

Unlike the first excursion there are no ladies in the present party. Dr. Richard Beck, found a certain resemblance to the Cobalt veins in certain European deposits. He and his father and grandfather have been engaged in the mining of the Saxony ore deposits which so closely resemble the Cobalt camp. The mines are almost worked out, but the smelters have with long experience attained such a lead in the treatment of cobalt oxide ores, that they can afford to buy all over the world and make a good profit.

The demand for cobalt ore is increasing slowly but steadily. It is being used in the production of high-class ware, and in conjunction with chromium and also in hardening steel. But there is no reliable indication that the market is going to expand so that it will be a very profitable side product for the Cobalt operators. All the members of the excursion are making copious notes for reference when they return. Their lockers and boxes in the baggage van are also being rapidly filled with specimens of rock all carefully wrapped up and filed away.

Dr. Tadassau Hiai, professor of Geology and Mineralogy for the Imperial Institute at Kyoto, Japan, is taking great pains to obtain the most complete notes of the district. There is nothing escapes him. Nor is it only rocks that engage his attention, but the sociological aspects of the North Country appeal to him almost as strongly.

The Canadian Pacific, have with characteristic thoroughness, provided their passengers with waiters who can speak nearly all the languages native to the members on the trip. While most of the Europeans are fine linguists, it rejoices them very much to be addressed in their dear home tongues.

Mr. Edward Rengers Scoch, the manager of the Rooiberg Minerals Development company of the Transvaal, represents South Africa. He has charge of the largest tin mine in South Africa. Many Cobalt men who have been on the Rand were chatting with him last night of mutual acquaintances.

Dr. Beck, who with Dr. Miller, lunched with Mr. Hugh Park this afternoon, was very glad to meet Mr. Joseph Mandy, a graduate of Freiberg. Mr. Mandy is now the principal of the Cobalt Laboratory and Assay office on Silver St.

It is understood that if it is at all possible the C2 excursion, one of those going to the west will be brought from Winnipeg over the National Transcontinental, as it was planned in the original programme. Major Leonard believes that it can be done, and if it can it certainly will. This will enable another group to spend a little time in Porcupine and Cobalt.

Daily News, Nelson, B.C.
Aug. 21-1913.

ANXIOUS TO AID ZINC INDUSTRY

Minister Expects Mining
Commission to be Named

TELLS OF WORK
OF R. F. GREEN

Canada's Mineral Wealth As-
tounds Eminent Geologists
Now Here.

The Dominion government is doing all that is within its power to encourage the zinc mining industry in Kootenay and it is with that idea in view that it is, with the co-operation of the British Columbia government, about to commence experiments with a new electrical method of obtaining zinc spelter, said Hon. Louis Coderre, minister of mines, who arrived in the city last evening in company with the party of about 100 members of the International Geological congress.

During the last session of the house R. F. Green, member for Kootenay, had kept the matter much to the fore and had spoken at every opportunity to R. W. Brock, director of the geological branch of the mines department and leader of the present excursion, and to himself on the possibilities of the zinc mining industry of Kootenay, stated Mr. Coderre.

Not satisfied with the small experiments alone, Dr. Eugene Haanel and Mr. Ingalls had succeeded in obtaining permission to conduct large experiments at the Nelson smelter, the use of which the British Columbia government had offered gratis.

Mr. Coderre stated that he was pleased to be able to stay in Nelson and meet the men vitally interested in the matter and he hoped and expected that his conference this morning with the council of the board of trade and the mining men would prove of much value to him and to the government.

The geological congress and the excursions which are being made throughout the country are arranged at a considerable expense to the country, but they will be of immense value to the Dominion at large and particularly to the mining districts, said Mr. Coderre. Forty-six nations are represented in the party, he said, and some of these are official representatives from their countries, who will make reports of their trip, and he felt sure that their reports would be glowingly favorable, judging from the extreme surprise shown by the members of the party at the wonderful natural resources and especially the mines of the country. The excursions were being enjoyed very much by all.

Expects Royal Commission.

On his return to Ottawa early next month Mr. Coderre said he expected to see the royal commission to investigate mining conditions in the west appointed, as had been asked.

On the trip through the Crows Nest pass the party visited the coal mines at Bull River, Maple Creek, Hillcrest, Corbin, Coleman, Coal Creek and Fernie and had found that those mines were full of promise, said Mr. Coderre, especially the mine at Corbin, where a seam was open 185 feet deep. It proved a unique sight to the geologists, he said, similar to which they claimed to have seen nothing elsewhere in the world.

It was his first trip west of Winnipeg and he was delighted with the country, its resources and prospects, and his eyes had been opened as regards the west, which he now saw in an altogether new light. He would carry back with him a new impression of the vast Dominion of Canada. He expected to return better physically and intellectually from his trip.

Speaking of his trip on Kootenay lake he was struck with the large cultivated areas along the lake shore and with the evident signs of prosperous ranches.

Nelson, dressed in its brilliant electric lights, appealed to him very much and he was delighted with what he had seen of the city.

Mr. Coderre is accompanied by Madame Coderre; his sister, Miss Coderre; Madame Falardeau, his two sons, Louis and Charles, and E. Paradis, his private secretary.

This morning he will meet the council of the board of trade and the mining men of the district to discuss

matters concerning the welfare of the mining industry, and the party will leave by special train this afternoon for Ponnington, from which point Mr. Coderre's special car Lorien will be picked up by the coast train this evening and the party will proceed to Rossland.

Geologists Arrive.

The geological party arrived on the steamer Nasookin last evening, having been met by a deputation from the Nelson board of trade at Kootenay Landing.

Immediately on arriving the party was conducted to the public bureau, where the mineral display from all parts of the Kootenay and Boundary country had been placed on exhibit to good advantage. Many expressions of delighted surprise were heard in the building from many of the geologists, who closely examined the exhibits from each district.

Guided by Mr. Brock, who is leader of the party, H. E. T. Haultain and H. Frechette, who act in the capacity of secretaries, the party then proceeded to the Strathcona hotel, where an informal social evening was spent and refreshments served.

The foreign members of the party are astonished with what they have seen on their journey, said Mr. Haultain in discussing the trip. "The Canadian Pacific railway has treated us royally, there having been not the slightest hitch, fault or flaw during our trip across the Dominion."

Mr. Sturdu, from the general passenger agent's office in Montreal, has accompanied the party throughout the journey in order look after its wants and to see that nothing is left undone for the comfort of the party.

Make Thorough Investigation.

Geological guides from the survey at Ottawa are with the party and all the geological features en route are inspected and studied, nor do the visitors confine their investigations to geology, as in each locality a searching enquiry is made into the social and economic conditions of the country. Lectures are given on varied topics on the train and all matters of interest concerning the district being traversed are fully discussed.

The geologists inspected the Crows Nest coal mines and were greatly impressed with them, particularly at Cerbin, the showing there being looked upon as one of the best en route.

Included in the party are: Bedford McNeil, president of the Institute of Mining and Metallurgy, London; J. B. Terrill, the Toronto explorer, geologist and mining engineer, and John Ashworth, president of the Manchester Geological and Mining society.

Mr. Ashworth is of the opinion that Canada, and particularly British Columbia, is on the verge of a great era of mining prosperity, in which he is keenly interested.

During last evening the city band played on the balcony of the Strathcona hotel, where the geologists were entertained and registered during their stay.

The party's train reached the city about 10 o'clock last evening and the party will leave at 4 o'clock this morning for the Boundary, where they will conduct further investigations.

Mr. Haultain is a former Nelson resident, having been interested in the mining industry here around 1903.

Geologists Visit Boundary Minister Sees Power Plants

Accompanied by a party of the members of the board of trade, Hon. Louis Coderre, secretary of state and minister of mines in the federal cabinet, and a number of the members of the geological congress, visited Bonnington Falls and Creel Lodge at Slocan Junction by special train yesterday afternoon.

The party visited the big power plant of the West Kootenay Power & Light company and saw the big falls, where thousands of horsepower of latent energy lie at the disposal of the district, the minister being particularly struck with the great benefit that the power which it is possible to develop at that point would be to the mining industry of Kootenay and the Boundary.

The party was shown over the plant by officials of the power company, and every point of interest in connection with the big electrical works was thoroughly explained. The minister showed a great keenness to familiarize himself with the intricate machinery that is used by the company to develop the 20,000 horsepower of electricity to which 9000 additional horsepower is soon to be added.

Very much were the minister and his party struck with the beauty of the scenery along the Kootenay river, particularly in the vicinity of the falls and the Slocan pool, and the interest in this feature of the trip was only overridden by the interest in the vast possibilities of the development of power at Bonnington Falls.

After visiting the power plant, the party went to Creel Lodge at Slocan Junction, where refreshments were provided. The minister remained at the junction in his car and left last evening for Rossland. The Nelson party returned to the city on the Boundary train.

See Largest Copper Smelter. (Special to The Daily News.)

GRAND FORKS, B. C., Aug. 21.—Seventy-five members of the geological congress and a large number of ladies arrived in the city this morning on a special over the Canadian Pacific from Nelson.

The party, which is making a tour of the Dominion, is under the guidance of R. W. Brock and O. E. Leroy of the department of mines, Ottawa. The train, which was composed of nine Pullman dining and baggage cars, was the finest equipped ever seen in this section of the country.

The party was met at the new union depot by a committee of citizens and escorted to autos, ample accommodation being provided, and was taken for a drive through the valley. The visitors inspected the fruit orchards, which at the present time are looking at their best, the autos landing them at the Granby smelter, where they spent some time in looking over and examining the largest copper reduction works in the British empire, under the guidance of Superintendent Bishop and the office staff.

Possibilities Impress Visitors.

About 11 o'clock the members of the congress and their wives boarded the special train, which had been run up to the smelter, for Phoenix, where they will inspect the larger producing mines of the district, after which they will drive down the hill to Greenwood to look over the smelter of the British Columbia Copper company.

The party, which represents many nations, was very favorably impressed with the possibilities of the district, one prominent Britisher stating that in all the tour of the Canadian west he had not witnessed a city where better inducements were offered for the establishment of a large number of industries.

The special passed through the city tonight on its way to Castlegar, and will carry the distinguished visitors to Trail, where they will inspect the large smelting works of the Consolidated company tomorrow morning, visiting the mines at Rossland in the afternoon, returning to Castlegar tomorrow evening and taking the boat for Arrowhead and going on to the coast.

See Granby Glory Hole.

(Special to The Daily News.)

PHOENIX, B. C., Aug. 21.—The special train carrying the 75 delegates of the International Geological congress, who have elected to make a study of matters geological in the Boundary district, steamed into this city at 12:45 o'clock today. The party disembarked at the Rawhide mine and made its way on foot over the hill via the Grey Eagle claim, to the west side of the "glory hole" of the Granby mine. About half of the party entered the mine and was shown over the various workings by the superintendent, Charles M. Campbell, assisted by a number of officials of the Granby company.

The other half elected to make a tour of the surface and examine the geology around and adjacent to the Granby claims, as well as those of the British Columbia Copper company, including the Brooklyn and Stemwinder properties.

Lunch was served in the large dining room of the Granby hotel and at 5 o'clock the scientists left for Greenwood, where a visit to the British Columbia Copper company's smelter took place. Quite a number, however, elected to take advantage of the excellent weather and made the trip to the valley on foot. While the men of the party were engaged in their geological pursuits, the women of the party to the number of six were pleasantly entertained by Mrs. Campbell, wife of the Granby company's superintendent, assisted by a number of local women.

The visitors before leaving expressed their pleasure for the courtesies extended by the officials of the mines.

GEOLOGISTS SCRUTINIZE PORCUPINE

Much Interested in Their Visit to the Goldfields

(From Nugget Representative.)

IROQUOIS FALLS, Aug. 22.—To commence a second busy day examining goldfields the geological congress excursionists this morning spent two hours at the nickel property of the Alexo Mines. The formation and general conditions were noted and the mining methods by the infant nickel company discussed.

Yesterday was an extremely busy day for the visitors, when they visited their first gold camp of the north in the Porcupine district. Rising early the members had scattered to various surface showings of the Big Dome mines, before eight o'clock. The "glory hole" was a point of interest, while the geologists found many interesting features in the general surface formation. The hundred foot level was visited and afterwards a trip of inspection made through the mill.

In the afternoon the Hollinger was the scene of the studies of the party and in addition nearly two miles of underground workings were shown the visitors on various levels. There was a wild scramble for gold samples during the day the result of which meant the sorting over of various dumps at the two mines and nearly every member returned with a sample of Porcupine gold in its native state. This afternoon the party will visit Kirkland Lake and Swastika districts, but a heavy rain now falling may mar the day to some extent.

Cobalt Nugget. Aug. 23-1913.

Taanks Of Geologists

Swastika, Aug. 22.

Editor Daily Nugget,
Cobalt.

Dear Sir,—We foreign geologists left Cobalt with the feeling of heartiest thanks for the kindness of all the inhabitants of your town. The hospitality which we found everywhere will never let us forget the interesting days spent in the famous silver centre.

Yours sincerely,

DR. RICHARD BECK,
Royal Bergakademie Rekarat,
Freiberg, Saxony,
Germany.

GEOLOGISTS DELIGHTED WITH VISIT

Ask Through the Nugget To Thank all Who Made Their Stay Enjoyable

"We were more than satisfied with what we saw at Cobalt on our visit there this week," stated Dr. Richard Beck, Rektor der Kgl. Berakademie, Freiberg, Germany, in an interview with a Nugget representative at Swastika last night, after the well known German geologist had returned from a visit to the Kirkland lake section.

"What are your impressions of Kirkland Lake," queried the reporter and the answer received was "very, very promising." Dr. Beck stated that he had never seen so rich an ore as that being mined in the new camp, while the fact that so many surface veins with free gold showings argued well for the district, and made it appear to be one of the greatest prospects he had ever known. Porcupine with its large veins also impressed Dr. Beck and other German geologists greatly and the reception they received in these camps and Cobalt would always be remembered by them.

"I want the Daily Nugget to express the thanks of the foreign geologists to all those who so kindly assisted us in every way in your northern mining camps," stated Dr. Beck, who like all other foreign visitors was enthusiastic over the receptions at all points visited.

"One impression which struck me forcibly," continued the doctor, "was the number of young mining engineers and mining geologists who are at work in the camps of this section. They are working with all the up-to-date methods of science and it argues well for a camp when so many young energetic men are at the head of affairs."

The tellurides Kirkland Lake resemble the tellurides in Bohemia near Cassejovic, the only point in the German Empire where telluride shows gold value. While the occurrence of the ores is similar to the German product does not carry gold in the same grade quantities in the Kirkland section. There is only one gold mine in Germany, although in Austria and Bohemia there are several working properties, all on a low-grade basis.

MOST REMARKABLE ORE SPECIALIST HAD EVER SEEN

Geologists Much Impressed With Visit To Porcupine and Kirkland Lake

Favorable impressions of Northern Ontario gold camps will always remain fresh in the memories of the members of the geologists Congress excursion C.6 after the two-day inspections at the Porcupine and Kirkland lake fields. Thursday was spent in the older of the camps, while yesterday was devoted to a trip to the Kirkland lake district, where the geologists were more than surprised at the abundance of native gold to be seen in the veins.

The fact that a downpour of rain kept up during the afternoon and evening did not dampen the ardor of these men in seeing Kirkland. At Swastika station a number of rigs were in waiting and of the party only three preferred to remain with the train. The party managed to arrive at the mine over the seven-mile road without being drenched but returning in the evening the rainfall was exceptionally heavy and all the members of the party although provided with waterproof coats, were soaked.

Dr. E. Howe, Newport, R.I., a mining engineer specializing in gold ores, described his visit to the Tough-Oakes in a manner which showed that he was an enthusiast of the first order for the new camp. "No one could make me believe such ore existed if I had not seen it," he stated, as he gazed on the gold showings at the 100-foot level in the vein and wall. He characterized the vein as being the most remarkable and richest he had ever seen and added that he had been in many mining camps.

Other geologists and mining engineers were impressed in a like manner and they braved the rain to walk around the surface and be shown other veins on the Tough-Oakes as well as the Burnside, Wright Hargraves and other properties in the immediate section. The men were gazing at veins with exceptionally rich surface showings and the formation in which these ore bodies occurred was the subject of much discussion.

The entire party were taken underground at the Tough-Oakes to the 100-foot level. Here the sixty members of the party posed for their photographs taken by G. A. Smith of Haileybury with the main vein as the background. Nearly half an hour was spent inspecting the vein and formation and the visitors took a delight in picking out gold showings in the veins by means of the lights.

Realizing that the delegates would enjoy a few samples of gold, Manager Charles O'Connell had a skip load of samples from the 200 foot level hoisted to the surface and put on the dumps. "Let us see what good high-graders you are," stated the manager as the party made a bee line for the samples.

Camp dinner was served at the mine and after the meal Dr. Miller took the opportunity to thank Mr. O'Connell for the reception he had given the visitors during the day. He referred to Mr. O'Connell's work in the Cobalt camp since its earliest days and of the excellent work which he had done. Mr. O'Connell made a suitable reply and thanked the party on behalf of his chief, Mr. Foster, for visiting the district.

The engineers found in Porcupine and Kirkland a vast difference. At the former camp large bodies of ore running to \$50.00 a ton were seen, while in the newer camp the veins were inclined to be smaller but richer. The formation was different too and it was studied extensively. At the Dome mines on Thursday morning an interesting portion of the visit was the inspection of the "glory hole," where the original discovery is being broken down and then raised to the mill through the incline from the hundred foot level. The entire surface was inspected and the various formations visited and explained by Prof. Burrows.

Many hundred feet of workings at the 100 foot level were also inspected while the mill was visited.

In the afternoon the members spent nearly two hours underground at the Hollinger mines. Almost every working on the 100-foot level was shown and many faces also visited at the 200 feet and 300 feet. The mill here was inspected and the party taken on the dumps where many samples of gold were secured by various members. The Porcupine Crown Property was also visited by some of the party. Last night after the return from Kirkland Lake the party remained for some time discussing what they had seen during the day, including the visit to the Alexo nickel mine at Iroquois Falls during the morning and every one was greatly impressed with the possibilities for the gold production of Timiskaming district. The high grade vein at the Alexo was considered by many to loom into a heavy producer.

Mr. Fanning, a mining engineer, representing the American Government in the Philippines took an especial interest in the gold mining of the north country and he inspected carefully all the mills visited as well as the mines themselves. He considered Kirkland as the highest grade proposition he had ever seen, while the large deposits of Porcupine meant to him a great production.

THE GEOLOGISTS ARE HEARTILY WELCOMED

Seventy-five Scholars from all Quarters of the Globe Visit The Rossland Mines. Will Return With Lasting Impressions.

The citizens of Rossland extend to the members of the International Geological Congress and the ladies a hearty welcome. These noted specialists will return to their respective countries with lasting impressions of the various points in British Columbia. In Rossland, particularly, they will be impressed with the complexity of the geological structure and its intimate bearing upon the character and extent of the ore deposits upon which the life of a mining camp depends. While ordinarily, the years of such a camp are limited, the promising showings of unprospected ore shoots in the Rossland hills indicate that the extraction of ore is really in its early stages, and much may be expected of the future. The visitors were delighted with a mining camp that produces such an abundance of beautiful flowers as was displayed at the luncheon, and with the luxuriant vegetation and picturesque gardens along the line to Rossland. They viewed with interest the vast timber resources which enter so intimately into the prosecution of mining, and the splendidly modern methods of timbering the big, underground workings. Altogether, they saw much to please them in a camp that has produced \$58,000,000 in metal values, with a yield of \$20,000,000 to the credit of one mine alone.

The party, consisting of 75 members and nine ladies, visited the Trail smelter early in the day and were met at Trail by Dr. Drysdale, Mayor Deschamps, M. E. Purcell and G. A. Lafferty. They arrived shortly before noon, with W. R. Brock, director of the geological department at Ottawa, who briefly outlined the geological fea-

tures of the surrounding hills. They then proceeded to the rink, where they were guests at luncheon of the Consolidated Mining and Smelting Co., and were welcomed, on behalf of the city, by Mayor Deschamps. After luncheon the ladies were driven about the city and the members were taken over the route outlined for an examination of the surface and underground workings of the mines.

In his address, Mayor Deschamps said:

"As Mayor of Rossland, and on behalf of the citizens, I am delighted to welcome you to our city. And, while here, we want you to be one of us, and to feel perfectly at home. I want to tell you that we are much honored by your visit. The provision made for your entertainment is very simple, but is extended with a full heart. The mountains which you have come to visit, and which surround us, have produced a good many millions of dollars in gold, silver and copper. As men learned in geological formations, we hope you will find enough evidences in these mountains to encourage our operators to double their efforts and to induce the outside world to come and help us in further development."

In the afternoon the ladies of the party were tendered a reception at the Rosland Club, and at dinner the members were cared for at the various hotels. They then gathered for the evening at the Rosland Club, and left by special train at 9:45 for the trip up the lakes, en-route to the Kamloops district.

The ladies were entertained in the evening at the home of Mrs. Deschamps.

Victoria Daily Times - Aug. 26-1913.

LADIES ALSO GUESTS

Entertained at Luncheon at Same Time as Men of Geological Congress.

While the members of the geological congress were enjoying each other's and their hosts' company at a luncheon given in their honor at the Alexandra club to-day, the ladies of the party were the guests of the government as represented by several hostesses at a smaller luncheon held in the dining-room of the club upstairs, about thirty-five guests sitting down at the pretty tables with their decorations of sweet peas and gypsophila.

The party was characterized by no speech-making, and the proceedings were delightfully informal. Mrs. Bowser presided at the head of the table, on her right being Mrs. Paterson, wife of the lieutenant-governor, and on her left Mrs. Adams, wife of President Adams. Others at the tables included Mrs. Eberts, Mrs. Henry Croft, Mrs. J. A. Macdonald, Mrs. Shallcross, Mrs.

Prior, Mrs. Butchart, Mrs. Fleet Robertson, Mrs. McGregor Young, Mme. Bourgeron, Mme. Roy, Mrs. Schofield, and Miss Dawson, all of whom were on the reception committee, and the following members of the geological congress: Mrs. L. Carey, Mrs. E. C. Case, Mrs. Coderre (wife of the minister of mines, Ottawa), Miss Coderre, Mrs. C. W. Drysdale, Miss M. Ewald, Mrs. Callardeau, Mrs. L. L. Fermor (India), Mrs. B. E. Fernow, Mrs. O. S. Flinle, Miss E. Grego, Dr. Anna Grutterinck, Miss L. Hatch, Mrs. H. E. Haultain, Miss A. Helne, Mrs. A. C. Lane, Mrs. F. B. Peck, Mrs. P. D. Quensel, Dr. C. A. Ralsin, Mrs. A. M. E. Rathger, Miss M. M. Fermler, and Mrs. C. W. Wright.

Mrs. Bowser, who wore a becoming gown of saxe blue with golden brown velvet trimmings, welcomed the ladies as they arrived, Mrs. Paterson also wearing a very handsome frock of flowered blue silk with lace trimming and a black hat with blue plume. The ladies of the geological party are being entertained with the other members of the congress at the garden party at Government House this afternoon.



FIRST PRIZE PICTURE—"CANOEING AND BOWLING."

This remarkable picture, snapped by a postcard camera, is simply the result of a twice-exposed film and its author, Harold McCoque, Pinelands, Muskoka, gets the first prize of \$5. It shows a couple canoeing in a group on the Belmont bowling green.



The above picture was taken at the beautiful scene of our conceptions of the world's formation, and its included about a score of ladies, members either

Victoria Daily Times, Aug. 26-1913.

EMINENT GEOLOGISTS REJOIN IN VICTORIA
Both Parties of International Congress Spend Day in City

Influential as was the party which arrived in the city yesterday from the International Geologists Congress under Dr. R. W. Brock's leadership, those who came to-day were men of even more widely known talents in their profession, including some of the great names of science. They arrived under the direction of Dr. F. D. Adams, president of the congress, on the night

boat from Vancouver, and at once entered waiting tally-hos for a drive round the city, the two parties being reunited at the Alexandra Club for the luncheon tendered them by the provincial government.

Party C 2, the section which reached the city yesterday, spent the morning examining the stratification at Albert Head, making the journey by automobiles. The particular geological phenomena in the vicinity of Albert Head is particularly interesting to scientists, and the quarrying operations for the breakwater have exposed matter of considerable interest.

In this morning's party were some of the best known of the visiting scientists, as well as representatives of the geological survey of Canada, whose leading members, together with those that have already arrived, are all now in the city.

Among to-day's party were Dr. Henry M. Ami, of the palaeontological division of the geological survey; Pro-

fessor Helge M. Backstrom, of Djursholm, Sweden, who was one of the six distinguished visitors honored with the doctorate of philosophy at McGill University; Professor Alfred Harker, of St. John's College, Cambridge, another of the visitors so honored; Dr. Florence Bascom, professor of geology at Bryn Mawr, Pennsylvania, the most prominent woman geologist in America; Dr. Alfred E. Barlow, president of the Canadian Mining Institute; Professor John Horne, of Edinburgh; Dr. W. F. Hume, representing the Institute Egyptian, in Cairo; Dr. T. J. Jehu, of St. Andrew's University, Edinburgh; Professor Charles K. Leith, who holds the chair of geology at the University of Wisconsin; Dr. Andrew Lawson, professor of geology and mineralogy in the University of California, and Dr. Lewis L. Fermor, a delegate of the government of India, from Calcutta.

This afternoon the two parties were guests of Lieut.-Governor and Mrs.

Paterson, at Government House.

Party C 2 leaves to-night, and party C 1 will return to Vancouver on the afternoon boat to-morrow, in order to take the daylight passage.

It has been arranged that the members of C1 excursion will to-morrow be given an opportunity to see the stratification at Albert Head, as the other party did to-day. So short has been the time given in the rush across Canada that Victoria is specially honored in having this day known as "Victoria Day" and set aside exclusively for the purpose of seeing Victoria.

The polyglot character of the gathering could be noticed in the languages spoken. There was a professor from the University of Athens, three from St. Petersburg, several from Germany, France, and Austria, and from such distant countries as India and Egypt. Numbered in the party is a prominent engineer from Indo-China.

GEOLOGISTS ARE TAKEN WITH WEST

First Party Arrived Yesterday
—Interesting View of Possible Effects Upon Canada by Prominent Member.

The geological invasion happened yesterday with the arrival of the party designated "C2," and from the hour of their arrival till late at night the members of it were kept busy sight-seeing and being generally entertained. Tally-hos met the steamer at the wharf in the afternoon, culled them as they stepped from the gangway, and at once proceeded to enlighten them as to the beauty spots of Victoria by taking them round the circular route. It was late in the afternoon before they discovered their rooms at the Empress Hotel, and then immediately after dinner a number of private parties went off to the various clubs, whither they had been freely invited, and thus left the general headquarters considerably depleted.

In all there were over sixty of the original "C2" party in the city, but even at that there was a casualty list which accounted for the absence of some. For instance, Mr. J. McEvoy, the associate leader of the party, was taken ill on the trip West, and when he arrived in Vancouver it was found that he was suffering from pneumonia, and in consequence he had to be left in the Vancouver Hospital. Dr. H. E. Boeke, a noted German geologist, dropped out at Rossland, unable to continue the trip. He will be picked up on the way back. The other party, "C1," which arrived today, also suffered a casualty on the way here, Dr. Coleman, of Toronto University, breaking a small bone in his leg while coming down the mountains at Field. He was also left at Vancouver to undergo an X-ray examination.

Not the least interesting feature of the day's proceedings was the trip which about seven of the geologists took to Nanaimo in the afternoon, with a view to having a look at the geological facings of the country in the strike district. Of course arrangements for this little side-trip were made beforehand, so that the party had no difficulty with preliminaries. On arriving at Nanaimo last night, they were to report to the mine owners, with a view to having an opportunity of studying at first hand the products of the Vancouver Island mines. Among the members of the party the greatest possible interest was evinced in the coal and mineral possibilities of the Island, and many of them expressed their regret that the shortness of their visit made it impossible for them to pay closer attention to this interesting topic.

Benefits Canada

An interesting interview as to the possible effects of the Congress' excursions throughout the Dominion was given The Colonist last night by Mr. J. B. Tyrrell, of Toronto, one of the most distinguished mining engineers of the country. "This is an excursion of geologists," he said, "and not politicians or speculators, and it is not to be expected that the results or effects of this visit will be

observed very rapidly, in that it is not likely to be followed by the influx of capital or anything of that sort; but at the same time, I believe that this visit of geologists will be of far more lasting good to the country than any visitation that the Dominion has ever experienced.

"Every man in this party is a student of geology. A great many of them are professors, and those who are not are practitioners in one form or another, so that the subject they are investigating is of paramount interest to all of them. We have no camp followers to divert attention from the main issue. In organizing these parties we excluded everyone not actively interested in the science of geology, either theoretically or practically, and the result is that you have here today a body of men, perhaps the most intelligent body of men that have ever visited the country, making a close and personal study of your geological features, not for purposes of speculation but simply for purposes of education and general self-instruction. From the point of view of the business man I think this excursion is the best advertisement that the Dominion ever had. Just consider the number of professors of geology that are here from all parts of the civilized world, and in conjunction with that thought consider what geology really means to the country as a whole. You all know that the mineral wealth of this section is tremendous, how tremendous you have no real conception of. And naturally it is desirable that it should be known as widely as possible. Can you imagine a better or more disinterested way of making it known than by having it taught in the schools and universities of other lands, where very little may be known about your resources one way or the other? That is what this excursion will do for Canada. The professors who are now with us will return to their homes and to their universities with Canada, in the geological sense, writ large in their memories. The vast mineral resources of British Columbia and other places will be discussed with the pupils in like manner with the established facts of other things, and in consequence Canada and British Columbia will be brought within the purview of all the geological students of the world.

"Today that may appear a somewhat vague thing, but I am convinced that it will not long be vague. This is a very young country, and already it has made tremendous leaps in the way of development, but when the knowledge of its wonderful mineral wealth is scattered all over the world, and instilled into the student mind, as it will of necessity be, I firmly believe that this country will take a step in advance such as it has never yet taken, with all its marvellous advancement."

Impressed With British Columbia

In conversation with a number of the party, The Colonist learned that the greatest surprise has been occasioned them by the wonderful productivity of the British Columbia mines, and several of the foreign delegates have expressed their intention of coming here again at an early date to make a more intimate study of the geological features of the country. Everything they have seen has convinced them that this particular section of Canada is richly endowed from the mineral as well as other standpoints, and from now on British Columbia will have attained a measure of popularity and intimacy which she could not possibly enjoy before.

The party designated "C 1" arrives this morning. The members will breakfast on board, and then adjourn to the Empress Hotel for a siesta. The "C 2" party will start out upon a geological survey at 9 o'clock, motoring to Albert Head, and at the same hour the members of "C 1" will set out upon a tally-ho ride round the city's environs.

A slight change has been made in the programme of the visiting geologists of the "C 1" excursion, who will leave Victoria tomorrow afternoon at 4:30 instead of waiting until the midnight boat, as was at first arranged. Those planning to entertain the visitors tomorrow should bear this alteration of the schedule in mind.

Much interest is being felt in the informal luncheon which will be tendered the visiting members at 1 o'clock today in the ballroom of the Alexandra Club by the acting Premier, Hon. W. J. Bowser, and members of the Executive Council. Hon. W. J. Bowser will preside, and at the same time Mrs. Bowser will act as hostess at a luncheon to be given the lady visitors connected with the congress in the tearoom of the club. Covers will be laid for about thirty. In the afternoon, from 4 to 6, the delegates will be the guests of His Honor the Lieutenant-Governor and Mrs. Paterson at Government House.

Victoria Daily Times
Aug. 26 - 1913.

GEOLOGICAL VISITORS GUESTS AT LUNCHEON

Distinguished Party of Scientists Entertained on Behalf of Province; Brief Speeches

The luncheon which was tendered to the members of the International Geological Congress to-day in the ballroom of the Alexandra Club by the province was a decided success, and the visitors were outspoken in their praise of the hospitality which had marked their visit to this portion of the Dominion.

There were about 250 guests at the luncheon, and they listened to a short list of speakers to the toast of the Congress. During the progress of the speeches the ladies who had been attending the luncheon given to the ladies of the party entered the gallery, and their presence was graciously acknowledged by the chairman.

After the service of the luncheon was concluded the loyal toast was honored by all the guests.

Hon. W. J. Bowser, acting premier, was in the chair, having his Honor the Lieutenant-Governor on the right and Dr. Frank D. Adams on his left. The vice-chairs were occupied by Hon. Price Ellison and Hon. W. R. Ross.

Among others present were Hon. Wm. Templeman, chairman of the local committee; Mr. Speaker Eberts, J. J. Shallcross, president of the board of Trade; Mayor Morley, Hon. H. E. Young, Hon. A. E. McPhillips and a number of other prominent gentlemen.

The chairman, in proposing the health of the members of the International Geological Congress, extended a very hearty welcome to them on behalf of the people of British Columbia. They were the most distinguished body of scientists that had yet visited the province, and whether the members came for the first time or were revisiting British Columbia it was the desire of every British Columbian that they should return to help them discover themselves and the immense resources of the province.

Dr. Frank D. Adams, as president of the congress, conveyed very cordial thanks to the people of the province and acknowledged special obligations to W. Fleet Robertson. It was a great pleasure to be present in Victoria, a thriving town before the Dominion of Canada was heard of. Those who had been here before would recognize the metamorphosis of residential districts into business sections.

Dr. Th. Tschernycschew, Russia, in an eloquent and poetic speech in French, heaped praise upon Victoria for its situation, its climate and the hospitality of its people.

Dr. E. T. Meilor, South Africa, did not see how any geologist could visit Canada without becoming enthusiastic over it, and as a Briton from the newest confederation of the empire he congratulated the Dominion on the position it had attained.

Dr. B. Gurich, Germany, spoke in his native tongue of the great hospitality of what he called a most wonderful province.

Dr. Louis E. Gentil, France, spoke of the close association of the two countries in former years and of the warm feelings entertained towards Canada in his land on that account.

Dr. Andrew C. Lawson, United States, remarked that in these days when everyone was coming to Canada it was small wonder that a body of scientific gentlemen should visit it. A quarter of a century ago he had been a resident of Canada, when he was a member of the Geological Survey, and he always delighted to return to the land that had brought him up. He expressed a keen appreciation of the work of the director and officers of the Survey and of the extent to which Canada was indebted for its progress to the work.

The party broke up after singing the national anthem.

Turner's orchestra was present and played during the luncheon, and out of delicate compliment to the speakers played the national anthem of their country as each was announced. The arrangements were in the hands of J. W. Robinson.

BARLOW DESCRIBES TOUR OF GEOLOGISTS

Banff Field District, He Says,
of Rare Interest; Shows
All Periods

CONGRESS' OBJECT TO STANDARDIZE SCIENCE

Tours Have Become Conspicuous
Feature Toward This
End; Ladies Enthusiastic

"Geology, being a history of the earth and its inhabitants, both past and present, is the largest science there is," said Dr. A. E. Barlow, of Montreal, who arrived early this morning with the main party of the International Geological Congress which is visiting the city in the course of a transcontinental tour.

This statement, however, does not make it necessary for the geologist to be so encyclopaedic in his knowledge as at first sight appears. Geology as a science was at one time quite within the ken of one man's mind; to-day its ramifications reach to infinity, and Dr. Barlow qualified his remark by adding that the geologist of to-day, owing to the impossibility of any one man knowing the entire subject, was a specialist. It is, therefore, of specialists that the congress is composed, and it is through the special knowledge of each that the members as a whole have been enabled to make such an intensely interesting tour as the present one.

In general the geologists are divided into two principal divisions—the economic or mining geologist, whose investigations are entirely along practical lines and for practical application to mining and its branches; and that department devoted entirely to pure science. In the exhaustive programme mapped out for the tourists both classes of students found ample opportunity of following their particular bent, and all are enthusiastic, said Dr. Barlow this morning to a Times' reporter, about the splendid arrangements made in their behalf.

"The object of the congress," continued the eminent Canadian scientist, is to standardize geological literature and give it a universal aspect.

Banff and Laggan.

"At Banff and Laggan, for instance," cited the speaker, "the history of the district has been carefully worked out, and the place is one of the most interesting, geologically, that we visited on our entire tour. Nearly all the geological periods are easily traced, from the earliest pre-Cambrian up to the Jurassic. At Mount Stephen we collected some beautiful fossils, Dr. Allan, of the University of Alberta, conducting the party over this district, and giving a very interesting and detailed account of the rocks. The trilobite

beds at Field are among the most perfectly preserved that I have ever seen, and there was a wonderful abundance of old crustaceans. At Glenogle, where we arrived a short time after leaving Field, we found some very fine grapholites. Professor Rothplatz, the most eminent authority in all Europe on the Cambrian period, gave us some interesting talks on the subject during the visit at Banff and Field, and Dr. W. L. Uglow, of the University of Wisconsin, who, by the by, is a Canadian and very well up in the geology of the district, also gave talks on the geological formation thereabouts which were very interesting."

Another eminent Canadian, who is now professor of geology in an American university, and who entertained the party with much-to-the-point comments on the pre-Cambrian features of the district, was Dr. A. C. Lawson, of the University of California, and who is now regarded as one of the world's greatest authorities on the rocks of that period.

Not the Only One.

Dr. Barlow pointed out an error which had crept into a note printed in the programme which accredits Bankhead with having the only anthracite coal mine in Canada, and said that he hoped none of the geologists who hadn't seen the anthracite mines at Canmore and other places would go away with a false impression on account of the mistake.

All the geologists were very interested in the Illicillwaet glacier, which they viewed from Observation Point, above Glacier station, and the beautiful colored pictures shown by Mr. Cadell, at one time on the geological survey of Scotland, and illustrating the recession of the big Rocky Mountain glacier were especially referred to by Dr. Barlow, who also referred to the interesting observations made by Dr. Vaux and Miss Vaux in connection with the same ice-area. All of these, he said, gave indubitable proof that the glacier was slowly receding, and that during the past year the movement had been particularly marked.

Entire Tour Interesting.

"In spite of the peculiar interest of the whole Banff district," said Dr. Barlow, "the entire tour has afforded the party with instructive features. At Coldwell, which we reached on our second day out from Toronto, we saw some very fine examples, very similar to the famous Norwegian occurrences, of nepheline syenite and related rock types, I myself acting as guide at that point. At Atikokan the members spent the afternoon at Steep Rock lake, examining the fossiliferous pre-Cambrian limestone, which is the oldest fossiliferous horizon in the world. This district proved of surpassing interest to Prof. Rothplatz, who was not satisfied to leave a region so peculiarly illustrative of his particular department with so brief an investigation, so he remained behind an additional day to make a more detailed examination of the rocks thereabouts.

"On Tuesday we went for a motor drive round Medicine Hat, and at the end of a two-hours' run we were taken to the big gas wells where one of these was ignited, the flame, which rose to a height of about 80 feet, making a wonderfully spectacular sight.

Tour Exhausting.

About twelve ladies accompany the principal party, and these, according to Dr. Barlow, are holding out pluckily and taking the keenest possible interest in the whole tour.

GREATEST WORK IS ESTIMATE OF COAL

Dr. Adams Speaks of International Geological Congress'
Statement of Supply

HAVE KEPT RECORDS FOR HUNDRED YEARS

Tells of Part Geologists Are
Playing in Collecting Valuable Information

When a man as eminent as the dean of the Science Faculty of McGill University is asked for an interview and immediately plunges off in an eulogy of another eminent man, it is quite evident that there is little egotism in his composition. Dr. F. D. Adams, leader of the international geological congress, has an immense admiration for the good work being done by other scientific men. Of his own particular place in the building up and perpetuation of the science of geology he has little to say. But this is characteristic of the true teacher, who is always an altruist.

In an interview last evening Dr. Adams, questioned as to the most active agent in the Dominion in the geological research work, at once plunged into an encomium of the splendid work being accomplished by the geological survey of Canada under the direction of R. W. Brock. Mr. Brock had, he said, shown wonderful ability in this work of investigation, and had trained a splendid body of young Canadian geologists to carry on the research work under his direction. The successful nature of the survey had been commented on, during the present trip, by all the foreign geologists, who had repeatedly referred in the most flattering way to the enthusiasm and ability of the young Canadian scientist to whose genius they were indebted for most of the interesting records which were extant on the subject of the geology of the whole country through which they have passed.

Many Years Needed.

"The Dominion of Canada, as actual area, is so large," said Dr. Adams in explaining the position of the geological survey, "that it will take many years yet to work out the structure of the country and study it in detail. But the geological survey has made a very good basis of general knowledge already; the structure of the whole Rocky mountains has been worked out quite well in a general way, and in the mining camp districts, Rossland, for instance, the survey has been particularly diligent, and has proved of great importance to the mining industry in those places.

"Another branch of the survey work which I think the public as a whole scarcely realizes the value of, is the provincial department of mines. These

departments in the various provinces deal more specifically with the statistics on the subject of mines, and the information which they place on record is of great value."

Dr. Adams referred in this connection to the Steffansson-Anderson expedition under the direction of the geological survey of Canada, and spoke optimistically of the discoveries which it is universally hoped by geologists as well as economists will be made in the lands of the frozen north.

"It is expected by geologists, who of course base their hopes on the report of the formations there, that there will be great mines of wealth discovered in the, as yet, unexplored north. It is not long ago, you know, since the startling discovery was made that there are big copper deposits along the shores of the Arctic sea. Arctic explorers had known for some time that Esquimaux and Indians in some districts thereabout had copper weapons and tools made from metallic copper. It is known that the Esquimaux have never possessed the secret of smelting ores. The inference was easily arrived at; they must have picked up the copper in a free state on the shore. Investigations proved this to be the actual fact, and showed that the copper crops up in just the same rock as it is found in the Hecla and Calumet mines at the south of Lake Superior."

Steffansson's Work.

"The Steffansson expedition is making investigations which will give a definite and accurate record of the conditions. If the deposits prove as large as anticipated the result will effect the whole history of Canada. At the present time there is not sufficient incentive to any transportation company to build a railway right northwards through the big untapped, unpopulated country beyond the agricultural lands even yet but sparsely settled at their outermost fringe. But let a discovery of big mineral wealth of the kind be published, and there will at once be a rush for the copper fields. Then the transportation companies will find it to their advantage to push new routes through territories now rarely traversed—and the problem of making use of all the big unutilized areas will solve itself.

Other Geological Surveys.

While on the subject of state geological surveys, Dr. Adams referred to the generous support which is given these by the governments of nearly all countries where such organizations exist. The American government, he said, had been one of the most liberal, and had put almost unlimited means at the disposal of the survey. The result was that the United States Geological Survey had made wonderful progress in its work, and had already built up a very good record. The Canadian government, too, had been very open-handed, and considering the vast area which had to be surveyed as compared with the new and unsettled state of much of the country, great progress was being made in the Dominion also.

The older countries had a supreme advantage in the very fact of their age. Geology as a practical science had been in existence for about a hundred years, during the whole of which time the countries not absorbed in the more confusing problems of actual expansion and settlement, had been making a coherent record of their geological features. Then, too, the actual areas of the older countries were almost insignificant as compared with Canada and the United States, and in this re-

continued on next page.

spect alone they had a great advantage as far as the matter of expediency was concerned. Russia was, perhaps, the single instance which might be cited as a fair comparison in point of area; but in that country they had no less than seventy Geological Surveys out at the present time under the direction of Prof. Tschernyschew.

What Congress Has Done.

"The greatest achievement of the International Geological Congress, or at any rate one of its greatest achievements, is, I think," said Dr. Adams, "the assessment which it has made on the coal resources of the world. A complete computation has been made, which not only gives a very accurate assessment of the actual tonnage, but specifies the character of the coal—whether coking or non-coking, anthracite or otherwise—for every country in the world."

"Have the assessments been accompanied by any statement as to how long the supply will last?" asked the interviewer.

"Coal is being used more rapidly every year," replied the professor. "It is known that it will be used more rapidly in the future than it is at present even. So it becomes impossible for any scientist to make any computation as to how long the supply will last. Besides, in making out statistics on the subject one has to consider the probability of other fuels being discovered, and their relative effect in lessening the consumption of coal. It is known that the United States has the largest coal supply in the world, and that Canada comes second. People generally think of the Maritime Provinces when the coal supply of the Dominion is mentioned, but the actual assessment shows that they only contain 2 per cent of the supply. The greatest fields are in Alberta and British Columbia and in the unexplored north, where it is expected, owing to the formations, that there are great mines of undiscovered wealth."

Going to Cobalt.

Dr. Adams, who left this afternoon with C.I. party for the return stage of the trip, said in conclusion that he was looking forward with much interest to the visit to the Cobalt district, where they will go to see the silver mines; they will also visit the gold camp at Porcupine, and, at Sudbury, the nickel and copper mines, which are the biggest in the world.

MEMBER OF GEOLOGIST PARTY HAS ACCIDENT

Dr. Coleman Sustains Potts' Fracture of Leg Bone at Field.

Vancouver, Aug. 27. — Dr. Coleman, professor of geology in Toronto University, a member of the party of visiting geologists, sustained a fracture of a bone of his right leg owing to a fall in descending a mountain at Field while examining the fossil beds in that vicinity a few days ago. The injured member was encased in plaster and the professor is now able to walk on crutches, which he will be obliged to use for the next five weeks. The injury he sustained is known as a Pott's fracture. Dr. Coleman makes light of the accident, which is rather a serious one considering his age.

WITH THE GEOLOGISTS



Dr. A. E. Barlow, president of the Canadian Mining Institute for a second term, is one of the most popular of the visiting delegates to the geological congress. He resides at Montreal, and was from 1883 to 1906 a member of the geological survey of Canada. He has written extensively, his monographs being standard works. A leading geologist told the Times yesterday that Dr. Barlow is regarded as the ablest expert on the metalliferous mines of Canada.

Dr. and Mrs. Barlow spent some time in Victoria last fall. He occasionally lectures at McGill University and elsewhere.

Daily Colonist, Victoria Aug. 27-1913.

GREAT GATHERING OF SCIENTIFIC MEN

Provincial Government Entertains Visitors to Luncheon in Alexandra Club—Unique, Cosmopolitan Assembly.

What was undoubtedly the most distinguished and cosmopolitan gathering of scientific men that ever assembled in the City of Victoria was seen in the Alexandra Club yesterday afternoon, when, under the aegis of the Provincial Government, the two parties of the Geological Congress joined with the local men in making a splendid aggregation.

The great hall of the club was practically filled with the men of all nations, there being about 200, in all, present. Acting-Premier Bowser occupied the chair, and with him were seated Professor Adams, the president of the congress, and Hon. Louis Coderre, Federal Minister of Mines. Ranged along the leading table were a number of distinguished scientists from all over the world, and throughout the hall names were frequently called that have often been heard of in the great work of scientific research.

His Honor Lieutenant-Governor Patterson was a prominent representative of Province affairs, as were also the Hon. Dr. Young, Minister of Education, Hon. W. R. Ross, Minister of Lands, Hon.

T. Taylor, Minister of Public Works; Hon. Price Ellison, Minister of Finance and Agriculture; Hon. D. M. Eberts, Speaker of the House; Chief Justice Macdonald, Mr. H. B. Thomson, M.P.P., and others. There were also present Lord Provost Stevenson, of Glasgow, Senator Macdonald, Mayor Morley, Col. Roy and Mr. A. E. Smith, United States Consul.

The function was rendered memorable as well as enjoyable by a series of brief speeches from the several leaders of the congress, and in this connection it should be said that to many of them the chief charm lay in the fact that the foreign delegates spoke to the audience in their native tongue. While the speaking was in progress the ladies entered the gallery, and were participants in the latter part of the programme. Excellent music was provided throughout the luncheon festivities; as the representative of each national rose to deliver his thanks, the orchestra struck up the national air of the country in question. In this sense the function was an object lesson in national anthems and imperial hymns, which appeared to be greatly enjoyed.

Hon. Mr. Bowser's Address

Acting-Premier Bowser, in formally welcoming the visitors to the City of Victoria, said that the gathering in which he stood was perhaps the most distinguished of the kind that had ever been in the Capital, or, for that matter, in the Province. "We have assembled here today," he said, "an aggregation of scientists such as is seldom seen anywhere in the world. It represents practically every civilized country in the world, and I do not think that I can put it better than one of the local newspapers did in describing the visit the other day when it referred to the members of the Geological Congress as being the elite of the world."

"In this western part of Canada we are glad indeed to extend the hand of welcome to such a gathering. Many of you may have seen parts of this Province before, but I am sure that for many of you this is the first opportunity you have had, and to all of you I would like to say on behalf of the people of the Province that no warmer welcome could be extended to you anywhere than the one we harbor in our hearts, however, we may fall short in the matter of expression. And I would go a step further in this connection and suggest to all of you that when you leave this city tonight or tomorrow, as the case may be, it will not be goodbye but simply au revoir."

"We feel that in British Columbia we have a great deal to offer the geologist. Nature has been very prodigal in the distribution of favors to her. We ourselves are but on the fringe of discovering what our own possessions are, and it will not be at all surprising if your visit should reveal to us many things which we have never dreamt of before in the way of minerals and other products. Just to give you an illustration of how far we are from knowing with any degree of accuracy what we have in this Province I may tell you that some little time ago one of our officials of the fishery department came back from a trip of inspection with the report that he had discovered another great lake, some four miles long and one mile broad, that had not yet been charted at all."

He then proposed the toast of the visitors, which was received with acclamation.

Welcome Acknowledged

Professor Frank D. Adama, president of the Congress was the first to respond to the toast. He expressed his very

great pleasure at the splendid reception that had been accorded the members of the congress in the city of Victoria, and in doing that he made special reference to the provincial mineralogist, Mr. Fleet Robertson, who had gone all the way to Ottawa in order to complete arrangements for the western excursion parties. In speaking of the congress he said that they had twenty-seven different nations represented, which he thought was a record for any kind of a congress.

