

Experiment 8.—Paper and wood were used as in experiment 7, with a nucleus of jagged gold set free from quartz by means of hydrofluoric acid; the nucleus lost .0013 gramme.

Experiment 9.—Similar to experiment 8 with a nucleus of native gold from Sandhurst (Bendigo). This showed a loss of .0001 gramme.

On incinerating the cork, cedar, &c., which had been used for reducing the gold, the residue retained the original form, but much shrunken and as has been observed by others, the microscopic structure of a cut section presents the appearance of burnished gold from the pressure of the knife.

No.	Nucleus.	Reducing matter.	Original weight of nucleus.	Weight of nucleus after experiment.	Difference in gms.	Number of days.
1.	Nugget	Dust from air.	3.4920	3.4900	.0020	168
2.	Gold foil	" " " "	1.5152	1.5110	.0042	168
3.	" " " "	" " " "	1.1713	1.1675	.0038	168
4.	" " " "	with cork	1.1410	1.1410	None	273
5.	" " " "	with filter paper.	.8500	.8464	.0036	273
6.	" " " "	Phosphorus in ether	.9330	.9326	.0004	273
7.	Gold in quartz.	paper and wood.	1.7630	1.7609	.0021	58
8.	Gold from " " " "	" " " " " " " "	2.8487	2.8474	.0013	58
9.	" " " " " " " "	" " " " " " " "	.6574	.6573	.0001	58

The above experiments all show that instead of the nucleus or nugget of gold increasing in weight and size in the presence of organic matter, there is a decrease which is just the reverse of the effects obtained by Wilkinson, Daintree, and others.

The loss in weight of the nucleus may have been due to the removal of small quantities of impurity in the gold used as a nucleus, the native gold would of course contain silver and other impurities, but the gold foil was regarded as particularly pure by the late Dr. Leibius of the Sydney Mint, by whom it had been assayed. This will be the subject of further experiment, the point of chief interest at this stage is that the nuclei did not show any increase in weight.

(To be continued.)

ONTARIO MINING INSTITUTE.

Proceedings of the Kingston Meeting on 3rd and 4th January—A Large Addition to the Membership—Many Papers of Interest Discussed.

The second ordinary meeting of the Ontario Mining Institute opened in Carruthers' Hall, on Thursday