"In coming across Canada," he proceeded, "many of the visitors from abroad have had an opportunity of seeing the geological features of the country. Before convening at all a number of them went through the Maritime Provinces, and now, after the congress, we are touring the whole Dominion. Our time is necessarily short, but at the same time we have been able to see something of the wonderful possibilities for development that are latent in this country. If I might speak with particular reference to the West, I should say that in British Columbia we have had an excellent opportunity of studying conditions. Many of our own men have profited immensely by the advice of the foreign experts, and I feel sure that even in the practical expression of geology benefits will be large and rapid. We have shown our foreign delegates that we are not merely 'Our Lady of the Snows,' but that we have something more than snow and ice. In fact, I think we have established the truth beyond doubt that we have, in immense proportion, other resources, if I might say so, belonging to the more torrid seasons of the year. When we go from here we will take with us the best possible of recollections of how they do things in the city of Victoria."

From Other Countries

Dr. E. T. Mellor, of the Geological Survey, South Africa, was the next speaker. Speaking with reference to geology, he said he was greatly pleased to observe that Canadians were enthusiastic about the work and were ready to spend large sums of money upon it. He pointed out that while in many cases the experiments carried on might result in nothing of any practical value being discovered, at the same time he assured them that none of it was wasted and that even the most seemingly fruitless of it would bear fruit in the long run.

"Compared with European countries," he proceeded, "Canada must be regarded as a young country, but she must not forget that there are other countries smaller still, which were looking to Canada for an example. South Africa is looking to you today, and I feel sure that South Africa will be strengthened and encouraged in her course by what we have seen in Canada during this present visit."

Dr. A. C. Lawson, of the University of California, in responding to the toast for the United States, said that he could personally testify to the development of Canada. "A quarter of a century ago I was a resident of British Columbia," he said; "I lived and worked here, and now that I have come back I begin to feel that I have come home. At all events my coming back in this way enables me to testify in a very decided manner to the marvelous development that has taken place in the interval."

"The people to the south of you, of whom I am now one, have gone through the same phase of progress that you are now but entering upon. You have not gone very far but we are watching you with the keenest of interest. You are deeply interested in the development of your natural resources. You are interested in getting out of the ground that which is in it, and as it is perfectly

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ture that all the material welfare of the world is intimately and absolutely wrapped up in the ground, it is in the very nature of progress that you should be interested in getting out the wonderful substances. That is the work of geology, and that is why you must cultivate the geologist. Perhaps, sometimes, there is a feeling that the discovery of these things is of passing interest and value only, and is sought for by individuals, but that is not the case. There is a deeper wisdom in the hearts of the people which demands a knowledge of what the earth contains.

"I feel that I must say that the success of the congress is due in a large measure to the labors of the director and officers of the Canadian Survey. Every one of the visiting delegates is deeply indebted to them, and I am sure that none of them more so than those of us who hail from the United States."

M. Louis Emile Gentil, Professor at l'Universite de Paris, France; Professor Tschernyschew, Th. Directeur du Comite Geologique de Russie, St. Petersburg, Russia; and Professor Gurlich, of Hamburg, Germany, also spoke briefly in their respective languages.

The proceedings closed with the singing of the National Anthem.

Afterwards the party assembled on the steps of the club and had their photographs taken en bloc.

Ladies Entertained

The luncheon given the ladies connected with the Geological Congress yesterday at the Alexandra Club was one of the pleasantest social features of their visit. Mrs. W. J. Bowser, wife of the Attorney-General and Acting Premier, performed the duties of hostess with characteristic grace, being beautifully gowned in Saxe blue crepe de chine with a small black satin hat trimmed with a black osprey. At Mrs. Bowser's right sat Mrs. Paterson, wife of His Honor the Lieutenant-Governor, wearing flowered blue silk taffeta relieved with lace and a black hat plumed with deep Saxe blue. The visitors present were:

Mrs. Adams, wife of the president of the Congress, who sat at Mrs. Bowser's left; Mrs. L. Carey, Mrs. E. C. Case, Mrs. Coderre, wife of the Minister of Mines, Ottawa; Miss Coderre, Mrs. C. W. Drysdale, Miss M. Ewald, Mrs. Caljardeau, Mrs. L. L. Fermor, India; Mrs. B. E. Fernow, Mrs. O. S. Flinnie, Miss E. Gregory, Dr. Anna Grutterinck, Miss L. Hatch, Mrs. H. E. Haultain, Miss A. Heine, Mrs. A. C. Lane, Mrs. F. B. Peck, Mrs. P. D. Quensel, Dr. C. A. Raisin, Mrs. A. M. E. Rathger, Miss M. M. Fernier, and Mrs. C. W. Wright.

Those invited to meet the distinguished travellers included Mrs. D. M. Eberts, Mrs. J. A. Macdonald, Mrs. Henry Croft, Mrs. E. G. Prior, Madame Roy, Mrs. J. J. Shallcross, Mrs. Fleet Robertson, Mrs. R. P. Butchart, Mrs. McGregor Young, Madame Bergeron, Mrs. E. O. Schofield and Miss Dawson, all of whom were members of the reception committee.

The tables were charmingly decorated with pink sweet peas and gypsophilla, the pink and grey walls of the tea room making an effective background for the animated groups of women, who, although many of them came from the other side of the Atlantic and sprang from another race, were all united in that common sisterhood, whose language is universal.

GEOLOGISTS LEAVE ON NORTHERN TRIPS

Second Section Departs—Excursions to Prince Rupert and Yukon

Many distinguished parties have left Victoria in the past after seeing this beautiful city, but it was particularly with regret that this afternoon the local committee bid farewell to the second party of geologists, whose presence has been a stimulus to the scientific section of the city in the last two days. The first party went out last evening.

The final excursion was taken to Albert Head, where the formation of that area was inspected with professional enthusiasm. After lunch the party boarded the afternoon boat for Vancouver.

Some of the leaders did not join the morning excursion, but preferred to spend the morning in the company of the cultured scientists of Victoria who were able to interest them in the ethnological associations of the aborigines of Vancouver Island, with their story of potlatch and totem, and tribal rites. Others showed collections of shells and minerals, the provincial museum being particularly attractive to the visiting savants.

Among the men who have been especially assiduous in looking after their welfare may be mentioned W. Fleet Robertson, provincial mineralogist; E. Jacobs, secretary of the local committee; W. J. Sutton, and among the German speaking visitors, A. von Girsewald.

One party will leave Vancouver tonight for Prince Rupert and the Skeena Valley, while another takes the specially chartered steamer Princess Maquinna, Capt. McLeod, for a visit to the Yukon. The latter trip will last some three weeks and will embrace a very wide field of investigation. With it will go Hon. Louis Coderre, minister of mines, who came across the continent with C 2 party.

Entertained Geologists.—His Honor the Lieutenant-Governor and Mrs. Paterson were the hosts at a garden party held yesterday afternoon in the grounds at Government House in honor of the members of the international Geological Congress. Most of the delegates and their wives attended, while quite a large number of local people were present, and the afternoon passed in a most enjoyable manner, tea being served in a pavilion on the lawn.

GEOLOGISTS ON WAY TO GOLD CAMP

Fifty-five Scientists Will Reach Porcupine To-morrow

The C2 excursion of the International Geological Congress will pass through here to-night on its way to Porcupine. This excursion is coming from the west. It was hoped that it would be possible to bring it over the National Transcontinental from Winnipeg, but later counsels decided against it. The special train will therefore pass through Cobalt tonight en route for the Porcupine gold field. The whole of to-morrow (Thursday) will be spent in Porcupine and Friday in Cobalt.

There is every indication that the party will be as important and as representative of the scientific world as the others that have preceded it. They will be taken care of here by the Cobalt branch of the Canadian Mining Institute, just as the other expeditions have been and will be conveyed round the mines. The party which has visited all the points of interest in the western tour is in excellent hands. Its fifty-five members are under the leadership of Mr. A. E. LeRoy, one of the most hardworking and able assistants of Mr. Lecky in making the Congress the success it undoubtedly has been. The secretary of the tour is Professor H. E. T. Haultain, professor of mining at the University of Toronto.

The "poste restante" correspondence which has already arrived at Mr. Coles office for delivery to the members when they reach here shows that the party is quite as international as any that has proceeded it and contains as many famous men in the geological world.

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Broke His Leg When On Mountain Trip

Word was received in Toronto last week that Prof. A. P. Coleman, of the Geological staff of the University, broke his leg while descending a mountain in the Yukon Territory. Prof. Coleman went West with a party of geologists after the convention in Toronto. Just where he is in the West is not known. His intention was to visit the ranges in Alaska and the Yukon.

The Departing Geologists

The twelfth International Geological Congress is over as far as the North Country is concerned, at all events, and ere long the visitors will have departed to their homes in various parts of the globe. To the "man in the street" the visit of the distinguished scientists, probably, has not been of much significance. The papers which have been read and the discussions which have taken place before the congress have been of a learned and technical character, and have not appealed to the ordinary mind in the same way that more "live" topics would have done.

Nevertheless, although the event has not been heralded with quite such a fanfare as might have arisen from the presence of some less distinguished body of visitors making a bigger display, the gathering was one which will result in a great deal of benefit indirectly to Canada. Many of the visitors travelled the Dominion extensively, they saw the country under the best conditions, and were impressed with what they saw. When they return to their native lands they will write and lecture about what they have seen and heard and this will mean that the opportunities which the Dominion offers will receive an excellent advertisement through a source which will carry great weight.

It is highly probable that what they say may be the means of inducing some of their fellow countrymen to emigrate to our shores, and Canada, for some time to come, may reap the benefit of the geologists' visit. It is not too much to hope,

Globe. Sep. 8-1913.

ONE PARTY OF GEOLOGISTS HAS RETURNED TO TORONTO

SECOND PARTY WENT ON TO SKAGWAY. PROF. COLEMAN GOING WITH IT.

The "C. 1" party of geologists who embarked on a trip to the Pacific coast after the close of the Geological Congress in Toronto have returned to this city. These tourists were accompanied by Dr. Frank B. Adams of McGill, Montreal, and Mr. J. W. Tyrrell of Toronto. Mr. John McLelsh of the Department of Mines at Ottawa acted as Secretary to the party.

Prof. Coleman, who broke a small bone in his ankle at Glacier, has gone on to Skagway with "C. 2" party, instead of coming back to Toronto. He declared that he could enjoy himself much better on the deck of the steamer watching the glaciers than reclining in a Pullman car on the journey back to Toronto. Professor Coleman had climbed a glacier and had returned to the bottom when he slipped on a smooth stone, causing him to turn his ankle violently.



The Visitors to the Geological Congress were Entertained at a Garden Party in Toronto by Mr. and Mrs. Dunlap. Mr. Dunlap is a Prominent Cobalt Mine Owner.



The Host and Hostess Receiving

Cobalt Nugget. Sep. 5-1913.

MINISTER OF MINES HERE WITH GEOLOGISTS' PARTY

Will Inspect the Various Mines and Leave Cobalt To-night

This morning in the early hours a special train of seven cars containing the members of the C2 excursion from the International Geological Congress pulled into the Cobalt station and its members including six ladies are now scattered over the hills of Cobalt. This is probably the most important and considerable of all the geological parties visiting the north this year. The special train was so long that it could not get in to the switch near the station and

had to be diverted into the switch near the Northern Customs concentrator. The Hon. Louis Coderre, Madame Coderre, their two sons and two lady friends accompany the party in their private car which is attached to the rear of the special train. The party came here from Porcupine. Yesterday they took great interest in the Dome and the Hollinger. This was the party which should have arrived in Northern Ontario

The Minister of Mines

"I am the Minister of Mines," said the Hon. Louis Coderre, "yet before I left Ottawa on the twelfth of August I had not seen a mine." He went on to say that he had seen enough on his trip of the importance of the industry of which he was the titular head in the Dominion that he intended to keep in close touch with its development and study it as fully as it deserved.

His declaration will be received with thankfulness by mining men who have for many years endeavored to impress Ottawa with the importance of the mining industry. Their efforts had little success with the late government. Mr. Templeman, the first Minister of Mines, hardly knew that the Cobalt and Porcupine camps existed and displayed but a languid interest in the industry in British Columbia, where he lives. The Hon.

Louis Coderre is the first minister at Ottawa to show any real and vivid interest in the department. He does not know much of the mining industry yet, but he is eager to learn and open to suggestion; which is all that can be asked at the present time. His staff has done good missionary work in this country and throughout the Dominion in advancing before the provincial governments and indicating as far as their judgment goes where it would be profitable to prospect.

The Hon. W. H. Hearst is a New Ontarian and as such is fully aware of the value of the mining industry; therefore, it has on the whole received adequate recognition at his hands. But the Dominion government in the person of its minister has been apathetic. In a few years it is probable that the portfolio of Minister of Mines will be regarded as one of the most important in the Canadian cabinet.

from the west over the National Transcontinental, but as a matter of fact it was diverted to the North Bay route. The stay here will not be long, the special train pulling out for Toronto at about 6 o'clock.

The leader of the party is Mr. Le Roy, and Prof. H. E. T. Haultain is secretary. They followed the usual route. Leaving their cars at half past eight they passed over the lake to the Little Silver Vein and so on to Diabase Mountain. Before lunch they went over the high-grade mill at the Nipissing. This afternoon they will be formed into separate parties before going over the Nipissing, the Penn-Canadian and the Coniagas. The list of members in the party reads:

Anderson, E. M., Geological Survey, Edinburgh, Scotland.
Ashworth, John, M.E., Manchester, England.

Bocke, H. E., Dr., Professor Mineralogisches Institut, Halle a.S., Germany.

Bogild, Dr. O. B., Professor Mineralogical Museum, Copenhagen, Denmark.

Borgstrom, Dr. L. H., Universite Helsingfors, Finland, Russia.

Brooks, A. H., Geological Survey, Washington, D.C., U.S.A.

Burrowe, A. G., Ontario Bureau of Mines, Toronto, Canada.

Camsell, C., Geological Survey, Ottawa, Canada.

Dahlblom, Lorent Edward Theodor, Bergmastare in Gefle-Dala District, Falun, Sweden.

Dick, William J., Commission of Conservation, Ottawa, Canada.

Dupaigne, Rev. Pierre, Licencie-Sciences, Professeur des Sciences Physique et naturelles au Seminaire de Philosophie, Montreal, Canada.

Dunn, George, Loudon, Annanhill, Kilmarnock, Scotland.

Fernow, Dr. B. E., Dean of Faculty of Forestry, University of Toronto, Toronto, Canada.

Fernow, Mrs.

Frechette, H., Mines Branch, Department of Mines, Ottawa, Canada.

Haultain, H. E. T., Prof. of Mining Engineering, University of Toronto, Toronto, Canada.

Haultain, Mrs.

Gardner, Samuel McLare, Mount Vernon Colliery Co., Ltd., Glasgow, Scotland.

Hopkins, Dr. Thos. Cramer, Maitre de Conferences a l'Universite, Uppsala, Sweden.

Hurl, Mark, Glasgow, Scotland.

Hurl, John McGlashan Redholm, M.E., Glasgow, Scotland.

Ives, Henry Goodson, Andover, New Hampshire, U.S.A.

Ives, J. T. B., F.G.S., Andover, New Hampshire, U.S.A.

Jarvis, Gerald, Arnprior, Ontario, Canada.

Kennedy, G., Toronto, Canada.

LeRoy, O. E., Geological Survey, Ottawa, Canada.

McMillan, Jf G., 225 Geoffrey St., Toronto, Canada.

McIntosh, Donald Sutherland, Prof. of Geology, Dalhousie University, Halifax, Canada.

Mellor, Dr. Edward Thomas, Geological Survey, South Africa.

Miller, Benjamin Leroy, Professor of Geology Lehigh University, South Bethlehem, Penn., U.S.A.

Peck, Frederick B., Lafayette College, Easton, Penn., U.S.A.

Peck, Mrs.

Powers, Sidney, Inst. of Technology, Boston, U.S.A.

Singwald, J. T., Jr., Associate in Economic Geology, Johns Hopkins University, Baltimore, Maryland, U.S.A.

Surzycki, T., Petrokow, Polognerussc, Russia.

Ubrecht, Dr. P. F., Batavia, Netherlands-India.

Wright, C. W., Ingurtozu, Sardinia, Italy.

Zuher, Dr. R., Professor of Geology University of Lemberg, Austria.

This is the first visit of the Dominion Minister of Mines since the appointment to the office, to the north country. It is also the first visit of an Minister of Mines for the Dominion since that office has not been in existence for many years. This afternoon Mr. A. A. Cole will escort the minister and his party to various points of interest in the camp.

There are many interesting men in the party. Probably the name of Dr. Fernow of the University of Toronto will be the best known to Northern Ontarians owing to the discussion which followed the publication of his report to the Commission of Conservation. Mrs. Fernow accompanies him.

Dr. L. H. Borgstrom of the University of Helsingfors, Finland, is also an interesting personality in the party. He is a Russian in a Finnish university. A noted Dane is Dr. O. B. Bogild from the Mineralogical Museum, Copenhagen.

Dr. Donald Sutherland McIntosh, Professor of Geology of Dalhousie University, Halifax, is extremely well known in scientific circles.

Cobalt Nugget. Sep. 17 - 1913.

TRAINED MINDS NEEDED TO DEVELOP RESOURCES

Remarkable Address of Dr. Falconer At Canadian Club of Timiskaming

The launching of the Timiskaming Canadian club season last night was an auspicious event in that it brought before the men of the north who have associated themselves with this great national movement one of the Dominion's foremost educationists, Dr. R. A. Falconer, the distinguished president of the University of Toronto. It was particularly fitting, too, that Dr. Falconer spoke on Canada in a style remote from the stereotyped form. The audience was carried through the past into the present and when Dr. Falconer sat down those who were present were impressed with the thought that it devolved on the individual to play his part in Canada's future. There was only one regret when the speaker drew his discourse to a close and that was that the time of a man with such an extensive knowledge of such a large and important subject was limited.

Dr. Falconer thanked the Canadian club for the reception which had been accorded him. He regretted that owing to the variety of duties at the university that he could spend only a day in Cobalt and one visiting Haileybury and Liskeard. To go through the representative mines of the camp and see what had been and what could be accomplished was to send one back with a new vision of the future before the Dominion and Province and what remained to be done. In the past few years the mining department of the university had been strengthened and two of the most eminent men in their professions, Prof. Haultain and Prof. Guest were in charge of the mining proper and metallurgy, respectively, and there were 60 students.

"We have heard a great deal of the possibilities of the clay belt east and west of Cochrane," said the speaker. "To have travelled over the Dominion as I have, I realize what a heritage we have in the Dominion. I want to speak as far as I can from personal experience."

Dr. Falconer spoke of a recent trip west to attend the opening of two new universities and the beginning of another at Point Grey, Vancouver. In his holidays he had strayed down to his old haunts in the Maritime provinces, where the natural beauty is unsurpassed. Did not Canada's beauty fill one with a thrill of hope. Merely material environments were not a sufficient basis of national life but without a certain material basis it was impossible to rear the structure of nationhood.

One of the most important events of the year was the visit of the Geologists to Canada. The geologists mingled with and told the men of this country things they did not know. They brought ideas that would fertilize with great results and they had gone back with a greater conception of the dominion. When these men came and passed through the country they were interested in what they saw. Hundreds travelled on the railways but did not see as the geologists, because these men were trained to see.

The resources of the north had been lying for millions of years perhaps, but those who reaped the advantages were those who saw. "All over the country there are privileges, all over opportunities. The question is whether you and I have the trained minds to grasp them when they come. A better training of our people in thoroughness is required. We do not want mere parrots who echo what others say. We want trained minds, trained thoughts; people to think and act. Material resources will never bring these. We cannot all see what the geologists see because they are trained to see. How many of us as we travel let our eyes roam over the beautiful scenery? How many of us have observed the beautiful entrances to Canada? As we have sailed up the St. Lawrence with a beautiful sunset behind the Laurentian hills, have we never been thrilled with the thought, this is my country. We say there are no great results in these things. There are great moral results. We ought to teach the children to see the things that should be seen.

"One of the things perhaps we do not see is the memorials of the past in the present. We have suddenly been put out in the world. When I studied twenty years ago I was well received at Edinburgh as Canadians were, but they did not think much of Canada. There has been a vast change in those twenty years. We have been thrust out in the very forefront of the world's expectations."

Dr. Falconer then reviewed briefly the hardships suffered by the people who emigrated to Canada in the pioneer days. "Think of the ships they came in. Think of the number that foundered on the rocky shores of the country. Think of the people dumped on land with perhaps not ten feet cleared and no knowledge of how to use the axe. They went in and learned. Only the strong survived. They struggled through. All this has had a moral effect on our history. There was that same experience all through the English speaking provinces. This is our country. The strength in these people came out. For three generations back we have been developing our own characteristics."

The speaker alluded to the terror of the Indians and graphically cited the experience of one family, the elder males of which fell victims to the red man's axe. The lure of freedom had brought these people out and they demanded that freedom from Britain in the form of independent government. England thought if Canada was given self government it would drift away, but these people said: "trust us and we will cling to you." That was a new thing in the world's history. Just as the English had secured freedom by struggle so was the conception of freedom by these people. "Our people were beginning to solve the greatest Imperial question. Unless they had obtained responsible government we do not know what the result might have

and our past is rich."

"The question of Quebec adds a great deal to the National life. Paris still is recognized as the intellectual centre of Europe. There in Quebec is that intellectual brilliancy and education must bring it out. The children must be taught what was in history and in the people of the past.

"It remains for us to see that those who come after us are trained to see what they ought to see, to hear what they ought to hear, and act as they ought to act," said Dr. Falconer in concluding.

Mr. J. W. Mahon, president of the club, was in the chair and after the toast to the King, he introduced Dr. Falconer.

Mr. George T. Smith, of Haileybury, vice president of the club, moved a vote of thanks in felicitous terms. Mr. F. Smiley of New Liskeard, another vice president of the club seconded it and the meeting most heartily supported the motion.

The ladies of St. Paul's Anglican church provided the dinner and were warmly complimented in a vote of thanks proposed by Mr. McAulay.

There were about sixty members present from Haileybury, Cobalt and New Liskeard.

Mr. George A. Smith and Crown Attorney Smiley, tendered the speaker a vote of thanks and Mayor McAulay and Mr. E. V. Neelands moved a vote of thanks to the ladies for the enjoyable luncheon they provided.

SAW HAILEYBURY.

The guest of Mayor Neil McAulay of Haileybury, Dr. Falconer, this morning saw as much of Haileybury and New Liskeard as the very wretched weather would permit. He was conducted over the Haileybury High School by Mr. W. A. Wilson, the principal and was most interested in the work there and the institution. Tonight he will return south to Toronto.

Cobalt Nugget. Sep. 6 - 1913.

LAST OF THE GEOLOGISTS TAKE THEIR DEPARTURE Tired by Their Long Journey but Were Enthusiastic During Their Visit

The third and last party of geologists departed from the camp on their special train last night and as far as Cobalt is concerned the Twelfth International Geological Congress is over.

A unique service on the last Sunday of the trip indicated the international and universal character of the excursion. Mr. J. Ashworth, a veteran mining engineer of Manchester, Eng., conducted the service. He is a Quaker. Mr. J. T. B. Ives read a chapter out of the New Testament. He is a Unitarian from Andover, New Hampshire, and Father Dupaigne of Montreal recited the Lord's Prayer in Latin and French. He is of course a Catholic.

The concert at Sudbury was of the same cosmopolitan nature. There were songs in Italian, French and German.

The party was subdivided into three sections yesterday, one going to the Coniagas, another to the Nipissing and another to the Penn Canadian. The train pulled out of the station last night sharply on time at 6.20 and will run straight to Toronto, where the members will disperse to their respective countries and homes. They all appeared rather tired yesterday after their long trip across the continent and back. Not much more than half returned, however. Quite a number took the extended trip to the Yukon and will not be back for some time, while one coach was slipped at North Bay last night, for the members that had not seen and wanted to see the Sudbury nickel fields. There were about 18 in this group so that there will be but the shadow of the original excursion arriving at the Union Station, Toronto, this morning.

Cobalt Nugget. Oct. 1 - 1913.

GEOLOGISTS PASS THROUGH COBALT

The Last Party Will go to Porcupine on This Afternoon's Train

The last, the very last party of geologists will pass through Cobalt this afternoon bound for Porcupine. They reached Sudbury yesterday, coming direct from the Pacific Coast and the Yukon. They have thus been travelling ever since the middle of August.

They will be joined here by Mr. A. A. Cole and the party will go through to Porcupine. Tomorrow they will see the Dome and Hollinger and any other mines they have time to visit and will leave the gold camp on the morning of Thursday for Cobalt. Here they will stay till Saturday night. Mr. A. G. Burrows came down from the Sesikinika district to Cobalt yesterday and last night took the train to North Bay where he will meet the party. He also will stay with them until they leave the north.

THE INTERNATIONAL GEOLOGICAL CONGRESS.

I.—ITS RAISON D'ETRE.

AN INTERNATIONAL CLEARING HOUSE.

(By A. G. CHARLETON, M.Inst.M.M., A.R.S.M.)

The twelfth International Geological Congress, recently held in Toronto, Canada, which I had the privilege of attending as one of the delegates of the Institution of Mining and Metallurgy, was a remarkable gathering and proved an immense success.

It brought together geologists from all parts of the world; men of international reputation drawn from every civilised nation familiar with the geological conditions and mineral deposits of almost every habitable portion of the globe thus far explored and surveyed. The delegates of the congress numbered close upon 500, and 23 tongues were spoken, although but three languages were officially recognised, namely, English, French and German, in any of which addresses might be delivered. The members of the congress formed a splendid body of alert, keen men; every type of brain was represented, long heads and round heads, but most of them possessing the clear, far-sighted eyes which generally distinguish men trained in science; whilst most of the members were endowed as well with that fine physique which can only be gained by a life largely spent out of doors, in striking contrast to men condemned to work all their lives confined in stuffy offices, studies and laboratories.

The congress took place in Canada this year on the invitation of the Canadian Government, and although its proceedings proper are now over a number of the delegates have remained in the colony and are taking advantage of the specially arranged excursions, some of which are not expected to return to Toronto before the end of October. As has been well observed, these international meetings serve in a sense as "an international clearing house for geology," whilst, moreover, they focus attention upon the countries in which they are held, thus tending to aid in their development and promote their prosperity. The immense economic value of geological research is now widely appreciated in its application to mining, civil and other branches of engineering, as well as in connection with industrial enterprises, and questions constantly arise, not only in the investigations of ore deposits, but in matters of water supply and the foundations of structures, road construction, &c., upon which geology bears.

THE FIRST CONGRESS.

The late Dr. T. Sterry Hunt, who from 1847 to 1872 was chemist and mineralogist to the Geological Survey of Canada, was appointed secretary of the annual meeting for the advancement of science, held in Buffalo, U.S.A., in August, 1876, at which the project of holding an international congress of geologists was proposed, styled the Comité Fondateur of 1876; and the first session of the congress was held in Paris in 1878. Meetings take place every three years in different specially selected countries to which the congress may be invited; and leading topics of scientific and economic importance are chosen in advance so that each member who is able to contribute information upon any specific subject may be prepared to do so. The International Committee deals with questions of general importance, requiring concerted action, such as the organisation of meetings, awards, the standardisation of geological colours and signs employed on maps, geological nomenclature and the planning of Continental maps; and it selects the countries where future sessions are to be held, the work of elaborating the programme for the next congress being a task of great magnitude, which usually takes two or three years to complete in detail. The excursions are perhaps the most generally interesting feature of the sessions, special facilities being provided in each country where a meeting is held to enable the delegates, brought from every part of the world, to make, under expert guidance, a personal examination of its chief characteristic geological features and mineral resources.

The "Transactions" of the Congress are works of great scientific and economic value and are issued as soon after the termination of each session as possible, and they contain a general report upon the work of the Congress and include the more important papers presented, with the discussion upon them, as well as special monographs issued in separate volumes. In this latter connection the previous (namely, the eleventh) Congress published a quarto volume on "Changes in Climate since the Maximum of the Last Period of Glaciation" and two quarto volumes and a large atlas on the "Iron Resources of the World." In addition to this, very valuable publications are presented to members of the Congress, prepared by the geologists and engineers of the country in which they meet, in the form of guide-books, maps and monographs. The Congress awards prizes for special achievement in the science and application of geology, such as the Spendiarrow prize.

SUBJECTS DISCUSSED.

The twelfth Congress met under the distinguished patronage of the Duke of Connaught, Governor-General of the Dominion, as Honorary President, and the Minister of Mines, Ottawa, the Minister of Railways and Canals, Ottawa, the Minister of Lands, Forests and Mines of Ontario, the Minister of Colonisation, Mines and Fisheries of Quebec, the Premier and Minister of Mines of British Columbia, and the Commissioner of Works and Mines of Nova Scotia acted as Honorary Vice-Presidents. The Canadian Executive Committee, which consisted of eleven prominent members of the Geological Surveys of the Dominion and several well-known Canadian mining engineers, was under the Presidency of Dr. Frank D. Adams, Dean of the Faculty of Applied Science and Logan Professor of Geology, McGill University, Montreal, with Dr. R. W. Brock acting as general secretary and Mr. W. Stanley Lecky secretary of the Congress, and a strong "Organisation Committee" was formed, consisting of over forty leading Canadian geologists, engineers and business men, to arrange details of excursions, etc. The special topics for discussion comprised:— (1) The Coal Resources of the World, (2) Differentiation in Igneous Magmas; (3) The Influence of Depth on the Character of Metalliferous Deposits; (4) The Origin and Extent of the Pre-Cambrian Sedimentaries; (5) The Sub-divisions, Correlation and Terminology of the Pre-Cambrian; (6) To What Extent was the Ice Age Broken by Inter-Glacial Periods? (7) The Physical and Faunal Characteristics of the Palaeozoic Seas, with Reference to the value of the Recurrence of Seas in Establishing Geological Systems; and (8) Various Geological Subjects of a Miscellaneous Character. The publication, later on, of the reports of committees upon the international geological map, as well as upon other subjects, will naturally be looked for with very great interest, and the remarkable monograph upon the coal resources of the world, just issued in the form of two handsome quarto volumes, with a folio atlas, is a most memorable event in the annals of geology: a permanent monument due to the work of geologists all over the world to the honour of the Twelfth International Congress. Exhibitions of specimens and maps to illustrate the geology of the districts traversed by the various excursions were arranged at Ottawa, Montreal, Quebec and Toronto, and the old Laurentian and pre-Cambrian rocks, which are most strikingly developed in Canada, were naturally of particular interest, but in the course of the various excursions organised for the occasion opportunities were afforded for the examination of rocks of all ages and kinds up to deposits as recent as the wonderful Niagara-Iroquois Beach of pleistocene age at Hamilton, Ontario, and such comparatively modern phenomena as the scenic falls and gorge of Niagara, which have a special charm for the physiographer and photographer. The dozen official excursions (ranging as far afield in one case as the Klondyke goldfield) were conducted in special trains, to which the general public were not admitted, making it possible for each party to stop at points of special interest, avoiding delays, and enabling them to visit a great many places in a comparatively short time, and to travel over any desired route. The organising work done by Dr. Frank D. Adams, F.R.S., the President; Mr. G. G. S. Lindsey, Chairman; the Finance Committee; the general secretary, Mr. R. W. Brock, F.R.S.C.; the secretary, Mr. W. Stanley Lecky; assisted by Mr. O. E. Le Roy and Mr. P. D. Quensel, calls for special mention, as well as that of the leaders of the excursions, who so largely contributed to make them a success, amongst whom might be named Dr. W. G. Miller, Dr. A. P. Coleman, Dr. T. L. Walker, Cyril Knight, A. A. Cole, A. G. Burrows, Percy Hopkins and J. B. Tyrrel, with whom the

writer was brought into personal contact upon the various expeditions in which he took part, which will be described in a subsequent article. The session in Toronto, which was held at the University, opened on 7th August, and concluded on 14th August, when honorary degrees were conferred by the University of Toronto upon a number of prominent geologists, including Dr. Aubrey Strahan, of the Geological Survey of Great Britain.

(To be continued.)

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THE INTERNATIONAL GEOLOGICAL CONGRESS.

II.—A VISIT TO THE SUDBURY COPPER-NICKEL FIELD.

(By A. G. CHARLETON, M.Inst.M.M., A.R.S.M.)

It is officially stated that over 40 per cent. of the mineral production of Canada is furnished by Ontario, and Northern Ontario possesses in Cobalt one of the most remarkable and productive silver fields, and in Sudbury the most valuable nickel mines in the world. An official excursion in which I took part afforded an opportunity for members of the Geological Congress to visit Sudbury, Cobalt and Porcupine. Sudbury lies about 35 miles north of Georgian Bay, the north-eastern part of Lake Huron. It may be said to be a place of international importance, because it is the chief source of the world's supply of nickel, which is extensively used in steel armour-plate, for ordnance and other purposes in arts and crafts. New Caledonia is the only other locality from which any very considerable supplies are at present obtained. The geological features and the character of the ores of these two localities are, however, entirely different.

GROWTH OF THE NICKEL INDUSTRY.

The Sudbury deposits were first worked in 1887 by the Canadian Copper Company, and difficulties experienced in treating the ore for copper led to the discovery that it contained nickel. The early difficulties in separating the two metals were speedily overcome, but a more serious problem then presented itself, namely, to find a ready market for the large quantity of nickel available. Fortunately, about 1890, the valuable properties of nickel-steel began to be appreciated, and the industry became firmly established, larger profits resulting from the nickel in the Sudbury ores than from the copper it contained, and of late years nickel mining has become exceedingly profitable and has been conducted upon a very large scale. Some conception of the importance and growth of the nickel industry may be gained by a comparison of the figures given in the twenty-first annual report of the Ontario Bureau of Mines, 1912, between the years 1907-1911.

	1907.	1909.	1911.
Ore raised (tons).....	351,916	451,892	612,511
Ore smelted.....	359,076	462,336	610,738
Bessemer matte produc'd	22,041	25,845	32,607
Nickel contents	10,602	13,141	17,043
Copper contents.....	7,003	7,873	8,966
Value of nickel (dollars)	2,270,442	2,790,798	3,664,474
Value of copper ..	1,020,913	1,122,219	1,231,118
Wages paid ..	1,278,694	1,234,904	1,830,526
Men employed	1,660	1,796	2,439

These figures will probably be exceeded in 1912-1913. The chief nickel-producing companies operating in the district during the past year were the Canadian Copper Company (controlled by the International Nickel Company) and the Mond Nickel Corporation. The formation of a new development company, the Canadian Nickel Corporation, Ltd., capitalised, it is reported, at \$30,000,000, has quite recently been announced.

GEOLOGY OF THE DEPOSIT.

The nickel region of Sudbury has well-defined geological boundaries, and all the ore deposits are connected with a great sheet of eruptive rock, the outer and lower edge of which consists of an easily weathered rock "norite," whilst its inner (upper edge) is formed of micropegmatite, a hard, resisting rock, that commonly stands up

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as high hills. This sheet forms a boat-shaped basin, which conforms to the general strike of the archæan rocks of the district, its interior being filled with sedimentary rocks, more or less flat. The basin is 36 miles long and 16 miles wide, and the known ore deposits lie either along the edge of the norite or within four miles of it, on projections or "offsets." Formerly the nickel deposits were regarded as lying in two independent ranges, a main southern range and a subsidiary range to the north, but it is now recognised that they are all connected with the same eruptive sheet. But the important deposits are not uniformly distributed around its margin, as there are rich portions separated by barren sections. The ore deposits at the western end of the basin have not proved, so far, to be of much importance, but the eastern end seems to offer considerable possibilities. The southern or main nickel range, from which practically all the ore hitherto mined and smelted has been produced, extends from the Sultana mine to the Garson mine; and along this somewhat irregular line of 33 miles seventeen mines have produced ore, and within two or three miles south of it ten other mines have been worked. Breaks occur in the range, however, as for instance a gap between the Crean Hill and Gertrade mines. On the northern range it is reckoned that there are only thirteen miles of the margin of the nickel eruptive that are ore-bearing. Some ore has, however, been found on an "offset" in Bowell township, running into Foy. The physiography of Sudbury is closely connected with its geology, and often serves as a guide in locating its ore deposits. The Huronian and Laurentian rocks enclosing the basin, consisting of hard granites, gabbros and quartzites, stand up as irregular rugged hills or short ridges, without any definite order, whilst the nickel eruptive sheet is remarkably uniform. Frequently the basic edge of the norite has been eaten into hollows, filled with drift or "muskegs"—small lakes hiding the actual edge of the norite and making explorations for ore bodies more difficult. Evidence of extensive ancient glaciation is to be seen everywhere. Many larger bodies of water are enclosed in the hills of the granitic or acid edge of the eruptive, affording convenient waterways between the interior of the basin and the narrow valley formed along its basic edge. The southern nickel-range, with its wider band of norite, has comparatively few lakes, but it is computed that there are at least 30 small bodies of water along the basic edge, often with ore bodies dipping beneath them owing to the slope of the underlying country rock. These lakes have occasionally been taken up as nickel locations.

The Sudbury ores are not by any means of a complex character. They consist mainly of an intimate admixture of pyrrhotite, pentlandite and chalcopyrite in amorphous forms, but native gold, silver, platinum and palladium are occasionally found in them as well in appreciable quantities. The generally accepted theory of the origin of the ore bodies at Sudbury is that they are due to "magmatic segregation"—that is to say, the molten mass of eruptive norite was charged with the sulphides of iron, nickel and copper, which separated out before cooling completely; and it is a remarkable fact that nickel ore bodies are also found associated with norite in Norway. Some observers hold the view that the ores have been deposited by the agency of water replacing the original constituent rock minerals. But the weight of evidence seems to be in favour of the first-named theory, which does not deny that there may have been subsequent rearrangement of some of the minerals present by water agency, which is quite probable.

The ore bodies of Sudbury are of several distinct types. 1. "Marginal," (a) dipping towards the axis of the basin consisting of ores with comparatively little rock and more than twice as much nickel as copper. (b) "Faulted marginal," irregular in shape and character—usually mixed with much rock and carrying as much copper as nickel, or sometimes more. 2. "Offsets," (a) columnar, roughly cylindrical bodies, nearly vertical, and going to great depths, usually rich in copper and the precious metals. (b) "Parallel offsets," not columnar, but sheet-like, dipping towards the basic edge, and carrying ore of a similar character to the "marginal deposits." Pentlandite and pyrrhotite form the major portion of the ore-bodies, intimately admixed with each other and with chalcopyrite. The latter mineral, while almost always present, is more often found in pure masses, small in size, but free from the other minerals. Occasionally some very rich "patches" of ore have been found carrying some of the rare and precious metals, and in the early days several thousand dollars' worth of gold were obtained by means of a three-stamp prospecting mill whilst sinking the shaft of the Vermilion mine.

The Creighton mine supplies a good example of a typical Sudbury ore, although the average nickel and copper contents naturally vary somewhat in different mines. The ore contains about 1 1/2 per cent. copper and 4 per cent. nickel, or 38 parts Cu to 100 parts Ni. Near the east end of this mine a characteristic contact of norite with the older gneiss may be seen, and the huge "open-cast," 300 ft deep, traversed below by underground workings, reached by means of an underlie shaft sunk near the edge of the pit, is a sight not to be forgotten, reminding one of some of the immense open-cast workings in the copper mines in the South of Spain. These open-cast workings are quite a feature of the Sudbury district. The members of the Geological Congress visited the Copper Cliff mine, one of the richest and most important of the early mines, which has now been abandoned. The ore body formed an irregular chimney, which has been followed for 1,300 ft (400 m) on an incline of 70 deg. to the east. The gossan-covered ridge at Frood, which was visited afterwards, is believed to contain the largest known nickel deposit in the world, estimated to contain between 35 and 100 million tons of ore. After testing it with diamond drills, the Canadian Copper Company has sunk two shafts and begun work on this deposit; and the Mond Nickel Company, which owns the "Frood Extension," taking in part of the centre of the ridge, is sinking a third shaft. At Murray, and in other parts of the field, explorations are in progress with diamond drills, and at Murray the nickel ore body is already known to reach a depth of 1,100 ft, and is estimated to include more than 10,000,000 tons.

And there are doubtless parts of the district, as yet unexplored, which will repay prospecting in this manner.

TREATMENT METHODS.

The general treatment of the Sudbury ores after hand sorting involves four distinct processes—(1) Roasting to remove part of the sulphur; (2) smelting in water-jacket furnaces, to produce furnace or standard matte; (3) re-smelting the standard matte in "converters," to enrich it up to 75 or 80 per cent. of nickel and copper; and (4) the separation and refining of the nickel and copper. Five companies at least, in addition to the Canadian Copper Company, have been engaged in the production of standard matte—the Drury Nickel Company, at the Chicago or Travers mine; the Mond Nickel Company, at Victoria mine (which possesses a remarkably fine plant), the Lake Superior Corporation, at Gertrude; the Vivians, at Murray mine; and the Dominion Mining Company, at Blezard mine—and their general method of treatment varies but little, though the size and equipment of the various plants differs enormously. Canadian matte from Copper Cliff is treated by special methods at Bayonne, N.J., by the International Nickel Company, whilst matte from the Victoria mine is treated by the Mond process at Clydach, Wales; the reduced metals being acted on in the Mond process by carbon monoxide, and the nickel separated from the copper as a volatile compound.

Norwegian matte, obtained from Norwegian ores, is treated differently, and separated electrolytically by the Hybinette process, at Kristiansand, Norway. There are, therefore, three absolutely different ways of separating nickel and copper from the high-grade matte, all of which seem to be commercially successful in a greater or less degree, and able to compete with one another and with the different process used in the treatment of New Caledonian ores.

The Canadian Copper Company possesses a large power plant at High Falls, on Spanish River, about 23 miles west of Copper Cliff Station, which is a splendid installation. The smelter sub-station—the main distributing point of the system—supplies motors in the building itself and elsewhere, having a total capacity of 7,700 horse-power, besides arc and incandescent lighting for the smelter, shops, etc., and the town of Copper Cliff. The Mond Nickel Company has hitherto smelted its ores at its works near the Victoria mines. Recently, however, new works have been erected at Coniston, near the crossing of the Canadian Pacific and Canadian Northern Railways, and the new smelters there when entirely completed will be a modern and magnificent plant. They are near the company's mine at Garson, from which the bulk of its ore is now obtained.

Nickel steel, possessing as it does both the qualities of strength and lightness, has afforded an opening for the use of large quantities of

nickel, in the development of the automobile industry, flying machines, &c. A chrome-nickel steel made from Mayari ore, obtained from the Island of Cuba, is claimed to possess a greater tensile strength of 8,000 to 10,000 lbs per square inch and a higher elastic limit in the rolled condition than carbon steel of the same carbon contents. Other nickel alloys, such as "Monel" metal, have attracted attention and come into use for various purposes, and the future of the metal, and consequently the future of Sudbury, looks extremely bright. The nickel district of Sudbury has been geologically examined most minutely, and its many interesting features have been most carefully and graphically described by Dr. A. P. Coleman, Professor of Geology at Toronto University, who was one of the guides of our party.

(To be continued.)

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THE INTERNATIONAL GEOLOGICAL CONGRESS.

III.—THE COBALT SILVER CAMP.

[By A. G. CHARLTON, M. INST. M. M., A. R. S. M.]

The Cobalt Camp is situated about 90 miles north-east of Sudbury, and it is remarkable that copper and nickel are found so closely associated in the latter district, occasionally carrying a considerable amount of gold, with but little silver, whilst in the Cobalt Field silver in large amount is associated with cobalt, nickel and arsenic, with but little gold present at any time. It was some time before the importance of the Cobalt discoveries were recognised. The district was, in fact, condemned by engineers in the early days, who failed to appreciate its immense value, and, although it seems unlikely that mining will be carried on there to great depths, as in some other fields, this is compensated for in other ways.

The attitude of those who condemned the district at first was doubtless largely owing to the fact that the individual veins of rich ore are narrow, averaging not more than 4 ins in width, which would be apt to prejudice many engineers, whose training naturally and very properly makes them liberal in their ideas, but cautious and conservative in business matters, and they argued from experience in other cases of a different kind that these narrow veins would speedily cut out. A good illustration that whilst it is frequently the case that men err on the side of undue optimism, they also sometimes miss good business opportunities through ultra-conservatism—in fact, you cannot divest mining of a speculative element, and it would be a dull and poor business if entirely robbed of its romance. The history of Cobalt has been peculiarly romantic. The large number of veins and their extreme richness, as the event has proved, has fortunately compensated for their small width, and sometimes several parallel veins and veinlets ramifying through the wall rocks give a considerable width of concentrating and rich ore, so that stopes are carried to a width of 25 ft or perhaps more, and individual rich veins may carry 2 or 3 ft of milling ore on either side of them.

In the early days Cobalt was a poor man's camp, and it was due to the enterprise and pluck of "the prospector" that it has acquired its world wide renown. One of the earliest "adventurers" is said to have extracted ore to the approximate value of \$250,000 at a total cost of \$2,500, and statistics, I believe, show that the dividends distributed by the mines represent over 50 per cent. of the value of the output of Cobalt.

Fortune, therefore, in this case has been on the side of the optimist and of far-sighted geologists like Dr. Willet Miller, Arthur A. Cole and others, whose confidence in the future of the district has been justified, and has led to its being opened up upon its present scale.

THE RAPID RISE OF THE FIELD.

The output of Cobalt in 1904, it appears, only amounted to 158 tons of ore, worth \$136,217, averaging 1,309 ozs of silver per ton, or 5.34 per cent.; cobalt, 10.21 per cent.; nickel, 8.86 per cent.; and arsenic, 45.56 per cent. To-day Cobalt is the greatest silver producer of any single field to the extent, it is said, of about 13 per cent. of the world's entire production, whilst the white arsenic produced from cobalt ores is estimated at 20 per cent. of its total output. The silver output for 1912 is given as 22,393 tons of ore, valued at \$17,455,080, and 5,449,732 ozs of bullion, worth \$5,333,106, or a combined value of \$20,793,186—that is, well over £4,150,000. Upon the present basis of production a rise of 1 cent per ounce in the yearly average price of silver is calculated to increase the income of the producing mines by \$300,000. In 1912 the largest shipments of ore (2,000-lb tons) were made from the following seven mines:—La Rose, 3,511; McKinlay-Darrah, 2,673; Coniagas, 2,119; Cobalt Townsite, 1,944; Nipissing, 1,369; Buffalo, 1,251; and Cobalt Lake, 1,085. The largest bullion shipments last year were from the Nipissing, 4,255,013 ozs, value \$2,607,734; Crown Reserve, 346,234 ozs, value \$210,634; O'Brien, 229,360 ozs, value \$141,765; Buffalo, 205,302 ozs, value \$124,895; and Kerr Lake, 171,645 ozs, value \$104,420. At the commencement of 1912 there were twelve dividend-paying companies. The Cobalt Townsite and Cobalt Lake Companies have since entered the dividend-paying list. At the end of 1912 six companies had more than repaid their shareholders the amount of their capitalisation—namely, the Crown Reserve had paid 275 per cent.; the Nipissing 161 per cent.; the Buffalo 156 per cent.; the Kerr Lake 144 per cent.; the McKinlay-Darrah 126 per cent. and Coniagas 107 per cent.; whilst the Trethewey had reached 96 per cent. and the Right of Way 77 per cent.

Cobalt proper covers an area of about six square miles in Coleman Township, but isolated mines have been found outside of the central group, such as Casey, 19 miles north-east of Cobalt; the Wetlaufer, 20 miles south-east; at the Mann claims and Miller-Lake O'Brien, at Gowganda, 50 miles north-west. The Elk Lake discoveries also lie in this direction. It is, therefore, reasonable to expect that important new discoveries are likely to be made in this vast area, which is approximately 5,000 square miles in extent, much of which has been very superficially, if at all, "prospected" or examined. Even in Cobalt itself, owing to the surface being covered with much timber and drift material, in the early days contacts and outcrops were concealed and difficult to locate.

The Nipissing is the largest property at Cobalt and has the largest output of any individual mine at present. Up to the end of 1912 it had produced no less than 27,741,248 ozs of silver, from ore, two-thirds or more of which averaged 1,500 ozs per ton. The proved reserves are estimated to contain nearly ten million ozs, and there is a large portion of the company's area still unexplored.

CONCENTRATION OF LOW GRADE ORES.

The richness of the ore in various mines is illustrated approximately by what it has cost to produce an ounce of silver. The cost in 1911, including mining and all other expenses, is stated to have been at the Kerr Lake 14.69, at the Nipissing 13.95, at the Crown Reserve 10.76, and at the Coniagas 8.3 cents per ounce. There are several "Custom," as well as a number of company mills at Cobalt, and the only mill idle in the camp in 1912 was the Silver Cliff, which was reopened early this year. The concentration of low grade ores at Cobalt is becoming a matter of greater importance each year. In 1912 a new record was reached, 455,516 tons having been treated at different mills, and with enlargements either planned or carried out is likely to show further substantial increases. The "flow sheets" of the different water concentration mills show considerable variations in treatment at the different mills and considerable variety in the machinery employed for the purpose, as well as in the manner in which it is arranged, the details of which cannot be gone into here. But it may be observed that the "concentration ratio" varies within very wide limits, namely, from 130 to 1 downwards to 22 to 1. The most recent and interesting metallurgical innovation at Cobalt is the employment of aluminium dust in place of zinc dust for the precipitation of silver from cyanide solution at the Nipissing mill. Including the necessary alkali, the cost of aluminium precipitation is probably 30 per cent. higher than zinc, but the higher class "precipitate" resulting and the recovery of cyanide seems likely to render its use advantageous.

The bulk of the ore shipments from Cobalt go for treatment to (1) the works of the Canadian Copper Company at Copper Cliff; (2) the Canadian Smelting and Refining Company at Orillia; (3) the Comagass Reduction Company at Thorold; and (4) the Deloro Mining and Reduction Company at Marmora, all in Ontario. There are, however, several other smaller buyers. The arsenic in the Cobalt ores is a valuable by-product, and so is the cobalt to a less extent.

From an engineering standpoint the Taylor plant of the Cobalt Hydraulic Power Company on the Montreal River is a most remarkable installation. This is for the compression of air carried down by a large volume of water into a large tunnel, and in its descent of 351 ft becomes a mixture of water and compressed air, which is liberated at the lower end of the tunnel 1,021 ft in length.

In the tunnel the air is compressed to 125 lbs. and is said to be remarkably free from moisture. The machinery for the collection, measurement and distribution of the air is contained in quite a small building, and it is delivered to Cobalt through nine miles of 20-in pipe, 7 1/2 miles of 12-in pipe and nine miles of 6-in and smaller sizes, and sold at 25 cents per 1,000 cubic feet at about 100 lbs. pressure and atmospheric temperature.

PROSPECTS OF NEW DISCOVERIES.

The value of the Cobalt veins is such that "intensive prospecting" is being carried on by the Nipissing Company on Nipissing Hill with a hydraulic monitor, which sweeps away the surface soil and lays bare the rock below, so that it can be closely examined for silver streaks no thicker than a knife blade. And, no doubt, important new discoveries will be made in the district from time to time by more thorough prospecting. People on the spot have a marvellous faith in mining at Cobalt. Large prices have, I believe, been paid in a number of cases for properties upon which little, if any, actual prospecting had been done; and important concessions have been taken up under the lakes merely upon geological probabilities, which have in some instances certainly repaid these apparently highly speculative ventures.

(To be continued.)

[The previous articles of this series appeared in our issues of 15th and 27th September.]

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h October, 1913.

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IV.—THE PORCUPINE GOLD FIELD.

HOLLINGER AND DOME MINES.

[By A. G. CHARLETON, M. INST. M. M., A. R. S. M.]

My last excursion in connection with the International Geological Congress included a visit to the Porcupine Goldfield, which is situated on the Hudson Bay slope of Northern Ontario, close to the southern fringe of "the great clay belt," destined, it is believed, to become at some future time an important farming country. Porcupine lies 100 miles north-west of Cobalt, at an altitude of about 1,350 ft above sea level. Little prospecting was done previous to 1909, when J. S. Wilson made a spectacular discovery of gold on what is now the Dome property. The disastrous forest fires which broke out in the middle of May and lasted until the middle of July, 1911, unfortunately gave the district a serious set-back, as they swept over South Porcupine and Pottsville and the northern part of Porcupine (Golden City), besides destroying a number of surface plants, and were attended by a very sad loss of life. But with undaunted courage and faith in the district the mine-owners set about reconstructing the mills, and gold to the estimated value of about \$1,800,000 was produced in 1912.

The two leading mines to-day are the Hollinger and the Dome. The outcrop of the first-named property is crossed by an old Hudson Bay trail, which scores of men must have traversed unsuspecting the wealth buried beneath their feet. Probably some of them camped on the very spot, where the main lode outcrops, where gold was afterwards discovered. The two premier mines differ, however, considerably in character, the Hollinger ore being comparatively rich and yielding a large profit per ton, whilst the Dome is a big deposit of ore of much lower grade on the whole. Other properties in the district include the McEnany, Miller-Middleton and Dixon. In 1910 the ore treated at Porcupine only amounted to 1,060 tons, which yielded 1,947 ozs of bullion, valued at \$35,539, whilst in 1912 the production of the district had risen to 88,466 tons, which yielded 50,633 ozs of bullion, valued at \$1,032,315. The forest fires of 1911 destroyed the small experimental plants of the Dome, Hollinger and Vipond, but the new mills of these companies and of the McIntyre were in a position to treat the above-named tonnage in 1912, and the construction of two other mills, the Dome-Lake and McEnany (Crown Reserve Mining Company) was also put in hand. With these mills in operation it appears reasonable to expect that the returns from this district in 1912 will be exceeded by its production in 1913.

THE HOLLINGER MINE.

At the Hollinger the ore reserves at the commencement of this year were estimated to amount to 644,540 tons, valued at \$11,271,400, and the profit made during the last half of the year was \$600,664.42. Up to the end of 1912 the company had paid three dividends of \$90,000 each, bringing the total dividend distribution up to that date to \$270,000. The reserves showed an estimated increase in value at the end of last year of \$1,041,400, allowing for ore standing in reserve at the beginning of the year, to the value of \$970,304.89, which was subsequently milled, and the mine at the end of 1912 had only been partially opened up to the comparatively shallow depth of the 300 ft level. There are stated to be forty-three veins upon the property, of which seven were discovered in 1912, and upon thirty-four of them no work has been done beyond sampling the outcrops. The three principal veins opened up are known as No. 1, No. 2 and No. 4, which showed reserves estimated to be worth \$6,026,100, \$2,648,250 and \$1,012,000 respectively at the commencement of 1913. But six other veins had been developed to some considerable extent, showing reserves varying in value from \$33,200 up to \$400,900 individually. The veins occur either in porphyry schist or near the contact, and development so far has been confined to veins in the porphyry. The strike of the schist is generally south-west to north-east, whilst the quartz veins cut across its strike at a small angle. No. 1 vein has a characteristic lenticular structure varying in width from 20 ft down to a few feet, the lenses frequently overlapping. The average estimated value of all the ore treated in 1912 was \$21.40 per ton, including low-grade ore sent to the mill at the start of milling operations and during the strike, but the average of all the ore won up to 5th October, 1912, is figured at \$23.69 per ton and 5,777 tons of clean ore milled from the stopes yielded an average value of \$37.89 per ton.

The mine costs at the Hollinger in February, 1913, exclusive of several items of extra-ordinary expenditure, chiefly attributable to the strike and alterations to the mill and plant, are stated to have been: Mining, \$3,558; milling, \$1,493; administration, etc., \$0,407; operating camp, \$0,261; general charges, \$0,209; clearing surface roads, etc., \$0,015; total, \$5,973 per ton of ore milled. But it is anticipated that, with uninterrupted work, the costs will be reduced approximately to \$5.50 per ton. Directly and indirectly, the strike is said to have cost the company \$100,000. The company employs about 500 men, and the working shifts are nine hours underground and eight hours on the surface. Skilled labour is paid \$3.25 to \$3.75 and unskilled labour \$2.50 to \$3.00 per day. Power is furnished from two independent sources at Mattagami River and Waiwaitan Falls. The new mill is said to be treating on an average 300 tons daily, with 30 stamps and making a 97 per cent. extraction from \$30.00 ore. With 40 stamps in operation its capacity is calculated to reach 450 to 500 tons per diem, as the stamp duty may be reckoned at 12 tons per stamp, using coarse screens. The machinery comprises a gyratory crusher of large size, with trommel, Blake crusher and belt conveyor, stamps with tube mills, Dorr classifiers and spitzkasten, Diester slime tables, Dorr thickeners, Moore filters, Merrill presses and other auxiliary cyanide plant, with bullion furnaces, etc., and preliminary amalgamation is dispensed with altogether.

CONDITIONS AT THE DOME.

At the Dome the ore bodies consist of veins and strings of quartz, much intermixed with schist, and the gold seems to occur along numerous small contact planes rather than in the quartz itself; very little sorting can, therefore, be done. Some rich specimen ore may be seen in the original discovery shaft a few feet from the surface at the end of a trench which follows along the back of a massive quartz outcrop. Two three-compartment shafts have been sunk—No. 1 to about 100 ft in depth and No. 2 some 250 ft or more—and the ore is carried from the mine to the mill by a double-tracked incline. The tonnage developed above the 45 ft level is estimated at 315,528 tons, with a sampling value of \$7.53 per ton. The new mill constructed after the fire of 1911 is stated to have treated from 23rd March, 1912, to 31st March, 1913, 101,812 tons of ore, which yielded \$1,043,995, and its duty has been brought up to 425 tons or more by increasing the tube mill and filter press capacity of the plant. The crushing machinery comprises gyratory crushers (40 1,250 lb), stamps and tube mills, whilst the gold-saving appliances comprise Dorr classifiers, amalgamating plates, concentrating cones, Dorr thickeners, Pachuca and mechanical agitators, cyanide solution tanks, Merrill slime presses and bullion furnaces. The works of the company are to be entirely operated by electricity, supplied by the Northern Canada Power Company, generated at Waiwaitan Falls, in place of using coal. The cost of power supplied to the mines at Porcupine in this way is stated to be \$50 per horsepower per annum, calculated on peak-loads.

The different character of the two deposits makes the mining methods, as well as the mill practice, adopted at the Dome and Hollinger widely different. At the former mine most of the ore is won by the open-cast or "glory-hole" method, whilst at the latter mining is carried on either by ordinary stoping or by "shrinkage stoping" when the ore is wide (running as it does in No. 1 vein up to 20 ft in width), and it is broken down in benches with long flat holes.

Most of the Porcupine surface ore is free-milling, but it became associated in depth with sulphides, and amalgamation had to be supplemented with cyanidation. At the Vipond mill rolls are employed after the crushers in place of stamps, with Harding mills and Colbath classifiers. The ore is crushed to 200 mesh. This plant has an estimated daily capacity of 100 tons, and is reported to have treated 6,000 tons between 7th July and the end of October of last year, but closed down temporarily for the addition of cyanide plant as it was found that not more than a 60 per cent. extraction could be obtained by amalgamation alone. Besides the Dome and Hollinger, several other mines in the district are reported to have done considerable development work with, it is said, satisfactory results, and are erecting, or have erected, treatment plants. For instance, the McEnany has sunk a vertical shaft to 417 ft or more, and the ore-shoots located are stated to have an average width of 3 to 4 ft and an average value of over \$20 per ton. The McIntyre Porcupine mines milled 14,500 tons of ore between 1st March and the end of 1912, and decided to put up a 300-ton mill, and the first unit of 150 tons was put in hand. The Vipond Porcupine mines have a main shaft over 347 ft deep.

KIRKLAND LAKE DISTRICT.

The writer, with several other members of the Porcupine excursion, made a branch visit to the Kirkland Lake District, in which several new discoveries were made last year. It is situated north-east of Swastika, which is about sixty-one miles north of Cobalt, on the Temiskaming and Northern Ontario Railway. Various gold claims have been opened up in this locality and one property, although only equipped with a small 5-stamp mill, is producing enough gold to pay running expenses. This claim is known as the Foster Tough-Oakes, and several veins have been located upon it. No. 2 vein is regarded as the principal one at present. It occurs in a grey and more or less banded conglomerate, a few feet north of the contact between the sedimentary series, and grey feldspar porphyry. The conglomerate seems to dip nearly at the same angle as the vein. A main incline shaft was started from the bottom of an open cast about 30 ft deep, and had reached a depth of 175 ft on 28th July last. The principal quartz vein seen at the surface and in the shaft, although narrow, appears to be persistent as well as rich, and the wall rocks are said to carry good values for a width of several feet, payable across the full width of the shaft, and apparently over a width of 15 ft or more at the bottom. Gold telluride (apparently "calaverite") was first noticed about 18 ft from the surface, and is stated to have increased in

quantity in depth, as the proportion of silver to gold has also done. Two early shipments of picked high-grade ore, won from the open cast, each of about twenty tons, returned 19.6 to 22.5 ozs in gold and 23.4 to 33.6 ozs silver per ton, and were valued at \$9,235.60 and \$8,567.36 respectively. The Burnside is another new discovery in the same locality, and other properties are being opened up between Swastika and Kirkland Lake, which was formerly rather inaccessible; but this will shortly be remedied by a new road, under construction by the Government.

CONCLUSION.

Summing up, it is clear that Canada possesses in this little piece of Ontario alone, which the writer visited, immense deposits of mineral, comprising gold, silver, nickel, iron and other metals, that are being worked with large profit, and the old Hudson Bay territory to the north, which is as yet one of the almost unexplored corners of the globe, is said to be rich in copper and other deposits. Canada, it is true, cannot at the present time boast of many deep mines; but it is a mining country in the making, and the gross value of its metallic products alone came in 1912 to over \$61,000,000, silver contributing \$19,425,656, nickel \$13,452,463, copper \$12,709,311, and gold \$12,559,443. Neither does the Dominion at present possess many large mines encompassed in a small area, like those of the Rand, Broken Hill, Kalgoorlie, Chartors Towers and other places, if one excepts Sudbury and Cobalt. But there are numerous mines, more or less scattered over Ontario and the West, and as railways and roads are pushed out into new, unexplored districts, one can scarcely doubt that many important individual discoveries will be made, and probably large new mining camps will be opened up, which will vastly increase its mineral production in a few years' time, and place it in the front rank amongst other mineral-producing countries.

And this brings me to the vital question whether these vast territories, with their potential mineral wealth, will lie idle for a time or will be left entirely to American and Canadian capitalists to explore and develop, or whether in the future, as in the past, British capital and British brains will take an active interest and an active part in co-operating in this important, beneficent and Imperial work, or will they leave it to Empire builders possessing greater enterprise and greater foresight?

[Concluded.]

[The previous articles appeared in our issues of 15th, 27th and 29th September.]

Cobalt Daily Nugget. Oct. 4-1913.

SAW MUCH GOLD

German Savant Astonished at Rich- ness of Surface Showings In Porcupine

"I saw more free gold in Porcupine than at any other camp I visited on the trip to America," stated Professor Dr. Bruno Weigand, of Strassburg, Germany, who is a member of the vanguard of geologists who arrived in Cobalt yesterday afternoon from Porcupine. Dr. Weigand, like other members of the party was impressed with the northern camp and the visits to the Dome and Hollinger mines were revelations to the party. Dr. Weigand stated that in the Nova Scotia trip no free gold has been seen in place, while in the Yukon a similar experience was met with and it was at Porcupine that the first free gold was seen in place.

The party inspected the geological route of the district of the Little Silver vein of the Nipissing, and across to diabase mountain. The surface formation was inspected at many interesting points.

This morning they were taken to the Coniagas mine where they were shown through the underground workings and the occurrence of the silver veins was commented on by the min-

ing engineers in the party. This afternoon they will be guests at the Nipissing mine, and the high grade and low grade mills will be inspected and this evening the party leave for Toronto, from which point they separate for their various homes in Europe, Asia and Africa.

Dr. R. G. McConnell, geologist with the geological survey of Canada, is in charge of the party, while he is assisted by Mr. A. A. Cole and Mr. A. G. Burrows.

The members of the party visiting Cobalt, include:

Prof. Weigand, Strassburg, Germany.

Prof. Schene, Halle, Germany.

Mr. Morel, mining engineer, Belgium.

Dr. and Mrs. Fermor of the geological survey, Calcutta, India.

Mr. Luttmann-Johnston, engineer for DeBeers, South Africa.

Mr. Inouye, director of the geological survey, Japan.

Mr. Zuede, mining engineer, Belgium.

Miss Rathkan, teacher of geology, Hamburg, Germany.

Toronto Globe. October 7-1913.

VISITING GEOLOGISTS

SAW WONDERS IN WEST

Glacier Three Thousand Feet Thick—Trees Growing Above Ice—Coal Being Mined With a

Steam Shovel

Mr. Luttmann H. Johnson of Johannesburg, South Africa, who is staying at the Queen's Hotel and who is a mining engineer, has been making a tour of Alaska and the Yukon with a small party of other geologists, Messrs. Grimmer, Wille and Noonan, who are also from Johannesburg, among them.

Mr. Johnson showed The Globe some quaint mementoes in the shape of Indian garments—"the real thing"—which smelt, as Mr. Johnson said, "something like a tan-yard." He had specimens of gold and silver and of copper, as well as of minerals the aspect of which conveys little to the lay mind.

"We went up the Yakutat Bay, in Alaska, in the Princess McKenna, which was provided for us by the C. P. R.," said Mr. Johnson, "and camped near the Nunatak glacier. When we came out of the bay we were so fortunate as to see the clouds lift from that rarely visible range of mountains of which Mount Elias is the highest—19,978 feet—and which the Duke of Abruzzi climbed. We saw also Mts. Augusta, Cook, and Hubbard.

Trees Growing on Moraine.

"On the Variegated glacier, alongside the Hubbard glacier, we saw the most strange sight, bushes and trees were growing on the ablation moraine above the ice. There were some stones and mud on top of the ice and in this

the trees had taken root and were flourishing.

"Mr. Martin of the United States Survey measured the total thickness of the ice on the Grand Pacific glacier which is a glacier of ordinary size. The ice is over 3,000 feet thick.

"We came back coasting from Yakutat to Skagway, practically following the old Klondike trail to Dawson City. At Whitehorse we saw volcanic ash three or four inches thick for a considerable distance. At Tantalus there is a coal mine and we also saw a copper mine at Whitehorse. Not only gold is found in the Yukon, but also copper and coal. One of the finest things we saw was the view from Sulphur Mountain, which is near Banff, of a series of step-faults in the Rockies. It was most wonderful from a geological point of view, as well as most beautiful.

Coal Mined with Steam Shovel.

"Another most interesting sight was the Frank landslide. A three-thousand-foot mountain has fallen down here, and has carried on, so that the end of the 'refuse' is very nearly 8,000 feet away from the base of the 3,000-foot mountain. Near Frank we saw a big deposit of coal. It is being mined with a steam shovel.

"We saw the outcrop of silver at the Rose Mine at Cobalt and we went to Porcupine and Sudbury. We were much impressed by the whole of this district. The difficulties of prospecting mean that by no means all of the wealth of the country has been discovered, in fact things are only beginning."

INTERNATIONAL GEOLOGICAL CONGRESS,

TWELFTH SESSION, CANADA, 1913

Executive Office, Victoria Memorial Museum, Ottawa.

Victoria Programme

HEADQUARTERS AT THE EMPRESS HOTEL

Secretary's Office, Room 416

The Presidents and Members of the following Clubs have invited all visiting members of the Congress to avail themselves of the privileges of their clubs as follows:—

- UNION CLUB, for Men
- PACIFIC CLUB, for Men
- ALEXANDRA CLUB, for Ladies

MONDAY, AUGUST 25th, 1913

2.30 p.m. C-2—Excursion arrives. Baggage to be left on boat and to be placed in hotel by hotel porters. Tallyhoss leave from dock giving drive round the city, returning to the Hotel about 5.30.

5.30 p.m. C-2—Arrive at Empress Hotel, where rooms will be ready and baggage placed therein.

7.00 p.m. C-2—Dinner at Empress Hotel.

One of the most important results of the theory of relativity is the prediction that the speed of light is constant in all inertial frames of reference. This prediction has been confirmed by a number of experiments, including the Michelson-Morley experiment and the experiment of Kennedy and Thorndike. The constancy of the speed of light is a fundamental principle of physics, and it is one of the two postulates of special relativity. The other postulate is the principle of relativity, which states that the laws of physics are the same in all inertial frames of reference. These two postulates lead to the Lorentz transformation, which relates the coordinates of an event in one inertial frame to the coordinates of the same event in another inertial frame. The Lorentz transformation shows that time and space are not absolute, but they are relative to the observer. This means that the time interval between two events and the distance between two events depend on the relative velocity of the observer. The Lorentz transformation also shows that the speed of light is constant in all inertial frames of reference. This prediction has been confirmed by a number of experiments, including the experiment of Kennedy and Thorndike. The constancy of the speed of light is a fundamental principle of physics, and it is one of the two postulates of special relativity. The other postulate is the principle of relativity, which states that the laws of physics are the same in all inertial frames of reference. These two postulates lead to the Lorentz transformation, which relates the coordinates of an event in one inertial frame to the coordinates of the same event in another inertial frame. The Lorentz transformation shows that time and space are not absolute, but they are relative to the observer. This means that the time interval between two events and the distance between two events depend on the relative velocity of the observer. The Lorentz transformation also shows that the speed of light is constant in all inertial frames of reference. This prediction has been confirmed by a number of experiments, including the experiment of Kennedy and Thorndike.

The Lorentz transformation is a mathematical expression that relates the coordinates of an event in one inertial frame to the coordinates of the same event in another inertial frame. It is a generalization of the Galilean transformation, which is valid only for low velocities. The Lorentz transformation shows that time and space are not absolute, but they are relative to the observer. This means that the time interval between two events and the distance between two events depend on the relative velocity of the observer. The Lorentz transformation also shows that the speed of light is constant in all inertial frames of reference. This prediction has been confirmed by a number of experiments, including the experiment of Kennedy and Thorndike. The constancy of the speed of light is a fundamental principle of physics, and it is one of the two postulates of special relativity. The other postulate is the principle of relativity, which states that the laws of physics are the same in all inertial frames of reference. These two postulates lead to the Lorentz transformation, which relates the coordinates of an event in one inertial frame to the coordinates of the same event in another inertial frame. The Lorentz transformation shows that time and space are not absolute, but they are relative to the observer. This means that the time interval between two events and the distance between two events depend on the relative velocity of the observer. The Lorentz transformation also shows that the speed of light is constant in all inertial frames of reference. This prediction has been confirmed by a number of experiments, including the experiment of Kennedy and Thorndike.

PROGRAMME OF EXCURSION

(The hours given in this programme are approximate.)

WEDNESDAY, JULY 23RD.

8 P.M. Leave Toronto *via* Canadian Pacific Railway from Union Station, foot of York Street.

THURSDAY, JULY 24TH.....

6 A.M. Arrive at Sudbury.....

FRIDAY, JULY 25TH.....

SATURDAY, JULY 26TH.....

} For details of programme for the three days at Sudbury and vicinity see Guide Book No. 7, pages 42 to 48.
} Banquet as guests of the Sudbury Board of Trade, Friday evening.

SUNDAY, JULY 27TH.

1 P.M. Leave Sudbury.

9 P.M. Arrive at Cobalt.

(For description of the route from Sudbury to Cobalt *via* North Bay see Guide Book No. 7, pages 102 to 108.)

MONDAY, JULY 28TH.

Forenoon.—After crossing Cobalt Lake, a walk will be taken up the Little Silver valley along the Kerr Lake branch of the Temiskaming and Northern Ontario Railway (see map, scale 800 feet to 1 inch). A cliff, about 70 feet in height, along the east side of the railway track, exhibits a typical development of the Cobalt series. At the base of the cliff is delicately banded grey-wacké. Above this is impure quartzite, overlying which is conglomerate. The Little Silver vein cuts the face of the cliff almost at right angles.

At two or three points immediately west of the railway track the basal breccia or conglomerate of the Cobalt series rests on the surface of the Keewatin. Part of the Cobalt series can be seen to have originated *in situ*.

The walk will be continued along the railway track, over Keewatin rocks, past the Provincial mine, thence across the Savage to Mount Diabase, where the Nipissing diabase sill can be seen resting on the Cobalt series.

From Mount Diabase the road will be followed, passing between Cart and Peterson lakes, thence over the Nipissing property, where the surface has been cleared by hydraulicking, to Cobalt Lake.

12.30 P.M. Luncheon on the car.

2.00 P.M. The members of the excursion will be formed into three or four groups for visits to mines.

6.30 P.M. Dinner on the car. In the evening there will be an opportunity to visit concentrating and other plants.

TUESDAY, JULY 29TH.

Forenoon.—Visits will be made to mines and plants.

2.00 P.M. Leave Cobalt for Haileybury. Luncheon on the car.

3.00 P.M. Embark on gasoline boats at Haileybury for trip on Lake Temiskaming, along the shores of which various outcrops will be examined.

7.00 P.M. Dinner on the car.

11.00 P.M. Leave for Poreupine.

WEDNESDAY, JULY 30TH.

- 7.00 A.M. Arrive at Porcupine (Dome mine).
- 8.30 A.M. Visit plant of Dome mine.
- 12 NOON. Leave for Timmins, in the vicinity of which mines and plants will be visited and the geological features examined.
- 11.00 P.M. Leave Timmins.

THURSDAY, JULY 31ST.

- 7.00 A.M. Arrive at Temagami.
- 8.30 A.M. Embark on "Belle of Temagami" for Temagami Inn and Bear Island where is to be seen a Hudson's Bay Company's post.
- 1.00 P.M. Luncheon on car.
- 2.30 P.M. Examine outcrops of Cobalt series and Keewatin along railway track north of the station, and the iron formation (jaspilite).
- 4.30 P.M. Leave Temagami.
- 4.45 P.M. Arrive at Doherty where outcrops of the Laurentian and Keewatin are to be seen with overlying Cobalt series.
- 6.45 P.M. Leave Doherty.
- 9.15 P.M. Arrive at North Bay.
- 10.00 P.M. Leave North Bay.

FRIDAY, AUGUST 1ST.

- 7.00 A.M. Arrive at Ottawa.
- Forenoon.*—Log-rolling contest as guests of Senator W. C. Edwards.
- Luncheon.*—At the Experimental Farm by the Department of Agriculture.
- Afternoon.*—Reception by the Geological Survey at the Victoria Memorial Museum.
- 6.30 P.M. Leave Ottawa.
- 10.00 P.M. Arrive at Montreal where a programme for the following day has been arranged by the Local Committee.

SATURDAY, AUGUST 2ND.

Montreal.

INTERNATIONAL GEOLOGICAL CONGRESS.

TWELFTH SESSION, CANADA, 1913.

Executive Office, Victoria Memorial Muscum, Ottawa.

PROGRAMME OF EXCURSION A3.

Sudbury, Cobalt and Porcupine.

LEADER.

Willet G. Miller.

ASSOCIATE LEADERS.

Sudbury—A. P. Coleman and T. L. Walker.

Cobalt—Cyril W. Knight and A. A. Cole.

Porcupine—A. G. Burrows and Percy E. Hopkins.

SECRETARY.

W. R. Rogers.

ASSISTANT SECRETARY.

Percy E. Hopkins.

LIST OF MEMBERS.

105. BARRELL, J., Professor of Geology, Yale University, New Haven, Conn., U.S.A.
170. BAIN, H. F., Editor Mining and Scientific Press, San Francisco, Cal., U.S.A.
167. BEYER, S. W., Iowa State College, Ames, Iowa, U.S.A.
17. BURROWS, A. G., Geologist, Bureau of Mines, Toronto, Ontario.
351. CAILLEBOTTE, JEAN, École Nationale Supérieure des Mines, Paris, France.
310. CERULLI-IRELLI, Serafino, Maître de conférences de Paléontologie, à l'Université de Rome, Italy.
411. CHARLETON, A. G., Past-President, Institution of Mining and Metallurgy, London, England.
- CHARLETON, MRS.
187. COLE, G. A. J., Director of the Geological Survey of Ireland, Dublin, Ireland.
20. COLE, A. A., Mining Engineer to the Temiskaming and Northern Ontario Ry., Cobalt, Ontario.
4. COLEMAN, A. P., Professor of Geology, University of Toronto, Toronto, Ontario.
670. CORKILL, E. T., Safety Engineer, Copper Cliff, Ontario.
556. COLLINS, W. H., Geologist, Geological Survey of Canada, Ottawa, Ontario.
239. DRESSER, J. A., Manager Lands Department, the Algoma Central and Hudson Bay Railway Company, Sault Ste. Marie, Ontario.
155. ECKFELDT, H., Professor of Mining Engineering, Lehigh University, South Bethlehem, Pa., U.S.A.
- ECKFELDT, MRS.
303. EMMONS, W. H., Professor of Geology, University of Minnesota, Minneapolis, U.S.A.

380. EUBANK, MISS ANNIE, Toronto, Ontario.
735. FOREST, F. H., Professeur de Géologie, Collège Bourget, Rigaud, Quebec.
699. GODFROY, CONSTANT, Ingénieur des Mines, La Haye, Netherlands.
335. GRABHAM, GEORGE WALTER, Government Geologist, Khartoum, Anglo-Egyptian Sudan.
100. HOPKINS, P. E., Geologist, Bureau of Mines, Toronto, Ontario.
154. HORE, R. E., Editor Canadian Mining Journal, Toronto, Ontario.
296. KEMP, J. F., Professor of Geology, Columbia University, New York City, U.S.A.
58. KNIGHT, C. W., Assistant Provincial Geologist, Bureau of Mines, Toronto, Ontario.
145. KIRKPATRICK, S. F., Professor of Metallurgy, School of Mining, Kingston, Ontario.
163. KITSON, A. E., Imperial Institute, London, England.
102. LANE, A. C., Professor of Geology, Tufts College, Boston, Mass., U.S.A.
182. LANE, MRS. A. C.
630. LINDEMAN, E., Mines Branch, Department of Mines, Ottawa, Ontario.
313. MATTIROLO, E., Ingénieur en chef des Mines, Rue Charles Albert 45, Torino, Italy.
454. McDERMID, CHARLES, Secretary Institution of Mining and Metallurgy, London, England.
230. McNEILL, BEDFORD, President Institution of Mining and Metallurgy, London, England.
229. McNEILL, MRS. BEDFORD.
267. MERCIAI, GUISEPPE, Professeur Instituto Geologico della Regia Universita, Pisa, Italy.
9. MILLER, WILLET G., Provincial Geologist of Ontario, Toronto, Ontario.
533. MORIN, LOUIS JOSEPH, Professeur de Sciences Naturelles, Séminaire de Joliette, Joliette, Quebec.
706. NOISEUX, JOS. ALFRED, Séminaire de Joliette, Joliette, Quebec.
495. ORDONEZ, EZEQUIEL, Ingénieur Géologue des Mines, Mexico, D.F., Mexico.
- ORDONEZ, MRS.
504. PFORDTE, OTTO F., Cairo, Greene County, New York, U.S.A.
158. RAISIN, MISS C. A., Bedford College, London, England.
151. RANSOME, F. L., United States Geological Survey, Washington, D.C.
559. REINECKE, L., Geologist, Geological Survey of Canada, Ottawa, Ontario.
69. ROGERS, W. R., Topographer, Bureau of Mines, Toronto, Ontario.
743. SCHULZE, HEINRICH, Ingenieur, Hanover, Germany.
275. SEARLS, FRED, Goldfields, Nevada, U.S.A.
674. SIMPSON, W. E., Fundicónde de Los Arcos, Toluca, Mexico.
449. SJÖGREN, H. S. A., Professor, Academy of Science, Stockholm, Sweden.
59. STANSFIELD, J., McGill University, Montreal, Quebec.
252. SZADECZKY DE SZADECSNE, JULES, Royal Hungarian University, Kolozsvár, Hungary.
11. TYRRELL, J. B., Geologist, Toronto, Ontario.
632. TYRRELL, MRS. J. B.
51. WALKER, T. L., Professor of Mineralogy, University of Toronto, Toronto, Ontario.
472. WHERRY, EDGAR T., Lehigh University, South Bethlehem, Pa., U.S.A.
67. WILSON, A. W. G., Mines Branch, Department of Mines, Ottawa, Ontario.
562. WILSON, M. E., Geologist, Geological Survey of Canada, Ottawa, Ontario.

INTERNATIONAL GEOLOGICAL CONGRESS,
TWELFTH SESSION, CANADA, 1913.

Executive Office, Victoria Memorial Museum, Ottawa.

List of Members and Programme
EXCURSION C-1.

Transcontinental, via Canadian Pacific Railway and Canadian
Northern Railway.

LEADER.

F. D. Adams.

ASSOCIATE LEADER.

J. B. Tyrrell.

SECRETARY.

J. McLeish.

ASSISTANT SECRETARY.

H. S. DeSchmid.

MEMBERS.

1. ADAMS, DR. F. D., Dean of the Science Faculty, McGill University, Montreal, Canada.
13. ALLAN, DR. J. A., Professor of Geology, University of Alberta, Edmonton, Canada.
14. AMI, DR. H. M., Ottawa, Canada.
514. ANDREE, DR. KARL, Privatdozent für Geologie und Paläontologie an der Universität, Marburg, Hessen, Germany.
276. ARLT, DR. HANS, Kgl. Bergassessor, München, Germany.
710. BACKLUND, H. G., Geologue-petrographe de la Direction des Mines, Buenos Aires, Argentine.
260. BÄCKSTRÖM, DR. H., Professeur de Petrographie a l'Universite de Stockholm, Djursholm, Sweden.
749. BARKER, PROFESSOR F. L., Rochester, New York.
3. BARLOW, DR. A. E., Westmount, Montreal, Canada.
108. BASCOM, MISS F., Ph.D., U.S. Geological Survey, Bryn Mawr College, Penn., U.S.A.
215. BIGOT, A., Doyen de la Faculté des Sciences de l'Université de Caen, Caen, France.

312. BODEN, DR. KARL, Privatdozent für Geologie an der Universität Geologisches Institut, Alte Akademie, München, Germany.
378. DE BUGGENOMS, LOUIS EUGENE, Docteur en droit, Consul honoraire de l'Equateur à Liege, Liege, Belgium.
208. CADELL, H. M., Grange, Linlithgow, Scotland.
245. CAREZ, MADAME B., Paris, France.
246. CAREZ, LEON, Docteur-es-Sciences, Paris, France.
191. CASE, DR. E. C., University of Michigan, Ann Arbor, Mich., U.S.A.
192. CASE, MRS., Ann Arbor, Mich., U.S.A.
310. CERULLI-IRELLI, DR. Serafino, Maitre de conferences de Paleontologie a l'Université de Rome, Italy.
555. CLAPP, DR. C. H., Geological Survey, Ottawa, Canada.
4. CLEMAN, DR. A. P., Professor of Geology, University of Toronto, Toronto, Canada.
556. COLLINS, DR. W. H., Geological Survey, Ottawa, Canada.
800. CONNOR, M. F., Mines Branch, Ottawa, Canada.
156. DALY, DR. R. A., Harvard University, Cambridge, Mass., U.S.A.
593. DEPRAT, J., Chef du Service Géologique de l'Indochine, Hanoi, Indo-Chine.
70. DE SCHMID, H. S., Mines Branch, Ottawa, Canada.
705. DINHAM, C. H., H.M. Geological Survey, Edinburgh, Scotland.
448. EWALD, MISS MARINA, Bryn Mawr College, Bryn Mawr, Pennsylvania, U.S.A.
300. FERMOR, DR. L. L., Geological Survey of India, Calcutta, India.
- FERMOR, MRS., Calcutta, India
847. FOERSTE, A. F., Dayton, U.S.A.
374. GENTIL, LOUIS EMILE, Professeur a l'Université de Paris, Paris, France.
28. GOODWIN, DR. W. L., Director, School of Mining, Kingston, Canada.
426. VON GROTE, DR. FRIEDRICH, München, Bayern, Germany.
516. GRUTTERINK, DR. AIDE, (Miss), Privat-Docte on Mikrochimie a l'Université de Leigden, Rotterdam, Netherlands.
379. GUINSBERG, ALBERT S., Licencie es-science, Ingenieur-metallurgiste, Institute Polytechnique; Laboratoire de Mineralogie, St. Petersburg, Russia.
502. GOLDMAN, MARCUS J., Johns Hopkins University, Baltimore, Md., U.S.A.
78. GWILLIM, J. C., School of Mining, Kingston, Ontario, Canada.
196. HANIEL, DR. C. A., Venusbergweg, Bonn. a Rh., Germany.
267. HARKER, A., St. John's College, Cambridge, England.
171. HATCH, MISS LAURA, Bryn Mawr, Pennsylvania, U.S.A.
157. HILLS, DR. T. MCD., Geological Department, Ohio State University, Columbus, Ohio, U.S.A.
527. HORNE, DR. JOHN, F.R.S., Edinburgh, Scotland.
206. HUME, DR. W. F., Geological Survey, Cairo, Egypt.
211. JEHU, T. J., The University, St. Andrew's, Scotland.
80. JOHNSTON, W. A., Geological Survey, Ottawa, Canada.
330. KEYES, DR. CHARLES, Des Moines, Iowa, U.S.A.
37. KINDLE, DR. E. M., Invertebrate Palaeontologist, Geological Survey, Ottawa, Canada.
40. LAMBE, L. M., Vertebrate Palaeontologist, Geological Survey, Ottawa, Canada.
102. LANE, DR. A. C., Tufts College, Boston, Mass., U.S.A.
182. LANE, MRS. A. C.
592. LANTENOIS, H., Ingenieur en chef de la Circonscription des Mines de l'Indochine, Hanoi, Indo-Chine.
291. LAWSON, DR. ANDREW C., University of California, Berkeley, Cal., U.S.A.

413. LEITH, DR. C. K., Professor of Geology, University of Wisconsin, Madison, Wis.
397. LOEWINSON-LESSING, DR. FRANCOIS, Professeur de Geologie et de Mineralogie, Institut Polytechnique, Pierre le Grand, St. Petersburg, Russia.
576. LOEWINSON-LESSING, Vladimir Etudiant Institut Polytechnique Pierre le Grand, St. Petersburg, Russia.
263. LORY, PROF. P. C., Chargé de Conférences de l'Université, Grenoble, France.
283. LUCK, HUGO FRANK PAUL, Leipzig, Germany.
68. MAILHOT, A., Professor of Geology l'École Polytechnique, Montreal, Canada.
- 4 2 500. DE MARGERIE EMMANUEL, Ancien Président de la Société géologique de France, Paris, France.
313. MATTIROLLO, ETTORA, Ingénieur en chef des Mines, Torino, Italy.
645. MACLEAN, A., Department of Geology, University of Toronto, Toronto, Canada.
93. McCONNELL, R. G., Geological Survey, Ottawa, Canada.
45. McLEISH, JOHN, Chief of the Division of Mineral Resources and Statistics, Mines Branch, Department of Mines, Ottawa, Canada.
267. MERCIAL, DR. GIUSEPPE, Professor, Instituto Geologico della Regia Università, Pisa, Italy.
299. MICHALON, LUCIEN, Ingénieur des Mines, Paris, France.
571. MILCH, DR. LUDWIG, Professor de Mineralogie und Petrographie Greifwald, Preussen, Germany.
434. MITSCHERLICH, HEINZ ERICH, Dipl. Bergingenieur, Karlsruhe, Baden, Germany.
436. MOLENGRAAFF, DR. GUSTAV ADOLF, Delft, Netherlands.
- ps 1 531. MOORE, ELWOOD S., DR., Professor of Geology and Mineralogy School of Mines, State College, Pennsylvania, U.S.A.
160. MILLER, A. M., State University, Lexington, Kentucky, U.S.A.
178. MURRAY, R. B., Elmhurst, Trelzwney Road, Cornwall, Camborne, England.
367. NICHOLAS, TRESSILIAN CHARLES, Trinity College, Cambridge, England.
344. PACKARD, LEONARD O., Boston Normal School, Boston, Mass., U.S.A.
492. PARSONS, ARTUR L., Lecturer in Mineralogy, University of Toronto, Toronto, Canada.
433. PAULCKE, PROFESSOR DR. WILHELM, Karlsruhe, Baden, Germany.
128. PERKINS, DR. C. H. BURLINGTON, Vermont, U.S.A.
328. QUENSEL, DR. PERCY DUDGEON, Lecturer in petrography, University of Uppsala, Sweden.
329. QUENSEL, MRS. P. D.
- 2 651. PEYERIMHOFF, HENRIDE, Maître des Requêtes honoraires au conseil d'Etat Secrétaire du Comité Central des Houillères de France, Paris, France.
506. PIATNIZKY, P. P., Professor of Mineralogy, University of Charkow, Russia.
158. RAISIN, MISS C. A. DR., Bedford College, London, W. England.
388. RATHGEN, MISS ANN MARIA ELIZABETH, Bonn a. Rhein, Germany.
185. RICE, DR. W. H., Professor of Geology, Wesleyan University, Middletown, Connecticut, U.S.A.
280. RIEDEL, ADOLPH JOHANNES, Braunschweig, Germany.
284. ROMER, EUGENIUSZ, Docteur-ès-sciences, Professeur à l'Université de Lemberg, Austria.
275. SEARLS, FRED JR., Goldfield, Nevada, U.S.A.
315. SCHENCK, PROFESSOR DR. ADOLF, Halle a. S. Germany.
347. SKOTTSBERG, DR. CARL JOHAN FREDERIK, Maître de conférences à l'Université, Uppsala, Sweden.

896. SKOUFOS, THÉODORE, Université d'Athènes, Athènes, Greece.
 401. STEINMAN, PROFESSOR DR. GUSTAV, Geheimer Bergrat, Bonn a Rhein., Germany.
 577. STEPANOV, PAUL, Géologue du Comité Géologique et Ingénieur des Mines, St. Petersburg, Russia.
 696. STILLE, DR. H. W., Professor an der Universität Leipzig, Direktor der Konglich Sachsischen Geologischen Landesanstalt, Leipzig, Germany.
 242. STOLLEY, PROFESSOR DR. E., Technische, Hochschule, Braunschweig, Germany.
 827. STRATANOWITZ, EUGENE, Geologist of the Rogoslowsk Mining Estate, Turjinskie, Rudniki, Russia.
 662. SUTTON, WILLIAM JOHN, Victoria, British Columbia, Canada.
 252. SZADECKZY, DR. JULES, Kolozsvár, Hungary.
 408. TAYLOR, FRANK B., Fort Wayne, Indiana, U.S.A.
 TAYLOR, MRS.
 ✓ 301. TEISSEYRE, DR. W. H. Professeur de Géologie, Galicia, Austria.
 188. TERMIER, P. M., Directeur du Service de la Carte Géologique de la France, Paris, France.
 189. TERMIER, Mlle.
 758. TIETZE, DR. EMILE, Directeur de l'Institut Géologique Impérial Royal d'Autriche, Vienne, Austria.
 241. TILMANN, DR. N., Bonn a Rhein, Germany.
 643. TOLMACEV, I. P., Conservateur en chef du Musée Géologique Pierre le Grande de l'Académie Impériale des Sciences St. Petersburg, Russia.
 810. TSCHERNEYSCHEW, Th. Directeur du Comité Géologique de Russia, St. Petersburg, Russia.
 11. TYRRELL, J. B., Toronto, Canada.
 214. UGLOW, W. L., Department of Geology, University of Wisconsin, Madison, Wisconsin, U.S.A.
 119. WALCOTT, DR. C. D., Smithsonian Institution, Washington, D.C., U.S.A.
 52. WALLACE, DR. ROBERT C., Professor of Geology and Mineralogy, University of Manitoba, Winnipeg, Canada.
 201. WELTER, DR. OTTO A., Bonn a Rhein, Germany.
 472. WHERRY, DR. EDGAR T., Assistant Professor, Lehigh University, South Bethlehem, Pennsylvania, U.S.A.
 220. WIGGLESWORTH, E., Geological Museum, Cambridge, Mass., U.S.A.
 562. WILSON, DR. M. E., Geological Survey, Ottawa, Canada.
 137. WORDIE, J. M., St. John's College, Cambridge, England.
 203. ZOUDE, PAUL L. C., Ingénieur civil des Mines, 109 Boulevard de Grande Ceinture, Bruxelles, Belgium.

16 Countries..... 115 members

Austria.....	3	Members	Hungary.....	1	Member
Argentina.....	1	"	India.....	2	"
Belgium.....	2	"	Indo-China.....	2	"
Canada.....	24	"	Italy.....	3	"
France.....	10	"	Netherlands.....	1	"
Germany.....	17	"	Russia.....	8	"
Great Britain.....	9	"	Sweden.....	1	"
Greece.....	1	"	United States of Am.	27	"

Sungam

PROGRAMME.

THURSDAY, AUGUST 14TH.

- 7.30 P.M. Leave Toronto, via Canadian Pacific Ry., from Union Station, foot of York Street. Members may board train any time after 6.30 p.m.
Supper will be served.

FRIDAY, AUGUST 15TH.

- 5.00 P.M. Arrive Coldwell. Nepheline syenite and related rock types.
- 6.00 P.M. Leave Coldwell.
- 12.00 Midnight, arrive Port Arthur, E. T.

SATURDAY, AUGUST 16TH.

- 2.00 A.M. Leave Port Arthur C.T. on Canadian Northern Ry.
- 8.00 A.M. Iron Spur. Visit Atikokan Iron Mines.
- 11.30 A.M. Leave Iron Spur.
- 12.15 P.M. Arrive Atikokan. This afternoon will be spent at Steep Rock Lake, examining the fossiliferous Pre-Cambrian limestone.
Walking and Motor Launches.

SUNDAY, AUGUST 17TH.

- 5.00 A.M. Leave Atikokan.
- 6.00 A.M. Arrive Banning. Examine exposures showing post-glacial faulting.
- 7.00 A.M. Leave Banning.
- 8.15 A.M. Arrive Mine Centre. Unconformity near Bad Vermilion Lake between Seine series and Keewatin-Laurentian complex.
Walking and Motor Launches.
- 12.00 Noon. Leave Mine Centre.
- 12.40 P.M. Arrive Bear's Pass. Relations of the Keewatin and Couchiching. Motor Launches and walking.
- 8.00 P.M. Leave Bear's Pass.

MONDAY, AUGUST 18TH.

- 7.00 A.M. Arrive Winnipeg. Leave by C.P.R. train about 8.00 a.m. for Stoney Mountain (fossiliferous Ordovician) and Stonewall (fossiliferous Silurian). Leave Stonewall 11.40 a.m.
Afternoon, see Winnipeg programme.
- 9.00 P.M. Leave Winnipeg, Canadian Pacific Railway Station.

TUESDAY, AUGUST 19TH.

- 7.00 P.M. Arrive Medicine Hat. Visit Gas wells.
- 9.00 P.M. Leave Medicine Hat.

WEDNESDAY, AUGUST 20TH.

- 7.10 A.M. Arrive Banff. Morning will be spent on Sulphur Mountain, where monoclinal structure of Eastern Rockies may be viewed. Walking.
- 2.00 P.M. Leave Banff.
- 2.15 P.M. Arrive Bankhead. The only anthracite coal mine in Canada.
- 7.00 P.M. Leave Bankhead.
- 7.15 P.M. Arrive Banff.

THURSDAY, AUGUST 21ST.

- 6.00 A.M. Leave Banff.
- 7.45 A.M. Arrive Laggan. Trolley to Lake Louise Chalet, Relations of Pre-Cambrian at Lake Agnes, Victoria and Lefroy Glaciers. Walk to Mirror Lake, Lake Agnes and Lookout Point. Lunch at 12.35 p.m., Lake Louise Chalet. In afternoon, drive to Moraine Lake and return to Chalet. Trolley to Laggan.
- 7.00 P.M. Arrive Laggan.

FRIDAY, AUGUST 22ND.

- 6.00 A.M. Leave Laggan.
- 8.00 A.M. Arrive Field, M.T. In forenoon, walk to trilobite beds or drive to Emerald Lake.
- 12.30 P.M. Lunch at Field. In the afternoon, drive to Takakaw Falls, Yoho Valley. Lower and Middle Cambrian.
- 6.30 P.M. Arrive Field.

SATURDAY, AUGUST 23RD.

- 6.00 A.M. Leave Field P.T. Traverse through Western Rockies and Eastern Selkirks.
- 6.45 A.M. Arrive Leancoil.
- 6.55 A.M. Leave Leancoil.
- 7.25 A.M. Arrive Glenogle.
- 7.45 A.M. Leave Glenogle.
- 8.05 A.M. Arrive and leave Golden.
- 9.10 A.M. Arrive Beavermonth.
- 9.20 A.M. Leave Beavermonth.
- 9.28 A.M. Arrive the Gateway Beaver River Canon.
- 9.43 A.M. Leave the Gateway Beaver River Canon.
- 11.08 A.M. Arrive Rogers Pass.
- 11.40 A.M. Leave Rogers Pass.
- 11.55 A.M. Arrive Glacier.

SUNDAY, AUGUST 24TH.

- 7.00 A.M. Leave Glacier. Continuation of traverse across the Selkirks.
- 9.00 A.M. Arrive Albert Canon Gorge.
- 9.25 A.M. Leave Albert Canon Gorge.
- 9.30 A.M. Arrive Albert Canon.
- 12.30 P.M. Leave Albert Canon.
- 1.50 P.M. Arrive Revelstoke.
- 2.50 P.M. Leave Revelstoke.

MONDAY, AUGUST 24TH—*Continued.*

- 3.10 P.M. Arrive Clanwilliam. Train waits 55 minutes on siding, then goes ahead and picks up party.
- 4.45 P.M. Arrive Mitikan Siding. 5 minutes stop.
- 5.40 P.M. Arrive Sicamous.

MONDAY, AUGUST 25TH.

- 5.40 A.M. Leave Sicamous.
- 8.20 A.M. Arrive Ducks.
- 8.30 A.M. Leave Ducks.
- 8.45 A.M. Arrive Campbell.
- 9.00 A.M. Leave Campbell.
- 9.30 A.M. Arrive Kamloops.
- 9.50 A.M. Leave Kamloops.
- 8.30 P.M. Arrive Vancouver. The canons of the Thompson and Fraser Rivers are traversed by day-light.
- 11.45 P.M. Leave Vancouver by night boat for Victoria.

TUESDAY, AUGUST 26TH.

- 7.00 A.M. Arrive Victoria. Breakfast on board boat. Victoria Day.

WEDNESDAY, 27TH.

- Geological excursions in the neighborhood of Victoria. (See guide book.)
- 11.45 P.M. Leave Victoria for Vancouver on night boat.

THURSDAY, 28TH.

- 7.00 A.M. Arrive Vancouver. Breakfast on board boat. Alternative excursions. Special boat to Britannia Beach, Howe Sound. Special car on B.C. Electric Railway to Clay deposits at Clayburn.
- 12.00 Midnight. Leave Vancouver, eastbound.

FRIDAY, AUGUST 29TH.

En route.

SATURDAY, AUGUST 30TH.

- 6.30 A.M. Arrive Calgary. Programme of the day to be announced later.
- 5.00 P.M. Leave Calgary.
- 12.00 Midnight. Arrive Edmonton on Canadian Pacific Railway.

SUNDAY, AUGUST 31ST.

- 1.00 A.M. Leave Edmonton, on Canadian Northern Railway.

MONDAY, SEPTEMBER 1ST.

- 7.00 A.M. Arrive Dauphin. Excursion to Snake Island, Lake Winnipegosis.
- 7.00 P.M. Leave Dauphin.

TUESDAY, SEPTEMBER 2ND.

- 1.40 A.M. Arrive Winnipeg by Canadian Northern Railway.
- 3.00 A.M. Leave Winnipeg by Canadian Pacific Railway.
- 7.00 A.M. Arrive Kenora. Geological excursion by motor boats on the Lake of the Woods. (See Guide Book.)
- 11.00 P.M. Leave Kenora.

WEDNESDAY, SEPTEMBER 3RD.

- 7.00 A.M. Arrive Port Arthur, L.T.
- 1.00 P.M. Leave Port Arthur.
- 2.00 P.M. Arrive Loon Lake.
- 5.00 P.M. Leave Loon Lake.

THURSDAY, SEPTEMBER 4TH.

- 1.30 P.M. Arrive Sudbury.

FRIDAY, SEPTEMBER 5TH.

- 10.00 P.M. Leave Sudbury.

SATURDAY, SEPTEMBER 6TH.

- 7.00 A.M. Arrive Toronto, Union Station.

**INTERNATIONAL GEOLOGICAL CONGRESS,
TWELFTH SESSION, CANADA, 1913.**

Executive Office, Victoria Memorial Museum, Ottawa.

List of Members and Programme.

EXCURSION C-2.

**Transcontinental—Via Canadian Pacific Railway, Grand Trunk
Pacific Railway and National Transcontinental Railway.**

LEADER.

R. W. Brock.

ASSOCIATE LEADER.

J. McEvoy.

SECRETARY.

H. E. T. Haultain.

ASSISTANT SECRETARY.

H. Frechette.

MEMBERS.

13. ALLAN, J. A., DR., Professor of Geology, University of Alberta, Canada.
521. ANDERSON, E. M., Geological Survey, Edinburgh, Scotland.
409. ASHWORTH, JOHN, M.E., Manchester, England.
186. BAKER, SIR AUGUSTINE, Dublin, Ireland.
198. BOEKE, H. E., DR., Professeur Mineralogisches Institut, Halle a.S., Germany.
218. BOGGILD, DR. O. B., Professeur Mineralogical Museum, Copenhagen, Denmark.
693. BORGSTROM, DR. L. H., Universite Helsingfors, Finland, Russia.
258. BROOKS, A. H., Geological Survey, Washington, D.C., U.S.A.
2. BROCK, R. W., Director Geological Survey, Ottawa Canada.
17. BURROWS, A. G. Ontario Bureau of Mines, Toronto, Canada.
19. CAMSELL, C., Geological Survey, Ottawa, Canada.
420. CARTWRIGHT, COSMO T., Mines Branch, Department of Mines, Ottawa, Canada.
535. CHARBONNIER, J., Manager, West Canadian Collieries Ltd., Blairmore, Alberta, Canada.
556. COLLINS, DR. W. H., Geological Survey, Ottawa, Canada.
555. CLAPP, DR. C. H., Geological Survey, Ottawa, Canada.
361. DAHLBLOM, LORENT EDWARD THEODOR, Bergmästare in Gefle-Dala District, Falun, Sweden.
5. DENIS, T. C., Superintendent of Mines for the Province of Quebec, Canada.
414. DICK, WILLIAM J., Commission of Conservation, Ottawa, Canada.
22. DOWLING, D. B., Geological Survey, Ottawa, Canada.

557. DRYSDALE, DR. C. W., Geological Survey, Ottawa, Canada.
575. DUPAIGNE, REVEREND PIERRE, Licencié-es-Sciences, Professeur des Sciences Physique et naturelles au Séminaire de Philosophie, Montréal, Canada.
370. DUNN, GEORGE, Loudon, Annanhill, Kilmarnock, Scotland.
63. FERNOW, DR. B. E., Dean of Faculty of Forestry, University of Toronto, Toronto, Canada.
- FERNOW, MRS.
66. FINNIE, O. S., Department of the Interior, Ottawa, Canada.
71. FRECHETTE, H., Mines Branch, Department of Mines, Ottawa, Canada.
74. HAULTAIN, H. E. T., Prof. of Mining Engineering, University of Toronto, Toronto, Canada.
- HAULTAIN, MRS.
394. GARDNER, SAMUEL McLARE, Mount Vernon Colliery Co., Ltd., Glasgow, Scotland.
78. GWILLIM, PROF. J. C., School of Mining, Kingston, Canada.
625. GÜRICH, PROF. DR. B., Hamburg, Germany.
72. HAANEL, B. E., Department of Mines, Ottawa, Canada.
204. HOBSON, BERNARD, F.G.S., Sheffield, England.
348. HOPKINS, DR. THOS. CRAMER, Maître de Conférences à l'Université, Uppsala, Sweden.
154. HORE, R. E., Michigan College of Mines, Houghton, Michigan, U.S.A.
270. VAN HORNE, DR. F. R., Case School of Applied Science, Cleveland, Ohio, U.S.A.
554. HOWLEY, DR. J. P., Director, Geological Survey of Newfoundland, St. John's, Newfoundland.
395. HURLL, MARK, Glasgow, Scotland.
396. HURLL, JOHN MCGLASHAN REDHOLM, M.E., Glasgow, Scotland.
924. INOUE, M., Director Geological Survey of Japan, Tokio, Japan.
460. IVES, HENRY GOODSON, Andover, New Hampshire, U.S.A.
461. IVES, J. T. B., F. G. S., Andover, New Hampshire, U.S.A.
416. JARVIS, GERALD, Arnprior, Ontario, Canada.
251. KIDO, CHUTARO, Superintendent of the Geological Institute of the South Manchuria Railway Company, Dairen, Kantoshu, Manchuria.
623. KENNEDY, G., Toronto, Canada.
38. KNIGHT, C. W., Assistant Provincial Geologist, Ontario Bureau of Mines, Toronto, Canada.
238. KUKUK, PAUL., Bergassessor a. D., Bochum i.W. Germany.
469. DE LAMOTHE, LEON JEAN BENJAMIN., General de Division, Inspecteur de Etudes techniques de l'Artillerie, 1 Place St. Thomas d'Aquin, Paris, France.
406. LUTTMAN-JOHNSON, H. M., F.R.G.S., Petworth, Sussex, England.
41. LEACH, W. W., Geological Survey, Ottawa, Canada.
904. LEBLING, C.
6. LEROY, O. E., Geological Survey, Ottawa, Canada.
7. LINDSEY, G. G. S., Toronto, Canada.
645. MACLEAN, A., Toronto University, Toronto, Canada.
498. MAIER, E., Professeur titulaire en géologie Université de Santiago, Santiago, Chili.
332. MARTIUS, DR. SIEGFRIED G., Assistant am mineralogischpetgraphischen Institut der Universität Bonn, Bonn a Rh., Germany.
58. McMILLAN, J. G., 225 Geoffrey St., Toronto, Canada.
44. McEVOY, J., Mining Engineer and Geologist, Toronto, Canada.
712. McEVOY, MRS.
456. MOREL, JEAN., Ingenieur civil des Mines, Boitsfort pres Bruxelles, Belgium.

365. MCINTOSH, DONALD SUTHERLAND, Prof. of Geology, Dalhousie University, Halifax, Canada.
- 352 MELLOR, DR EDWARD THOMAS, Geological Survey, South Africa.
455. MILLER, BENJAMIN LEROY, Professor of Geology Lehigh University, South Bethlehem, Penn., U.S.A.
373. PECK, FREDERICK B., Lafayette College, Easton, Penn., U.S.A.
PECK, MRS.
307. POWERS, SIDNEY, Inst. of Technology, Boston, U.S.A.
853. SAUGRAIN, DR. G., Géologue publiciste, Paris.
560. SCHOFIELD, S. J., Geological Survey, Ottawa, Canada.
275. SEARLS, F., JR., Goldfields, Nevada, U.S.A.
649. SINGEWALD, J. T., JR., Associate in Economic Geology, Johns Hopkins University, Baltimore, Maryland, U.S.A.
930. SPRUY, C., Arvers, Belgium.
50. STIRLING, J. T., Chief Inspector of Mines for Alberta, Edmonton, Canada.
873. SURZYCKI, T., Petrokow, Pologne-russe, Russia.
602. SUTTON, W. J., Victoria, B.C.
872. THWAITES, F. T., Madison, Wisconsin, U.S.A.
756. UBRECHT, DR. P. F., Batavia, Netherlands-India.
57. VALIQUETTE, J. H., Bureau of Mines, Quebec, Canada.
517. VIVIAN, STEPHEN, Inst. M. & M., London, England.
- 119 WALCOTT, DR. C. D., Smithsonian Institution, Washington, D.C., U.S.A.
- 52 WALLACE, DR. R. C., Professor of Geology and Mineralogy, University of Manitoba, Winnipeg, Manitoba, Canada.
838. WALLIS, H. B., London, England.
839. WILBRAHAM, A. G. B., London, England.
- 67 WILSON, DR. A. W. G., Mines Branch, Department of Mines, Ottawa, Canada.
249. WOLFF, PROF. DR. TH. F. WILHELM, Kgl., Landesgeologe, Frohnau b. Berlin, Germany.
243. WEIGAND, DR. B., Deutsche Geolog. Gesellschaft, Elsass, Germany.
562. WILSON, DR. M. E., Geologist, Geological Survey, Ottawa, Canada.
615. WRIGHT, C. W., Ingiurtosu, Sardinia, Italy.
WRIGHT, MRS.
217. ZUBER, DR. R., Professor of Geology, University of Lemberg, Austria.

21 Countries. 90 Members

Austria.	1	Members	Ireland.	1	Members
Belgium.	2	"	Italy.	2	"
Canada.	38	"	Japan.	1	"
Chili.	1	"	Manchuria	1	"
Denmark.	1	"	Netherlands.	1	"
Egypt.	1	"	Newfoundland.	1	"
Finland.	1	"	Russia.	1	"
France.	1	"	South Africa.	1	"
Germany.	6	"	Sweden.	1	"
Great Britain.	11	"	United States.	16	"
India.	1	"			

PROGRAMME.

THURSDAY, AUGUST 14TH.

8.00 P.M. Leave Toronto, *via* Canadian Pacific Railway from Union Station, foot of York St. Members may board train any time after 7.00 p.m. Supper on train.

FRIDAY, AUGUST 14TH.

En route. A portion of the Lake Superior shore will be passed during daylight.

SATURDAY, AUGUST 16TH.

11.30 A.M. Arrive Winnipeg. Day coach train leaves C.P.R. Station at 2.30 p.m. for Stoney Mountain and Stonewall. Fossiliferous Ordovician at former, and Silurian (Niagara) at latter point. Dinner on special train.
9.00 P.M. Leave Winnipeg.

SUNDAY, AUGUST 17TH.

7.00 P.M. Arrive Medicine Hat. Gas wells.
10.30 P.M. Leave Medicine Hat.

MONDAY, AUGUST 18TH.

8.55 A.M. Arrive Hillcrest. The day will be spent examining Hillcrest, Coleman and McGillivray coal mines. The monoclinial structure of the Rockies, and the Frank landslide.
11.00 A.M. Leave Hillcrest.
11.15 A.M. Arrive Frank.
11.55 A.M. Leave Frank.
12.05 P.M. Arrive Blairmore.
2.00 P.M. Leave Blairmore.
2.20 P.M. Arrive Coleman.

TUESDAY, AUGUST 19TH.

5.00 A.M. Leave Coleman. The coal mine at Corbin and those of the Crows Nest Pass, near Fernie, will be examined.
8.00 A.M. Arrive Corbin.
11.30 A.M. Leave Corbin.
2.10 P.M. Arrive Fernie. From Fernie, the party will be conveyed to Coal Creek.

WEDNESDAY, AUGUST 20TH.

5.30 A.M. Leave Fernie. The route crosses the Western ranges of the Rockies and the whole of the Purcell Range. Boat trip on Kootenay lake.
6.10 A.M. Arrive Elko. The Elk river canon.

WEDNESDAY, AUGUST 20TH—*Continued.*

- 7.10 A.M. Leave Elko.
 - 8.05 A.M. Arrive Wardner. View up the valley of the Kootenay river.
 - 8.15 A.M. Leave Wardner.
 - 9.45 A.M. Arrive Wattsburg.
 - 10.00 A.M. Leave Wattsburg.
 - 12.00 Noon. Arrive Kitchener.
 - 1.30 P.M. Leave Kitchener.
 - 2.45 P.M. Arrive Kootenay Landing M.T.
 - 3.50 P.M. Leave Kootenay Landing P.T., C.P.R. steamer.
 - 8.00 P.M. Arrive Nelson.
- The special train will be barged to Nelson. Members will be notified later when they may occupy it at Nelson.

THURSDAY, AUGUST 21ST.

- 4.00 A.M. Leave Nelson.
- The low grade copper deposits at Phoenix and the associated formations will be examined. The Granby Consolidated smelter at Grand Forks and the British Columbia Copper Co.'s smelter at Greenwood will also be visited. It is recommended that members rise early, 5.00 a.m., to view the scenery along Lower Arrow lake between Robson and the Tunnel.
- 8.45 A.M. Arrive Grand Forks.
 - 10.45 A.M. Leave Grand Forks.
 - 1.30 P.M. Arrive Phoenix.
 - 5.00 A.M. Leave Phoenix. Walk to Greenwood.
 - 9.00 A.M. Leave Greenwood.

FRIDAY, AUGUST 22ND.

- 3.30 A.M. Arrive Castlegar.
- 7.00 A.M. Leave Castlegar on day coach train. Special train is sent on to Arrowhead. The Trail smelter will be visited in the morning and the gold and copper deposits at Rossland and the associated formations will be examined in the afternoon.
- 9.45 P.M. Leave Rossland.
- 11.45 P.M. Arrive Robson for Arrowhead.
- 12.00 Midnight. Leave Robson for Arrowhead. The day's route to Revelstoke traverses the Columbia trench dividing the Selkirk and Columbia Mountains systems.

SATURDAY, AUGUST 23RD.

- 2.35 P.M. Leave Arrowhead on special train.
- 10.30 P.M. Arrive Kamloops.

SUNDAY, AUGUST 24TH.

- 2.00 P.M. Train leaves Kamloops. Members join train at Savona at 3.30 p.m.
 - 4.00 P.M. Leave Savona.
- Tertiary section of conformable lavas and pyroclastics along the north shore of Kamloops lake. Fish and plant remains in the Tranquille beds.

MONDAY, AUGUST 25TH.

- 1.30 A.M. Arrive Vancouver.
- 10.00 A.M. Leave Vancouver by boat.
- 2.30 P.M. Arrive Victoria. Geological excursions in vicinity of the city.

TUESDAY, AUGUST 26TH.—Victoria Day.

- 11.45 P.M. Leave Victoria by boat.

WEDNESDAY, AUGUST 27TH.

- 7.00 A.M. Arrive Vancouver. Breakfast on board boat. Visit Stanley Park.
- 12.00 Noon. Leave Vancouver on special train.

THURSDAY, AUGUST 28TH.

- En route eastbound. Arrive Glacier about 7.00 a.m.
- 2.30 P.M. Arrive Laggan. Visit Lake Louise.
- 5.00 P.M. Leave Laggan.
- 6.00 P.M. Arrive Banff.
- 8.30 P.M. Leave Banff.

FRIDAY, AUGUST 29TH.

- 7.30 A.M. Arrive Edmonton. Leave Canadian Pacific special train. Examination of coal measures and mines in vicinity of Edmonton.
- 7.00 P.M. Leave Edmonton, westbound, on the Grand Trunk Pacific special train for Tete Jaune Pass.

The following times are approximate.

SATURDAY, AUGUST 30TH.

- A day's traverse through the ranges of the Rockies.
- 7.30 A.M. Arrive Pocahontas. Jasper Park Collieries.
- 10.30 A.M. Leave Pocahontas.
- 3.30 P.M. Arrive Mt. Robson Station.
- 3.45 P.M. Arrive Swiftwater.
- 5.00 P.M. Arrive Tête Jaune. The present western terminus of the Grand Trunk Pacific Railway.

SUNDAY, AUGUST 31ST.

- Leave Tête Jaune.
- Arrive Swiftwater. On a clear day, an excellent view of Mt. Robson may be had from this point.

MONDAY, SEPTEMBER 1ST.

- The coal deposits at Tofield and Hawkins will be briefly examined. The bison (buffalo) park will be visited at Wainwright.
- 11.00 A.M. Arrive Tofield.
- 1.00 P.M. Leave Tofield.
- 3.30 P.M. Arrive Hawkins.

MONDAY, SEPTEMBER 1ST—*Continued.*

4.00 P.M. Leave Hawkins.
5.20 P.M. Arrive Wainwright.
7.00 P.M. Leave Wainwright.

TUESDAY, SEPTEMBER 2ND.

3.00 A.M. Arrive Saskatoon. A short trip will be made to some typical western wheat fields.
12.00 Noon. Leave Saskatoon.

WEDNESDAY, SEPTEMBER 3RD.

8.00 A.M. Arrive Superior Junction. From this point to Cochrane, the route is over the National Transcontinental Railway.
8.10 P.M. Leave Superior Junction.

THURSDAY, SEPTEMBER 4TH.

En route to Cochrane.

FRIDAY, SEPTEMBER 5TH.

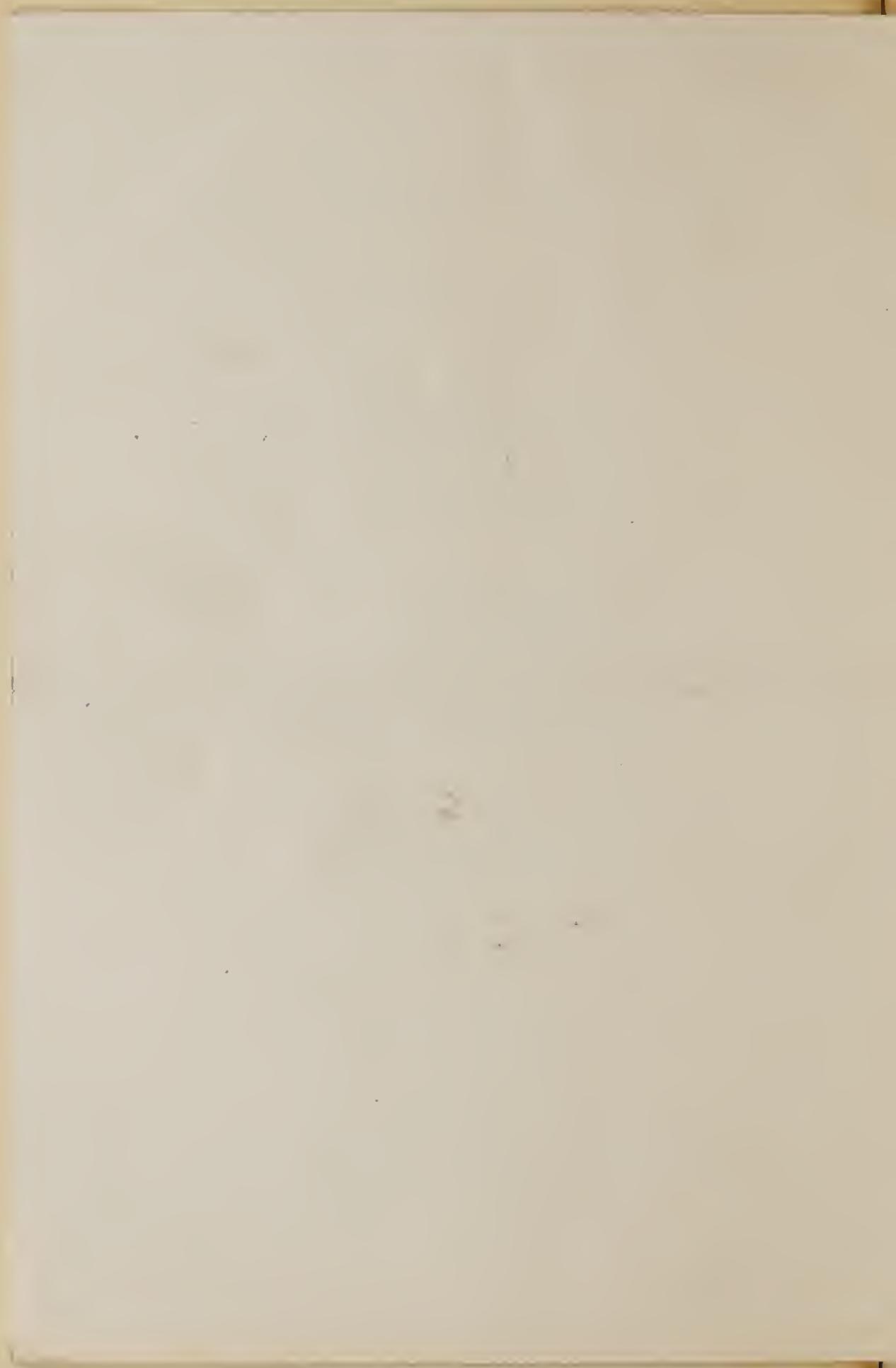
Arrive at Cochrane in the early morning and proceed to the Porcupine gold fields spending the day there.
11.00 P.M. Leave Porcupine.

SATURDAY, SEPTEMBER 6TH.

7.00 A.M. Arrive Cobalt. The day will be spent in examining the geology and ore deposits and in visiting the concentrating mills.
8.00 P.M. Leave Cobalt.

SUNDAY, SEPTEMBER 7TH.

9.00 A.M. Arrive Union Station, Toronto, on Grand Trunk Railway



**INTERNATIONAL GEOLOGICAL CONGRESS,
TWELFTH SESSION, CANADA, 1913.**

Executive Office, Victoria Memorial Museum, Ottawa.

List of Members and Programme.

EXCURSION C-2.

**Transcontinental—Via Canadian Pacific Railway, Grand Trunk
Pacific Railway and National Transcontinental Railway**

LEADER.

R. W. Brock.

SECRETARY.

H. E. T. Haultain.

ASSOCIATE LEADER.

J. McEvoy.

ASSISTANT SECRETARY.

H. Frechette.

MEMBERS.

13. ALLAN, J. A., DR., Professor of Geology, University of Alberta, Canada.
521. ANDERSON, E. M., Geological Survey, Edinburgh, Scotland.
409. ASHWORTH, JOHN, M.E., Manchester, England.
186. BAKER, SIR AUGUSTINE, Dublin, Ireland.
198. BOEKE, H. E., DR., Professeur Mineralogisches Institut, Halle a.S., Germany.
218. BOGGILD, DR. O. B., Professeur Mineralogical Museum, Copenhagen, Denmark.
693. BORGSTROM, DR. L. H., Universite Helsingfors, Finland, Russia.
258. BROOKS, A. H., Geological Survey, Washington, D.C., U.S.A.
2. BROCK, R. W., Director Geological Survey, Ottawa Canada.
17. BURROWS, A. G. Ontario Bureau of Mines, Toronto, Canada.
19. CAMSELL, C., Geological Survey, Ottawa, Canada.
420. CARTWRIGHT, COSMO T., Mines Branch, Department of Mines, Ottawa, Canada.
535. CHARBONNIER, J., Manager, West Canadian Collieries Ltd., Blairmore, Alberta, Canada.
556. COLLINS, DR. W. H., Geological Survey, Ottawa, Canada.
555. CLAPP, DR. C. H., Geological Survey, Ottawa, Canada.
361. DAHLBLOM, LORENT EDWARD THEODOR, Bergmästare in Gefle-Dala District, Falun, Sweden.
5. DENIS, T. C., Superintendent of Mines for the Province of Quebec, Canada.
414. DICK, WILLIAM J., Commission of Conservation, Ottawa, Canada.
22. DOWLING, D. B., Geological Survey, Ottawa, Canada.

557. DRYSDALE, DR. C. W., Geological Survey, Ottawa, Canada.
575. DUPAIGNE, REVEREND PIERRE, Licencie-es-Sciences, Professeur des Sciences Physique et naturelles au Seminaire de Philosophie, Montreal, Canada.
370. DUNN, GEORGE, Loudon, Annaahill, Kilmarnock, Scotland.
63. FERNOW, DR. B. E., Dean of Faculty of Forestry, University of Toronto, Toronto, Canada.
- FERNOW, MRS.
66. FINNIE, O. S., Department of the Interior, Ottawa, Canada.
71. FRECHETTE, H., Mines Branch, Department of Mines, Ottawa, Canada.
74. HAULTAIN, H. E. T., Prof. of Mining Engineering, University of Toronto, Toronto, Canada.
- HAULTAIN, MRS.
394. GARDNER, SAMUEL McLARE, Mount Vernon Colliery Co., Ltd., Glasgow, Scotland.
78. GWILLIM, PROF. J. C., School of Mining, Kingston, Canada.
625. GÜRICH, PROF. DR. B., Hamburg, Germany.
72. HAANEL, B. E., Department of Mines, Ottawa, Canada.
204. HOBSON, BERNARD, F.G.S., Sheffield, England.
348. HOPKINS, DR. THOS. CRAMER, Maitre de Conferences a l'Universite, Uppsala, Sweden.
154. HORE, R. E., Michigan College of Mines, Houghton, Michigan, U.S.A.
270. VAN HORNE, DR. F. R., Case School of Applied Science, Cleveland, Ohio, U.S.A.
554. HOWLEY, DR. J. P., Director, Geological Survey of Newfoundland, St. John's, Newfoundland.
395. HURLL, MARK, Glasgow, Scotland.
396. HURLL, JOHN McGLASHAN REDHOLM, M.E., Glasgow, Scotland.
924. INOUE, M., Director Geological Survey of Japan, Tokio, Japan.
460. IVES, HENRY GOODSON, Andover, New Hampshire, U.S.A.
461. IVES, J. T. B., F. G. S., Andover, New Hampshire, U.S.A.
416. JARVIS, GERALD, Amprior, Ontario, Canada.
251. KIDO, CHUTARO, Superintendent of the Geological Institute of the South Manchuria Railway Company, Dairen, Kantoshu, Manchuria.
623. KENNEDY, G., Toronto, Canada.
38. KNIGHT, C. W., Assistant Provincial Geologist, Ontario Bureau of Mines, Toronto, Canada.
238. KUKUK, PAUL, Bergassessor a. D., Bochum i.W. Germany.
469. DE LAMOTHE, LEON JEAN BENJAMIN., General de Divison, Inspecteur de Etudes techniques de l'Artilerie, 1 Place St. Thomas d'Aquin, Paris, France.
- ~ 406. LUTTMAN-JOHNSON, H. M., F.R.G.S., Petworth, Sussex, England.
41. LEACH, W. W., Geological Survey, Ottawa, Canada.
904. LEBLING, C.
6. LEROY, O. E., Geological Survey, Ottawa, Canada.
7. LINDSEY, G. G. S., Toronto, Canada.
645. MACLEAN, A., Toronto University, Toronto, Canada.
- ✓ 498. MAIER, E., Professeur titulaire en géologie Université de Santiago, Santiago, Chili.
- ✓ 332. MARTIUS, DR. SIEGFRIED G., Assistant am mineralogischpetgraphischen Institut der Universität Bonn, Bonn a Rh., Germany.
58. McMILLAN, J. G., 225 Geoffrey St., Toronto, Canada.
44. McEVOY, J., Mining Engineer and Géologist, Toronto, Canada.
712. McEVOY, MRS.
456. MOREL, JEAN., Ingenieur civil des Mines, Boitsfort pres Bruxelles, Belgium.

365. MCINTOSH, DONALD SUTHERLAND, Prof. of Geology, Dalhousie University, Halifax, Canada.
- 352 MELLOR, DR EDWARD THOMAS, Geological Survey, South Africa.
455. MILLER, BENJAMIN LEROY, Professor of Geology Lehigh University, South Bethlehem, Penn., U.S.A.
373. PECK, FREDERICK B., Lafayette College, Easton, Penn., U.S.A.
PECK, MRS.
307. POWERS, SIDNEY, Inst. of Technology, Boston, U.S.A.
853. SAUGRAIN, DR. G., Géologue publiciste, Paris.
560. SCHOFIELD, S. J., Geological Survey, Ottawa, Canada.
275. SEARLS, F., JR., Goldfields, Nevada, U.S.A.
649. SINGEWALD, J. T., JR., Associate in Economic Geology, Johns Hopkins University, Baltimore, Maryland, U.S.A.
930. SPRUY, C., Anvers, Belgium.
50. STIRLING, J. T., Chief Inspector of Mines for Alberta, Edmonton, Canada.
873. SURZYCKI, T., Petrokow, Pologne-russe, Russia.
602. SUTTON, W. J., Victoria, B.C.
872. THWAITES, F. T., Madison, Wisconsin, U.S.A.
756. UBRECHT, DR. P. F., Batavia, Netherlands-India.
57. VALIQUETTE, J. H., Bureau of Mines, Quebec, Canada.
517. VIVIAN, STEPHEN, Inst. M. & M., London, England.
- 119 WALCOTT, DR. C. D., Smithsonian Institution, Washington, D.C., U.S.A.
- 52 WALLACE, DR. R. C., Professor of Geology and Mineralogy, University of Manitoba, Winnipeg, Manitoba, Canada.
838. WALLIS, H. B., London, England.
839. WILBRAHAM, A. G. B., London, England.
- 67 WILSON, DR. A. W. G., Mines Branch, Department of Mines, Ottawa, Canada.
249. WOLFF, PROF. DR. TH. F. WILHELM, Kgl., Landesgeologe, Frohau b. Berlin, Germany.
243. WEIGAND, DR. B., Deutsche Geolog. Gesellschaft, Elsass, Germany.
562. WILSON, DR. M. E., Geologist, Geological Survey, Ottawa, Canada.
615. WRIGHT, C. W., Ingurtosu, Sardinia, Italy.
WRIGHT, MRS.
217. ZUBER, DR. R., Professor of Geology, University of Lemberg, Austria.

21 Countries..... 90 Members

Austria.....	1	Members	Ireland.....	1	Members
Belgium.....	2	"	Italy.....	2	"
Canada.....	38	"	Japan.....	1	"
Chili.....	1	"	Manchuria.....	1	"
Denmark.....	1	"	Netherlands.....	1	"
Egypt.....	1	"	Newfoundland.....	1	"
Finland.....	1	"	Russia.....	1	"
France.....	1	"	South Africa.....	1	"
Germany.....	6	"	Sweden.....	1	"
Great Britain.....	11	"	United States.....	16	"
India.....	1	"			

PROGRAMME.

THURSDAY, AUGUST 14TH.

8.00 P.M. Leave Toronto, *via* Canadian Pacific Railway from Union Station, foot of York St. Members may board train any time after 7.00 p.m. Supper on train.

FRIDAY, AUGUST 14TH.

En route. A portion of the Lake Superior shore will be passed during daylight.

SATURDAY, AUGUST 16TH.

11.30 A.M. Arrive Winnipeg. Day coach train leaves C.P.R. Station at 2.30 p.m. for Stoney Mountain and Stonewall. Fossiliferous Ordovician at former, and Silurian (Niagara) at latter point. Dinner on special train.

9.00 P.M. Leave Winnipeg.

SUNDAY, AUGUST 17TH.

7.00 P.M. Arrive Medicine Hat. Gas wells.

10.30 P.M. Leave Medicine Hat.

MONDAY, AUGUST 18TH.

8.55 A.M. Arrive Hillcrest. The day will be spent examining Hillcrest, Coleman and McGillivray coal mines. The monoclinical structure of the Rockies, and the Frank landslide.

11.00 A.M. Leave Hillcrest.

11.15 A.M. Arrive Frank.

11.55 A.M. Leave Frank.

12.05 P.M. Arrive Blairmore.

2.00 P.M. Leave Blairmore.

2.20 P.M. Arrive Coleman.

TUESDAY, AUGUST 19TH.

5.00 A.M. Leave Coleman. The coal mine at Corbin and those of the Crows Nest Pass, near Fernie, will be examined.

8.00 A.M. Arrive Corbin.

11.30 A.M. Leave Corbin.

2.10 P.M. Arrive Fernie. From Fernie, the party will be conveyed to Coal Creek.

WEDNESDAY, AUGUST 20TH.

5.30 A.M. Leave Fernie. The route crosses the Western ranges of the Rockies and the whole of the Purcell Range. Boat trip on Kootenay lake.

6.10 A.M. Arrive Elko. The Elk river canon.

WEDNESDAY, AUGUST 20TH—Continued.

- 7.10 A.M. Leave Elko.
- 8.05 A.M. Arrive Wardner. View up the valley of the Kootenay river.
- 8.15 A.M. Leave Wardner.
- 9.45 A.M. Arrive Wattsburg.
- 10.00 A.M. Leave Wattsburg.
- 12.00 Noon. Arrive Kitchener.
- 1.30 P.M. Leave Kitchener.
- 2.45 P.M. Arrive Kootenay Landing M.T.
- 3.50 P.M. Leave Kootenay Landing P.T., C.P.R. steamer.
- 8.00 P.M. Arrive Nelson.
The special train will be barged to Nelson. Members will be notified later when they may occupy it at Nelson.

THURSDAY, AUGUST 21ST.

- 4.00 A.M. Leave Nelson.
The low grade copper deposits at Phoenix and the associated formations will be examined. The Granby Consolidated smelter at Grand Forks and the British Columbia Copper Co.'s smelter at Greenwood will also be visited. It is recommended that members rise early, 5.00 a.m., to view the scenery along Lower Arrow lake between Robson and the Tunnel.
- 8.45 A.M. Arrive Grand Forks.
- 10.45 A.M. Leave Grand Forks.
- 1.30 P.M. Arrive Phoenix.
- 5.00 A.M. Leave Phoenix. Walk to Greenwood.
- 9.00 A.M. Leave Greenwood.

FRIDAY, AUGUST 22ND.

- 3.30 A.M. Arrive Castlegar.
- 7.00 A.M. Leave Castlegar on day coach train. Special train is sent on to Arrowhead. The Trail smelter will be visited in the morning and the gold and copper deposits at Rossland and the associated formations will be examined in the afternoon.
- 9.45 P.M. Leave Rossland.
- 11.45 P.M. Arrive Robson for Arrowhead.
- 12.00 Midnight. Leave Robson for Arrowhead. The day's route to Revelstoke traverses the Columbia trench dividing the Selkirk and Columbia Mountains systems.

SATURDAY, AUGUST 23RD.

- 2.35 P.M. Leave Arrowhead on special train.
- 10.30 P.M. Arrive Kamloops.

SUNDAY, AUGUST 24TH.

- 2.00 P.M. Train leaves Kamloops. Members join train at Savona at 3.30 p.m.
- 4.00 P.M. Leave Savona.
Tertiary section of conformable lavas and pyroclastics along the north shore of Kamloops lake. Fish and plant remains in the Tranquille beds.

MONDAY, AUGUST 25TH.

- 1.30 A.M. Arrive Vancouver.
- 10.00 A.M. Leave Vancouver by boat.
- 2.30 P.M. Arrive Victoria. Geological excursions in vicinity of the city.

TUESDAY, AUGUST 26TH.—Victoria Day.

- 11.45 P.M. Leave Victoria by boat.

WEDNESDAY, AUGUST 27TH.

- 7.00 A.M. Arrive Vancouver. Breakfast on board boat. Visit Stanley Park.
- 12.00 Noon. Leave Vancouver on special train.

THURSDAY, AUGUST 28TH.

- En route eastbound. Arrive Glacier about 7.00 a.m.
- 2.30 P.M. Arrive Laggan. Visit Lake Louise.
- 5.00 P.M. Leave Laggan.
- 6.00 P.M. Arrive Banff.
- 8.30 P.M. Leave Banff.

FRIDAY, AUGUST 29TH.

- 7.30 A.M. Arrive Edmonton. Leave Canadian Pacific special train. Examination of coal measures and mines in vicinity of Edmonton.
- 7.00 P.M. Leave Edmonton, westbound, on the Grand Trunk Pacific special train for Tete Jaune Pass.

The following times are approximate.

SATURDAY, AUGUST 30TH.

- A day's traverse through the ranges of the Rockies.
- 7.30 A.M. Arrive Pocahontas. Jasper Park Collieries.
- 10.30 A.M. Leave Pocahontas.
- 3.30 P.M. Arrive Mt. Robson Station.
- 3.45 P.M. Arrive Swiftwater.
- 5.00 P.M. Arrive Tête Jaune. The present western terminus of the Grand Trunk Pacific Railway.

SUNDAY, AUGUST 31ST.

- Leave Tête Jaune.
- Arrive Swiftwater. On a clear day, an excellent view of Mt. Robson may be had from this point.

MONDAY, SEPTEMBER 1ST.

- The coal deposits at Tofield and Hawkins will be briefly examined. The bison (buffalo) park will be visited at Wainwright.
- 11.00 A.M. Arrive Tofield.
- 1.00 P.M. Leave Tofield.
- 3.30 P.M. Arrive Hawkins.

MONDAY, SEPTEMBER 1ST—*Continued.*

- 4.00 P.M. Leave Hawkins.
- 5.20 P.M. Arrive Wainwright.
- 7.00 P.M. Leave Wainwright.

TUESDAY, SEPTEMBER 2ND.

- 3.00 A.M. Arrive Saskatoon. A short trip will be made to some typical western wheat fields.
- 12.00 Noon. Leave Saskatoon.

WEDNESDAY, SEPTEMBER 3RD.

- 8.00 A.M. Arrive Superior Junction. From this point to Cochrane, the route is over the National Transcontinental Railway.
- 8.10 P.M. Leave Superior Junction.

THURSDAY, SEPTEMBER 4TH.

En route to Cochrane.

FRIDAY, SEPTEMBER 5TH.

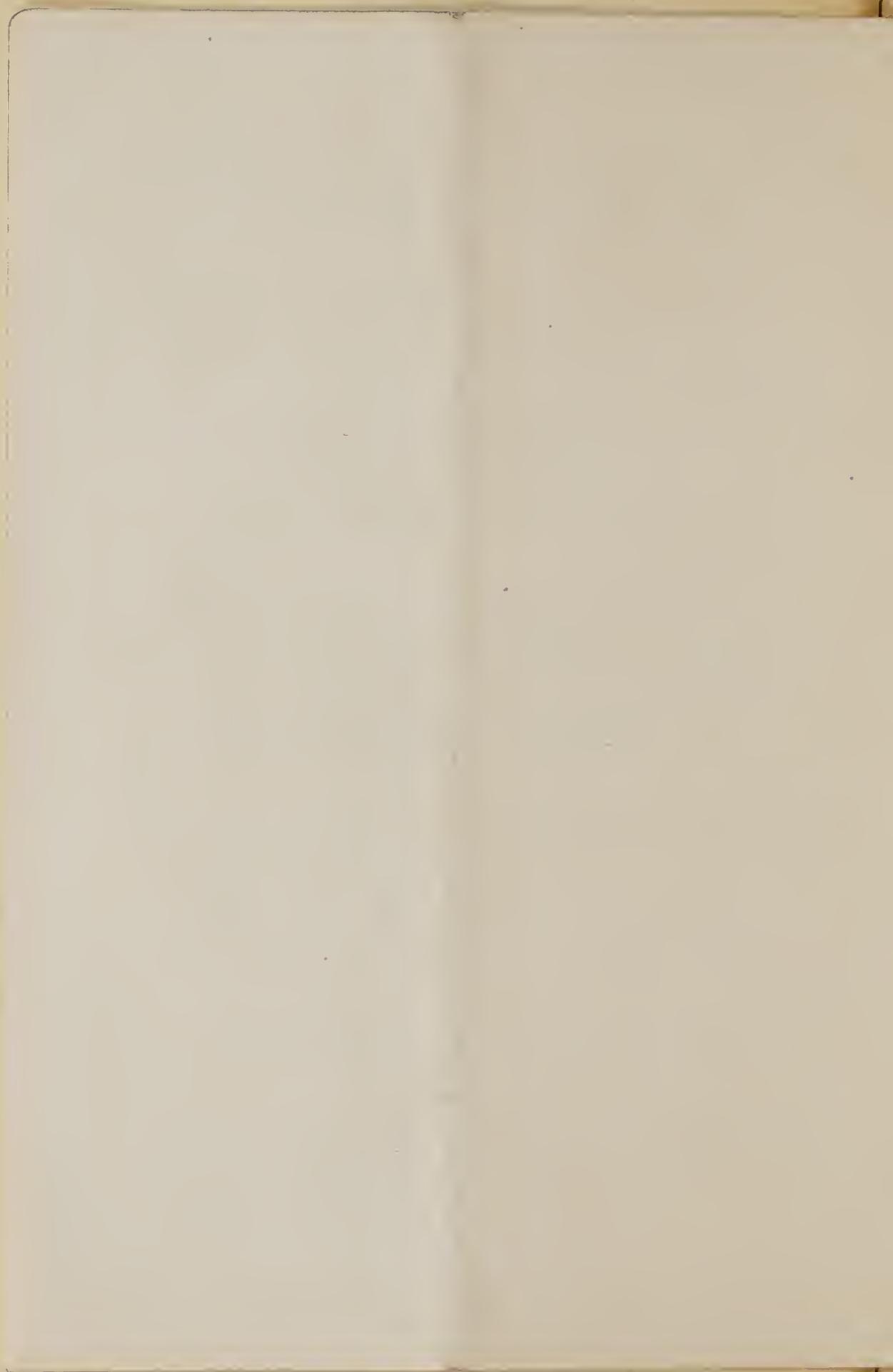
- Arrive at Cochrane in the early morning and proceed to the Porcupine gold fields spending the day there.
- 11.00 P.M. Leave Porcupine.

SATURDAY, SEPTEMBER 6TH.

- 7.00 A.M. Arrive Cobalt. The day will be spent in examining the geology and ore deposits and in visiting the concentrating mills.
- 8.00 P.M. Leave Cobalt.

SUNDAY, SEPTEMBER 7TH.

- 9.00 A.M. Arrive Union Station, Toronto, on Grand Trunk Railway



INTERNATIONAL GEOLOGICAL CONGRESS.

TWELFTH SESSION, CANADA, 1913.

Executive Office, Victoria Memorial Museum, Ottawa.

PROGRAMME OF EXCURSION A3.

Sudbury, Cobalt and Porcupine.

LEADER.

Willet G Miller.

ASSOCIATE LEADERS.

Sudbury—A. P. Coleman and T. L. Walker.

Cobalt—Cyril W. Knight and A. A. Cole.

Porcupine—A. G. Burrows and Percy E. Hopkins.

SECRETARY.

W. R. Rogers.

ASSISTANT SECRETARY.

Percy E. Hopkins.

LIST OF MEMBERS.

105. BARRELL, J., Professor of Geology, Yale University, New Haven, Conn., U.S.A.
170. BAIN, H. F., Editor Mining and Scientific Press, San Francisco, Cal., U.S.A.
167. BEYER, S. W., Iowa State College, Ames, Iowa, U.S.A.
17. BURROWS, A. G., Geologist, Bureau of Mines, Toronto, Ontario.
351. CAILLEBOTTE, JEAN, École Nationale Supérieure des Mines, Paris, France.
310. CERULLI-IRELLI, Serafino, Maître de conférences de Paléontologie, à l'Université de Rome, Italy.
411. CHARLETON, A. G., Past-President, Institution of Mining and Metallurgy, London, England.
— CHARLETON, MRS.
187. COLE, G. A. J., Director of the Geological Survey of Ireland, Dublin, Ireland.
20. COLE, A. A., Mining Engineer to the Temiskaming and Northern Ontario Ry., Cobalt, Ontario.
4. COLEMAN, A. P., Professor of Geology, University of Toronto, Toronto, Ontario.
670. CORKILL, E. T., Safety Engineer, Copper Cliff, Ontario.
556. COLLINS, W. H., Geologist, Geological Survey of Canada, Ottawa, Ontario.
239. DRESSER, J. A., Manager Lands Department, the Algoma Central and Hudson Bay Railway Company, Sault Ste. Marie, Ontario
155. ECKFELDT, H., Professor of Mining Engineering, Lehigh University, South Bethlehem, Pa., U.S.A.
— ECKFELDT, MRS.
303. EMMONS, W. H., Professor of Geology, University of Minnesota, Minneapolis, U.S.A.

380. EUBANK, MISS ANNIE, Toronto, Ontario.
735. FOREST, F. H., Professeur de Géologie, Collège Bourget, Rigaud, Quebec.
699. GODFROY, CONSTANT, Ingénieur des Mines, La Haye, Netherlands.
335. GRABHAM, GEORGE WALTER, Government Geologist, Khartoum, Anglo-Egyptian Sudan.
100. HOPKINS, P. E., Geologist, Bureau of Mines, Toronto, Ontario
154. HORE, R. E., Editor Canadian Mining Journal, Toronto, Ontario.
296. KEMP, J. F., Professor of Geology, Columbia University, New York City, U.S.A.
58. KNIGHT, C. W., Assistant Provincial Geologist, Bureau of Mines, Toronto, Ontario.
145. KIRKPATRICK, S. F., Professor of Metallurgy, School of Mining, Kingston, Ontario.
163. KITSON, A. E., Imperial Institute, London, England.
102. LANE, A. C., Professor of Geology, Tufts College, Boston, Mass., U.S.A.
182. LANE, MRS. A. C.
630. LINDEMAN, E., Mines Branch, Department of Mines, Ottawa, Ontario.
313. MATTIROLO, E., Ingénieur en chef des Mines, Rue Charles Albert 45, Torino, Italy.
454. McDERMID, CHARLES, Secretary Institution of Mining and Metallurgy, London, England.
230. McNEILL, BEDFORD, President Institution of Mining and Metallurgy, London, England.
229. McNEILL, MRS. BEDFORD.
267. MERCIAI, GUISEPPE, Professeur Instituto Geologico della Regia Universita, Pisa, Italy.
9. MILLER, WILLET G., Provincial Geologist of Ontario, Toronto, Ontario.
533. MORIN, LOUIS JOSEPH, Professeur de Sciences Naturelles, Séminaire de Joliette, Joliette, Quebec.
706. NOISEUX, JOS. ALFRED, Séminaire de Joliette, Joliette, Quebec.
495. ORDONEZ, ÈZEQUIEL, Ingénieur Géologue des Mines, Mexico, D.F., Mexico.
- ORDONEZ, MRS.
504. PFORDTE, OTTO F., Cairo, Greene County, New York, U.S.A.
158. RAISIN, MISS C. A., Bedford College, London, England.
151. RANSOME, F. L., United States Geological Survey, Washington, D.C.
559. REINECKE, L., Geologist, Geological Survey of Canada, Ottawa, Ontario.
69. ROGERS, W. R., Topographer, Bureau of Mines, Toronto, Ontario.
743. SCHULZE, HEINRICH, Ingenieur, Hanover, Germany.
275. SEARLS, FRED, Goldfields, Nevada, U.S.A.
674. SIMPSON, W. E., Fundiconde de Los Arcos, Toluca, Mexico.
449. SJÖGREN, H. S. A., Professor, Academy of Science, Stockholm, Sweden.
59. STANSFIELD, J., McGill University, Montreal, Quebec.
252. SZADECSKY DE SZADECSNE, JULES, Royal Hungarian University, Kolozsvár, Hungary.
11. TYRRELL, J. B., Geologist, Toronto, Ontario.
632. TYRRELL, MRS. J. B.
51. WALKER, T. L., Professor of Mineralogy, University of Toronto, Toronto, Ontario.
472. WHERRY, EDGAR T., Lehigh University, South Bethlehem, Pa., U.S.A.
67. WILSON, A. W. G., Mines Branch, Department of Mines, Ottawa, Ontario.
562. WILSON, M. E., Geologist, Geological Survey of Canada, Ottawa, Ontario.

Wilbrahan

PROGRAMME OF EXCURSION

(The hours given in this programme are approximate.)

WEDNESDAY, JULY 23RD.

8 P.M. Leave Toronto *via* Canadian Pacific Railway from Union Station, foot of York Street.

THURSDAY, JULY 24TH.

6 A.M. Arrive at Sudbury.

FRIDAY, JULY 25TH.

SATURDAY, JULY 26TH.

} For details of programme for the three days at Sudbury and vicinity see Guide Book No. 7, pages 42 to 48.
} Banquet as guests of the Sudbury Board of Trade, Friday evening.

SUNDAY, JULY 27TH.

1 P.M. Leave Sudbury.

9 P.M. Arrive at Cobalt.

(For description of the route from Sudbury to Cobalt *via* North Bay see Guide Book No. 7, pages 102 to 108.)

MONDAY, JULY 28TH.

Forenoon.—After crossing Cobalt Lake, a walk will be taken up the Little Silver valley along the Kerr Lake branch of the Temiskaming and Northern Ontario Railway (see map, scale 800 feet to 1 inch). A cliff, about 70 feet in height, along the east side of the railway track, exhibits a typical development of the Cobalt series. At the base of the cliff is delicately banded grey-wacké. Above this is impure quartzite, overlying which is conglomerate. The Little Silver vein cuts the face of the cliff almost at right angles.

At two or three points immediately west of the railway track the basal breccia or conglomerate of the Cobalt series rests on the surface of the Keewatin. Part of the Cobalt series can be seen to have originated *in situ*.

The walk will be continued along the railway track, over Keewatin rocks, past the Provincial mine, thence across the Savage to Mount Diabase, where the Nipissing diabase sill can be seen resting on the Cobalt series.

From Mount Diabase the road will be followed, passing between Cart and Peterson lakes, thence over the Nipissing property, where the surface has been cleared by hydraulicking, to Cobalt Lake.

12.30 P.M. Luncheon on the car.

2.00 P.M. The members of the excursion will be formed into three or four groups for visits to mines.

6.30 P.M. Dinner on the car. In the evening there will be an opportunity to visit concentrating and other plants.

TUESDAY, JULY 29TH.

Forenoon.—Visits will be made to mines and plants.

2.00 P.M. Leave Cobalt for Haileybury. Luncheon on the car.

3.00 P.M. Embark on gasoline boats at Haileybury for trip on Lake Temiskaming, along the shores of which various outcrops will be examined.

7.00 P.M. Dinner on the car.

11.00 P.M. Leave for Porcupine.

WEDNESDAY, JULY 30TH.

- 7.00 A.M. Arrive at Porcupine (Dome mine).
- 8.30 A.M. Visit plant of Dome mine.
- 12 NOON. Leave for Timmins, in the vicinity of which mines and plants will be visited and the geological features examined.
- 11.00 P.M. Leave Timmins.

THURSDAY, JULY 31ST.

- 7.00 A.M. Arrive at Temagami.
- 8.30 A.M. Embark on "Belle of Temagami" for Temagami Inn and Bear Island where is to be seen a Hudson's Bay Company's post.
- 1.00 P.M. Luncheon on car.
- 2.30 P.M. Examine outcrops of Cobalt series and Keewatin along railway track north of the station, and the iron formation (jaspilite).
- 4.30 P.M. Leave Temagami.
- 4.45 P.M. Arrive at Doherty where outcrops of the Laurentian and Keewatin are to be seen with overlying Cobalt series.
- 6.45 P.M. Leave Doherty.
- 9.15 P.M. Arrive at North Bay.
- 10.00 P.M. Leave North Bay.

FRIDAY, AUGUST 1ST.

- 7.00 A.M. Arrive at Ottawa.
- Forenoon.*—Log-rolling contest as guests of Senator W. C. Edwards.
- Luncheon.*—At the Experimental Farm by the Department of Agriculture.
- Afternoon.*—Reception by the Geological Survey at the Victoria Memorial Museum.
- 6.30 P.M. Leave Ottawa.
- 10.00 P.M. Arrive at Montreal where a programme for the following day has been arranged by the Local Committee.

SATURDAY, AUGUST 2ND.

Montreal.

Twelfth International Geological Congress

PROGRAMME FOR SATURDAY, AUGUST 9TH,
1913.

SATURDAY, AUGUST 9TH.

- 9.00 a.m. Meeting of Council, Building No. 23,
Room 16.
- 9.30 a.m. Reunion of the Commission du Degré
geothermique, Room 59.
- 10.00 a.m. General Meeting, Building No. 35.
Topic No. 7, "The Physical and
Faunal Characteristics of the Palæo-
zoic seas with reference to the
value of the recurrence of Seas in
establishing geological systems."
1. The shelf-seas of the Palæozoic and
their relations to diastrophism and
geological systems, by T. C. Cham-
berlin, Chicago, U.S.A.
 2. Die paläozoischen Meere in Süd
Amerika, by Gustav Steinmann,
Bonn, Germany.

- 10.00 a.m. 3. The delimitation of the geologic periods, illustrated by the paleogeography of North America, by Charles Schuchert, New Haven, U.S.A.
4. The Palæozoics of the Bagdad railway, by Paul ~~Krausch~~^{Freep}, Berlin, Germany.
5. On the Old Red Sandstone series of Northwestern Spitzbergen, by Olaf Holtedahl, Christiania, Noway.
6. The Ordovician-Silurian boundary, by E. O. Ulrich, Washington, U.S.A.
7. Periodicity of Palæozoic orogenic movements, by T. C. Chamberlin and R. T. Chamberlin, Chicago, U.S.A.

10.45 a.m. Special Sectional Meeting, Building No. 23, Room 8, on Tectonics.

Morgan

1. The problems of tectonic experiments, by W. Paulcke, Karlsruhe, Germany.
2. The relations of seismic disturbances in the Philippines to geologic structure, by M. S. Maso and Warren D. Smith, Manila, P.I.
3. The angle of shear, by Th. Dahlblom, Falun, Sweden.
4. Excavation deformations, by D. McDonald, Panama.
5. (Title to be announced), by E. O. Hovey, New York, U.S.A.
6. Landslides and the sinking of ground above mines, by Ernest Howe, Newport, U.S.A.

2.00 p.m. Reunion of the "Commission de la Carte Géologique d'Europe et du Monde, Building No. 23, Room 57.

2.30 p.m. Meeting of Section 1, Building No. 23, Room 8, Miscellaneous papers—*Memo*
Economic and Chemical.

1. Ergebnisse der geologischen Untersuchungen über die Phosphoritlagerstätten Russlands, by J. Samojloff, Moscow, Russia.
2. The occurrence of petroleum and natural gas in the Mid-continent field, by Chas. N. Gould, Oklahoma City, U.S.A.
3. Natural gas in Transylvania, by Jules de Szadeczky, Kolosvar, Hungary.
4. L'èmeri de Naxos, by S. A. Papavasiliou, Athens, Greece.
5. The geological occurrences of precious stones on the American continent, by Geo. F. Kunz.
6. Über die Plastizität des Steinsalzes und ihre Abhängigkeit von der Temperatur, by L. Milch, Germany.
7. On a new area of nepheline rocks, by P. Quesnel, Upsala, Sweden.
8. Studies on the etched figures of Japanese quartz, by Shimmatsu Ichikawa, Fukui-ken, Japan.
9. A physico-chemical contribution to the study of dolomitization, by R. C. Wallace, Winnipeg, Canada.

- 2.30 p.m. 10. Some notes on rock analysis, by M. F. Connor, Ottawa, Canada.
- 2.30 p.m. Meeting of Section 2, Building No. 23, Room 37, Topic No. 7 continued.
- 4.00 p.m. Garden Party. Mrs. and Mrs. D. A. Dunlap, 93 Highlands Ave., Rosedale.
- 8.30 p.m. Lecture illustrated with motion pictures and lantern slides on Western Canada, along the line of Grand Trunk Pacific Railway (C2 Excursion), by Cy. Warman, Building 23, Room 8.

EXCURSIONS.

- 9.30 a.m. Excursion B5, Moraines north of Toronto. Electric car at 9.30 a.m., Terminal of Metropolitan Railway, Yonge Street, North Toronto.
- 11.50 p.m. Excursion B6, Muskoka. Leaves Union Station by Grand Trunk Railway.

Notice to Members Residing in the University Dormitories.

LUGGAGE OF MEMBERS NOT JOINING EXCURSIONS C1, C2, or C6.

The following provisions have been made regarding transport of luggage of members residing in University dormitories and who are *not* joining excursions C1, C2 or C6:

An agent of Rawlinson, Ltd., will be present in the Congress Office on Wednesday, August 13th, from 1.30 p.m. to 6.30 p.m., and on Thursday, August 14th, from 8.30 a.m. to 6.30 p.m.

The agent will be prepared to receive orders for transferring luggage from University residences to trains, boats, etc. Owner of luggage must give notice to agent at least 2½ hours before time of departure of train or boat. Owner should be present in dormitory to deliver luggage to carter and to receive a receipt for the luggage; or owner may instruct janitor to act for him.

In order to procure luggage at train or boat it is necessary to produce receipt obtained from carter.

At railway station or boat it will be necessary for owner to personally ship and check his luggage.

SHIPMENT OF BOXES CONTAINING MINERAL SPECIMENS, FOSSILS, ETC.

The boxes containing specimens collected on excursions are stored at warehouse of M. Rawlinson, Ltd., 610 Yonge Street.

Owners are requested to go to the warehouse and give instructions regarding the shipment of the boxes. The aid of carpenters may be had at the warehouse.

In no case should owner leave Toronto without giving notice regarding disposal of boxes.

INTERNATIONAL GEOLOGICAL CONGRESS

TWELFTH SESSION, CANADA, 1913.

Wednesday, August 13, 1913

ADDITIONS TO DAY'S PROGRAMME.

- 10.00 a.m.—General meeting, Building No. 35.
Topic No. 4.—President, P. TERMIER.
3. The title of the paper by John Horne is "The Pre-Cambrian sedimentaries between the Moine thrust and the eastern border of the Scottish Highlands"
 7. The relation of late Pre-Cambrian sedimentation to the plain at the bottom of the Palæozoic, by C. K. Leith.
- 10.00 a.m. Section 3, Building 23, Room 11.
Special meeting for the reading of papers not reached on previous days.
1. Le commencement et la fin de la période glaciare, by N. O. Holst.
 2. Ueber erdgeschichtliche Kälteperioden, by W. von Lozinski.
 3. New York State under the Labradorean ice-sheet, by H. L. Fairchild.
 4. Fields of outflow of the North American ice-sheet, by Warren Upham.
 5. The Patrician glacier south of Hudson bay, by J. B. Tyrrell.
- 12.30 p.m. A group photograph will be taken in front of the Main Building, No. 23. Photographs 11" by 14" may be purchased from the photographer in Building No. 23. A much larger photograph will also be for sale.
- 2.30 p.m. General Meeting, Building No. 35.
Topic No. 5.—President A. STRAHAN.
8. Pre-Cambrian correlation from the Lake Superior standpoint, by C. K. Leith.
- Miscellaneous:
9. The geology of Indo-China and Honan by J. Deprat.
To be read by title.
 10. Les roches alcalines de Madagascar comparées a celles des montagnes montérégiennes, by A. Lacroix.
 11. Les ressources minéralogiques de Madagascar, by A. Lacroix.

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DELEGATIONS AND MEMBERS AS ON
JULY 4th, 1913

International Geological Congress

TWELFTH SESSION, CANADA, 1913

SECRETARY'S OFFICE:
VICTORIA MEMORIAL MUSEUM, OTTAWA, CANADA

The Session

Will be held at the University of Toronto, Toronto
from August 7th to 14th

Patrons.

Honorary President:

Field Marshal, His Royal Highness the Duke of Connaught
Governor-General of the Dominion of Canada, Ottawa, Canada.

Honorary Vice-Presidents:

The Rt. Hon. The Prime Minister of the Dominion of Canada
and Secretary of State for External Affairs, Ottawa, Canada.

The Hon. The Minister of Mines, Ottawa, Canada.

The Hon. The Minister of Railways and Canals, Ottawa, Canada.

The Hon. The Minister of Lands, Forests and Mines of Ontario,
Toronto, Canada.

The Hon. The Minister of Colonization, Mines and Fisheries
of Quebec, Quebec, Canada.

The Hon. The Premier and Minister of Mines of British Columbia
Victoria, Canada.

The Hon. The Commissioner of Works and Mines of Nova
Scotia, Halifax, Canada.

**DELEGATIONS AND MEMBERS AS ON
JULY 4, 1913.**

So many requests have been made for advance lists of delegations and members that this list is being printed now although it will be out of date before it is printed, for the reason that members are joining and delegations are being appointed daily.

At the last Session, which was held in Sweden in 1910, there were 879 members, 625 of whom actually attended the Session. Thirty-six countries were represented and there were 175 delegations, appointed by various governments, universities and societies throughout the world.

On July 4, the numbers of the Twelfth Session are as follows:—

40 countries represented ; 295 delegations ; 714 members.

Argentine.

Delegations.

Government of Argentine: J. KEIDEL, 1138.
 Directorate General of Mines, Geology and Hydrology of the
 Department of Agriculture, Buenos Aires: J. KEIDEL, 1138.
 Museo Nacional de Historia Natural, Buenos Aires: D. A.
 GALLARDO, 1135.
 Universidad Nacional, Buenos Aires: J. KEIDEL, 1138.
 Government of the Argentine Republic: D. A. GALLARDO, 1135.

Members.

H. G. Backlund..... 710	J. Keidel..... 1138	Museo Nacional de
D. A. Gallardo..... 1135	W. Mohring..... 604	Historia Natural,
E. M. Hermitte..... 541		Buenos-Aires..... 117

Australia.

Delegations.

Commonwealth Government of Australia, Melbourne: E. C.
 PLAYFORD, 1616.

Members.

C. F. Heathcote... 318	A. G. Maitland..... 681	E. C. Playford..... 616
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British Guiana.

Delegations.

Government of British Guiana: F. B. HARRISON, 1019.
Science and Agriculture Department, Georgetown: J. B. HARRISON, 1019.

Members.

J. B. Harrison, 1019

British Isles.

Delegations.

Government of Great Britain: G. A. J. COLE, 187.
Geological Survey of Great Britain, London: A. STRAHAN, 159.
Geological Survey of Ireland, Dublin: G. A. J. COLE, 187.
Geological Survey and Museum, Edinburgh: A. STRAHAN, 159.
Board of Education, London: A. STRAHAN, 159.
University of Oxford, Oxford: W. J. SOLLAS, 1125; H. L. BOWMAN, 528.
University, Glasgow: A. E. KITSON, 163.
University College, Dundee: H. MARSHALL, 708.
University, Sheffield: B. HOBSON, 204.
University of Bristol, Bristol: H. S. REYNOLDS, 1056.
University, St. Andrews: T. J. JEHU, 211.
University of Edinburgh, Edinburgh: JOHN HORNE, 527.
University College, Dundee: T. J. JEHU, 211.
University of London, London: HENRY A. MIERS, 366.
Institution of Mining and Metallurgy, London: B. MCNEILL, 229; C. MCDERMID, 454; A. G. CHARLETON, 411; F. W. HARBORD, 1,177; SIR T. H. HOLLAND, 345; J. A. L. HENDERSON, 294; S. VIVIAN, 517.
Manchester Geological and Mining Society, Manchester: SIR T. H. HOLLAND, 345; J. ASHWORTH, 409.
Geological Survey of Great Britain and Museum of Practical Geology, London: A. STRAHAN, 159.
University, Manchester: SIR T. HOLLAND, 345.
Royal Irish Academy, Dublin: J. A. G. COLE, 187.
Natural History Museum, Galway: R. J. ANDERSON, 209.
Palæontological Society, London: A. STRAHAN, 159.
Mining Institute of Scotland, Glasgow: J. HORNE, 527.
The University, Aberdeen: W. A. GIBB, 1,017; JOHN HORNE, 527.
Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne, Newcastle-upon-Tyne: H. LOUIS, 1041.
University, Aberdeen: W. A. GIBB, 1017.

University of Cambridge, Cambridge: A. HARKER, 209.
 University of London, London: T. F. SIBLY, 538.
 University of Durham, Newcastle-upon-Tyne: H. LOUIS, 1041.
 University College, Galway: R. J. ANDERSON, 209.
 Linnean Society, London: H. F. OSBORN, 147; Miss C. A. RAISIN, 158.
 Manchester Literary and Philosophical Society: SIR T. H. HOLLAND, 345.
 Staffordshire and Warwickshire Institution of Mining Engineers, Birmingham: JOHN CADMAN, 423.
 Geological Society of London, London: AUBREY STRAHAN, 159.
 Geological Society of Glasgow, Glasgow: JOHN HORNE, 527.
 Royal Society, London: F. D. ADAMS, 1; A. HARKER, 207.
 Royal Scottish Geographical Society, Edinburgh: J. HORNE, 527.
 Mineralogical Society, S.-Kensington: H. L. BOWMAN, 528.
 Geologist's Association, London: J. W. EVANS, 136.
 Institution of Mining Engineers, London: J. P. PORTER, 47; W. L. GOODWIN, 28; G. H. ASHWIN, 1141.
 North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne: T. W. GIBSON, 1144.
 British Association for the Advancement of Science, London: H. A. MIERS, 366.

Members.

R. J. Anderson.....	209	S. McC. Gardner....	394	R. B. Murray.....	178
E. M. Anderson.....	521	W. A. Gibb.....	1017	Museum of Practical	
F. E. Armstrong....	399	J. W. Gregory.....	525	Geology, London..	607
G. H. Ashwin.....	1141	A. Hague.....	1018	C. McDermid.....	454
J. Ashworth.....	409	F. W. Harbord.....	1177	P. McIntyre.....	292
A. Augustine.....	186	A. Harker.....	207	B. McNeill.....	229
Sir A. F. Baker.....	186	J. A. L. Henderson..	294	Mrs. B. McNeill....	230
J. Barrowman.....	268	Robt. S. Herries... 164		T. C. Nicholas.....	367
F. A. Bather.....	129	Mrs. R. S. Herries.. 165		G. M. Part.....	364
L. L. Belinfante....	125	B. Hobson.....	204	B. N. Peach.....	1051
W. H. Bell.....	210	Sir T. H. Holland... 345		Sir A. McRobert....	169
R. G. Carruthers... 545		J. Horne.....	527	Lady R. W. McRobert	168
H. L. Bowman.....	528	M. Hurl.....	395	Miss C. A. Raisin... 158	
H. M. Cadell.....	208	J. McG. Hurl.....	396	F. R. C. Reed.....	667
J. Cadman.....	423	Iron and Steel Insti-		S. H. Reynolds.....	1056
A. G. Charleton.... 411		tute, London..... 216		W. Schofield.....	553
C. T. Clough.....	140	T. J. Jchu.....	211	T. E. Sibly.....	538
G. A. J. Cole.....	187	Miss M. S. Johnston. 112		W. J. Sollas.....	1125
R. E. Commons.....	205	G. L. Kerr.....	639	J. S. Pryor.....	609
Miss K. M. Crosse... 111		A. E. Kitson.....	163	A. Strahan.....	159
W. H. Davis.....	355	D. A. Louis.....	393	J. J. H. Teall.....	1067
C. H. Dinham.....	705	H. Louis.....	1041	C. W. Turlington... 302	
J. Drugman.....	152	A. M. Luttmann-John-		E. W. Turnbridge... 293	
G. L. Dunn.....	370	son.....	406	S. Vivian.....	517
J. W. Evans.....	136	M. Maclaren.....	686	A. H. Whalley.....	600
Wm. G. Fearnside... 173		H. Marshall.....	708	A. H. Williams.....	598
C. W. Fennell.....	150	Sir H. A. Miers.... 366		J. M. Wordie.....	137

Bulgaria.

Members.

G. Bontchew..... 429 L. Vankow..... 542

British West Indies.

Delegations.

Government of Trinidad: J. CADMAN, 423.

Mines Department, Trinidad: J. CADMAN, 423.

Canada.

Delegations.

Mines Branch of the Department of Mines, Ottawa: EUGENE HAANEL, 31; ALFRED W. G. WILSON, 67; JOHN MCLEISH, 45; HUGH S. DE SCHMID, 70.

Department of Colonization, Mines and Fisheries, Quebec: S. DUFALT, 1126; T. C. DENIS, 5; J. B. VALIQUETTE, 57.

McMaster University, Toronto: W. H. MCNAIRN, 199.

Université Laval, Quebec: Abbé R. GUIMONT, 30.

University of New Brunswick, Fredericton: P. COX, 1127.

Université Laval, Montreal: P. P. CHOQUETTE, 194; A. MAILHIOT, 68.

École Polytechnique, Montreal: A. MAILHIOT, 68.

Dalhousie College, Halifax: A. S. MACKENZIE, 1118; D. S. MCINTOSH, 365.

University of Ottawa, Ottawa: REV. A. LAJEUNESSE, 1031; REV. J. MCGUIRE, 548.

University of Saskatchewan, Saskatoon: G. H. LING, 1145.

University of Manitoba, Winnipeg: R. C. WALLACE, 52.

McGill University, Montreal: F. D. ADAMS, 1; J. A. BANCROFT, 16.

Nova Scotian Institute of Science, Halifax: D. S. MCINTOSH, 365.

Royal Society of Canada, Ottawa: H. M. AMI, 14; H. L. M. LAMBE, 40; J. WHITE, 53.

Queen's University, Kingston: W. T. MAC CLEMENT, 487.

School of Mining, Kingston: W. L. GOODWIN, 28; W. NICOL, 46; M. B. BAKER, 15; J. E. HYDE, 82.

Canadian Mining Institute, Montreal: H. E. HAULTAIN, 74; D. A. DUNLAP, 1190; G. R. MICKLE, 1191; W. G. TRETHERWAY, 1192.

Société de Géographie de Québec, Québec: M. L'ABBE V. A. HUARD, 1186.

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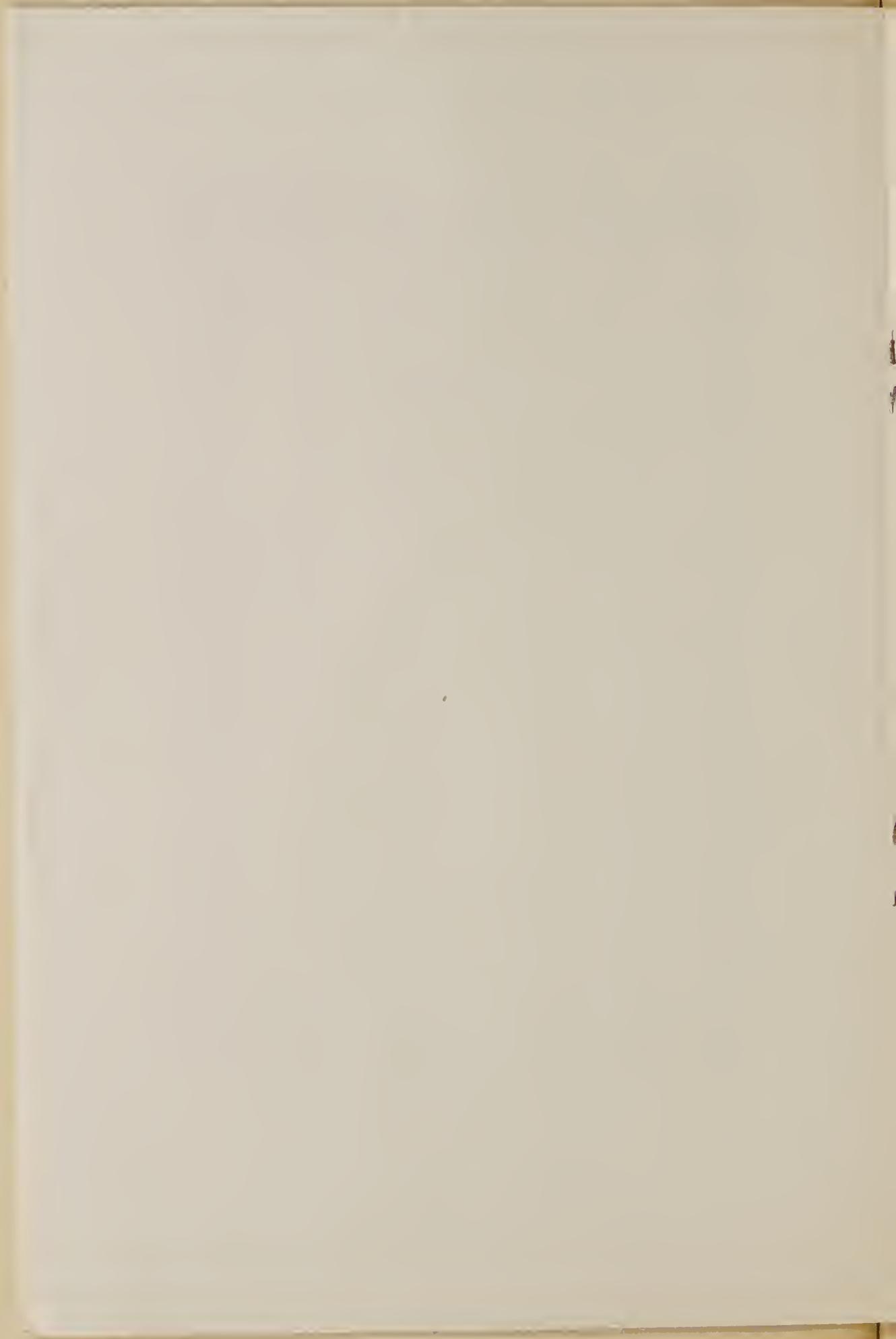
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482. C. MINOT WELD, A.B., S.M., Low Moor, Virginia, U.S.A.
483. CAMILLE RODRIGUES-ELY, Ancien Elève de l'École Polytechnique, 2 Boulevard Henri IV, Paris, France.
484. ANSELMO FERRAZ DE CARVALHO, Professeur de Géologie, Directeur du Musée géologique de l'Université, 22, Rue Lourenço d'Azevedo, Coimbra, Portugal.
485. JOHAN AUGUST UDDEN, Ph.D., 305 West 21st Street, Austin, Texas, U.S.A. Delegate of the Bureau of Economic Geology and Technology of the University of Texas, Austin.
486. ROBERT SPEIGHT, M.A., D.Sc., Canterbury College, Christchurch, New Zealand.
487. W. T. MACCLEMMENT, Professor, M.A., D.Sc., Queen's University, Kingston, Ontario, Canada. Delegate of Queen's University, Kingston.
488. J. CRAIG WATSON, Mechanical Engineer, Canadian Mining and Finance Company, Timmins, Ontario, Canada.
489. J. M. GORDON, B.Sc., M.E., 1025 Transportation Building, Montreal, Canada.

490. SAMUEL ALFRED TAYLOR, Dean of the School of Mines of the University of Pittsburg, 506 Second National Bank Building, Pittsburg, Pennsylvania, U.S.A.
491. ALEXANDER N. WINCHELL, D.Sc., University of Wisconsin, Madison, Wisconsin, U.S.A.
492. ARTHUR LEONARD PARSONS, B.A., Lecturer in Mineralogy, University of Toronto, 22 Kendal Avenue, Toronto, Canada. Delegate of the University of Toronto.
493. SERVICE GÉOLOGIQUE DE BELGIQUE, Palais du Cinquante-naire, Bruxelles, Belgium.
494. PAUL FRÉDÉRIC LUCIEN JOSEPH LAURENT FOURMARIER, Ingénieur des Mines, Ingénieur géologue, Secrétaire général de la Société Géologique de Belgique, Répétiteur de géologie à l'Université de Liège, 140 Avenue de l'Université de Liège, 140 Avenue de l'Observatoire, Liège, Belgium.
495. EZEQUIEL ORDONEZ, Ingénieur Géologue des Mines, 2a General Prim 43, Mexico, D.F., Mexico.
496. GEORGE F. KAY, State Geologist of Iowa, Head of the Department of Geology of the University of Iowa, B.A., M.A., F.G.S.A., Bella Vista Place, Iowa City, Iowa, U.S.A. Delegate of the State University of Iowa, Iowa City, and of the Iowa Geological Survey, Iowa City.
497. JAMES I. SHANNON, S.J., St. Louis University, Grand Avenue and W. Pine Boulevard, St. Louis, Missouri, U.S.A. Delegate of St. Louis University, St. Louis.
498. ERNST MAIER, Dr. Phil., Professeur titulaire en géologie, Université de Santiago, Casella 1559, Santiago, Chili. Delegate of the Government of Chili.
499. ELLIS THOMSON, B.A.Sc., 57 Queens Park, Toronto, Canada.
500. EMMANUEL DE MARGERIE, Ancien Président de la Société géologique de France, 44 rue de Fleurus (VI), Paris, France.
501. MME. DE MARGERIE, 44 rue de Fleurus, Paris, France.
502. MARCUS J. GOLDMAN, E.M., Johns Hopkins University, Baltimore, Maryland, U.S.A.
503. GEORGE MURGOCI, Dr., Professeur à l'École des ponts et chaussées, Rue Transylvania 13, Bucarest, Roumania.
504. OTTO F. PFORDTE, M.E., Cairo, Green County, N.Y., U.S.A.

505. EDWARD O. ULRICH, M.A., D.Sc., 2421 First Street, Washington, D.C., U.S.A. Delegate of the Geological Society of Washington, Washington.
506. PORPHYRY PETROVITSCH PLATNIZKY, Professeur de minéralogie à l'Université, Charkow, Russia.
507. ALEXIS BORRISLAK, Géologue du Comité Géologique de Russie, Wassili Ostrow, 4 Linie, 15, St. Pétersbourg, Russia.
508. GILBERT VAN INGEN, Assistant Professor of Geology, Princeton University, P. O. Box 248, Princeton, New Jersey, U.S.A. Delegate of Princeton University, Princeton.
509. WILLIAM JOHN SINCLAIR, Instructor in Geology, Ph.D., 30 Mercer Street, Princeton, New Jersey, U.S.A.
510. WILLIAM BERRYMAN SCOTT, Professor of Geology, Ph.D., LL.D., Sc.D., 56 Bayard Lane, Princeton, New Jersey, U.S.A. Delegate of the American Philosophical Society of Philadelphia, Philadelphia and of Princeton University, Princeton.
511. ARTHUR KEITH, U. S. Geological Survey, Washington, D. C., U. S. A. Delegate of the Government of the U. S. A.
512. ELMER A. HOLBROOK, S. B., Professor of Mining Engineering, Nova Scotia Technical College, Halifax, Nova Scotia, Canada.
513. PAUL DIENST, Dr. phil., Assistent am geologischen Landesmuseum, Invalidenstrasse 44, Berlin N 4, Germany.
514. KARL ANDRÉE, Dr. phil., Privatdozent für Geologie und Paläontologie an der Universität Marburg, Ritterstrasse 16 (Forsthof), Marburg, Hessen, Germany.
515. JOHANNES WALTER, Dr. phil., Professor der Geologie und Paläontologie, Domstrasse 5, Halle a. S., Germany.
516. ALIDE GRUTTERINK, Dr. phil., Privat-Docte en mikrochimie à l'Université de Leigden, Liekenhuis aan den Coolsingel, Rotterdam, Netherlands.
517. STEPHEN VIVIAN, 151 Cannon Street, London, E. C., England. Delegate of the Institution of Mining and Metallurgy, London.
518. JAMES HOUGH STOLLER, Professor of Geology and Biology, Union College, Schenectady, New York, U.S.A. Delegate of Union College of Union University, Schenectady.

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520. F. L. CLERC, Eates Park, Colorado, U. S. A.
521. ERNEST MASSON ANDERSON, M.A., BSc., H. M. Geological Survey, 43 Ladysmith Road, Edinburgh, Scotland.
522. CHARLES HENRY RICHARDSON, A. B., A. M., Ph. D., Professor of Mineralogy, Syracuse, New York, U. S. A. Delegate of Syracuse University, Syracuse.
523. OLAF ANDERSEN, M. A., Assistant Petrologist, Geophysical Laboratory, Washington, D. C., U. S. A. Delegate of the Norsk Geologisk Forening, Kristiana.
524. WHITMAN CROSS, Ph. D., 2138 Bancroft Place, Washington, D. C., U. S. A. Delegate of the Government of the United States and of the National Academy of Sciences, Washington.
525. JOHN WALTER GREGORY, D. Sc., F. R. S., Professor of Geology, University of Glasgow, Scotland.
526. REAL ACADEMIA DE CIENCIAS Y ARTES, Barcelona, Spain.
527. JOHN HORNE, LL.D., F. R. S., F. G. S., 12 Keith Crescent, Blackhall, Midlothian, Edinburgh, Scotland. Delegate of the Royal Society of Edinburgh, Edinburgh, of the University of Edinburgh, Edinburgh, of the Royal Scottish Geographical Society, Edinburgh and of the Geological Society of Glasgow, Glasgow.
528. HERBERT LISTER BOWMAN, M.A., D.Sc., Professor of Mineralogy in the University of Oxford. Magdalen College, Oxford, England. Delegate of the University of Oxford, Oxford and of the Mineralogical Society, London.
529. HENRY CLAY DEMMING, Colonel, Consulting Geologist Commonwealth of Pennsylvania, Nos 15 and 17 North Third Street, Harrisburg, Pennsylvania, U.S.A.
530. LOUIS M. PRINDLE, Geologist, U. S. Geological Survey, Washington, D. C., U. S. A.
531. ELWOOD S. MOORE, B. A., M. A., Ph.D., Professor of Geology and Mineralogy, School of Mines, State College, Pennsylvania, U. S. A. Delegate of the Pennsylvania State College.
532. HENRIK WAERN, Chemical Engineer, Metallurgist, Copper Cliff, Ontario, Canada.

533. LOUIS JOSEPH MORIN, B. A. Licencié-es-Sciences, Professeur de Sciences Naturelles, Séminaire de Joliette, Joliette, Canada.
534. PERCY W. RACEY, B. Sc., c/o Consolidated Mining and Smelting Company of Canada, Ltd., Rossland, B.C., Canada.
535. JULES CHARBONNIER, Technical Manager of the West Canadian Collieries Ltd., Blairmore, Alberta, Canada.
536. JOSEF OPPENHEIMER, Dr., Technische Hochschule, Brünn, Austria. Delegate of the Deutsche Franz Joseph Technische Hochschule, Brünn.
537. J. W. SPENCER, B. A. Sc., A. M., Ph. D., LL.D., 2019 Hellger Place, Washington, D. C., U. S. A.
538. T. FRANKLIN SIBLY, D. Sc., King's College, London, W.C., England. Delegate of King's College of the University of London, London.
539. NOEL J. OGILVIE, D. L. S., 574 McLaren Street, Ottawa, Canada.
540. O. N. SCOTT, B. Sc., General Assets Limited, Dominion Bond Building, Toronto, Canada.
541. ENRIQUE MARTIN HERMITTE, Ingénieur Civil des Mines, Maipu 1241, Buenos Aires, Argentine.
542. LAZAR VANKOV, Dr., Professeur de Géologie à l'Université de Sofia, Sofia, Bulgaria.
543. CONST. A. KTENAS, Professeur ordinaire de Minéralogie et de Pétrographie à l'Université Nationale, 5 rue Agathone, Athènes, Greece.
544. WILLIAM HERBERT BIXBY, Brigadier General of Corps of Engineers and Chief of Engineers, U. S. Army, 735 Southern Building, Washington, D. C., U. S. A.
545. R. G. CARRUTHERS, Geological Survey of Scotland, 33 George Square, Edinburgh, Scotland.
546. WALTER RENTON INGALLS, 505 Pearl Street, New York City, U. S. A.
547. ALBERT OFFRET, Professeur de Minéralogie à la Faculté des Sciences de l'Université de Lyon, Lyon, France.
548. REVEREND JAS. MCGUIRE, O. M. I., University of Ottawa, Ottawa, Canada. Delegate of the University of Ottawa, Ottawa.
549. ALEXANDER MARSHALL HAY, 1428 Traders Bank Building, Toronto, Canada.

550. ALJA ROBINSON CROOK, Ph. D., Director State Museum, Springfield, Illinois, U. S. A. Delegate of the Illinois State Museum of Natural History, Springfield.
551. MARTIN NORDEGG, Managing Director German Development Co., Limited, 9 Toronto Street, Toronto, Canada.
552. MARIUS R. CAMPBELL, Geologist, U. S. Geological Survey, Washington, D. C., U. S. A. Delegate of the Government of the U. S. A.
553. WALTER SCHOFIELD, B. A., c:o Mrs. Schofield, 3 Amphill Road, Liverpool, England.
554. JAMES P. HOWLEY, Director of the Geological Survey of Newfoundland, F. G. S., St. John's, Newfoundland. Delegate of the Government of Newfoundland, St. Johns.
555. C. H. CLAPP, Geological Survey, Ottawa.
556. W. H. COLLINS, Geological Survey, Ottawa.
557. C. W. DRYSDALE, Geological Survey, Ottawa.
558. R. HARVIE, Geological Survey, Ottawa.
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560. S. J. SCHOFIELD, Geological Survey, Ottawa.
561. M. Y. WILLIAMS, Geological Survey, Ottawa.
562. M. E. WILSON, Geological Survey, Ottawa.
563. W. J. WILSON, Geological Survey, Ottawa. Delegate of the Natural History Society of New Brunswick, St. John.
564. W. H. BOYD, Geological Survey, Ottawa.
565. C. O. SENEAL, Geological Survey, Ottawa.
566. A. DICKISON, Geological Survey, Ottawa.
567. A. H. BROWN, c:o The Hudson Bay Mines Limited, Cobalt, Ontario, Canada.
568. E. GEINITZ, Geheimer Hofrat, Direktor der Grossherzoglich Mecklenburgischen Geologischen Landesanstalt, Rostock i. M., Germany.
569. PAUL BAMBERG, Fabrikbesitzer, Kleine Seestrasse 12, Wannsee bei Berlin, Germany.
570. GEOLOGISCHES INSTITUT DER UNIVERSITAT HEIDELBERG, Heidelberg i. Baden, Germany.
571. LUDWIG MILCH, Dr. phil., Professor der Mineralogie und Petrographie, Schützenstrasse 12, Greifswald, Preussen, Germany. Delegate of the Geographische Gesellschaft Greifswald, Greifswald.

572. JOHANN KOENIGSBERGER, Dr., Professor an der Universität, Hebelstrasse 33, Freiburg i. B., Germany.
573. AUGUST ROTHPLETZ, Dr. phil., Professor an der Universität München, Gieselastrasse 6, München, Germany. Delegate of the Königliche Ludwig-Maximilians-Universität, München and of the Königlich Bayerische Akademie der Wissenschaften, München.
574. LAJOS LÓCZY DE LÓCZ, Dr.-ès-sciences, Ingénieur diplômé, Directeur de l'Institut Géologique du Royaume Hongrois, Stefánia útca 14, Budapest, Hungary. Delegate of the Institut Géologique du Royaume Hongrois, Budapest, of the Académie Hongroise des Sciences, Budapest and of the Société Hongroise de Géographie, Budapest.
575. REVEREND PIERRE DUPAIGNE, Licencié-ès-Sciences, Professeur des Sciences physiques et naturelles au Séminaire de Philosophie, 164 Chemin de la Côte des Neiges, Montréal, Canada.
576. WLADIMIR LOEWINSON-LESSING, Etudiant, Institut Polytechnique Pierre le Grand, St-Pétersbourg, Russia.
577. PAUL STEPANOV, Géologue du Comité Géologique et Ingénieur des Mines, Wassili Ostrow, 4 Lin. 15, St. Pétersbourg, Russia. Delegate of the Government of Russia.
578. CONSTANTIN VISCONTE, Géologue de l'Institut pétrographique Lithogaea, Ordinka 32, Moscou, Russia.
579. NICHOLAS N. BOGOLUBOW, Conservateur du Musée géologique de l'Université Impériale, Musée géologique de l'Université Impériale, Moscou, Russia.
580. ALFRED BERGEAT, Dr., Professor an der Universität, Oberteichufer 12, Königsberg i. Preussen, Germany. Delegate of the Deutsche Mineralogische Gesellschaft, Jena.
581. TORBERN FEGRAEUS, Dr., Géologue en Chef à la Société Nobel Frères, c/o Nobel Frères, Ekarterina Canal No. 6., St. Pétersbourg, Russia.
582. IDA H. OGILVIE, Ph. D., Assistant Professor of Geology, Barnard College, 29 Claremont Avenue, New York City, U. S. A. Delegate of Barnard College of Columbia University, New York.

583. GROSSHERZOGLICH HESSISCHE GEOLOGISCHE LANDE-
ANSTALT, Darmstadt, Hessen, Germany.
584. KÖNIGLICH PREUSSISCHES OBERBERGAMT Breslau,
Breslau, Germany.
585. GUSTAV SELIGMANN, Dr., Kommerzienrat, Neustadt 5
Koblenz a. Rhein, Germany.
586. W. J. WRIGHT, Bear River, Nova Scotia, Canada.
587. S. W. WERNER, Montreal, Canada.
588. A. O. DUFRENSNE, Montreal, Canada.
589. NORMAN L. BOWEN, M. A., Ph.D., Geophysical Labora-
tory, Washington, D. C., U. S. A.
590. LORING N. BAILEY, M. A., Ph. D., LL.D., Geophysical
Laboratory, Washington, D. C., U. S. A.
591. J. J. SEDERHOLM, Ph. D., Directeur de la Commission
géologique de Finlande, Helsingfors, Finlande, Russia.
Delegate of the Geologiska Kommissionen i Finland,
Helsingfors.
592. H. LANTENOIS, Ingénieur en chef de la Circonscription
des Mines de l'Indochine, Hanoi, Indo-Chine.
593. J. DEPRAT, Chef du Service Géologique de l'Indochine,
Hanoi, Indo-Chine.
594. ELISABETH JÉRÉMINE, Docteur-ès-sciences, Assistante de
géologie aux Cours Supérieurs des Femmes, Labo-
ratoire de géologie, Wassili-Ostrow, 10 L. 35, St-
Pétersbourg, Russia.
595. JACQUES MAKEROV, Institut géologique de l'Université,
St. Pétersbourg, Russia.
596. JOSEPH EDMUND WOODMAN, M. A., Sc. D., Professor of
Geology and Director of the Geological Museum,
New York University, University Heights, New
York City, U. S. A. Delegate of the New York
Academy of Sciences, New York and of New York
University, New York.
597. EDWIN THEODORE DUMBLE, B. Sc., 2003 Main Street,
Houston, Texas, U. S. A.
598. A. H. WILLIAMS, 385 Holloway Road, London, England.
599. EDWARD RENGERS SCHOCH, M. I. M. M., M. E., Manager
of the Rooiberg Minerals Development Co., Ltd.,
Rooiberg via Warmbaths, Transvaal Province, South
Africa.
600. EDMUND BESSELL WHALLEY, Whitehill, Rotherham,
England.

601. HENRY LEIGHTON, A. B., University of Pittsburg, Pittsburg, Pennsylvania, U.S.A. Delegate of the School of Mines of the University of Pittsburg, Pittsburg.
602. WILLIAM JOHN SUTTON, B.S., E.M., 749 Discovery Street, Victoria, British Columbia, Canada.
603. HARRY FIELDING REID, Dr., Professor of Dynamical Geology and Geography, Johns Hopkins University, Baltimore, Maryland, U. S. A. Delegate of Johns Hopkins University, Baltimore.
604. WALTER MÖHRING, Dr., 25 de Mayo 293, Buenos Aires, Argentina.
605. W. S. BAYLEY, Ph. D., Associate Professor of Mineralogy and Economic Geology, University of Illinois, Urbana, Illinois, U. S. A.
606. NEWTON HORACE WINCHELL, A.M., 501 East River Road, Minneapolis, Minnesota, U. S. A. Delegate of the University of Minnesota, Minneapolis.
607. THE MUSEUM OF PRACTICAL GEOLOGY, Jermyn Street, London, S. W., England.
608. SEMINAR FÜR GEOGRAPHIE, Rathaus Zimmer 406/7, Rathausmarkt, Hamburg I, Germany.
609. J. STONEMAN PRYOR, Westbourne House, Saltash, Cornwall, England.
610. ALFRED GRUND, Professor der Universität, Blaues Haus, Bubentsch bei Prag, Böhmen, Austria.
611. CARL DIENER, Dr. Phil., Professor der Paläontologie, Universität, Wien, Austria.
612. EDUARD C. ABENDANON, Ingénieur des Mines, Noordoinde 86, La Haye, Notherlands. Delegate of the Geologisch Mijnbowkundig Genootschap voor Nederland on Kolonien, 's-Gravenhage.
613. BIBLIOTHÈQUE DE L'ÉCOLE NATIONALE SUPÉRIEURE DES MINES, 60 Boulevard Saint-Michel, Paris, France.
614. COMITÉ DES FORGES ET MINES DE FER DE MEURTHE-ET-MOSELLE, 40 rue Gambetta, Nancy, Meurthe-et-Moselle, France.
615. CHARLES WILL WRIGHT, B. S., E. M., Ingurtosu, Sardinia, Italy.
616. EDWARD COPLEY PLAYFORD, Surveyor, Special Magistrate, Pine Creek, Darwin, Northern Territory of Australia. Delegate of the Commonwealth Government of Australia, Melbourne.

617. LUIGI BALDACCII, Inspecteur général des Mines, Directeur du Service de la Carte géologique, Ministère d'Agriculture, via XX Settembre, Rome, Italy.
618. GAETANO PLATANIA, DOTT., Prof. di Geografia Fisica e Vulcanologia nella R. Università di Catania, Catania, Italy.
619. JAKOB FRÜH, Professeur, Dr. phil., École Polytechnique Fédérale, Zürich, Switzerland.
620. HENRI MONTAUDON, 16 rue du Rocher, Paris, France.
621. JOSEPH DANIELS, assistant Professor of Mining, Engineering and Metallurgy, University of Washington, College of Mines, Seattle, Washington, U. S. A.
622. FRANK ARNOLDI, K. C., 103 Bay Street, Toronto, Canada. Delegate of the Canadian Institute, Toronto.
623. GEORGE KENNEDY, M. A., LL.D., K. C., 147 Bloor Street West, Toronto, Canada. Delegate of the Canadian Institute, Toronto.
624. HANS ERICH BÖKER, Kgl. Bergassessor der Geologischen Landesanstalt, Paulsborner Strasse 1, Berlin-Halensee, Germany.
625. GEORG GÜRICH, Prof., Dr., Lübeckertor 22, Hamburg, Germany.
626. FERDINAND BROILI, Prof. Dr., Universität München, Germany.
627. RICHARD LACHMANN, Dr. phil., Privatdozent, Schuhbrücke 38:39, Breslau, Germany.
628. MAX SEMPER, Prof., Dr., Dozent an der Technischen Hochschule, Bachstrasse 34, Aachen, Germany.
629. EUGENE ALLEN SMITH, A. M., Ph. D., LL.D., State Geologist of Alabama, University, Alabama, U.S.A. Delegate of the Geological Society of America, New York.
630. EINAR LINDEMAN, graduate of the Royal Technical Highschool of Stockholm, Mines Branch, Department of Mines, Ottawa, Canada.
361. R. RANDAL ROSE, B. A. Sc., Sudbury, Ontario, Canada.
362. (MRS.) J. B. TYRRELL, 534 Confederation Life Building, Toronto, Canada.
633. CHARLES LAPWORTH, LL. D., F. R. S., F. G. S., Geological Department of the University, Edmund Street, Birmingham, England.

634. G. N. COUNT PLUNKETT, President of the Royal Society of Antiquaries of Ireland, 26 upper Fitzwilliam Street, Dublin, Ireland.
635. REAL ACADEMIA DE CIENCIAS EXACTAS, FISICAS Y NATURALES, Valverde, 26, Madrid, Spain.
636. HARRY H. STOEK, Prof. Mining Engineering, B. S. and E. M., 1104 West Oregon Street, Urbana, Illinois, U. S. A.
637. RALPH A. TOPLEY, B. A., Marysville, New Brunswick, Canada.
638. JAMES MCG. CRUICKSHANK, Liverpool, Nova Scotia, Canada.
639. GEORGE L. KERR, Mining Engineer, 39 Elmbank Crescent, Glasgow, Scotland.
640. PAUL PRAVOSLAVLEFF, Prof., Dr., Cabinet géolog. de l'Institut Polytechnique du Don, Novotscherkassk, Russia.
641. ALEXEI ALEXEIEV, Assistant du Cabinet Géologique de l'Université de la Nouvelle Russie, Konnaia 10, Odessa, Russia.
642. ANATOLE RIABININE, Géologue du Comité Géologique de Russie, Ingénieur des Mines, Comité géologique, St. Pétersbourg, Russie.
643. I. P. TOLMACEV, Conservateur en chef du Musée Géologique Pierre le Grand de l'Académie Impériale des Sciences, St. Pétersbourg, Russie. Delegate of the Académie Impériale des Sciences, St-Pétersbourg.
644. A. H. PHILLIPS, D. Sc., Professor of Minerology, Princeton University, Princeton, N. J., U. S. A. Delegate of Princeton University, Princeton.
645. A. MACLEAN, B. A., Department of Geology, University of Toronto, Toronto, Canada. Delegate of the University of Toronto, Toronto.
646. MAX BORKOWITZ, 233 St. James Street, Montreal, Canada.
647. EDWARD H. KRAUS, Ph. D., Professor of Mineralogy and Petrography and Director of the Mineralogical Laboratory in the University of Michigan, University of Michigan, Ann Arbor, Michigan, U. S. A. Delegate of the University of Michigan, Ann Arbor.
648. SIDNEY PAIGE, Associate geologist U. S. Geological Survey, Geological Survey, Washington, D. C., U. S. A.

649. JOSEPH T. SINGEWALD, Jr., Ph. D., Associate in Economic Geology, Johns Hopkins University, Baltimore, Md., U. S. A. Delegate of the Franklin Institute of the State of Pennsylvania, Philadelphia.
650. E. V. D'INVILLIERS, D. Sc., 518 Walnut Street, Philadelphia, Pennsylvania, U. S. A. Delegate of the Franklin Institute of the State of Pennsylvania, Philadelphia.
651. HENRI DE PEYERIMHOFF, Maître des Requêtes honoraires au Conseil d'État, Secrétaire du Comité Central des Houillères de France, 55 rue de Chateaudun, Paris, France.
652. SOCIEDAD GEOLÓGICA MEXICANA, 6a Ciprés 176, Mexico, D. F., Mexico.
653. JUAN S. AGRAZ, Professor, 6a Ciprés 176, Mexico, D. F., Mexico.
654. ERNST ANGERMANN, Dr., Bolivar 15, Apartado, 365 Monterrey N. L., Mexico.
655. CARLOS CASTRO, Professor, 6a del Ciprés 176, Mexico, D. F., Mexico.
656. HERMION LARIOS, Instituto Geológico de Mexico 6a del Ciprés, 176, Mexico, D. F., Mexico.
657. PAUL WAITZ, Dr., Geólogo Jefe de Seccion, 6a del Ciprés 176, Mexico, D. F., Mexico.
658. ERNST WITTICH, Dr. phil., Instituto geológico Nacional, 6a Ciprés 176, Mexico, D. F., Mexico.
659. GEOLOGISCHES INSTITUT DER K. K. UNIVERSITÄT GRAZ, Graz, Austria.
660. AXEL HAMBERG, Prof., Dr., Uppsala, Sweden. Delegate of the Société de Géographie à l'Université d'Uppsala, Uppsala.
661. G. C. BATEMAN, c/o Canadian Mining and Exploration Co., Limited, 801 Traders Bank Building, Toronto, Canada.
662. CARL SCHMIDT, Dr. phil., ordentlicher Professor der Mineralogie und Geologie an der Universität, Basel, Münsterplatz $\frac{5}{7}$, Basel, Switzerland.
663. C. L. DUPARC, Professeur à l'Université de Genève, 22 Chemin des Caroubiers, Villa Marguerite, Carouge près Genève, Switzerland.
664. STEINAR FOSLIE, State Mining Geologist, Royal Geological Survey, Kristiania, Norway.

665. DAVID L. H. FORBES, M. E., 306 Manning Chambers, 72 Queen St. West, Toronto, Canada.
666. INSTITUTO GEOLÓGICO DE MEXICO, 6a Cíprès 176, Mexico, D. F., Mexico.
667. F. R. C. REED, M. A., Sedgwick Museum, Cambridge, England.
668. INTERNATIONALER VEREIN DER BOHRINGENIEURE AND BOHRTECHNIKER, Fötzeinsdorferstrasse No. 22, Wien, XVIII/3, Austria.
669. ARNOLD HAGUE, Ph. B., Dr. Sc., LL.D., U. S. Geological Survey, Washington, D. C., U. S. A. Delegate of the National Academy of Sciences, Washington, D. C., and of the U. S. Geological Survey, Washington, D. C.
670. EDWARD T. CORKILL, B. Sc., M. E., Bureau of Mines, Toronto, Canada.
671. JULES CORNET, Professeur de Géologie à l'Ecole des Mines, 86 Boulevard Dolez, Mons, Belgium.
672. MAURICE LERICHE, Professeur de Géologie à l'Université de Bruxelles, 47 rue du Prince Royal, Bruxelles, Belgium.
673. T. F. SUTHERLAND, B. Sc., Box 384, Cobalt, Canada.
674. WILLIAM EVANS SIMPSON, A.R.M., Fundicion de Los Arcos, Toluca, Mexico.
675. KIRBY THOMAS, Mining Engineer, 42 Broadway, Suite 1027, New York City, U. S. A.
676. H. S. YOUNG, c:o Tretheway Silver Cobalt Mine, Limited, Mine Office, Cobalt, Ontario, Canada.
677. G. F. MORRISON, c:o Pellatt & Pellatt, Traders Bank Building, Toronto, Canada.
678. KWONG YUNG KWANG, Dr. of Eng., M.I.M.M., Mines de Lincheng, Lincheng, via Peking, North China.
679. ANDRÉ DEFLINE, Ingénieur au Corps des Mines, 124 Avenue Victor Hugo, Paris, France.
680. MICHAEL HALTENBERGER, Ph. D., Budapest, Hungary.
681. ANDREW GIBB MAITLAND, Government Geologist, Director of the Geological Survey, Geological Survey Office, Perth, Western Australia.
682. S. MEUNIER, Professeur au Muséum, 3 quai Voltaire, Paris, France.
683. M. M. ALLORGE, L. ès Sc., Villa St. Germain, Louviers, France.

684. J. P. G. BERGERON, Dr. ès Sciences, Ancien Président de la Société Géologique de France, 157 Boulevard Haussmann, Paris, France.
685. R. SIEGER, Professor der Geographie an der Universität, Goethestrasse 43, Graz, Austria.
686. M. MACLAREN, Doctor of Science, Royal Colonial Institute, Northumberland Avenue, London, W. C., England.
687. CAMILLO CREMA, Dr. Ingénieur au Corps royal des Mines d'Italie, R. Ufficio Géologico, via S. Susanna 13, Rome, Italy.
688. EUGENE POITEVIN, Mining and Civil Engineer, B. A. Sc., Geological Survey of Canada, Ottawa, Canada.
689. REALE SOCIETA GEOGRAFICA, Rome, Italy.
690. LABORATOIRE DE GÉOLOGIE DE L'UNIVERSITÉ DE LIÈGE' 7 place de l'Université, Liège, Belgium.
691. F. P. GULLIVER, A. B., A. M., Ph.D., 30 Huntington Lane, Norwich, Connecticut, U. S. A.
692. T. B. WILLIAMS, Master of Science from Queen's University in Mining Engineering, Head Engineer for the Canmore Coal Co., Canmore, Alberta, Canada.
693. L. H. BORGSTRÖM, Phil. Dr., Université, Helsingfors, Finlande, Russia.
694. OSCAR VORWEG, Hauptmann a. D., Warmbrunn, Germany.
695. J. WYSOGORSKI, Dr. phil., wissenschaftlicher Assistent und stellvertretender Direktor des Mineralogischen Institutes, Lübecker Tor 22, Hamburg 5, Germany.
696. H. W. STILLE, Dr. phil., Professor an der Universität Leipzig, Direktor der Königlich Sächsischen Geologischen Landesanstalt, Stallbaumstrasse 10, Germany, Leipzig.
697. J. D. IRVING, Ph. D., 284 Orange Street,, New Haven Connecticut, U. S. A.
698. A. H. WESTERGARD, Docteur ès Sciences, Géologue au Service géologique de Suède, Sveriges Geologiska Undersökning, Stockholm, Sweden.
699. CONSTANT GODFROY, Ingénieur des Mines, 1e Rusthoekstraat, 9, LaHaye, Netherlands.
700. ERIK W. DAHLGREN, Directeur de la Bibliothèque Royale, Stockholm, Sweden.

701. A. MOSCO VICI, Mining Engineer, Consulting Mining Engineer, 310 Transportation Building, Montreal, Canada.
702. J. H. LEES, B. A., M. S., Asst. State Geologist, State House, Des Moines, Iowa, U. S. A.
703. E. M. NÖRREGAARD, Lecturer on Chemistry and Geology at the Royal Academy of Arts, Holmens Kanal 22, Copenhagen, Denmark.
705. C. H. DINHAM, B. A., F. G. S., H. M. Geological Survey, 33 George Square, Edinburgh, Scotland.
706. J. A. NOISEUX, C. V. S., A. M., Séminaire de Joliette, Joliette, Canada.
707. R. STEVENSON, E. M., C. E., Room 51-15 Court Square, Boston, Massachusetts, U. S. A.
708. HUGH MARSHALL, D. Sc., F. R. S., Prof., Chemistry Department, University College, Dundee, Scotland.
709. SOCIÉTÉ DES SCIENCES DE VARSOVIE, Varsovie, Pologne, Russia.
710. H. G. BACKLUND, Géologue-pétrographe de la Direction des Mines, Maipu 1241, Buenos Aires, Argentine.
711. B. ROSE, Bengough, Saskatchewan, Canada.
712. F. A. McEVoy, (Mrs.) c/o James McEvoy, 306 Stair Bldg., 123 Bay Street, Toronto, Canada.
713. ROLLAND C. ALLAN, Director of the Geological Survey of Michigan, Lansing, Michigan, U. S. A.
714. E. A. COLLINS, B. Sc., 423 Johnston St., Kingston, Ontario, Canada.

1003. GEORGE F. BECKER, U. S. Geological Survey, Washington, Delegate of the Government of the U. S. A. and of the National Academy of Sciences, Washington.
1006. A. C. BOYLE. Delegate of the State of Wyoming Geological Survey, Cheyenne, U. S. A.
1012. THOMAS C. CHAMBERLIN, University of Chicago. Delegate of the Government of the U.S.A., and of the Washington Academy of Sciences, Washington, U. S. A.
1013. WILLIAM MORRIS DAVIS. Delegate of the Geological Society of America, New York, U. S. A.
1017. WILLIAM ALFRED GIBB, 1 Belvidere Street, Aberdeen. Delegate of the University, Aberdeen, Scotland.
1019. J. B. HARRISON, Director of Science and Agriculture. Delegate of the Government of British Guiana.
1023. PROFESSOR IRVING. Delegate of Yale University, New Haven, U. S. A.
1028. M. KILIAN. Delegate of the Université de Grenoble, Grenoble, France.
1029. G. KLEMM. Delegate of the Grossherzoglich Hessische Geologische Landesanstalt, Darmstadt, Hessen, Germany.
1031. REV. A. LAJEUNESSE, O. M. I. Delegate of the University of Ottawa, Ottawa, Canada.
1033. JAMES H. LEES, Assistant State Geologist of the Iowa Geological Survey. Delegate of the Iowa Geological Survey, U. S. A.
1039. LOUIS LÓCZY DE LÓCZ, Stefánia útca 14, Budapest VII. Delegate of the Institut Géologique du Royaume Hongrois, Budapest, Hungary.
1041. HENRY LOUIS, Armstrong College, Newcastle-on-Tyne. Delegate of Armstrong College of the University of Durham, Newcastle-on-Tyne, England.
1042. PROFESSOR LULL. Delegate of Yale University, New Haven, U. S. A.
1044. HUGH MARSHALL, Erigmore, Hill Crest Road. Delegate of the University College, Dundee, Scotland.
1049. GEORGE N. MORANG. Delegate of the Government of Guatemala.
1054. PERCY EDWARD RAYMOND, Assistant Professor of Palæontology. Delegate of the Harvard University, Cambridge, and the Museum of Comparative Zoology, Cambridge, U. S. A.

1056. S. H. REYNOLDS. Delegate of the University of Bristol, Bristol, England.
1060. WARREN D. SMITH, Philippine Islands. Delegate of the Government of the U. S. A.
1061. HERBERT WARINGTON SMYTH, Secretary for Mines. Delegate of the Government of the Union of South Africa, Cape Town, South Africa.
1062. DR. SALOMON. Delegate of the Universität Heidelberg, Heidelberg, Germany.
1066. F. N. TCHERNYCHEFF. Delegate of the Government of Russia and of the Commission Sismique Centrale, St. Petersburg, Russia.
1068. CYRUS F. TOLMAN, associate professor of Geology at the University. Delegate of Leland Stanford Junior University, Stanford University, California, U. S. A.
1069. R. D. TYLER. Delegate of the State of Wyoming Geological Survey, U. S. A.
1086. DAVID WHITE, Geological Survey, Washington, D. C. Delegate of the Government of the U. S. A., of the Washington Academy of Sciences, Washington, and of the National Academy of Sciences, Washington, U. S. A.
1104. JOSEF FELIX POMPECKJ, Dr. Phil., Professor der Geologie und Paläontologie an der Universität Tübingen, Tübingen (Württemberg), Germany.
1109. ERNST ESCH, DR., Roqueteweg 37, Darmstadt, Germany.
1110. L. WOLFF, Bergrat, Vor dem Rammelsberge, Goslar (Harz), Germany.
1111. SOCIEDAD MEXICANA DE GEOGRAPHIA Y ESTADISTICA, I a calle de la Academia, 9, Mexico, Mexico.
1112. CARL HARRY FERDINAND ROSENBUSCH, Dr. Phil., ordentlicher Professor der Mineralogie und Geologie, Geheimer Rat, Kaiserstrasse 25, Heidelberg (Baden), Germany.
1113. ADELHEID STEINMANN, Poppelsdorfer Allée 98, Bonn a. Rh., Germany.
1115. ALFRED L. HALL, B.A., F. G. S., Mines Department, Geological Survey Service, Pretoria, Union of South Africa.
1118. A. S. MACKENZIE, Dr., President of the University. Delegate of the Dalhousie University, Halifax, N.S., Canada.

1122. L. MILCH. Delegate of the Geographische Gesellschaft Greifswald, Schützenstrasse 12, Greifswald, Germany.
1125. W. J. SOLLAS, M.A., F.R.S., Professor of Geology in the University of Oxford. Delegate of the University of Oxford, Oxford, England.
1126. SERGIUS DUFAULT, Sous-Ministre de la Colonisation, des Mines et des Pêcheries, Québec, Canada. Delegate of the Department of Colonization, Mines and Fisheries, Quebec, Canada.
1127. PHILIP COX, N.A., Ph.D., Professor of Natural History and Geology of the University of New Brunswick. Delegate of the University of New Brunswick, Fredericton, Canada.
1129. TIMOTHY MULLINS, Colombian Consul in Toronto, Canada. Delegate of the Government of Colombia.
1131. FRANCIS SCHAFARZIK, Dr., Professor of Geology at the Technical University of Sciences, Budapest, Hungary. Delegate of the Technical University of Sciences, Budapest, Hungary.
1132. CARLOS I. LISSON, Engineer, P. O. Box 787, Lima, Peru. Delegate of the Sociedad de Ingenieros, Lima, Peru.
1135. DR. D. ANGEL GALLARDO, Buenos Aires, Argentine. Delegate of the Museo Nacional de Historia Natural, Buenos Aires.
1137. GEORGE L. CANNON, Professor, Denver, Col., U. S. A. Delegate of the Colorado Scientific Society, Denver.
1138. JUAN KEIDEL, Dr., Directorate General of Mines, Geology and Hydrology of the Department of Agriculture, Buenos Aires. Delegate of the Government of Argentine and of the Directorate General of Mines, Geology and Hydrology of the Department of Agriculture, Buenos Aires.
1141. G. H. ASHWIN, Birk House, Ardsley, Bamsley, England. Delegate of the Institution of Mining Engineers, London, England.
1143. ALFRED TARRUT, 457 St. Catherine Street, Outremont, Montreal, Canada. Delegate of the Académie de Mâcon, Mâcon, Saône-et-Loire, France.
1144. THOMAS WILLIAM GIBSON, Bureau of Mines, Toronto, Canada. Delegate of the North of England Institute of Mining Engineers, Newcastle-upon-Tyne, England.

1145. G. H. LING, Dr., Dean of the Faculties of Arts and Science, University of Saskatchewan, Saskatoon, Canada. Delegate of the University of Saskatoon, Saskatoon.
1146. H. L. BORGSTRÖM, Docteur-ès-sciences, Université de Helsingfors, Finland, Russia. Delegate of Geografiske Föreningen, Helsingfors.
1149. STANISLAS MEUNIER, Professeur de Géologie, Muséum National d'Histoire Naturelle, Paris, France. Delegate of the Muséum National d'Histoire Naturelle, Paris.
1150. JOHN MILNE, Professor. Delegate of the Asiatic Society of Japan, Tokyo.
1152. P. J. STEPANOW, Geologist. Delegate of the Government of Russia.



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No. 8

Visit of International Geologists

Excursion Parties of International Geological Congress Arrive in British Columbia—Representatives from Many Countries—Hospitable Reception—Importance of Occasion Realized by Public



International Geological Congress Excursionists and other Guests of Government of British Columbia. Group outside Alexander (Ladies) Club, Victoria, after complimentary luncheon.

In the July number of the B. C. Mining Exchange there was given information relative to the Twelfth International Geological Congress, including particulars of arrangements for holding the session of the Congress in Toronto, Ontario; the

object, and value of the Congress, and the character of the attendance at its periodical sessions. Some additional information follows, and, as well, an account of the visit to Western Canada of two Congress excursion parties:

A Favorable Comparison.

From a recently issued pamphlet it is learned that at the Eleventh Session, which was held in Sweden in 1910, there were 879 members, of whom 625 actually

attended the session. Thirty-six countries were represented, and there were 175 delegations, appointed by various governments, universities and societies throughout the world. It has not yet been made public how many delegates and members attended the Twelfth Session, but on July 24, the then known members of the session were as follows: Countries represented, 45; delegations appointed, 303; members enrolled, 902. A comparison of the figures shows that those for the Twelfth Session were appreciably higher than for the Eleventh.

The Meetings in Toronto.

The business meetings of the Congress held recently in Toronto were marked by excellent attendances and animated discussions. In addition, there was abundant hospitality shown the visitors, numbers of whom are distinguished scientists. The provision made for their entertainment was suitable to the notable occasion, and much appreciation was expressed of the generous hospitality so freely extended.

No attempt will be made here to even summarize the business that had the serious attention of the Congress, but reference may well be made to the chief subject before the main meeting, namely:

The Coal Resources of the World.

The preparation of the monograph, which fills three quarto volumes together, containing about 1,360 pages and is accompanied by an atlas of some seventy maps in colors, was entrusted to officials of the Geological Survey of Canada. Each country of the world was asked to contribute an article covering its coal resources, and with practically no exception each country selected its leading authorities, usually experts connected with the official Government Geological Surveys or Departments of Mines, to secure material for and write its chapter. In many cases new investigations in the field were necessary, unpublished material was drawn upon, and the old work revised and brought up to date. The result is a most complete and authoritative statement of the coal resources of the globe. Not only is the quantity of coal discussed, but also the amount of each kind, its mode and conditions of occurrence, including depth below ground, and this for practically each coal district in each country and each state. Even the Arctic and Antarctic regions are covered. Fifty-two countries have articles of length, fifteen are covered by short articles, nine report no resources of coal, twenty-five colonies are included in the reports of the motherlands. A chapter of about one hundred pages summarizes the individual reports and totals the resources of the world. The work is well illustrated with figures, maps, etc.

In its report of the opening meeting of the Congress, the Toronto Globe said: "That monumental contribution to the world's stock of knowledge, which will mark the Twelfth International Geological Congress, 'The Coal Resources of the World,' was laid under the lenses of the geologists, mineralogists and petrologists of the world yesterday, and was found practically without a flaw. The total coal reserves of the world, compiled from all the reports received, amount to 7,397,533 million tons, of which nearly 4,000,000

millions are bituminous coals, nearly 3,000,000 millions are brown coals of various grades, and nearly 500,000 millions are anthracite coals. Of the anthracite coals, Asia, with the great Chinese fields, has by far the largest supply of any of the great continental divisions, furnishing 407,637 million tons; in bituminous coal America, with 271,080 million tons, leads by a great margin, as it does also in the various grades of brown coals. The world's production of coal for the year 1910 was about 1,145 million tons, so that, though much must be allowed for loss in mining and for areas that for various reasons cannot be economically mined, there still remain many hundreds of years before exhaustion of the supply may be looked for. Taking up the individual countries, however, it is found that in more than one case the end is in sight."

The Congress Excursions.

Before the Congress opened its sessions at Toronto, there were carried out excursions to the Maritime Provinces, Quebec and Ontario. While the Congress was sitting trips were made to various places of interest within easy reach from Toronto.

Those Who Came West.

The party designated C-1. left Toronto at 7.30 p.m. on Thursday, August 14, and Winnipeg on the night of Monday following. After having spent a day each at Banff, Laggan, Field, and Glacier, and shorter stays at Sicamous and other places en route to the Coast, Vancouver was reached on Monday night, August 25th, and the trip to Victoria was made by night, arriving at the capital early Tuesday morning, 26th inst. This party was under the leadership of Dr. Frank D. Adams, president of the Congress, with Mr. J. B. Tyrrell as associate leader, Mr. J. McLeish, secretary, and Mr. Hugh S. De Schmid, assistant secretary. The members of the party were:

Adams, Mrs. F. D.
Adams, Dr. F. D., Dean of the Science Faculty, McGill University, Montreal, Quebec.
Ami, Dr. H. M., Ottawa, Ontario.
Andree, Dr. Karl, Privatdozent fur Geologie und Palaeontologie an der Universitat, Marburg, Hessen, Germany.
Arlt, Dr. Hans, Kgl. Bergassessor, Munchen, Germany.
Backlund, H. G., Geologue-petrographe de la Direction des Mines, Buenos Aires, Argentine.
Backstrom, Dr. H., Professeur de Petrographie a l'Universite de Stockholm, Djursholm, Sweden.
Barlow, Dr. A. E., Westmount, Montreal, Quebec.
Bascom, Miss F., Ph.D., U. S. Geological Survey, Bryn Mawr College, Pennsylvania, U. S. A.
Bigot, A., Doyen de la Faculte des Sciences de l'Universite de Caen, Caen, France.
Boden, Dr. Karl, Privatdozent fur Geologie an der Universitat Geologisches Institut, Alte Akademie, Munchen, Germany.
Cadell, H. M. Linlithgow, Scotland.
Carez, Madame B., Paris, France.

Carez, Leon, Docteur-es-Sciences, Paris, France.
Case, Dr. E. C., University of Michigan, Ann Arbor, Michigan, U. S. A.
Case, Mrs., Ann Arbor, Mich., U. S. A.
Cerulli-Irelli, Dr. Serafino, Maitre de conferences de Paleontologie a l'Universite de Rome, Italy.
Clapp, Dr. C. H., Geological Survey, Ottawa, Ontario.
Cole, L. H., Mines Branch, Canada Department of Mines, Ottawa, Ontario.
Coleman, Dr. A. P., Professor of Geology, University of Toronto, Toronto, Ontario.
Connor, M. F., Mines Branch, Ottawa, Ontario.
Daly, Dr. R. A., Harvard University, Cambridge, Massachusetts, U. S. A.
Deprat, J., Chef du Service Geologique de l'Indochine, Hanoi, Indo-Chine.
De Schmid, H. S., Mines Branch, Ottawa, Ontario.
Dinham, C. H., H. M. Geological Survey, Edinburgh, Scotland.
Dufault, S.
Ewald, Miss Marina, Bryn Mawr College, Pennsylvania, U. S. A.
Fermor, Dr. L. L., Geological Survey of India, Calcutta, India.
Fermor, Mrs., Calcutta, India.
Gentil, Louis Emile, Professeur a l'Universite de Paris, Paris, France.
Goldman, Marcus J., Johns Hopkins University, Baltimore, Md., U. S. A.
Goodwin, Dr. W. J., Director, School of Mining, Kingston, Ontario.
Gregory, Miss.
von Grote, Dr. Friedrich, Munchen, Bayern, Germany.
Grutterink, Dr. Alide (Miss), Privat-Docte on Mikrochimie a l'Universite de Leigden, Rotterdam, Netherlands.
Guinsberg, Albert S., Licencie es-science, Ingenieur-metallurgiste, Institute Polytechnique; Laboratoire de Mineralogie, St. Petersburg, Russia.
Haniel, Dr. C. A., Venusbergweg, Bonn, a Rh., Germany.
Harker, A., St. John's College, Cambridge, England.
Hatch, Miss Laura, Bryn Mawr, Pennsylvania, U. S. A.
Helme, Miss.
Hills, Dr. T. McD., Geological Department, Ohio State University, Columbus, Ohio, U. S. A.
Horne, Dr. John, F.R.S., Edinburgh, Scotland.
Hume, Dr. W. F., Geological Survey, Cairo, Egypt.
Jehu, T. J., The University, St. Andrew's, Scotland.
Johnston, W. A., Geological Survey, Ottawa, Ontario.
Keyes, Dr. Charles, Des Moines, Iowa, U. S. A.
La Mothe, General L. J. B. de General de Division, Inspecteur de Etudes technique de l'Artillerie, Place St. Thomas l'Agriin, Paris, France.
Lane, Dr. A. C., Tufts College, Boston, Mass., U. S. A.
Lane, Mrs. A. C.
Lantenois, H., Ingenieur en chef de la Circonscription des Mines de l'Indochine, Hanoi, Indo-Chine.

Lawson, Dr. Andrew C., University of California, Berkeley, Cal., U. S. A.

Loewinson-Lessing, Dr. Francois, Professeur de Geologie et de Mineralogie, Institut Polytechnique, Pierre le Grand, St. Petersburg, Russia.

Loewinson-Lessing, Vladimir Etudiant Institut Polytechnique Pierre le Grand, St. Petersburg, Russia.

Lory, Prof. P. C., Charge de Conferences de l'Universite, Grenoble, France.

Luck, Hugo Frank Paul, Leipzig, Germany.

Mailhot, A., Professor of Geology l'Ecole Polytechnique, Montreal, Que.

de Margerie Emmanuel, Ancien President de la Societe geologique de France, Paris, France.

Mattirolo, Ettore, Ingenieur en chef des Mines, Torino, Italy.

McConnell, R. G., Geological Survey, Ottawa, Ontario.

McLeish, John, Chief of the Division of Mineral Resources and Statistics, Mines Branch, Department of Mines, Ottawa, Ontario.

Mercial, Dr. Giuseppe, Professor, Istituto Geologico della Regia Universita, Pisa, Italy.

Michalon, Lucien, Ingenieur des Mines, Paris, France.

Milch, Dr. Ludwig, Professor de Mineralogie und Petrographie Griefwald, Preussen, Germany.

Mitscherlich, Heinz Erich, Dipl. Bergingenieur, Karlsruhe, Baden, Germany.

Molengraaff, Dr. Gustav Adolf, Delft, Netherlands.

Moore, Elwood S., Dr., Professor of Geology and Mineralogy School of Mines, State College, Pennsylvania, U. S. A.

Miller, A. M., State University, Lexington, Kentucky, U. S. A.

Nicholas, Tressilian Charles, Trinity College, Cambridge, England.

Paulcke, Professor Dr. Wilhelm, Karlsruhe, Baden, Germany.

Perkins, Dr. C. H. Burlington, Vermont, U. S. A.

Quesnel, Dr. Percy Dudgeon, Lecturer in petrography, University of Uppsala, Sweden.

Quesnel, Mrs. P. D.

Peyerimhoff, Henride, Maitre des Requetes honoraires au conseil d'Etat Secretaire du Comite Central des Houillers de France, Paris, France.

Raisln, Miss C. A. Dr., Bedford College, London, W. England.

Rathgen, Miss Ann Maria Elizabeth, Bonn a. Rhein, Germany.

Rice, Dr. W. H., Professor of Geology, Wesleyan University, Middletown, Connecticut, U. S. A.

Redel, Adolph Johannes, Braunschweig, Germany.

Romer, Euheniusz, Docteur-es-sciences, Professeur a l'Universite de Lemberg, Austria.

Saugrain, Dr. G., Geologie Publiciste, Paris, France.

Schenck, Professor Dr. Adolf, Halle a. S. Germany.

Skottsberg, Dr. Carl Johan Frederik, Maitre de conferences a l'Universite, Uppsala, Sweden.

Skoufos, Theodore, Universite d'Athenes, Athenes, Greece.

Steinman, Professor Dr. Gustav, Geheimer Bergrat, Bonn a. Rhein, Germany.

Stepanov, Paul, Geologue du Comite Geologique et Ingenieur des Mines, St. Petersburg, Russia.

Stille, Dr. H. W., Professor an der Universitat Leipzig, Direktor der Koniglich Sachsischen Geologischen Landesanstalt, Leipzig, Germany.

Stolley, Professor Dr. E., Technische Hochschule, Braunschweig, Germany.

Stratanowitz, Eugene, Geologist of the Rogoslowsk Mining Estate, Turjinskie, Rudniki, Russia.

Sutton, William John, Victoria, British Columbia.

Szadeckzy, Dr. Jules, Kolozsvar, Hungary.

Termier, P. M., Directeur du Service de la Carte Geologique de la France, Paris, France.

Termier, Mlle.

Tietze, Dr. Emile, Directeur de l'Institut Geologique Imperial Royal d'Autriche, Vienne, Austria.

Tilmann, Dr. N., Bonn a. Rhein, Germany.

Tscherneyschew, Th. Directeur du Comite Geologique de Russia, St. Petersburg, Russia.

Tyrrel, J. B., Toronto, Ontario.

Valiquette, J. H., Bureau of Mines, Quebec.

Walcott, Dr. C. D., Smithsonian Institution, Washington, D. C., U. S. A.

Wallace, Dr. Robert C., Professor of Geology and Mineralogy, University of Manitoba, Winnipeg, Manitoba.

Welter, Dr. Otto A., Bonn a Rhein, Germany.

Wherry, Dr. Edgar T., Assistant Professor, Lehigh University, South Bethlehem, Pennsylvania, U. S. A.

White, Jas., Secretary Commission of Conservation, Ottawa, Ontario.

Wigglesworth, E., Geological Museum, Cambridge, Mass., U. S. A.

Wilson, Dr. M. E., Geological Survey, Ottawa, Ontario.

Wordie, J. M., St. John's College, Cambridge, England.

Zoude, Paul L. C., Ingenieur civil des Mines, 109 Boulevard de Grande Ceinture, Bruxelles, Belgium.

The full number of the party was 115 members, but a few did not continue with the party right through to Victoria. The number of countries represented was 16, as under:

	Members
Austria	3
Argentina	1
Belgium	2
Canada	24
France	10
Germany	17
Great Britain	9
Greece	1
Hungary	1
India	2
Indo-China	2
Italy	3
Netherlands	1
Russia	8
Sweden	4
United States of America	27

Party C-2.

Party C-2 also left Toronto on the evening of Monday, August 14, but half an hour later than C-1, but as no visit was made to any place on the way, Winnipeg was reached on Saturday just before noon and the journey westward resumed the same night. Sunday evening was spent at Medicine Hat, and then the C. P. R. main line was left, this party coming to British Columbia via the Crowsnest railway. Monday, 18th, was spent in the coal mining district of the Rocky Mountain foothills east of the divide, Tuesday in the British Columbia Crowsnest district, and Nelson was the stopping place on Wednesday night. Thursday was spent in the Boundary district, Friday at Rosland and Trail, Saturday Revelstoke was passed through and that night Kamloops was reached. Just after midnight of Sunday the travellers were in Vancouver, and they remained there until Monday morning at ten o'clock, when the morning steamer was taken for Victoria, the latter city having been reached at 2.30 o'clock in the afternoon.

Mr. R. W. Brock was leader of C-2, and Mr. Jas. McEvoy associate leader, with Mr. H. E. T. Haultain as secretary and Mr. H. Frechette as his assistant. The members of this party were as under:

Anderson, E. M., Geological Survey, Edinburgh, Scotland.

Ashworth, John, M.E., Manchester, England.

Baker, Sir Augustine, Dublin, Ireland.

Boeke, H. E., Dr., Professeur Mineralogisches Institut, Halle a.S., Germany.

Boggild, Dr. O. B., Professeur Mineralogical Museum, Copenhagen, Denmark.

Borgstrom, Dr. L. H., Universite Helsingfors, Finland, Russia.

Brooks, A. H., Geological Survey, Washington, D. C., U. S. A.

Brock, R. W., Director Geological Survey, Ottawa, Ontario.

Camsell, C., Geological Survey, Ottawa Ontario.

Charbonnier, J., Manager, West Canadian Collieries Ltd., Blairmore, Alberta.

Dahlblom, Lorent Edward Theodor, Bergmastare in Gefle-Dala District, Falun, Sweden.

Dick, William J., Commission of Conservation, Ottawa, Ontario.

Dowling, D. B., Geological Survey, Ottawa, Ontario.

Drysdale, Dr. C. W., Geological Survey, Ottawa, Ontario.

Dupaigne, Reverend Pierre, Licencié-es-Sciences, Professeur des Sciences Physique et naturelles au Seminaire de Philosophie, Montreal, Quebec.

Dunn, George, Loudon, Annanhill, Kilmarnock, Scotland.

Fernow, Dr. B. E., Dean of Faculty of Forestry, University of Toronto, Toronto, Ontario.

Fernow, Mrs.

Finnie, O. S., Department of the Interior, Ottawa, Ontario.

Frechette, H., Mines Branch, Department of Mines, Ottawa, Ontario.

Haultain, H. E. T., Prof. of Mining Engineering, University of Toronto, Toronto, Ontario.

- Haultain, Mrs.
 Gardner, Samuel McLare, Mount Vernon Colliery Co., Ltd., Glasgow, Scotland.
 Gurich, Prof. Dr. B., Hamburg, Germany.
 Hobson, Bernard, F.G.S., Sheffield, England.
 Hopkins, Dr. Thos. Cramer, Maitre de Conferences a l'Universite, Uppsala, Sweden.
 Hore, R. E., Michigan College of Mines, Houghton, Michigan, U. S. A.
 van Horne, Dr. F. R., Case School of Applied Science, Cleveland, Ohio, U. S. A.
 Howley, Dr. J. P., Director, Geological Survey of Newfoundland, St. John's, Newfoundland.
 Hubrecht, Dr. P. F., Batavia, Netherlands-India.
 Hurl, Mark, Glasgow, Scotland.
 Hurl, John McGlashan Redholm, M.E., Glasgow, Scotland.
 Inouye, M., Director Geological Survey of Japan, Tokyo, Japan.
 Ives, Henry Goodson, Andover, New Hampshire, U. S. A.
 Ives, J. T. B., F. G. S., Andover, New Hampshire, U. S. A.
 Jarvis, Gerald, Arnprior, Ontario.
 Kido, Chutaro, Superintendent of the Geological Institute of the South Manchuria Railway Company, Dairen, Kantoshu, Manchuria.
 Kennedy, G., Toronto, Ontario.
 Kukuk, Paul, Bergassessor a. D., Bochum i.W. Germany.
 Lebling, C.
 LeRoy, O. E., Geological Survey, Ottawa, Ontario.
 Luttmann-Johnson, H. M., F.R.G.S., Petworth, Sussex, England.
 Maier, E., Professeur titulaire en geologie Universite de Santiago, Santiago, Chili.
 Martius, Dr. Siegfried G., Assistant am mineralogischpetgraphischen Institut der Universitat Bonn, Bonn a Rh., Germany.
 McMillan, J. G., 225 Geoffrey St., Toronto, Ontario.
 McEvoy, J., Mining Engineer and Geologist, Toronto, Ontario.
 McEvoy, Mrs.
 McIntosh, Donald Sutherland, Prof. of Geology, Dalhousie University, Halifax, Nova Scotia.
 Mellor, Dr. Edward Thomas, Geological Survey, South Africa.
 Miller, Benjamin Leroy, Professor of Geology, Lehigh University, South Bethlehem, Penn., U. S. A.
 Morel, Jean, Ingenieur civil des Mines, Boitsfort pres Bruxelles, Belgium.
 Peck, Frederick B., Lafayette College, Easton, Penn., U. S. A.
 Peck, Mrs.
 Powers, Sidney, Inst. of Technology, Boston, U. S. A.
 Schofield, S. J., Geological Survey, Ottawa, Ontario.
 Singewald, J. T., Jr., Associate in Economic Geology, Johns Hopkins University, Baltimore, Md., U. S. A.
 Spruyt, C., Anvers, Belgium.
 Stirling, J. T., Chief Inspector of Mines for Alberta, Edmonton, Alberta.
 Surzycki, T., Petrokow, Pologne-russe, Russia.
 Thwaites, F. T., Madison, Wisconsin, U. S. A.
 Wallis, H. B., London, England.
 Wilbraham, A. G. B., London, England.
 Wilson, Dr. A. W. G., Mines Branch, Department of Mines, Ottawa, Ontario.
 Wolff, Prof. Dr. Th. F. Wilhelm, Kgl., Landesgeologe, Frohnau b Berlin, Germany.
 Weigand, Dr. B., Deutsche Geolog. Gesellschaft, Elsass, Germany.
 Wilson, Dr. M. E., Geologist, Geological Survey, Ottawa, Ontario.
 Wright, C. W., Ingiurtosu, Sardinia, Italy.
 Wright, Mrs.
 Zuber, Dr. R., Professor of Geology, University of Lemberg, Austria.

The published list of names of those comprising the C-2 party showed that there were 90 members representing 21 countries, as under:

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A GLANCE

at the Contents of this issue should convince the man who handle Mining Materials and Machinery that there is no better medium for reaching the mining men than the advertising columns of this Journal

	Members
Austria	1
Belgium	2
Canada	38
Chili	1
Denmark	1
Egypt	1
Finland	1
France	1
Germany	6
Great Britain	11
India	1
Ireland	1
Italy	2
Japan	1
Manchuria	1
Netherlands	1
Newfoundland	1
Russia	1
South Africa	1
Sweden	1
United States	16

However, various causes led to the number being reduced before Victoria being reached, so that only about 70 visited that city. In addition there were Hon. Louis Coderre, Dominion Minister of Mines; Madame Coderre and two sons, Miss Coderre, Madame Callardean, and the minister's secretary.

Small Party Visited Nanaimo.

Some of the members of C-2 party wishing to visit one of the Vancouver Island coal mining districts, they crossed to Nanaimo on Monday morning, 25th, with Mr. William J. Dick, mining engineer to the Canada Conservation Commission, as guide. The other members of this small party were: Mr. A. H. Brooks, Mr. J. Charbonnier, Dr. B. Gurich, Herr Paul Kukuk, Prof. E. Maier, and Dr. R. Zuser. The Geological features of especial interest in the vicinity of Nanaimo were shown to the visitors, but owing to the coal mines being closed as a result of a strike of the miners, it was not practicable for underground examination of any of the coal faces to be made. On Tuesday morning train was taken to Victoria where the main body of the excursionists was rejoined.

Proceedings at Victoria.

The following will give an outline of the proceedings of the visitors when at Victoria:

The C-2 party arrived at half-past two o'clock on Monday, 25th, having crossed from Vancouver by the C. P. R. steamer "Princess Charlotte." At the dock tally-hos were in waiting and on these the visitors were taken for a drive around the city and suburbs. The Empress hotel was reached at 6 o'clock, on return from the drive, and dinner was served at 7 o'clock. The evening was spent at the hotel in an informal and sociable manner, many residents of the city assembling to meet the distinguished visitors. On Tuesday morning the C-2 party was taken in motor cars to a number of places in and about Victoria and were shown various features of particular interest to geologists. By noon this party was back at the hotel. Meanwhile the C-1 party, which had come over from Vancouver by the Monday night steamer, had been taken in tally-hos for a three hours' drive, and they, too, reached the Empress hotel at noon. Shortly after one o'clock all sat

down to a luncheon served in the ballroom of the Alexandra Club, as the guests of the Provincial Government of British Columbia.

For an hour or two after luncheon the visitors were left free to spend the time as best pleased them, and then all proceeded to Government House grounds, where His Honor the Lieutenant-Governor (Hon. T. W. Paterson) and Mrs. Paterson entertained them, together with many local ladies and gentlemen, at a Garden Party. In the evening both parties, together with a number of residents of Victoria who were assisting in making things pleasant for the visitors, dined in the ballroom of the Empress hotel, where several hours were afterward spent. Before midnight the C-2 party went on board a C. P. R. steamer, by which during the night they returned to Vancouver.

On Wednesday morning the members of C-1 party were taken to see the same geological features that had been shown

account of the proceedings at the luncheon on Tuesday:

What was undoubtedly the most distinguished and cosmopolitan gathering of scientific men that ever assembled in the City of Victoria was seen in the Alexandra Club yesterday afternoon, when, under the aegis of the Provincial Government, the two parties of the Geological Congress joined with the local men in making a splendid aggregation.

The great hall of the club was practically filled with the men of all nations, there being about 200, in all, present. Acting-Premier Bowser occupied the chair, and with him were seated Professor Adams, the president of the Congress, and Hon. Louis Coderre, Federal Minister of Mines. Ranged along the leading table were a number of distinguished scientists from all over the world, and throughout the hall names were frequently called that have often been heard of in the great work of scientific research.

His Honor Lieutenant-Governor Paterson was a prominent representative of Province affairs, as were also the Hon. Dr. Young, Minister of Education; Hon. W. R. Ross, Minister of Lands; Hon. T. Taylor, Minister of Public Works; Hon. Price Ellison, Minister of Finance and Agriculture; Hon. D. M. Eberts, Speaker of the House; Chief Justice Macdonald, Mr. H. B. Thompson, M.P.P., and others. There were also present Lord Provost Stevenson, of Glasgow; Senator Macdonald, Mayor Morley, Col. Roy, Mr. A. E. Smith, United States Consul, and Mr. Carl Loewenberg, German Imperial Consul.

The function was rendered memorable as well as enjoyable by a series of brief speeches from the several leaders of the Congress, and in this connection it should be said that to many of them the chief charm lay in the fact that the foreign delegates spoke to the audience in their native tongue. While the speaking was in progress the ladies entered the gallery, and were participants in the latter part of the programme. Excellent music was provided throughout the luncheon festivities; as the representative of each nation rose to deliver his thanks, the orchestra struck up the national air of the country he represented. In this sense the function was an object lesson in national anthems and imperial hymns, which appeared to be greatly enjoyed.

Hon. Mr. Bowser's Address.

Acting-Premier Bowser, in formally welcoming the visitors to the City of Victoria, said that the gathering in which he stood was perhaps the most distinguished of the kind that had ever been in the Capital, or, for that matter, in the Province. "We have assembled here today," he said, "an aggregation of scientists such as is seldom seen anywhere in the world. It represents practically every civilized country in the world, and I do not think that I can put it better than one of the local newspapers did in describing the visit the other day when it referred to the members of the Geological Congress as being the elite of the world.

"In this western part of Canada we are glad indeed to extend the hand of



LEAHY'S RAWHIDES SHEEP CRLEK B.C.

Rawhiding Ore from Nugget Gold Mine.

the other party on Tuesday morning. They had, however, the benefit of a specially pleasant addition to the programme in the shape of luncheon served in the open air on the property of Mr. P. F. Higgs, at Albert Head, which was generally voted to have been one of the most enjoyable of the many forms of entertainment provided during the course of the excursion. Victoria was reached on return by three o'clock, and at half-past four adieu was said to the Capital, it having been arranged for an early departure to be made, so as to admit of this party having the benefit of a daylight trip from Victoria to Vancouver, the trip to Victoria having been made at night.

GREAT GATHERING OF SCIENTIFIC MEN.

Under this heading, the Victoria Daily Colonist printed the following

welcome to such a gathering. Many of you may have seen parts of this Province before, but I am sure that for many of you this is the first opportunity you have had, and to all of you I would like to say on behalf of the people of the Province that no warmer welcome could be extended to you anywhere than the one we harbor in our hearts, however we may fall short in the matter of expression. And I would go a step further in this connection and suggest to all of you that when you leave this city tonight or tomorrow, as the case may be, it will not be good-bye, but simply au revoir.

"We feel that in British Columbia we have a great deal to offer the geologist. Nature has been very prodigal in the distribution of favors to her. We ourselves are but on the fringe of discovering what our own possessions are, and it will not be at all surprising if your visit should reveal to us many things which we have never dreamt of before in the way of minerals and other products. Just to give you an illustration of how far we are from knowing with any degree of accuracy what we have in this Province, I may tell you that some little time ago one of our officials of the fishery department came back from a trip of inspection with the report that he had discovered another great lake, some four miles long and one mile broad, that had not yet been charted at all."

He then proposed the toast of the visitors, which was received with acclamation.

Welcome Acknowledged.

Professor Frank D. Adams, president of the Congress, was the first to respond to the toast. He expressed his very great pleasure at the splendid reception that had been accorded the members of the Congress in the city of Victoria, and in doing that he made special reference to the Provincial Mineralogist, Mr. Wm. Fleet Robertson, who had gone all the way to Ottawa in order to assist in making arrangements for the western excursion parties. In speaking of the Congress, he said that they had twenty-seven different nations represented, which he thought was a record for any kind of a Congress.

"In coming across Canada," he proceeded, "many of the visitors from abroad have had an opportunity of seeing the geological features of the country. Before convening at all a number of them went through the Maritime Provinces, and now, after the Congress, we are touring the whole Dominion. Our time is necessarily short, but at the same time we have been able to see something of the wonderful possibilities for development that are latent in this country. If I might speak with particular reference to the West, I should say that in British Columbia we have had an excellent opportunity of studying conditions. Many of our own men have profited immensely by the advice of the foreign experts, and I feel sure that even in the practical expression of geology benefits will be large and rapid. We have shown our foreign delegates that we are not merely 'Our Lady of the Snows,' but that we have something more than snow and ice. In fact, I think we have established the

truth beyond doubt that we have, in immense proportion, other resources, if I might say so, belonging to the more torrid seasons of the year. When we go from here we will take with us the best possible of recollections of how they do things in the city of Victoria."

From Other Countries.

Dr. E. T. Mellor, of the Geological Survey, South Africa, was the next speaker. Speaking with reference to geology, he said he was greatly pleased to observe that Canadians were enthusiastic about the work and were ready to spend large sums of money upon it. He pointed out that while in many cases the experiments carried on might result in nothing of any practical value being discovered, at the same time he assured them that none of it was wasted and that even the most seemingly fruitless of it would bear fruit in the long run.

"Compared with European countries," he proceeded, "Canada must be regarded as a young country, but she must not forget that there are other countries smaller still, which were looking to Canada for an example. South Africa is looking to you today, and I feel sure that South Africa will be strengthened and encouraged in her course by what we have seen in Canada during this present visit."

Dr. A. C. Lawson, of the University of California, in responding to the toast for the United States, said that he could personally testify to the development of Canada. "A quarter of a century ago I was a resident of British Columbia," he said; "I lived and worked here, and now that I have come back I begin to feel that I have come home. At all events my coming back in this way enables me to testify in a very decided manner to the marvelous development that has taken place in the interval.

"The people to the south of you, of whom I am now one, have gone through the same phase of progress that you are now but entering upon. You have not gone very far, but we are watching you with the keenest of interest. You are deeply interested in the development of your natural resources. You are interested in getting out of the ground that which is in it, and as it is perfectly true that all the material welfare of the world is intimately and absolutely wrapped up in the ground, it is in the very nature of progress that you should be interested in getting out the wonderful substances. That is the work of geology, and that is why you must cultivate the geologist. Perhaps, sometimes, there is a feeling that the discovery of these things is of passing interest and value only, and is sought for by individuals, but that is not the case. There is a deeper wisdom in the hearts of the people which demands a knowledge of what the earth contains.

"I feel that I must say that the success of the Congress is due in a large measure to the labors of the director and officers of the Canadian Geological Survey. Every one of the visiting delegates is deeply indebted to them, and I am sure that none of them more so than those of us who hail from the United States."

M. Louis Emile Gentil, Professor at l'Universite de Paris, France; Professor

Tscherneyschew, Th. Directeur du Comite Geologique de Russia, St. Petersburg, Russia; and Professor Gurich, of Hamburg, Germany, also spoke briefly, in their respective languages.

The proceedings closed with the singing of the National Anthem.

Afterward the party assembled on the steps of the club and had their photographs taken en bloc.

Ladies Entertained.

The luncheon given the ladies connected with the Geological Congress yesterday at the Alexandra Club was one of the pleasantest social features of their visit. Mrs. W. J. Bowser, wife of the Attorney-General and Acting-Premier, performed the duties of hostess with characteristic grace. At Mrs. Bowser's right sat Mrs. Paterson, wife of His Honor the Lieutenant-Governor. The visitors present were:

Mrs. Adams, wife of the president of the Congress, who sat at Mrs. Bower's left; Mrs. L. Carey, Mrs. E. C. Case, Mrs. Coderre, wife of the Minister of Mines, Ottawa; Miss Coderre, Mrs. C. W. Drysdale, Miss M. Ewald, Mrs. Callardeau, Mrs. L. L. Fermor, India; Mrs. B. E. Fernow, Mrs. O. S. Finnie, Miss E. Gregory, Dr. Anna Grutterink, Miss L. Hatch, Mrs. H. E. T. Haultain, Miss A. Heine, Mrs. A. C. Lane, Mrs. F. B. Peck, Mrs. P. D. Quesnel, Dr. C. A. Raisin, Mrs. A. M. E. Rathgen, Miss M. M. Fermier, and Mrs. C. W. Wright.

Those invited to meet the distinguished travelers included Mrs. D. M. Eberts, Mrs. J. A. Macdonald, Mrs. Henry Croft, Mrs. E. G. Prior, Madame Roy, Mrs. J. J. Shallcross, Mrs. Fleet Robertson, Mrs. R. P. Butchart, Mrs. McGregor Young, Madame Bergeron, Mrs. E. O. Scholefield and Miss Dawson, all of whom were members of the reception committee.

Reports of the proceedings of the different excursions of the members after leaving Victoria will appear in our September issue.

Provincial Mining News

(Compiled for the B. C. Mining Exchange by E. Jacobs).

Cariboo.

Announcement has been received of the intention of the Provincial Labor Commission to hold sittings in Cariboo district during September. The dates are: Tete Jaune Cache, 9th; Fort George, 12th; and between 13th and 25th, Barkerville, Quesnel, 150-Mile House, Clinton, Lillooet, and Ashcroft.

Mr. A. Stewart, resident engineer at Quesnel for the Public Works Department, has arranged to make a tour of inspection of the route of the proposed wagon road between Barkerville and Fraser river—from Bear lake through to Fraser river via Goat river.

Drilling, to test the gold-bearing gravel, has been commenced at the Meadows, below the old Kurtz & Lane shaft, on Williams creek, Cariboo, by a New York syndicate, the object being to ascertain

weeks. Six months have passed and not a single one of them is back, nor is likely to be. Within six weeks of the strike being called the company was informing applicants for work that it was full-handed, and ever since it has had more men apply for work than it has had vacancies for. Britannia camp is entirely non-union now, and there is every reason to believe it will continue to be. The management emphatically denies that it has made any compromise with or concession to the Union, or that it has any intention of doing so. It will continue to pay good wages and provide good food and accommodation for men who will do a fair day's work in return.

As an evidence that the company's mining operations were not long seriously hampered by the Union in calling a strike, it may be mentioned that the output of ore for eight months of this year, to August 31, inclusive, was approximately 132,000 tons, which is 11,300 tons greater than the corresponding period of 1912. The action of the local Union of the Western Federation has deprived many men of permanent employment at the Britannia mines, and a few of those called out had been working on the property a long while—up to seven years in individual cases; now they are effectually barred from regaining employment there. Further, the Union has brought about, by withdrawing its members from the Britannia property, the establishment there, in a locality quite free from interference by pickets and other Union devices for worrying workers, of a strong non-union camp, and one that is likely to be there to stay.

HAZELTON DISTRICT MINING NEWS.

The Omineca Miner of the 16th inst. says:

A notable find of copper ore near Tatla lake has been reported by J. P. Thorkildson, who brought in excellent samples of bornite this week. He states that thirty claims have been staked and that a thirty-foot vein, nearly all min-

eral, has been uncovered. Vancouver and Owen Sound people are interested with him in a large group, besides which there are several claims staked by the Indians who first found the showing. The claims lie fifteen miles north of Tatla lake and four miles from the Driftwood river. The ore is reported to assay 25 per cent. in copper, \$10.60 in silver, and a little gold.

"We have had a splendid trip," said P. C. Gillis, who returned on Wednesday from a visit to the Rocher de Boule mountain. Mr. Gillis and Dr. J. R. E. Sievers, two Butte men who are heavily interested in the Rocher de Boule, spent several days on the hill, in company with Dan J. Williams, a well known Butte mining engineer. They visited their own property, the Ohio, Highland Boy and other groups, and were greatly pleased with the showings. "Best of all," Mr. Gillis said, "we found that we could not discount the statements which had been made as to the ore showings. The claims look much better than we expected." After expressing their appreciation of the manner in which they had been treated by everyone they met, and especially by Frank Brown, who guided them through the camp, Mr. Gillis said they would recommend the immediate resumption of development on a large scale on the Rocher de Boule. He expects that work will be under way before the snow flies.

H. C. Hankin and Tom Wallador left today to work on the Monarch and Skookum claims, on Hudson Bay mountain. These claims adjoin the native silver group bonded by Trethewey and Martin.

HIGH VALUE ON SILVER STANDARD ORE.

The Omineca Herald of the 8th inst. says:

Thirty thousand dollars and sixty-one cents was the returns from the Trail smelter for the first shipment of ten

cars of ore from the Silver Standard mine. Two hundred and eighty-two tons of ore went \$106.42 per ton.

This was by far the richest cargo ever hauled over the G.T.P. into Prince Rupert, and it is only the first of many train loads that will leave New Hazelton in the near future. It was the biggest shipment of ore that has yet been made from any of the northern mining camps and it was the richest shipment from any of the quartz camps. It proves the mineral resources of the New Hazelton camp.

One mine on Glen Mountain, four miles from New Hazelton, shipped ten cars of ore that returned over \$30,000. This ore was all taken from the one development shaft on No. 2 vein which is down 250 feet. There was practically no sorting of the ore before sacking.

The Silver Standard is owned by a private company who are developing the property for their own profit. There is no stock for sale to anyone. There was therefore no desire to boost the value of the ore. At that the smelter returns were greater than the members of the company anticipated and great enthusiasm has been aroused locally. The Silver Standard has proven that they have the goods.

Since the first shipment was made development work has been continued and the crosscut tunnel which was driven from the bottom of the shaft to tap the No. 2 vein at the 300 foot level was completed a short time ago. At the present time Manager Haskins is drifting into very choice concentrating ore and the size of the ore body is increasing every day. He has sent down a report, that they are in 40 feet and have a big lot of fine ore. He has also encountered what appears to be a new ore for that property which he thinks will increase the gold values, but before committing himself he sent a sample to the assayer. The Silver Standard has sprung surprises from the beginning and the highest hopes are held by everyone.

The Silver Standard is not the only high grade mine in the New Hazelton Camp. This is by no means a one mine camp. The Erie sent a carload to the smelter which went over \$100 and the Harris mines sent a carload which went over \$70. The latter mine has since broken into into a big rich shoot of ore and every foot of development work has shown an improvement in the property. With every mine that has been developed, the results have been exceptionally good. All have held their own as depth has been attained and there has not been a single blank. In fact the New Hazelton camp holds something of a record and it gives promise of beating all other records and developing into the richest quartz mining camp on the American continent.

On their claims located just above Chicken lake, Jennings Bros. have disclosed a fine showing of galena, says the Omineca Miner.

The machinery is working smoothly at the Richmond mine and the mine is being unwatered preparatory to the commencement of operations.

Not only has the Prince Rupert Exhibition

recognized the importance of the mineral industry of the north by giving more prizes, cups and larger awards than has ever been offered at a previous British Columbia exhibition, but

The Management Extends a Cordial Invitation

to manufacturers and selling agencies of mining machinery to display their products.

THE NORTH'S FIRST EXHIBITION

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For further information write L. BULLOCK-WEBSTER, Secretary.

The British Columbia Agricultural and Industrial Association

PERSONAL AND GENERAL

Movements and News
of Prominent Mining Men

Written for the B. C. Mining
Exchange by E. JACOBS

One of the prominent men who visited British Columbia this month was Dr. Adams, president of the International Geological Congress and leader of the C-1 excursion. Of him, the London Mining Journal's "Who's Who" says: Adams, Frank D., Ph.D., D.Sc., F.G.S., F.R.S., F.R.S. Can.; Dean of the Faculty of Applied Science and Logan Professor of Geology, McGill University, Montreal, Quebec, since 1894; born Montreal, 1859. Educated Montreal High School, McGill University, Yale University, Heidelberg University. On staff of Geological Survey of Canada, 1880; Lecturer in Geology at McGill University, 1889. Publications: Many papers dealing more especially with problems of metamorphism and the older crystalline rocks of the earth's crust, which have appeared in various scientific publications in Canada, England, and the United States; also "Researches on Experimental Geology." Dr. Adams, who during the two-year period to March, 1912, was president of The Canadian Mining Institute, is well and widely known throughout Canada and parts of the United States.

Another well known Canadian, also with the Congress excursionists, was Dr. H. M. Ami, who was a delegate of the Royal Society of Canada, Ottawa. He is on record in "Who's Who" as follows: Ami, Henry M., M.A., D.Sc., F.G.S.; F.G. S. Am.; F.G.S. Switzerland; F.G.S. Can.; Palaeontological Division, Geological Survey of Canada, Ottawa, since 1882; born Belle Riviere, near Montreal, 1858. Education, private tuition; Ottawa Public and Grammar Schools; McGill University, Redpath Exd. Macdonald Scholar and Dawson Prizeman. Faculty of Arts, B.A., 1882; M.A., 1885; D.Sc. (Queen's), 1892; D.Ss. (McGill), 1907. President Ottawa Field-Naturalists Club, 1899-1901. President Ottawa Valley Graduates Society of McGill University, 1902-03. Awarded the Bigsby Medal by Council of Geological Society of London, 1903. Five years in "A" Company, Governor-General's Foot Guards. Publications: "Resources of the Country Between Quebec and Winnipeg Along the Line of the National Transcontinental Railway," and other Government reports; numerous papers on graptolites, palaeozoic faunas of Eastern Canada; publications relating to the Palaeontology and Chronological Geology of Canada, issued in Canada, Great Britain and United States of America. Editor of The Ottawa Naturalist, 1895-1900.

Mr. John Ashworth, M.I.M.E., of Manchester, England, another of the Congress visitors, had been in British Columbia before this trip. He is vice-president of the Manchester Geological and Mining Society and of the I.M.E. When at Rossland recently he said to the Rossland Miner: "This province should become Greater Britain. You have everything here, and the country

needs people." He thinks there are tremendous possibilities in the mineral resources of Western Canada. This development, however, called for large capital. "Nothing short of ample capital should attempt to do anything. It is not only useless but positively harmful for companies of small capital to try to work a mine. Failure means disaster to the whole country as well as to the people directly concerned. Failures give the country a bad name, and there has been altogether too much of that sort of thing in the past. Mining development should be conservatively done to give the company itself and the country the stability it must have to ensure permanence."

Mr. C. J. Seymour Baker is again at Barkerville, having arrived there lately from London, England. He will continue his experiments in connection with the recovery of gold from black sand, and do more development in his gold-quartz claims in Cariboo district.

Dr. Alfred E. Barlow, F.R.S.C., McGill University, Montreal, Quebec, accompanied the Geological Congress excursionists to British Columbia. He is now filling the position of president of The Canadian Mining Institute for a second year. He has long been a most assiduous, unselfish, and aggressive member of the Institute, whether as an ordinary member, councillor, or vice-president, and as president retains his zeal and constant effort for the advancement of its best interests. He was born in Montreal. In the year 1883, he secured the degree of A.B. at McGill University; six years later he became an A.M.; and eleven years after that a Sc.O. Throughout the long period, 1883-1906, he was an officer of the Geological Survey of Canada. The notable geological work he has done, and the excellent monographs he has written, need not be mentioned in detail here. Suffice it to state that his brilliant field work in investigating the nickel-copper field of Sudbury district, Ontario, in particular, brought high reputation to both himself and the Survey, and his memoir on that subject is still a standard. In 1906 he resigned his position on the Survey to undertake important professional work for a European syndicate. Since that time he has been a free lance. While he occasionally lectures at McGill University, in attending to his professional engagements he has to do much traveling about the Dominion.

Mr. T. Walter Beam, of Denver Colorado, now resident at Hedley, in the vicinity of which the New York Syndicate No. 2 is doing some important exploratory work with diamond drills under his direction, was in Victoria late in August, with Mr. Gomer P. Jones, general superintendent for the Hedley Gold Mining Co.

Mr. A. J. Becker, of New Denver, formerly manager of the Lucky Jim zinc

mine, in Slocan district, made a trip to Winnipeg recently.

Mr. W. M. Bennett, manager of the McAllister and Mountain Con mines, Slocan, has returned to Sandon from a business visit to Spokane, Washington.

Mr. D. C. Botting, of Seattle, formerly inspector of coal mines for the State of Washington, accompanied Mr. Geo. Watkin Evans to the Matanuska coal field, Alaska, in connection with getting out coal for tests by United States navy ships.

Dr. R. W. Brock, M.A., F.R.S.C., of Ottawa, Director of the Geological Survey of Canada, is general secretary of the International Geological Congress, to which, in addition to his home representation, he was delegate of the Societa di Naturalisti, Naples, Italy. He is well known in British Columbia, having done much geological work in various parts of the province prior to having been appointed Director of the Survey. When at Rossland with the C-2 excursion, of which he was in charge as leader, he expressed to the Miner the sentiments of the touring experts, and they were all complimentary to that locality. The view of the Flower Show there, Mr. Brock said, was a capital idea, and one that agreeably surprised visitors who were looking for nothing but ore from a town of the high altitude and character of Rossland. He spoke of how Sir Augustine Baker, one of the Irish geologists, had left his lunch to admire one particular variety of flower included in the display, which he had never seen in such a stage of perfection. "The arrangements in Rossland and the reception accorded the delegates have been the finest of any place visited," said Mr. Brock. "The geologists have been delighted with the geological formations of Rossland and the prevalence of metals in the rock." Mr. Brock was personally pleased with the mining situation in Rossland, and quoted several remarks by foreign members of the party, who were astonished at the richness of the ore in sight. While several were mainly interested in coal mining, and all considerably enjoyed their investigations of the Crow's Nest Pass coal areas, the majority wanted to find gold, silver, and lead, and they were consequently delighted with what they found in Rossland camp.

Dr. E. L. Bruce, who had been engaged for several months assisting Dr. Chas. W. Drysdale in his geological work in Rossland camp, has returned to Columbia University, New York, where he is an instructor in mineralogy.

Mr. Frederick K. Brunton, assistant superintendent of the British Columbia Copper Co.'s smelting works in Boundary district, has returned to Greenwood, after having attended the meeting of American Institute of Mining Engineers held lately at Butte, Montana.

Mr. James Buchanan, superintendent of the Consolidated Mining and Smelting Co.'s smelting works at Trail, has returned to that place from a visit to Scotland.

Dr. D. D. Cairnes, of the Geological Survey of Canada, was in Vancouver

toward the end of August, having come south from Yukon Territory to meet the International Geological Congress excursionists and accompany some of them on their trip to Alaska and Yukon. While in Vancouver he gave information concerning the Shushanna gold field, having quite lately been in the vicinity of the "discovery" claim of that field.

Concerning a trip to Ontario made lately by Mr. Lorne A. Campbell, M.L.A., of Rossland, general manager of the West Kootenay Power and Light Co., the Nelson Daily News said: "With the object of inspecting the plans for some of the machinery to be used in the construction of the new unit at the West Kootenay Power and Light Co.'s plant at Bonnington falls, which is to supply power for the Canadian Pacific Railway Co.'s Castlegar to Rossland line, which is to be electrified. Mr. Campbell was in Nelson en route to Milwaukee. The new unit, explained Mr. Campbell, will be of 9,000 h.p., and will increase the total capacity of the company at Bonnington to 29,000 h.p. Of this, 25,000 will be at the upper plant and 4,000 h.p. at the lower plant, it being the plant at the upper falls that is being enlarged."

Mr. C. F. Caldwell, manager for the company operating the Utica mine, about 18 miles from Kaslo, has returned from a visit to Wisconsin, U. S. A.

Mr. H. H. Claudet, formerly of Rossland, was in London recently, having gone there from Switzerland, where he had been putting in an Elmore oil concentration plant.

The Rossland Miner says of a former British Columbia mine superintendent: An old-timer, visiting Rossland this week, after an absence of 10 years, is Neil Cochrane, a mining man who is still interested in property here, especially in the South Belt. Mr. Cochrane is now superintendent of the Jumper Californian Gold Mines, Tuolumne county, California, which he declares to be a dividend-paying concern, and with which he has been connected for seven years. There never was a mining camp, Mr. Cochrane remarked, that did not have its ups and downs, and he was glad to find Rossland's prosperity returning. He left California for a month, to get away from the excessive heat, which had been up to 110 degrees.

Dr. A. P. Coleman, Professor of Geology at the University of Toronto, Toronto, Ontario, had the misfortune to fall and break a small bone in one of his legs when crossing a glacier near Field, to which place he had traveled from Ontario as a member of the Geological Congress C-1 excursion party. He was brought to Vancouver for surgical aid.

Mr. A. Copeland has returned to the Slocan district, and will do more work on his Colonial mining property near Cody.

Another of the Geological Congress visitors was Dr. R. A. Daly, Professor of Geology, Massachusetts Institute of Technology, Boston, who is a delegate of Harvard University, Cambridge, Massachusetts; the Museum of Com-

parative Zoology, Cambridge, and the Boston Society of Natural History. He is by no means a stranger in British Columbia, for he spent several field seasons in making geological investigations along the 49th parallel, when the delimitation of the boundary line between British Columbia and the State of Washington was in progress. Lately he has been engaged, for the Geological Survey of Canada, in work that is part of what is required for the development of a geological map and section, which is to extend along the main line of the Canadian Pacific railway from the Great Plains to the Pacific ocean. He is a Canadian, who ranks high among the leading geologists of the United States. He has contributed many very important papers on the geology of igneous rocks, and is regarded as a prominent authority on this subject.

Mr. M. S. Davys, of New Denver, Slocan lake, managing director for the Silverton Mines, Ltd., paid a short visit to Vancouver and Victoria at the end of August.

Writing on June 28 to a friend in Victoria, B. C., from Bendigo, State of Victoria, Australia, Mr. John Dean, formerly a resident of Rossland, said: "Just a few lines with postcards illustrative of mining in Bendigo. I am told that more than eighty million pounds sterling has been taken out of this camp in dividends, and they are still grinding out considerable gold. One of the interesting features is a mine with hoisting gear and other equipment in the heart of the city, less than 200 ft. from the postoffice and principal hotel with accommodation for 80 guests."

The Kaslo Kootenayan printed the following: Mr. Ed. Dedolph, a former Kaslo resident, the owner of property here and a member of the staff of the Dominion Department of Mines, has been in town several days, having only recently arrived in the Kootenays from Montreal, in which city he has been engaged in department work since leaving Kaslo. Mr. Dedolph has been doing a great deal of research work, and as a result of experiments in the laboratory believes that there is a possibility that the problem of the reduction of zinc and mixed zinc-lead-silver ores by an electrical process that saves value where old processes lose, is solved. His present mission here is to try the plan out at the electric smeltery put up at Fairview some years ago, where it is hoped that the success of the scheme from a commercial standpoint will be demonstrated. Mr. Dedolph is an enthusiastic admirer of the Kootenays, and particularly of Kaslo. People living here, he says, do not realize, as a whole, how well off or how fortunate they are and the possibilities that are about them.

Mr. Walter R. Dewdney, gold commissioner for Greenwood mining division, was married recently to Miss Ferguson, of Midway. Mr. and Mrs. Dewdney spent part of their honeymoon in the Coast cities.

Mr. A. L. Dean, who years ago was on the metallurgical staff at the Trail smelting works and went thence to

Tasmania, where he has since been metallurgist for the Mt. Lyell Mining and Railway Co., lately resigned from that position.

Mr. T. R. Drummond, formerly general manager for the Dominion Copper Co. at Boundary Falls and afterward with the Nipissing Co. at Cobalt, Ontario, recently resigned as mining superintendent for the Inspiration Con. Copper Co., Arizona, U. S. A.

Mr. Howard W. Dubois, managing director for the Quesnelle Hydraulic Gold Mining Co., was at Barkerville, Cariboo, lately.

Mr. Wm. Fernie, of Oak Bay, Vancouver island, has been on one of his periodical visits to the Kootenay country.

Mr. W. E. Finch, manager for the syndicate that is developing the Idaho-Alamo group of mines, in Slocan district, returned to New Denver early in August from a visit to his home in Spokane, Washington.

Mr. D. G. Forbes has been investigating mining conditions in Portland Canal division and Moresby island of the Queen Charlotte group, to report on same to the Provincial Department of Mines.

Mr. S. S. Fowler, general manager for the New Canadian Metal Co., operating the Bluebell lead mine and concentrating mill at Riodel, Kootenay lake, spoke for the mining industry of Kootenay district in the course of an interview at Nelson with the Hon. Louis Coderre, Minister of Mines for Canada. His arguments in favor of assistance to the zinc mining industry were effectively supported by Mr. Ernest Levy, manager of the Le Roi No. 2 mines at Rossland, and the Van-Roi mine, Slocan.

It has been announced that Mr. Geo. L. Fraser is to retire from the management of the coal property of the Columbia Coal and Coke Co., situated between Granite creek and Collins gulch, Tulameen.

Mr. J. D. Galloway, who has been appointed acting assistant to the Provincial Mineralogist, had charge of the exhibit of minerals sent to the Vancouver Exhibition from the Mineral Museum of the Department of Mines, Victoria.

Dr. W. L. Goodwin, F.R.S.C., Director of the School of Mining, Kingston, Ontario, was one of the International Geological Congress excursionists who visited Western Canada at the end of August. He was a delegate to the Congress of the Institution of Mining Engineers, London, England, as well as of the School of Mining over which he presides.

Mr. Lionel Hill, assistant to Mr. Ernest Levy, manager for the Le Roi No. 2, Ltd., has returned to Rossland from a visit to England, whence he went in the summer.

Mr. W. H. Holmes, of Granite creek, Similkameen, was a recent visitor to Hedley. The Gazette said of him: Mr. Holmes came to Granite creek in 1885; he took up the land on the Similkameen in the early nineties, which has ever since been known as Holmes' Flat, and

later went back to Granite creek, where he has since resided. He knew Hedley, or rather the location of Hedley, many years ago, but this is the first time he has been here since there were any houses in the place nearer than Pinto's cabins and the buildings at the missions a short distance below.

In its issue of August 16 the Ashcroft Journal said: "John Hopp, of Barkerville, was in Ashcroft this week. He called at the Journal office and paid his subscription, which goes to prove that the best men of the district appreciate our paper for what little it does contain. Mr. Hopp has large mining interests in Cariboo. He has been made famous lately by his connection with the recent dynamiting celebration, which was thrashed out to Mr. Hopp's satisfaction at the last Clinton assize." To those not informed concerning the "recent dynamiting celebration" mentioned, it may be explained that the manager of an English company that has been spending money on mining property in Cariboo was sentenced to 'three months' imprisonment for having dynamited one of Mr. Hopp's water ditches. Quite lately water gates on this ditch have been opened so as to interfere with the use of the water on one of Mr. Hopp's mining properties, so it seems as if another prosecution may have to be undertaken to prevent a continuance of indulgence in law-breaking propensities existing in the Barkerville district.

Mr. Reginald E. Hore, editor of the Canadian Mining Journal, Toronto, Ontario, was a member of the International Geological Congress Excursion C-2. He was formerly Instructor in Petrography in the Department of Geology, Michigan College of Mines, Houghton, Michigan, U. S. A., and is a well known writer for mining journals.

Mr. Henry Kehoe recently returned to Spokane from Nevada. He will be remembered as having for some time made Vancouver his headquarters when examining mining properties in the Coast district.

Mr. Rowland King has resigned from the laboratory staff at the British Columbia Copper Co.'s smelting works at Greenwood, Boundary district. It is stated that he will take a college course in mining engineering or metallurgy.

Mr. W. W. Leach, of the Geological Survey staff, who had been chosen as one of the guides for the C-2 Excursion of the Geological Congress in the Crow's Nest coal district, was taken ill with fever and so was unable to leave Ottawa to come West with the party.

Mr. Francis D. Little, of Victoria, has been at Hon. James Dunsmuir's Noble Five silver-lead mine, near Cody, Slokan, looking into the question of additional development work proposed to be done there.

The London Mining Journal said, in its issue of August 30: "Sir Richard McBride, K.C., K.C.M.G., the Premier of British Columbia, arrived in England on August 26 by the S.S. 'Mauretania' on a short visit, and is staying at the Savoy hotel."

Mr. James McEvoy, of Toronto, Ontario, who came West with the Inter-

national Geological Congress party in the capacity of associate leader of the C-2 Excursion, was taken ill with pneumonia when en route to the Coast, and on arrival in Vancouver had to go to the hospital for medical treatment and careful nursing. Later he was stated to be convalescent and intending to recuperate at Shawnigan lake, Vancouver island, before returning to Toronto. He was accompanied by Mrs. McEvoy.

Mr. John McLeish, of Ottawa, Chief of the Division of Mineral Resources and Statistics, Mines Branch of the Canada Department of Mines, was secretary to the Excursion C-1 of the International Geological Congress. He has, among other important official duties, the compilation and preparation for publication of the periodical reports on the mineral production of the Dominion. He accompanied the C-1 Excursion to Victoria and Vancouver, and thence to Edmonton, Alberta, before returning East. He had as assistant secretary, Mr. H. S. De Schmid, also of the Mines Branch staff.

Mr. W. W. Mein, of New York, consulting engineer of the Canadian Mining and Exploration Co., Ltd., was at Hedley, Similkameen, recently. He was accompanied by his assistant, Mr. Ralph S. G. Stokes, of San Francisco. They visited the Hedley Gold Mining Co.'s Nickel Plate mine and, as well, looked over the Kingston property, in the same camp.

Mr. John L. Retallack, of Kaslo, recently visited parts of Similkameen and Tulameen districts, in which he looked over a number of mineral claims.

Dr. Heinrich Ries, Professor of Geology, Cornell University, Ithaca, New York, who was one of the Geological Congress excursionists to the Coast, is the foremost authority on clays. He has made many valuable contributions to the knowledge of the clays of America. He has been engaged by the United States Geological Survey and by the State Surveys of Michigan, Maryland, New Jersey, Texas, Wisconsin, and Virginia, to report on clays. During recent years he has done similar work for the Geological Survey of Canada, and this year his field work is in the Boundary and Similkameen districts of this province.

Mr. Frank Robbins, now of Los Angeles, California, will be remembered by many mining men of the province as having years ago been manager of the North Star mine, Kimberley, East Kootenay, which was the first mine in that district to ship silver-lead ore. In a letter recently received by the Provincial Mineralogist, Mr. Robbins acknowledged receipt of the Annual Report of the Minister of Mines for 1912, and paid a warm tribute of appreciation of the value of the report to those who try to keep in touch with the development of the mining industry of the province.

Mr. Wm. Fleet Robertson, Provincial Mineralogist, accompanied the Geological Congress Excursion C-9 from Vancouver to Prince Rupert and thence to Hazelton and Moricetown.

Mr. Oscar Stromberg, who had been construction engineer at the Trail smelting works for about three years, lately

left the province for Colorado, to take a similar position in that state.

Mr. W. F. Teetzel, late Gold Commissioner for the Nelson mining division, has retired from the Provincial Government service and entered that of the Dominion Government. He is remaining in British Columbia.

Mr. J. B. Tyrrell, M.A., F.R.S.C., of Toronto, who accompanied the International Geological excursionists to the Coast, has taken a very prominent part in developing the mineral resources of Canada. He was educated at Weston High School, at Upper Canada College, and at the University of Toronto; B.A. 1880, M.A. 1889, and in the same year degree of B.Sc. from Victoria University. In 1881 he received a commission from the Government of Canada as a geologist on the staff of the Dominion Geological Survey. In 1883 he explored the Rocky Mountains north of the International Boundary. In 1884-86 he was in the Province of Alberta, and determined the course of the gold in Saskatchewan river and outlined the extent of many of the coal seams in the province. In 1887-89 he was exploring in Northwest Manitoba, and in 1890-91 was on and around Lake Winnipeg. In 1892 he was occupied in the previously unknown region southeast of Lake Athabasca, and outlined the geology of that part of the country for the first time. In 1893 he began the exploration of a great unknown region, of about 200,000 square miles in area, between the Mackenzie river and the west coast of Hudson bay, a large part of which is commonly known as the "Barren Grounds," and during that and the next following year he explored and mapped for the first time the Dubawnt and Kazan rivers, two rivers of the first magnitude, as well as numerous smaller streams. The characters of the rocks passed over during these two years were carefully studied, and incidentally observations were made on the glacial geology of the country explored which added greatly to the knowledge of conditions during the Glacial Period, and very largely revolutionized the Glacial Theory as held at that time. For these explorations he was awarded a diploma and the "Back" grant by the Royal Geographical Society, England. In 1895 he investigated the geology of country northeast of Lake Winnipeg and continued investigations into northwest of that lake, where, beside locating the occurrence of several bands of mineral-bearing Huronian rocks, he determined the existence of a large area of rich agricultural land, being the northern continuation of the glacial lake Agassiz. In 1897 he was engaged in the exploration of central and northern Manitoba, and determined the source of supply of the artesian water of the city of Winnipeg. In 1898 he began the investigation of the geology of the Klondike gold-fields and of other parts of Yukon Territory. He resigned from the Geological Survey and afterward—1899-1905—practised as mining engineer at Dawson, Yukon, reporting on many large properties and engaging in mining himself. In 1906 he removed to Toronto, where he has ever since practised as a consulting mining engineer. He has published in various journals and other

publications numerous papers on mining and scientific subjects.

Dr. Charles Doolittle Walcott, secretary of the Smithsonian Institution, Washington, D. C., ranks among the leading geologists of the world. He has made a special study of the oldest fossiliferous formations, and has written numerous volumes on the stratigraphy and palaeontology of the Paleozoic rocks. Dr. Walcott has done some very valuable work in British Columbia, studying the Cambrian in the Rocky mountains from which he has obtained remarkable fossils. After having been for several years on the staff of the United States Geological Survey, Dr. Walcott was in 1894 appointed Director of the Survey, which position he held until 1902, when he joined the Reclamation Service. In 1907 he was appointed secretary of the Smithsonian Institution.

Mr. Ernest Waterman, manager of the Princeton Coal and Land Co., was at the Coast lately, from Similkameen district.

Mr. Bruce White has returned to Kootenay from a prospecting trip to the Athabaska country in northeastern Alberta and northwestern Saskatchewan.

Dr. Alfred W. G. Wilson, of the Mines Branch, Canada Department of Mines, was a member of C-2 Excursion party of the Geological Congress to Victoria and Vancouver and then joined C-8 for the trip to Malaspina glacier and Dawson, Yukon. He is expected to remain in British Columbia some time after his return from the North, to obtain information relative to the zinc mining situation in the province.

Mr. James Wright, managing director of the Grand Trunk British Columbia Coal Co., Vancouver, during the month went to the company's property at Twenty-Mile, about 15 miles east of New Hazelton, Skeena district, to obtain some coal for a bulk test at the works of the Nanaimo Gas and Coke Co. About five tons was shipped, this having been the first lot of coal, other than samples, sent out of the district.

MINERS IN FIRST-AID COMPETITIONS.

Nanaimo was well represented at the St. John Ambulance First Aid competition and demonstration held at Victoria on August 9 in connection with the Victoria Carnival. The Western Fuel Company paid expenses of a number of its employes, the party including the competitors mentioned below and Mr. Thos. McGuckie, the company's general superintendent. Other competitors were supplied by Victoria City Police who, however, had a walkover for police first-aid competition, and by Number three troop Victoria Boy Scouts. Several Victorians also competed in men's civilian competitions. Fourteen ladies competed in their classes.

Before competitions commenced Alderman Cuthbert, president of the Carnival executive committee, made an appropriate address, in the course of which he commended Nanaimo miners,

among others, for taking so much interest in First Aid work, and expressed much appreciation of their attendance to assist in making the Carnival a success. There was a large attendance of public and competitors were frequently applauded. The Victoria Boy Scouts band rendered a number of instrumental selections. Major McTavish, Vancouver, President British Columbia Branch St. John Ambulance Association, and Major Moncrieff, Victoria, were the two judges. The following gives results where Nanaimo men competed:

Miners' competition required competitors to run 100 yards to scene of accident, attend to injured, place him on stretcher, carry him back to judge and answer questions on the case. Two Nanaimo teams first consisted of (1) J. W. Jemson, G. B. Bradshaw, Wm. Neave and Charles Barsby, and (2) of R. B. Fulton, Matthew Gunniss, Thos. Pearson and R. W. Morton. The first-named team won the silver cup, and all eight competitors received medals. Four Nanaimo men competed in the Civilians' First Aid. Out of five teams of two men each, Adam McNeill and John Hamilton were second, and Wm. Brough and Isaac Carruthers third. The same four men won the other Civilians' competition, receiving a cup and four medals. The Brechin team, Jemson, Bradshaw, Neave, and Barsby, were second in the Grand Open competition, Victoria City Police being first and winning cup. Three Nanaimo teams competed in that event. Matthew Gunniss won the Victoria Cross race in which fourteen competed; this competition required competitor to run 100 yards, attend injured man, and carry him back to judge at starting point. In mixed competition, each team consisting of two ladies and two men, Miss Bannister, Miss Whittier, Robert Fulton and Chas. Barsby were first, beating four other teams. Altogether the miners from Nanaimo made a most creditable showing.

SENDS ORE TO EXHIBITION.

E. F. Voigt sent the following ore samples to the Vancouver exhibition all being chalcopiritic and heavily charged with hematite iron: Automatic—largest known ore body in Voigt camp, average values copper, 2½ per cent., gold \$3.50. No. 37—large ore body, well exposed, average assay, copper 4 per cent., gold \$5.50. No. 18—700 feet of tunnels, extensive ore body, copper 8 per cent., gold \$4.50. No. 14—This high grade claim runs an average of copper 9 per cent., gold \$11.50 and has 300,000 tons of ore blocked out.—Similkameen Star.

The B. C. Copper Co. has decided to put in at the old smeltery at Boundary Falls a concentrating plant with which to reduce the percentage of silica in ore from its Lone Star and Washington mine, and so make a product more suitable for smelting with ores from its other mines in the district.

The Jewel mine and mill, of Long lake, are again in operation. A force of 40 men is employed and about fifty tons of ore being treated daily.

CONSISTENT AT ANY RATE.

The Toronto Globe announces that it "stands today where it stood in 1911," In 1911 the Globe was in wrong.—Ottawa Journal.



NOTICE OF CANCELLATION OF RESERVE

NOTICE IS HEREBY GIVEN that the reserve existing on lands embraced in Township 24, Rupert District, notice of which, bearing date June 12, 1912, was published in The B. C. Gazette on June 13, 1912, be cancelled to permit of the pre-emption of said lands under the provisions of Section 10 of the "Land Act" on and after 9 o'clock in the forenoon of Friday, October 17, 1913; all such pre-emption entries to be made in accordance with existing surveys varying in area with a maximum of 40, 80 or 160 acres to each pre-emption, as the said lands may be subdivided by a survey.

R. A. RENWICK,

Deputy Minister of Lands.

Lands Department, Victoria, B. C.
9th July, 1913.

To Surveyors and Prospectors

Messrs. TEMPLE & TRACY having purchased the Ranching and Store business near **Hanceville, B.C.** formerly owned by Mr. Norman Lee, wish to announce that they are prepared to

Outfit and Equip MINING AND SURVEYING PARTIES

who may be going into the Chilcoteen country or towards Bella Coola, with

Provisions, Tools and Pack Horses

on a considerable scale and at reasonable prices.

Varied and Ample Stock of Supplies Always Kept on Hand

For Estimates or Further Particulars, Apply to

Messrs. TEMPLE & TRACY
Hanceville, B.C.



CANCELLATION OF RESERVE.

NOTICE is hereby given that the reserve covering lands formerly held under expired Timber Licences Nos. 39195 and 38196, situated in the vicinity of Powell Lake, New Westminster District, is cancelled, and that said lands will be open for entry by pre-emption on Monday, the 3rd day of November, 1913, at the hour of 9 o'clock in the forenoon.

R. A. RENWICK,

Deputy Minister of Lands.

Lands Department,
Victoria, B. C.

aug. 2

nov. 1



NOTICE OF CANCELLATION OF RESERVE.

NOTICE is hereby given that a reserve covering certain lands situated in the vicinity of North Thompson River, Kamloops District, formerly held under expired Timber Licences Nos. 11267 and 13758, notice of which appeared in the B. C. Gazette on the 27th of December, 1907, is hereby cancelled and said lands will be opened to entry by pre-emption on Monday, the 8th day of December, 1913, at 9 o'clock in the forenoon; application to be made to the Government Agent at Kamloops, B. C.

ROBT. A. RENWICK,
Deputy Minister of Lands.

Lands Department,
Victoria, B. C.,

27th August, 1913.

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NOTICE OF CANCELLATION OF RESERVE.

Notice is hereby given that a reserve, the notice of which appeared in the B. C. Gazette of December 27th, 1907, is cancelled, in so far as it relates to lands formerly held under Special Timber Licences Nos. 32710, 38000, 40345, 10419, 40346, 40127, 31332, 11693, 40347, 40349, 40129, and 33317, all in Kamloops Land District, and the said lands will be open to entry by pre-emption at the hour of 9 o'clock in the forenoon on Friday, October 17th, 1913.

ROBERT A. RENWICK,

Deputy Minister of Lands.

Lands Department, Victoria, B. C.,
15th July, 1913.



NOTICE OF CANCELLATION OF RESERVE.

Notice is hereby given that the reserve covering lands formerly held under expired Timber Licence, No. 37459, notice of which appeared in the B. C. Gazette on the 27th of December, 1907, is cancelled.

The said lands situated on Lasqueti Island, and covering portions of Sections 11, 12, 14 and 15, will be open to pre-emption entry at 9 o'clock in the forenoon on Monday, October 20, 1913; all applications to be made for legal subdivisions of said Sections 11, 12, 14 and 15, Lasqueti Islands, which are within the boundaries of lands formerly covered by said licence.

R. A. RENWICK,

Deputy Minister of Lands.

Lands Department, Victoria, B. C.,
12th July, 1913.



CANCELLATION OF RESERVE.

Notice is hereby given that the reserve covering lands formerly held under expired Timber Licences Nos. 39195 and 38196, situated in the vicinity of Powell Lake, New Westminster District, is cancelled, and that said lands will be open for entry by pre-emption on Monday, the 3rd day of November, 1913, at the hour of 9 o'clock in the forenoon.

R. A. RENWICK,

Deputy Minister of Lands.

Lands Department, Victoria, B. C.,
30th July, 1913.



CANCELLATION OF RESERVE.

Notice is hereby given that the reserve covering lands formerly held under Timber License No. 31020, now expired, situated at Pender Harbor, notice of which appeared in the British Columbia Gazette on the 27th of December, 1907, is cancelled, and that said lands will be open to entry by pre-emption at 9 a.m. on Monday, the 25th day of August, 1913.

R. A. RENWICK,

Deputy Minister of Lands.

Lands Department,
Victoria, B.C., 17th May, 1913.



NOTICE OF REMOVAL OF PROVINCIAL ASSESSOR AND COLLECTOR'S OFFICE.

Notice is hereby given that, on and after June 5, 1913, the Provincial Assessor and Collector's Office, Parliament Buildings, will be removed to the Belmont House, rooms 116, 117, 118, corner of Government and Humboldt Streets, Victoria, B. C.

All assessed taxes on real property, personal property and income, including the taxes due by corporations and others under the "Taxation Act," also all rural school taxes under the "Public Schools Act," for the Victoria assessment district, will, therefore, be payable in future at the above-named offices.

Taxpayers are reminded that in order to obtain the discount of 10 per cent. on the current year's taxes payment must be made to the Collector at the above address on or before the 30th day of June, 1913.

All communications respecting taxes may be addressed to the undersigned, Postoffice Drawer 1597, or to the above address.

E. E. LEASON,

Provincial Assessor and Collector,

Victoria Assessment District.

Dated at Victoria, B. C., June 2, 1913.



CANCELLATION OF RESERVE.

NOTICE is hereby given that the reserve, notice of which appeared in the B. C. Gazette on the 27th of December, 1907, is cancelled in so far as it relates to lands formerly covered by Timber Licence No. 41206, known as Lot 456, Sayward District, and same will be opened to entry by pre-emption on Monday, the first day of December, 1913, at the hour of 9 o'clock in the forenoon.

The lands in question will shortly be subdivided into suitable parcels for pre-emption, and all applications must be made in accordance with such subdivision, particulars of which will be available at the office of the Government Agent, in Vancouver, to whom applications must be submitted.

R. A. RENWICK,

Deputy Minister of Lands.

Lands Department,
Victoria, B. C.,

12th August, 1913.

aug. 16

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With B. Hobson's
compliments
Sheffield

[Extracted from the GEOLOGICAL MAGAZINE, Decade V, Vol. X,
No. 593, pp. 486-90, November, 1913.]

THE TWELFTH INTERNATIONAL GEOLOGICAL CONGRESS IN CANADA.

By B. HOBSON, M.Sc., F.G.S.

AT the Stockholm meeting of the Congress in 1910 an invitation to hold the twelfth meeting in Canada was accepted. As the Congress met in the United States in 1891 and in Mexico in 1906, members were thus afforded an opportunity of visiting all the great divisions of North America. The Canadian meeting was held at Toronto from August 7 to 14, 1913, under the presidency of Professor F. D. Adams, of McGill University. About 600 members attended it, although the total enrolled was nearly twice as great, and 46 countries were represented among the members. The Congress was formally opened by the Right Hon. Sir Charles Fitzpatrick, on behalf of H.R.H. the Duke of Connaught, the Honorary President, who was unavoidably absent, and speeches of welcome were made by others. Dr. R. W. Broek, Director of the Geological Survey of Canada and General Secretary of the Congress, presented to the Congress a monograph entitled "The Coal Resources of the World", the result of an inquiry made upon the initiative of the Executive Committee of the Twelfth Congress, with the assistance of Geological Surveys and mining geologists of different countries. It consists of three quarto volumes of about 400 pages each (11 by 8½ inches) and an atlas of 66 pages of maps in colours (13½ by 19½ inches) published by Morang & Co., of Toronto, at \$25 per set, net. It forms a fitting companion to the volume on the Iron Ore Resources of the World, published under the auspices of the Stockholm Congress.

In the second circular of invitation to the Toronto Congress seven topics were mentioned as having been selected by the Executive Committee as the principal subjects of discussion. The first of these was "The Coal Resources of the World". Not much was said on this subject, no doubt owing to those best qualified to speak having given their views in the monograph. The second subject was "Differentiation in Igneous Magmas". On this subject Professor R. A. Daly read a paper entitled "Sills and Laccoliths illustrating Petrogenesis". He advocated gravitative differentiation and tabulated seventy different sills and laccoliths, in twenty-nine of which he maintained that such differentiation is shown. He also maintained that many species of igneous rocks are due to large-scale assimilation of country rocks by overhead or other stopping, giving rise to syntectic magmas. Dr. A. Harker followed with a paper on "Fractional Crystallization the Prime Factor in the Differentiation of Rock Magmas", in which he pointed out that a rock magma at a temperature below that of the upper part of the temperature range of crystallization must be pictured as an open fabric or sponge of crystalline matter with interstices occupied by liquid magma. Under crustal stresses the interstitial liquid may be squeezed out and thus differentiation may arise, as the crystalline and liquid parts necessarily differ in composition. A stratification and differentiation may also be brought about by gravity acting upon a wholly fluid magma or (more effectively) by the sinking of crystals in a magma still mainly fluid.

Dr. Iddings in a paper on "Some examples of Magmatic Differentiation and their bearing on the problem of Petrographical Provinces" agreed with Dr. H. S. Washington in emphasizing the importance of sufficient analyses. In Dr. Washington's paper on "The Volcanic Cycles in Sardinia" he pointed out that there are three cycles—firstly, that of the extensive early (Tertiary) flows; secondly, that of the two large volcanoes of Monte Arci and Monte Ferru; thirdly, that of the small recent scoria cones. In the first two cycles the sequence began with acid, followed by intermediate and basic rocks. The lavas of the third cycle are felspar basalt in which no definite sequence has as yet been made out. Rocks of typically Atlantic and others of typically Pacific type occur in Sardinia, even in the same volcano, as at Ferru and Arci. Professor W. H. Hobbs in a paper on "Variations in Composition of Pelitic Sediments in relation to Magmatic Differentiation" endeavoured to account for some of the variations in igneous rocks usually attributed to differentiation by supposing many igneous rocks to be the result of the fusion of argillaceous sediments. Dr. V. Sabatini gave "A Classification of the Eruptive Rocks of Italy". The discussion was continued by Dr. J. W. Evans, Professor F. Loewinson-Lessing, Professor A. Bergeat, Dr. W. Cross, and summed up by Professor H. Bäckström, who advocated reserving judgment until more experimental work has been done.

The third subject discussed was the "Influence of Depth on the Character of Metalliferous Deposits". Professor J. F. Kemp opened the discussion with a paper bearing that title. He concluded that (1) while there seems to be nothing to prevent precipitation at greater depths than we have yet reached, yet conditions seem to be specially favourable in those portions which lie between the present surface and 2,000–4,000 feet in depth; (2) secondary enrichment has increased the yield of those portions of many veins which are above 1,000 feet in depth, the vertical extent of its action being limited to a relatively short stretch below the ground-water level. Professor J. P. Krusch followed with a paper on the colloidal precipitation of primary and secondary ores. Professor W. H. Emmons in "The Mineral Composition of Primary Ore as a factor determining the Vertical Range of Metals deposited by Secondary Processes" outlined the processes of enrichment of sulphide ores of gold, silver, and copper, and reviewed some of the more important experiments that may illustrate this process. Dr. L. L. Fermor "On the Formation in Depth of Oxidized Ores and of Secondary Limestones" stated and illustrated the thesis that when deposits consisting of chemical sediments, such as oxides and carbonates as of iron, manganese, or calcium, admixed with mechanical sediments, such as sand and clay, are buried to a depth sufficient to bring them into the zone of anamorphism, reactions take place, which frequently necessitate the elimination from the oxides of oxygen in excess of protoxide proportions, as from Fe_2O_3 and MnO_2 ; of carbon dioxide from carbonates; and of water from hydrated oxides, such as limonite. It seems to be usually tacitly assumed that these escape or are removed from the scene of action, but it is conceivable that the pressure is such that they are unable to escape. When, in course

of time, this pressure is released these substances will probably effect a reversal of the original change. P. F. Fanning gave "A contribution to the Metallogeny of the Philippine Islands", and Dr. M. Maclaren a paper on "The Persistence of Ore in Depth".

The fourth topic discussed was "The Origin and Extent of the Pre-Cambrian Sedimentaries". Dr. J. J. Sederholm in "Different Types of Pre-Cambrian Unconformities" described the conditions in Fenno-Scandia, and incidentally mentioned that "it seems that our separation of the strongly metamorphic schists, near Lake Ladoga, from the Kalevian proper, as a much older subdivision, designated Ladogian, was founded on an erroneous correlation between the post-Kalevian granites at Lake Ladoga and the younger pre-Kalevian granites of Western Finland". In a second paper "On Regional Granitization (or Anatexis)" Sederholm described palingenesis or the formation of new rocks in Finland by the refusion *in situ* of pre-existing igneous or sedimentary rocks. Professor G. A. J. Cole gave "Illustrations of the Formation of Composite Gneisses and Amphibolites in North-West Ireland". Professor W. S. Bayley described "The Pre-Cambrian Sedimentary Rocks in the Highlands of New Jersey". Dr. G. F. Matthew dealt with "Cambrian and Pre-Cambrian in the Maritime Provinces of Canada".

The fifth subject discussed was "The Subdivisions, Correlation, and Terminology of the Pre-Cambrian". Dr. A. Strahan gave an account of "The Subdivisions and Correlation of the Pre-Cambrian Rocks of the British Isles", and stated that we seem to lack justification for attempting a chronological sequence of pre-Cambrian rocks in the British Isles, further than is involved in placing the Lewisian gneiss among the oldest, and the Torridonian among the later formations. Dr. J. Horne described the pre-Cambrian and Dalradian rocks of Scotland. Professor A. C. Lawson read a paper on "A Standard Scale for the Pre-Cambrian Rocks of North America", in which he took the Lake Superior region as typical, and tabulated in ascending order Couthiching, Kewatin (grouped together as Ontarian), Laurentian granite gneiss, batholithic in Ontarian, *Unconformity*, Lower Huronian, *Unconformity*, Upper Huronian, Algoman granite gneiss, batholithic in Huronian, *Eparchæan Interval*, Animikie, *Unconformity*, Keweenawan (Nipigon), grouped together as Algonkian, *Unconformity*, Upper Cambrian (Potsdam). Mr. W. H. Collins, of the Geological Survey of Canada, in "A Classification of the Pre-Cambrian Formations in the region east of Lake Superior", announced that the gap of 70 miles between the Sudbury and the Cobalt districts has been investigated by the Geological Survey and was closed last autumn so that the sequences in the two areas can be correlated, and he gave a table of correlation. Professor A. P. Coleman read a paper on "The Sudbury Series and its bearing on Pre-Cambrian Classification". The impression made upon the writer by the discussion on American pre-Cambrian classification was that hardly two authorities agree, and that the grouping under the name of Huronian of three or more systems, separated by great unconformities, only leads to confusion. Mr. E. Vredenburg and Sir T. H.

Holland gave separate papers on the classification of the pre-Cambrian in India, and Dr. J. J. Sederholm read "Some Proposals concerning the Nomenclature of the Pre-Cambrian, etc.", the most important of which led to a resolution passed by the Congress that countries which possess contiguous areas of pre-Cambrian rocks should form international committees, including representatives of their Geological Surveys, for the purpose of correlating their pre-Cambrian formations.

The sixth topic of discussion was "To what extent was the Ice Age broken by Interglacial Periods?" Mr. G. W. Lamplugh opened the discussion with a paper on "The Interglacial Problem in the British Isles". [This subject was dealt with in detail in his address to the Geological Section of the British Association at York in 1906.] He now stated that his views "have not been modified since in any essential particular", nor could he see any "reason for supposing that our Islands had been more than once enwrapped by ice-sheets, however the case may stand in other countries"; and is of opinion "that the great ice-sheets held their ground in the basins surrounding our Islands throughout the deposition of the drift series, and that the supposed Interglacial deposits are indicative only of marginal fluctuations and of the independent culmination of separate lobes during the long period of glaciation".

Professor A. P. Coleman gave "An Estimate of Post-Glacial and Interglacial Time in North America"; Mr. N. O. Holst gave (in French) "The Beginning and End of the Glacial Period"; Dr. Warren Upham, "The Sangamon Interglacial Stage in Minnesota and Westward." Professor T. F. W. Wolff, "On Glacial and Interglacial in North Germany," stated that there were three glaciations in that region, and that at Phöben near Potsdam in one and the same borehole two stratigraphically and faunistically distinct interglacial horizons occur, the lower with *Paludina diluviana* and the upper with *P. Duboisii*.

The seventh topic for discussion was "The Physical and Faunal Characteristics of the Palæozoic Seas, with reference to the value of the Recurrence of Seas in establishing Geological Systems". Professor T. C. Chamberlin contributed "The Shelf Seas of the Palæozoic and their relations to Diastrophism and Geological Systems". Professor G. Steinmann followed with "The Palæozoic Seas in South America". Professor C. Schuchert read a paper on "The Delimitation of the Geologic Periods illustrated by the Palæogeography of North America". He has drawn up eighty-five maps of North American geographies since the Cambrian. He proposes to divide geologic time into periods based on the amount of submergence as measured by the area submerged as shown on these maps. The Cambrian is divided into Waucobic, Acadic, Ozarkic; the Ordovician into Canadic, Ordovicic, Cincinnatic; the Mississippian into Mississippic, Tennesic; while the Pennsylvanic and Permian are united in a single system. Dr. E. O. Ulrich discussed "The Ordovician-Silurian Boundary", and incidentally rejected Schuchert's Cincinnatic System. Professor F. Frech described "The Palæozoics of the Bagdad Railway". Dr. O. Holtedahl in his paper "On the Old Red

Sandstone Series of North-Western Spitzbergen" gave the following correlation:—

<i>Spitzbergen.</i>	<i>Thickness.</i>	<i>Scotland.</i>
Wijde Bay Series . . .	2,000 metres . . .	Upper Old Red.
Grey Hoek Series . . .	2,000 ,, . . .	Middle Old Red (Orcadian).
Wood Bay Series . . .	2,500 ,, . . .	Lower Old Red (Caledonian).
Red Bay Series . . .	2,300 ,, . . .	Downtonian.

For want of guide fossils in the Grey Hoek Series its contemporaneity with the Middle Old Red is not proved. A paper on Periodicity of Palæozoic orogenic movements by T. C. Chamberlin and R. T. Chamberlin was also read. Six papers on tectonics and many miscellaneous papers were contributed, among which two papers on the geology of Argentina, by H. Keidel and Bailey Willis respectively, deserve special mention.

No account of the meeting of the Geological Congress in Canada would be complete without a reference to the excursions, which were to many the most attractive feature. Twelve excursions were arranged to take place before the meeting. The chief of these were that to Quebec and the Maritime Provinces, led by G. A. Young, J. M. Clarke, E. R. Faribault, etc., occupying nineteen days; that to Haliburton-Bancroft (Ontario), conducted by F. D. Adams and A. E. Barlow, seven days; and that to Sudbury-Cobalt-Porcupine (Ontario), led by W. G. Miller, ten days. Ten short excursions took place during the meeting and nine excursions after the meeting. The chief of these were the two great transcontinental excursions, C 1, by the Canadian Pacific main line over the Kicking Horse Pass to Victoria, Vancouver Island, and back, twenty-three days, and C 2, by the Crow's Nest Pass to the same place and back, twenty-three days, and last, but not least, C 8, to Yukon and Malaspina and back, twenty-five days. The excursions were splendidly organized, and in connexion with them guidebooks, in ten sections, divided into thirteen handbooks, were prepared. These comprised a total of 2,012 pages, illustrated by 154 maps, mostly coloured, 41 sections or drawings, and 281 process reproductions of photographs. They not only summarize pre-existing knowledge, but contain much new material.

If in this short account little has been said of the public functions, such as the conferring of honorary degrees and the unveiling at Percé and at Ottawa of memorial tablets to Sir William Logan, strict limitations of space must be the writer's excuse.

Program (subject to revision)

Thursday Aug. 21st

Leave Wilson 4:00 a.m.

Up at 6:00 a.m. to see contents and structure
mine shafts of Iron Mine of Arrow Lake
breakfast 6:30 a.m.

Leave Grand Forks 8:45 a.m.

Visit large copper smelter

Leave Grand Forks 10:45 a.m.

Leave Elliott 11:35 a.m.

Change from Vancouver train to 500 - local
train for climb up to Phoenix

See lunch on train

Leave Phoenix 12:45 p.m.

Ground surface section Curlew Mine to Grandby
Mine plans and mine model in Grandby office

Refreshments at Grandby

Refreshments at Grandby

Party divides

A Surface party to Grandby & Grandby Mine

B Underground party for Grandby Mine

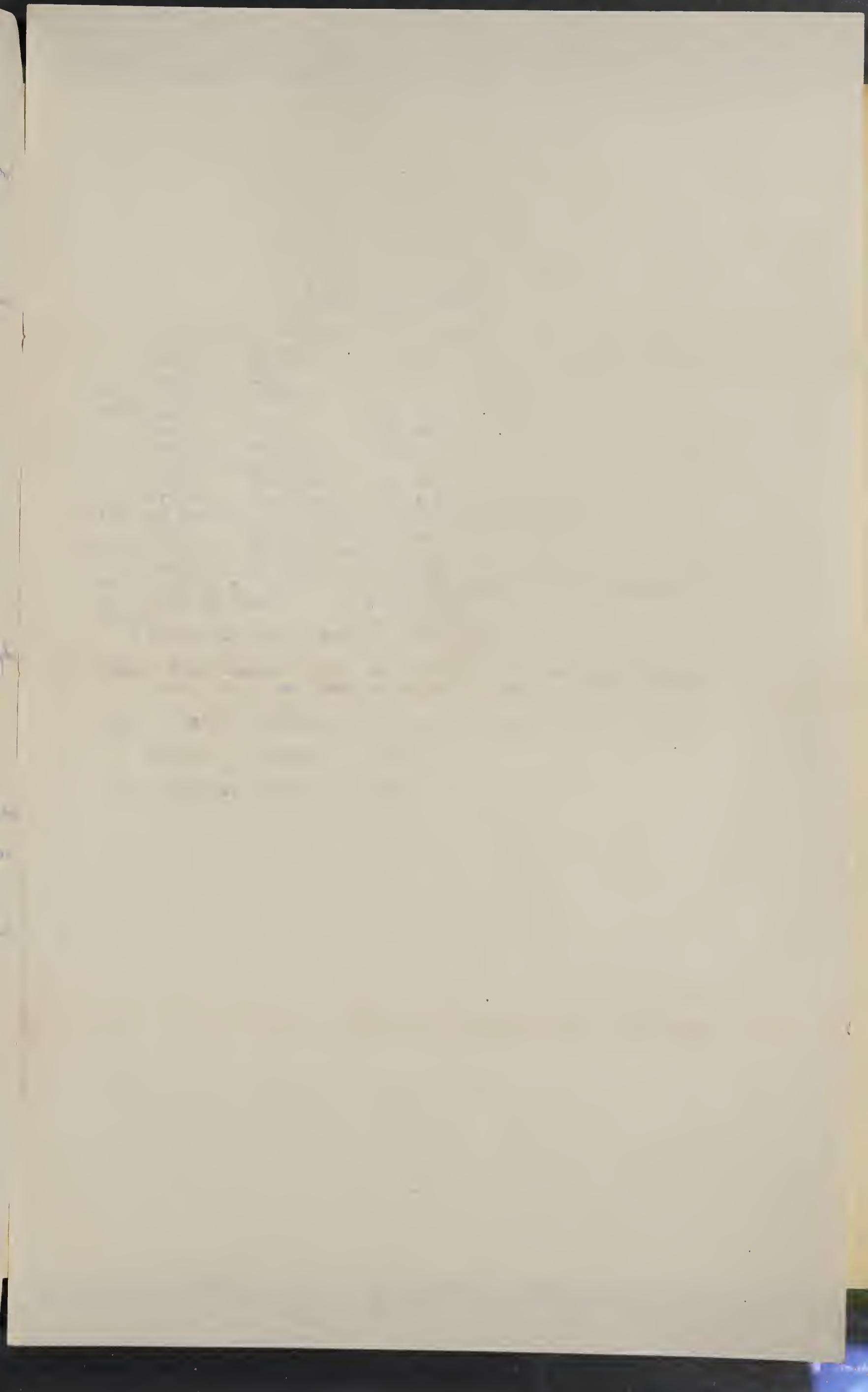
Leave Phoenix 5:00 p.m.

Walk to Grandby 4 miles, breakfast
down hill.

Arrive on one mine train 6:30 p.m.

Visit Grandby smelter 8:00 p.m.

Leave Grandby 9:00 p.m.



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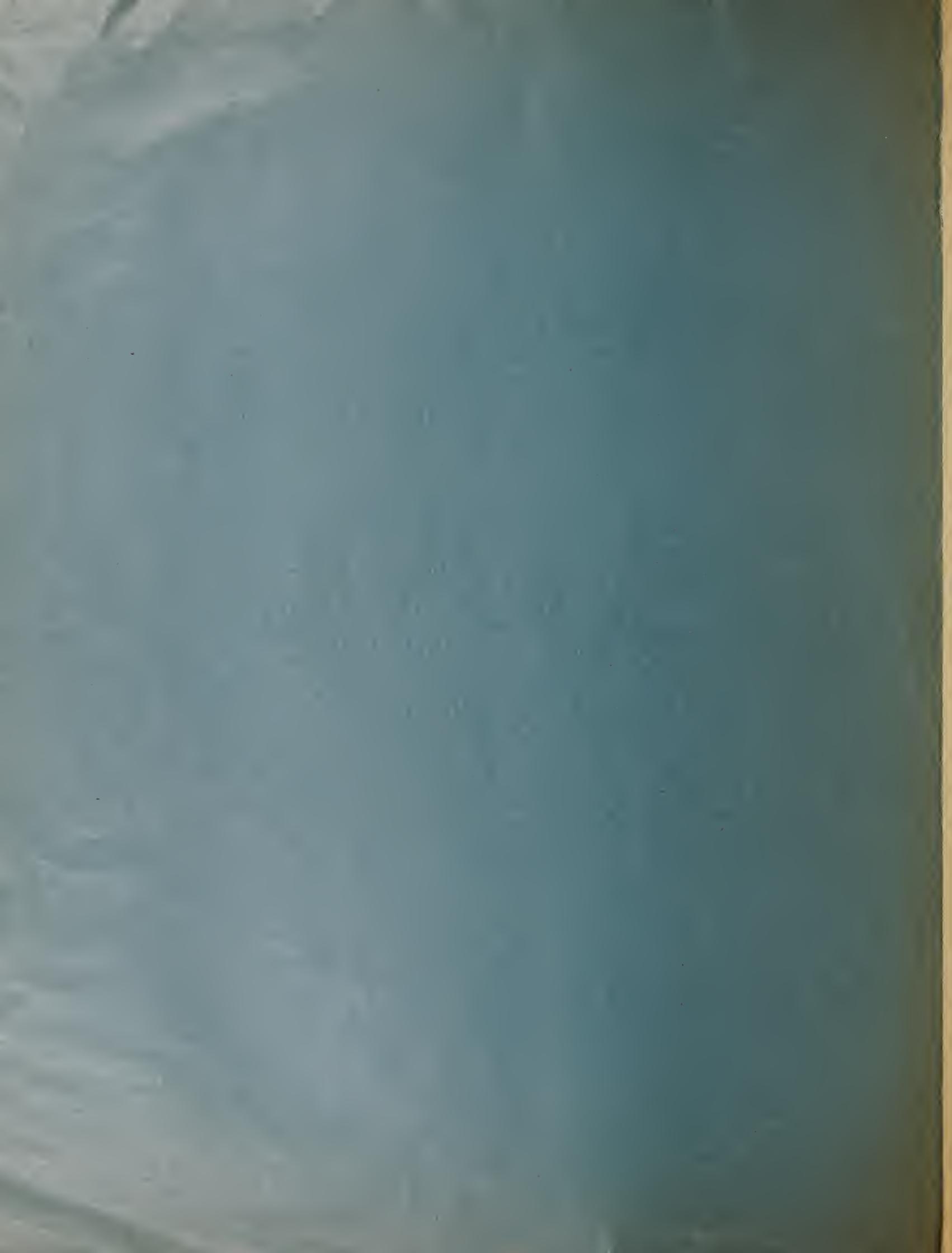
Cordial Souvenir

P. S.

L'EXCURSION A1 DU XII^e CONGRÈS GÉOLOGIQUE INTERNATIONAL :
LA RÉGION APPALACHIENNE DU CANADA

L'EXCURSION C1 DU XII^e CONGRÈS GÉOLOGIQUE INTERNATIONAL :
LES TERRAINS PRÉCAMBRIENS DE LA RÉGION DES LACS ;
LES PROBLÈMES TECTONIQUES DES GRANDES CHAINES DE L'OUEST

PAR M. PIERRE TERMIER.



INSTITUT DE FRANCE.

ACADÉMIE DES SCIENCES.

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t. 137, p. 621 (séance du 20 octobre 1913).

GÉOLOGIE. — *L'Excursion A₁ du XII^e Congrès géologique international :
la région appalachienne du Canada.* Note de M. **PIERRE TERMIER.**

Parmi les très nombreuses excursions au Canada qu'avait organisées le Comité directeur du XII^e Congrès géologique international, deux s'annonçaient comme particulièrement importantes, comme devant offrir au voyageur le moyen de connaître, en quelques semaines, l'état présent de toute la géologie canadienne, et de se faire une idée exacte des problèmes non encore résolus : l'excursion A₁, dans la province de Québec et les Provinces Maritimes; l'excursion C₁, transcontinentale et prolongée jusqu'au Pacifique. J'ai eu la joie de prendre part à toutes les deux. La première a duré 18 jours, du 13 juillet au 1^{er} août; la deuxième 23 jours, du 14 août au 6 septembre. Elles ont été favorisées par un temps admirable.

L'excursion A₁, conduite avec beaucoup de science et de dévouement par MM. G.-A. Young, P.-E. Raymond, J.-M. Clarke, W.-A. Bell, E.-R. Faribault, W.-H. Twenhofel, J.-E. Hyde, nous a promenés à travers la région de terrains primaires, les uns très plissés, les autres simplement ondulés ou même demeurés presque horizontaux, qui s'étend entre le fleuve Saint-Laurent et la côte atlantique de la Nouvelle-Écosse. J'appelle ce pays *la région appalachienne du Canada* : car il est le prolongement, en territoire canadien, de la région primaire plissée, dite des Appalaches, qui joue un si grand rôle dans l'Est des États-Unis. La même bande plissée s'en va, plus au nord, former Terre-Neuve; elle s'enfonce ensuite sous les eaux de l'Atlantique, et Marcel Bertrand croyait la voir, dans les

profondeurs océaniques, se raccorder avec la bande plissée armoricaine. L'intérêt de l'excursion, à mes yeux, était double : stratigraphique et tectonique. Étudier, avec les meilleurs connaisseurs, toute une série primaire, presque complète et souvent riche en fossiles; discerner les plissements de cette série, les suivre et les dater, dans une bande plissée qui ne mesure guère moins de 600^{km} en largeur, et qu'il fallait parcourir, en longueur, sur plus de 500^{km} : c'était de quoi s'occuper, et même se passionner, pendant 18 jours.

La région appalachienne du Canada longe, en se serrant et se moulant contre lui, le bord sud-oriental de la Laurentia. On sait que la Laurentia (d'Eduard Suess), qu'on appelle encore le Bouclier canadien, est un immense domaine de la surface terrestre demeuré comme figé depuis les temps cambriens : toutes les couches que l'on y rencontre, et qui ne sont point antérieures au Cambrien, sont horizontales; elles peuvent être faillées et dénivellées, elles ne sont ni redressées, ni plissées. Cette Laurentia figée comprend la plus grande partie du Canada; au Sud, elle s'avance très loin dans les États-Unis. Elle va à l'Ouest jusqu'aux Montagnes Rocheuses, au Nord-Ouest jusqu'au Mackenzie, au Nord jusqu'aux montagnes récemment découvertes dans les Terres d'Ellesmere, de Grinnell et de Grant; au Nord-Est, elle se prolonge sous l'Atlantique; et l'ancien continent Nord-Atlantique, dont le Groenland et l'Islande ne sont que des débris, lui appartenait presque en entier. Québec est un point du bord sud-oriental de la Laurentia. Au nord-est de Québec, ce même bord coïncide avec la vallée du Saint-Laurent; il s'infléchit vers l'Est, puis vers le Sud-Est, le long du rivage de la Gaspésie, passant entre ce rivage et la côte sud de l'île d'Anticosti; sous les eaux du Golfe du Saint-Laurent, il contourne Anticosti et, reprenant la direction du Nord-Est, passe au détroit de Belle-Isle pour se perdre ensuite dans l'Atlantique. Au sud-ouest de Québec, le bord sud-oriental de la Laurentia traverse la vallée du Saint-Laurent, puis, prenant peu à peu la direction S.-S.-O. et même une direction presque S., s'en va coïncider avec la longue dépression du lac Champlain. Partout où l'on peut le voir, ce bord sud-oriental de la Laurentia est une grande faille. Entre les deux pays que sépare la faille, le contraste est frappant : contraste dans l'allure des terrains paléozoïques, ici parfaitement horizontaux; là plissés, contournés, parfois broyés; contraste dans le relief du sol, beaucoup plus accusé dans la Laurentia qui est un pays surélevé, formé d'ailleurs de roches dures, tandis que le pays de Paléozoïque plissé est une contrée basse, profondément usée, aux formes molles.

Il y a peu de régions, à la surface de la Terre, où la géographie actuelle

soit aussi intimement liée à une très vieille géologie, où les traits actuels du relief aient une aussi grande antiquité, que dans la région appalachienne du Canada. On a pu dire que, depuis le Cambrien, ou tout au moins depuis l'Ordovicien inférieur, le Saint-Laurent existe, presque à la même place à partir du lieu où se trouve aujourd'hui Québec : tantôt à l'état de chenal maritime, long et étroit, servant de fosse temporaire pour une active sédimentation marine, contournant Anticosti par le sud et passant par Belle-Isle; tantôt à l'état de vaste vallée fluviale, colligeant les eaux de l'immense continent américain et les portant à la mer, comme aujourd'hui, dans le voisinage du détroit de Cabot. Tout autour du Golfe du Saint-Laurent, le dessin des côtes est un vieux dessin, déterminé dans ses grandes lignes par des phénomènes antérieurs au Carbonifère. La péninsule de la Nouvelle-Écosse, de forme si curieuse, est un chaînon précambrien, jadis relié à Terre-Neuve, recouvert en partie par toute une série transgressive qui est elle-même demeurée presque horizontale, mais manifestant néanmoins l'allure précambrien dans l'alignement de ses collines et de ses côtes, dans les *rias* qui accidentent l'île entière du Cap-Breton. La Baie de Fundy n'a guère changé depuis les temps triasiques; et, aux temps triasiques, elle ressemblait beaucoup à ce qu'elle était dans les temps carbonifères. Il suffit de très peu d'imagination pour voir ce pays aux différentes époques du Paléozoïque, au Gothlandien, au Dévonien supérieur, au Westphalien, au Permien. En vérité, si quelque membre de notre humanité avait vécu dans ces temps prodigieusement reculés, à la fin du Dévonien, par exemple; s'il avait alors parcouru toute cette région appalachienne, déjà plissée et se préparant déjà pour la grande transgression carbonifère; et s'il revenait aujourd'hui, après des milliers de siècles de sommeil ou d'exil, dans la Gaspésie, le Nouveau-Brunswick ou la Nouvelle-Écosse, il ne s'y sentirait point étranger.

Les grands mouvements orogéniques, dans la région appalachienne du Canada, sont d'âge dévonien. Comme toujours, ils ont été lentement préparés par des mouvements préliminaires; et, après eux, pendant longtemps, le sol a continué de s'onduler. Mouvements préliminaires et ondulations posthumes ont eu, en grand, la même direction que le plissement principal. Les mouvements préliminaires les plus anciens remontent au Cambrien. C'est au Cambrien que l'histoire a cessé d'être la même pour la Laurentia et pour la région appalachienne.

L'âge du plissement principal n'a peut-être pas été partout exactement le même. Dans la Gaspésie et autour de la Baie des Chaleurs, où il y a deux séries dévoniennes très fossilifères, l'une du Dévonien inférieur, l'autre du

Dévonien supérieur, et où la grande disordannée se place entre ces deux séries, le plissement principal est daté d'une façon assez précise : il s'est fait dans le Dévonien moyen. Nulle part, il ne paraît avoir tardé jusqu'au Dinantien.

Ce plissement principal, d'âge dévonien, a été extrêmement énergique. Les plis sont souvent très serrés, avec tendance générale à un déversement, à un chevauchement vers le Nord-Ouest. C'est la poussée vers la Laurentia, signalée depuis longtemps. Peut-être a-t-elle été jusqu'à la formation de véritables nappes, qui auraient peu à peu disparu. Nous n'avons vu qu'un recouvrement indiscutable, celui de l'Ordovicien du Cap des Rosiers par le Dévonien inférieur du Cap Bon-Ami et de la Grande-Grève, à l'extrême pointe de la Gaspésie. La surface de charriage, malheureusement peu visible, plonge ici au S.-O., sous un angle d'environ 30°.

Très souvent, les plis sont droits et les couches verticales. Les phénomènes d'écrasement et de laminage ne m'ont paru ni très fréquents, ni très intenses. J'en ai vu pourtant de très beaux à la mine de fer de Bathurst, au sud de la Baie des Chaleurs : un microgranite laminé, prenant l'aspect de gneiss, et même l'aspect de phyllades luisants, gris ou vert clair, dans une bande d'Ordovicien plissé. Il y a des écrasements analogues, et bien plus fréquents, dans les terrains azoïques de la Nouvelle-Écosse, granites et diabases de la côte est du Bras-d'Or, phyllades aurifères et granites de la région d'Halifax ; mais ces terrains sont probablement précambriens et leur plissement appartient à une époque beaucoup plus reculée que le plissement appalachien.

Les plis d'âge dévonien sont, d'une façon générale, dirigés du S.-O. au N.-E. Ce sont eux, comme je l'ai dit plus haut, qui déterminent l'allongement de la Nouvelle-Écosse et de l'île du Cap-Breton ; eux aussi qui déterminent les *rias* de cette île et ceux de Terre-Neuve. Mais les plus occidentaux de ces plis, ceux qui sont tout contre le bord de la Laurentia, s'infléchissent, à partir de Sainte-Anne-des-Monts, parallèlement à la côte de la Gaspésie. À Gaspé et à Percé, ils sont orientés vers le S.-E. Il est clair que c'est là une sinuosité toute locale et que les mêmes plis, aujourd'hui cachés au fond du Golfe du Saint-Laurent, reprennent bientôt, entre Anticosti et les Magdalen-Islands, la direction du N.-E. Le manteau carbonifère du Nouveau-Brunswick empêche de voir le même mouvement sinueux dans les plis dévoniens de cette province. Il semble que l'on retrouve une sinuosité analogue, mais très atténuée, sur la rive orientale de la Baie de Fundy, dans le long fjord (Minas Bay) qui la prolonge, et dans le pays qui s'étend entre Truro et Arisaig : elle serait alors manifestée par

les ondulations posthumes beaucoup plus que par les plis dévoniens, à peu près invisibles. En tout cas, la région effondrée de l'ancienne chaîne dévoniennne, qui est devenue le Golfe du Saint-Laurent, correspond à un resserrement très énergique du faisceau de plis; et il me semble voir, sous les eaux du golfe, tous les plis de la Gaspésie se serrer et s'écraser le long de la côte occidentale de Terre-Neuve.

Cette grande chaîne dévoniennne, large d'au moins 600^{km} dans sa partie la plus large, large encore de 400^{km} dans le nord de Terre-Neuve, se continuait sans doute, vers le Nord-Est, bien au delà. Mais allait-elle, comme le voulait Marcel Bertrand, vers le sud de l'Angleterre et vers la Bretagne? Je ne le crois pas, maintenant que j'ai vu. La chaîne dévoniennne du Canada est une chaîne *calédonienne tardive*, je veux dire par là un rameau de la grande chaîne du nord de l'Écosse constitué un peu plus tard que le rameau écossais. C'est avec les Highlands d'Écosse que les vieilles montagnes terre-neuviennes me paraissent se raccorder, à travers l'Atlantique.

Ici, comme là, sur les plis calédoniens partiellement arasés, s'étendent, transgressifs et riches en conglomérats grossiers, les Grès Rouges. Ceux du Canada sont un peu plus jeunes que ceux d'Écosse et leurs termes élevés sont d'âge dinantien. Ces Grès Rouges du Canada, datés, çà et là, par des Poissons ou des Plantes, sont souvent restés presque horizontaux. Les formations de Bonaventure, de Scaumenac, des Horton Bluffs, leur appartiennent. Les couches dites de Windsor (avec calcaires à Brachiopodes et nombreux amas de gypse) me paraissent être la partie haute, incontestablement dinantienne, du même complexe.

Après le dépôt de ce manteau de Grès Rouges, et sans doute vers la fin du Dinantien, nouveau mouvement, peu intense, déplaçant légèrement les rivages et produisant, çà et là, des lacunes et des discordances dans la sédimentation. Puis, dans une aire peu étendue de l'ancienne chaîne, aire correspondant à la région nord-est du Nouveau-Brunswick, à l'île du Prince-Édouard, à l'île du Cap-Breton et au nord-ouest de la Nouvelle-Écosse, le Westphalien se dépose, presque partout avec d'énormes épaisseurs. La base de ce Westphalien est souvent désignée sous le nom de *Riversdale and Union formation* et assimilée, d'une façon assez imprécise, au Millstone Grit; elle renferme beaucoup de couches rouges, grès ou schistes, et de nombreux schistes noirs à *Leaia* et à *Anthracomya*; ce seul groupe peut avoir plus de 3000^m de puissance. La partie haute est un Houiller productif, exploité très activement sur divers points (Stellarton, Pictou, Sydney, etc.), mesurant 600^m d'épaisseur à Sydney, plus de 2000^m à Joggins. Peut-être les couches les plus élevées de ce Houiller productif sont-elles stéphaniennes.

Nouveau mouvement encore, nouvelle discordance et nouvelle formation de conglomérats, à l'époque stéphanienne. Le conglomérat de New-Glasgow est la base d'une série fort épaisse de sédiments grossiers, dont la partie haute est permienne, et qui forment aujourd'hui toute l'île du Prince-Édouard et presque tout l'isthme qui rattache la Nouvelle-Écosse au continent. Le Trias de la Baie de Fundy, qui s'avance au nord jusqu'à Truro, correspond à un épisode analogue, mais plus tardif et ayant affecté une région que la transgression permienne n'avait sans doute pas atteinte.

Trias et Permien sont demeurés à peu près horizontaux. Dans le vaste manteau carbonifère, dont l'épaisseur peut aller à près de 4000^m, il n'y a, en général, que des ondulations, ou encore des dénivellations par failles. Le Houiller de Sydney et de la Baie des Glaces s'enfonce doucement sous la mer, avec une faible pente et une régularité parfaite; et l'exploitation s'avance déjà hardiment sous les flots de l'Atlantique. Nulle part, nous n'avons vu le Carbonifère véritablement plissé. Il l'est cependant, sur quelques points, dans le sud du Nouveau-Brunswick et aussi à Pictou; mais ces plissements locaux ne sont intenses, paraît-il, que dans le Carbonifère le plus ancien.

Les analogies stratigraphiques entre le Carbonifère des Provinces Maritimes et celui de l'Angleterre et du nord de la France sont tout à fait remarquables. On les a d'ailleurs signalées depuis longtemps. Mais, tectoniquement parlant, il n'y a pas de liaison directe entre les Appalaches et la chaîne houillère européenne. Dans le Canada, la chaîne appalachienne est une chaîne d'âge dévonien moyen, donc une chaîne calédonienne; et les mouvements qui l'ont affectée, à diverses reprises, au Carbonifère, au Permien, peut-être encore au début du Trias, sont de très petits mouvements, qui ne méritent pas d'être appelés autrement que *mouvements posthumes*. Plus loin au Sud-Ouest, dans les États-Unis, ces mouvements posthumes sont peu à peu devenus plus intenses et ont réédifié une vraie chaîne, un vrai chaînon d'*Altaïdes américaines*, dans l'exact prolongement des *Calédonides canadiennes*.

INSTITUT DE FRANCE.

ACADÉMIE DES SCIENCES.

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t. 157, p. 747 (séance du 3 novembre 1913).

GÉOLOGIE. — *L'Excursion C 1 du XII^e Congrès géologique international : les terrains précambriens de la région des Lacs ; les problèmes tectoniques des grandes chaînes de l'Ouest.* Note de M. **PIERRE TERMIER.**

L'Excursion C 1 du XII^e Congrès géologique international, partie le 14 août de Toronto et rentrée dans cette ville le 6 septembre, a visité successivement : la rive nord du lac Supérieur, les lacs Steepröck et Bad Vermilion, le lac de la Pluie, les affleurements siluriens des environs de Winnipeg, les Montagnes-Rocheuses entre Bankhead et Golden, la chaîne des Selkirk entre Golden et Revelstoke, les Columbia Ranges entre Revelstoke et le lac Shuswap, le Plateau Intérieur, les gorges de la Fraser au travers des Coast Ranges, les environs de Vancouver et de Victoria ; et, au retour, la Prairie entre Calgary et Dauphin, le lac Winnipegosis, le lac des Bois, Port-Arthur, enfin les gîtes de nickel et de cuivre de Sudbury. Le Professeur Fr.-D. Adams avait assumé la charge écrasante de diriger cette caravane de 120 géologues sur un parcours de plus de 8000^{km}. Grâce à la prudence, au dévouement, à la science de cet excellent chef, le programme s'est accompli à souhait. Dans le détail des courses, nous étions guidés par des savants du plus haut mérite, MM. A.-P. Coleman, A.-C. Lawson, R.-A. Daly, J.-B. Tyrrell, J.-A. Allan, A.-E. Barlow, A.-L. Parsons, A. Mac Lean, W.-L. Uglow, D.-B. Dowling, Ch.-W. Drysdale, Ch. Camsell, Ch.-A. Clapp. Pour raconter tout ce que nous avons vu, il faudrait plusieurs volumes. Je ne veux parler ici que des deux questions qui m'attiraient le plus : la question du Précambrien, et la question, obscure encore, de la structure des grandes chaînes de l'Ouest.

Précambrien de la région des Lacs. — Le Professeur Lawson, qui est assurément l'un des meilleurs connaisseurs de cette partie de la Laurentia, classe ainsi qu'il suit, *de haut en bas*, les terrains précambriens de la région des Lacs : Keweenawien, Animikie, Algoman, groupe de la Seine, groupe du lac Steeproek, Laurentien, Keewatin, Coutchiching. Les deux termes supérieurs, Keweenaw et Animikie, forment l'Algonkien. Les autres termes, *et tous ceux que l'on trouvera plus tard au-dessous d'eux*, forment l'Archéen. C'est entre l'Archéen et l'Algonkien que semble se placer la grande discordance, le principal épisode de la formation de la *chaîne huronienne*. Le mot *huronien*, qui a été appliqué tout à la fois à l'Animikie, au Keewatin et aux terrains intermédiaires, ne peut plus être conservé pour désigner un système d'étages ; mais on peut encore l'employer pour désigner l'ensemble des mouvements orogéniques précambriens. Algoman et Laurentien sont deux venues granitiques, d'âge différent ; et ces mots ne s'appliquent à aucune série sédimentaire. Les groupes Seine et Steeproek sont au contraire des étages de sédiments : Steeproek est discordant sur Keewatin, Seine discordant sur Steeproek. Keewatin est une série schisteuse où abondent les formations volcaniques (roches basiques intrusives, tufs, *agglomerates*) et que les granites recoupent et injectent. Sous Keewatin, il y a une série cristallophyllienne, concordante, *dont on ne connaît que la partie haute*, faite de micaschistes (*Coutchiching*).

Nous avons très bien vu tout cela. L'Algonkien, sur la rive nord du lac Supérieur, est presque horizontal. On sait que, sur la rive sud du même lac, il s'enfonce sous le Cambrien, fournissant ainsi un point de départ très sûr à qui veut remonter dans l'énorme série précambrienne. Seine et Steeproek sont plissés l'un et l'autre, avec des allures nettement différentes ; Steeproek beaucoup plus plissé, redressé et serré que Seine. Il me paraît *certain* que ces deux groupes sont pré-algonkiens ; et il est *presque certain* que Steeproek, plus ancien que Seine, en est séparé par une discordance. Les fossiles trouvés en 1911 par M. Lawson, dans les calcaires de la série Steeproek, sont donc — avec les Crinoïdes découverts à la même date, par M. Cayeux, dans les minerais de fer huroniens — *les plus anciens fossiles connus*. Nous avons visité leur gisement : ce sont de grands organismes analogues à des Éponges (*Atikokana lawsoni*).

Steeproek et Seine sont discordants sur Keewatin : là encore, il n'y a pas le moindre doute. A la Mine Centre, près du lac Bad Vermilion, la base de la série Seine est formée d'un conglomérat à gros galets de granite, de microgranite, de schistes et de roches vertes du Keewatin : ce conglomérat

repose en transgression et en forte discordance sur le Keewatin, qui est, lui-même, traversé et injecté par le granite et le microgranite.

Enfin, au lac de la Pluie, nous avons observé, dans un anticlinal du Keewatin, les micaschistes sous-jacents : l'ensemble, Keewatin et Coutchiching, est recoupé par un granite que M. Lawson rapporte à l'Algoman; cet ensemble paraît concordant.

On ne sait rien autre. Le Keewatin, toujours assez semblable à lui-même, se retrouve à l'Ouest dans le Manitoba, à l'Est dans les régions de Sudbury, de Cobalt et de Porcupine, peut-être même très loin dans la province de Québec. Ça et là, discordants sur lui, on observe des sédiments (séries Sudbury, Temiskaming, etc.), sans doute assimilables à Steeprock et à Seine, et, comme ces derniers, postérieurs à la grande venue granitique. Mais, sur d'immenses espaces, il n'y a que granites et gneiss, ou forêt sans affleurements, ou Glaciaire : et l'on reste alors désarmé. C'est dire combien est courte encore, et lacunaire, et imprécise, notre connaissance du Précambrien dans le Centre et l'Est du Canada.

Problèmes tectoniques des grandes chaînes de l'Ouest. — On a coutume de décomposer, un peu arbitrairement et artificiellement, les grandes chaînes de l'Ouest, ou Cordillères canadiennes, en plusieurs bandes ou zones parallèles, qui diffèrent par la stratigraphie et la physiographie, et entre lesquelles on est tenté de placer des discontinuités. Ce sont, de l'est à l'ouest : les Montagnes-Rocheuses, les Selkirk, les Columbia Ranges, le Plateau Intérieur, les Coast Ranges.

Dans les Rocheuses, on connaît toute une série sédimentaire, presque continue, assez bien datée, sans aucune discordance importante, et dont la plupart des termes sont très épais : Crétacé (avec anthracite et houille), Jurassique, Permien, Carbonifère (presque exclusivement calcaire), Dévonien, Silurien, Cambrien, Précambrien. Le Crétacé a 1300^m de puissance, le Carbonifère 1600^m, le Dévonien 1800^m, l'Ordovicien plus de 2000^m, le Cambrien plus de 5000^m. Ce dernier terrain est très fossilifère et renferme l'admirable faune décrite par M. C.-D. Walcott. Le Précambrien est schisteux, non métamorphique. Son substratum est inconnu.

La tectonique s'ordonne ainsi. A l'est, les terrains sont plissés en une série isoclinale couchée sur le Crétacé de la Prairie. Dans cette série, où toutes les assises sont concordantes, les flancs inverses des plis et les charnières ont disparu : on a donc un paquet d'écaillés, toutes plongeant vers l'O.-S.-O., paquet où le Carbonifère joue le rôle principal. Dans les environs

de Banff il y a au moins cinq écaïlles distinctes, donc cinq plis. Les failles, dessinées sur les cartes et les coupes, ne sont que les surfaces de base des écaïlles. J'ai vu l'une de ces surfaces à Bankhead, qui met en contact le calcaire dévonien et les schistes crétacés parfaitement parallèles : le Dévonien, qui surmonte le Crétacé, est, sur 1^m ou 2^m d'épaisseur, transformé en *mylonite*. Tout le système d'écaïlles *semble plonger sous* le vaste pays tabulaire, formé de Cambrien et de Précambrien presque horizontaux, qui est le pays des hautes montagnes. Dans ce pays tabulaire, que nous avons étudié à Laggan et à Field, les couches cambriennes sont d'une régularité parfaite : largement ondulées, parfois faillées, *elles ne sont pas laminées*. Vers l'ouest de la zone tabulaire, les couches se mettent à plonger à l'O.-S.-O. ; le Cambrien s'enfonce ainsi sous une bande de terrain siluriens de plus en plus redressés et plissés. Les plis de cette bande silurienne, dans leur ensemble, sont déversés au S.-O. ; mais ils sont souvent verticaux. Au total, les Rocheuses sont un pays tabulaire surélevé, formé des couches les plus anciennes, demeurées presque horizontales ; et, de part et d'autre, ce pays tabulaire est flanqué de séries isoclinales plongeant sous lui. L'allure générale des Rocheuses est une allure en éventail.

Dans les Selkirk, séparés des Rocheuses par un grand accident le long duquel coule la Columbia et que personne n'a encore observé, les terrains sont tout autres : ce sont des quartzites et des phyllades *azoïques*, quelques niveaux de marbres, enfin des gneiss. Les quartzites les plus élevés sont assimilés, par M. Daly, aux quartzites du Cambrien inférieur des Rocheuses ; le reste des sédiments est assimilé au Beltien (Précambrien) du Montana. Tout cet ensemble a environ 10000^m de puissance et est parfaitement concordant. La base, grésuse ou conglomératique, est discordante sur les gneiss. Beaucoup d'assises sont très cristallines, même dans les quartzites supérieurs. *Les phénomènes de laminage m'ont paru fréquents*. Dans la partie inférieure du complexe rapporté au Beltien, il y a près de 3000^m d'épaisseur de phyllades (Quarzphyllit) sériciteux, *charbonneux*, parfois calcaires : c'est la *Laurie métargillite* de M. Daly.

La tectonique des Selkirk est simple, en apparence ; dans l'est, couches largement ondulées, suivant une direction parallèle à la chaîne ; dans l'ouest, relèvement général des couches, produisant bientôt l'apparition au jour du substratum gneissique. Ce relèvement se fait sous un angle faible (environ 25° en moyenne).

Les Columbia Ranges, entre Revelstoke et Sicamous, ne montrent que terrains métamorphiques et granite. Les terrains métamorphiques sont des

gneiss, des micaschistes, *des calcschistes micacés, avec lits de marbre, extraordinairement semblables à nos Schistes lustrés des Alpes*, des phyllades. C'est la série dite du lac Shuswap : toutes les couches y sont concordantes, et, à toute hauteur, il y a des lits granitiques interstratifiés (sills). Au N.-O., elle supporte, sans discordance, une énorme accumulation (3000^m d'épaisseur) de laves et de tufs volcaniques, l'*Adams lake formation*, d'âge inconnu.

Tectoniquement parlant, les Columbia Ranges m'ont paru ressembler aux Selkirk, et je ne crois pas à l'existence, entre ces deux zones, d'une discontinuité. La série Shuswap est fréquemment horizontale, ou faiblement inclinée. *Les phénomènes de laminage y sont fréquents.* Dans la région de Barkerville que j'ai visitée autrefois, à 300^{km} ou 400^{km} au N.-O. de Sicamous, les *Schistes du Cariboo*, qui paraissent être le prolongement des terrains Shuswap, sont énergiquement plissés, en plis dirigés N. 60° O. et non déversés.

Le Plateau Intérieur est formé, dans sa partie haute, de sédiments et de coulées volcaniques, demeurés presque horizontaux, d'âge oligocène ou miocène. Cet épais manteau, postérieur au plissement des Cordillères, étant supposé enlevé, il reste un substratum très plissé où l'on connaît du Carbonifère, du Trias et du Jurassique (*Nicola group*), du Crétacé inférieur, enfin de l'Éocène. Ces termes sont tous fort puissants : le groupe Nicola, à lui seul, aurait 4000^m d'épaisseur, dont les neuf dixièmes en laves ou tufs. Ça et là, on observe des amas granitiques, assimilés à ceux des Coast Ranges, et attribués, comme âge, au Jurassique. La tectonique est mal connue. Les plis sont serrés, et leur direction générale est N.-O.

Enfin, les *Coast Ranges* sont surtout formées de diorite quartzifère (granodiorite) et de granite, avec de longues bandes plissées de Carbonifère et de Crétacé inférieur. Les roches granitiques sont de deux âges : jurassique et crétacé. L'Éocène et le Crétacé supérieur, peu plissés, n'apparaissent que sur la côte et dans les îles. On connaît, ça et là, du Jurassique fossilifère. Mais toute cette stratigraphie est encore bien imprécise, à cause de l'immensité du pays, de la densité trop grande de la forêt, et aussi de l'abondance des laves et des tufs dans presque tous les étages. La tectonique, naturellement, est incertaine. Mais j'insiste sur ce fait, trop timidement signalé : *la fréquence et l'intensité des écrasements.* La plus grande partie de la ville de Victoria est bâtie sur des roches granitiques ou dioritiques écrasées. Dans le Howe Sound, près de Vancouver, les hautes falaises sont faites, les unes de diorite quartzifère, les autres de schistes paléozoïques

verticaux, d'âge inconnu, coupés de bandes microgranitiques : ces bandes sont totalement érasées, laminées et transformées en phyllades. *Les Coast Ranges sont le lieu des plissements les plus intenses et des écrasements les plus complets, entre toutes les Cordillères canadiennes.* Il ne faudra pas perdre cela de vue.

On sait qu'au N. du 56^e parallèle, le long de la côte, d'autres plis apparaissent, très serrés, et déversés vers le Pacifique, ou, ce qui revient au même, s'enfonçant sous les Coast Ranges. C'est la chaîne du Saint-Elie. Son prolongement méridional est caché sous les flots.

Cette division du grand pays plissé de l'Ouest en bandes parallèles rappelle singulièrement les zones des Alpes occidentales, de Charles Lory, ou encore les zones des Alpes orientales avant 1903 : des bandes mal définies, sans limites précises, ou séparées par de grandes dépressions longitudinales *dont la signification géologique est inconnue.* Ed. Suess admet seulement trois bandes : Saint-Elie, Chaîne intermédiaire, Rocheuses. Mais Saint-Elie n'est que le faisceau extérieur, à déversement ouest, des Coast Ranges ; et celles-ci ne diffèrent du faisceau plissé du Plateau Intérieur que par l'abondance plus grande des roches granitiques. Pour moi, je préférerais la division suivante : Cordillère occidentale, à plissements et écrasements intenses ; Cordillère centrale, comprenant surtout des terrains métamorphiques et de *très vieux* terrains, et d'allure tectonique *en apparence* plus tranquille (c'est la bande des terrains aurifères ; elle comprend Shuswap, Columbia Ranges, Selkirk, Cariboo, Finlay, Yukon) ; enfin Cordillère orientale (Montagnes-Rocheuses) dont j'ai dit l'allure en éventail, et qui comprend l'immense série paléozoïque, sans terrains métamorphiques.

En somme, une zone centrale, faite de *très vieux* terrains et de terrains métamorphiques, où le plissement *paraît* avoir le minimum d'intensité ; et deux zones bordières très plissées (surtout celle de l'ouest), manifestant l'une et l'autre une tendance au déversement à l'extérieur de la chaîne, celle de l'O. vers le Pacifique, celle de l'E. vers la Prairie, et contenant des terrains relativement jeunes : tel est l'ensemble de la grande chaîne, large de 600^{km} à 700^{km}, qui sépare la Prairie du Pacifique.

Cette chaîne s'est faite en plusieurs fois, comme toutes les chaînes ; mais il y a eu un épisode principal, probablement vers la fin du Crétacé, ou vers le début de l'Éocène : et cet épisode, dont nous ignorons la durée, a dû agir sur toute la chaîne, sinon simultanément, du moins avec continuité. En quoi a-t-il consisté ? Personne, encore, ne pourrait le dire.

Nulle part, dans la région que j'ai visitée, je n'ai eu l'impression du *pays de nappes*, cette impression d'*incohérence organisée* que l'on a presque partout dans les Alpes. Le Cambrien des hautes montagnes, dans les Rocheuses, a vraiment l'air d'être à peu près *en place*. Sans doute, il est classé vers l'Est, sur la série isoclinale de Banff, mais ce déplacement semble être de faible amplitude; et l'on sait d'ailleurs que l'allure isoclinale de la bande extérieure et son déversement sur la Prairie s'atténuent au nord et disparaissent, pour faire place à une allure de plis très simples.

S'il y a eu de grands charriages, dans l'Ouest canadien, c'est au sein de la Cordillère centrale que l'on découvrira des preuves de leur existence. Je crois volontiers, comme M. Daly, à l'âge *beltien* d'une partie des terrains des Selkirk; mais je suis moins convaincu de l'âge *prébeltien* des terrains métamorphiques du Shuswap et du Cariboo. *A côté d'une région où le granite est monté jusque dans le Jurassique, et même jusque dans le Crétacé inférieur, il y a de fortes vraisemblances pour que les séries cristallophylliennes soient jeunes.* S'il en était ainsi, si les calcschistes micacés de Sicamous, par exemple, étaient paléozoïques ou mésozoïques, comme tout changerait dans l'histoire de la chaîne, et quelles lumières nouvelles sur toute la région côtière du Pacifique! Les écrasements, si manifestes, des Coast Ranges, n'auraient plus rien d'étonnant. Sachons attendre, et faisons confiance aux géologues américains!

ILLUSTRATED SECTION OF THE TORONTO SUNDAY WORLD

33RD YEAR—PAGES 1 TO 8

TORONTO SUNDAY MORNING AUGUST 17 1913

—PRICE FIVE CENTS.

Hardy Swimmers Race Across the Harbor---Geologists' Garden Party



MRS. CHARLETON, ONE OF THE PROMINENT WOMEN AT THE GEOLOGISTS' GARDEN PARTY.



THE DUNLAP ROSEDALE RESIDENCE AND GROUNDS DURING THE GARDEN PARTY GIVEN TO THE VISITING GEOLOGISTS.



MRS. D. A. DUNLAP AND HER LITTLE SON.

A Variety of Picnics--Political, Military, Scottish and Plain Social



NORTH TORONTO LIBERAL-CONSERVATIVE ASSOCIATION PICNIC.

On the platform—Bottom row, seated, left to right: W. S. Dinnick, W. F. Maclean, M.P., E. A. Donovan, M.L.A., F. Howe. Second row, standing: R. McCarrie, A. H. Birmingham, W. Baillie, W. G. Ellis, H. McCrae, C. S. Henry, H. H. Ball. Third row, standing: S. Hall, S. Robins, H. A. Laffree, T. Brennand, A. Macdonald, J. Shackleton, O. Renale.



NEW METHOD LAUNDRY PICNIC AT NIAGARA-ON-THE-LAKE.



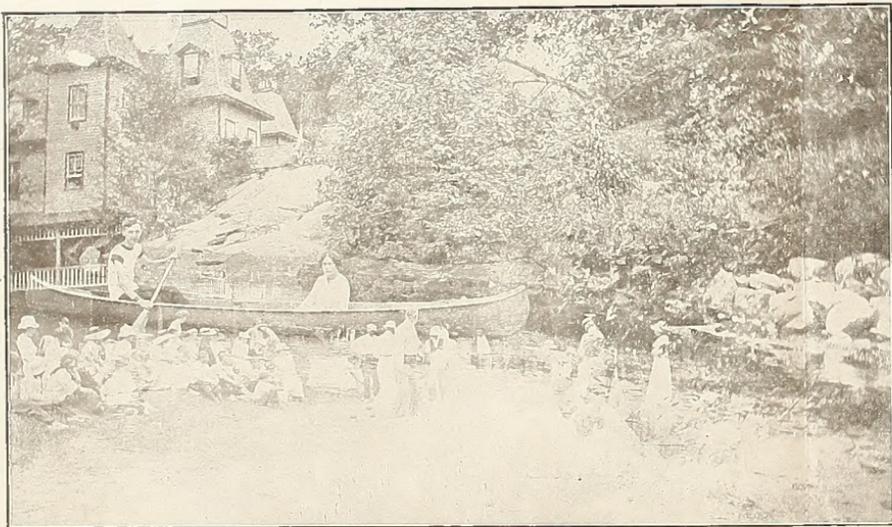
RAMESES PATROL AT THEIR FIRST ANNUAL PICNIC, HELD AT ISLAND PARK.

Gathering of Geologists From the Ends of the Earth, & Daring Couple on 7,000-mile Canoe Trip



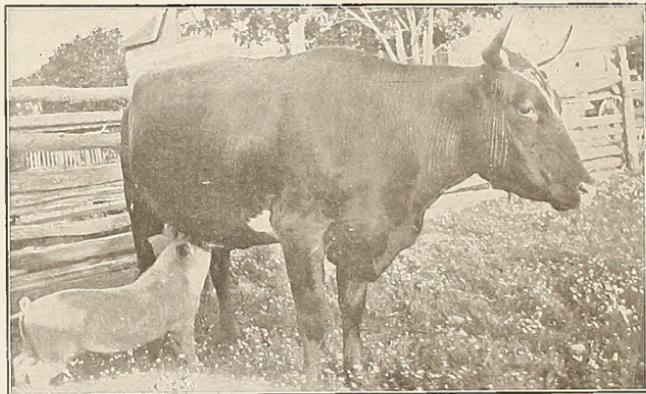
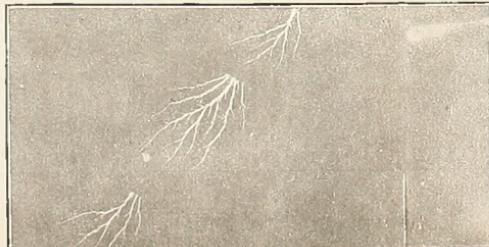
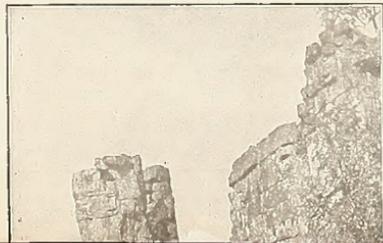
A NOTABLE GATHERING—THE 270 DELEGATES TO THE 12TH INTERNATIONAL GEOLOGICAL CONGRESS AT TORONTO UNIVERSITY. The above picture was taken at the beautiful front entrance to the main building of Toronto University. The big group includes some of the foremost figures in the realm of geology and the kindred sciences, men whose discoveries have corrected or confirmed our conceptions of the world's formation, and its history previous to the era recorded by man. There were 270 delegates from 46 countries. Dr. Coleman, Dr. Miller, Dr. Parkes, and Mr. J. B. Tyrell were among the prominent representatives of Canada. The Congress included about a score of ladies, members either in their own right as geologists, or in that of their distinguished husbands.

A Page of Freak Pictures---Tricky Work of the Camera and Some Tricks of Nature



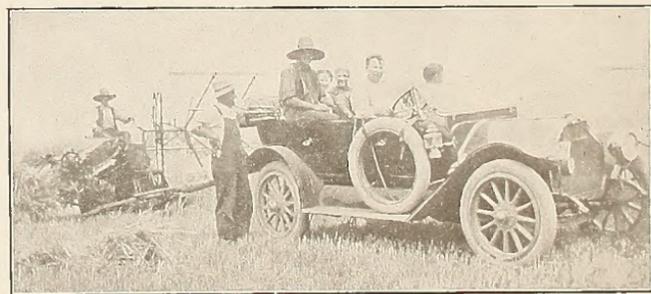
FIRST PRIZE PICTURE—"CANOING AND BOWLING."

This remarkable picture, snapped by a postcard camera, is simply the result of a twice-exposed film, but it is so unique that it wins first place, and its author, Harold McCoque, Pinelands, Muskoka, gets the first prize of \$5. It shows a couple canoing in front of the Belmont Hotel, and underneath a group on the Belmont bowling green.



SECOND PRIZE PICTURE—"THE FOSTER MOTHER."

Here is a truly unusual picture. It needs no explanation. Miss Flora Neelands secured the snap at Waterloo Farm, Stroud, Ont., and wins the second prize of \$2.00.



MOTOR CAR DISPLACES THE HORSES.

Do you recognize James Simpson, the well-known Toronto labor leader, driving his car on Mr. Barton's farm at Beeton, Ont., and drawing the blunder through the fields of grain? He says it worked well.

Map of Part of the ONTARIO INTERLAKE PENINSULA

Showing SHORE-LINES of ANCIENT GREAT LAKES

To illustrate Report of A. F. HUNTER, M.A. 1905

Scale 8 miles to 1 Inch = 64000



Drawn for Photolithography from Postal Map of Ontario, by L.N. Richard.

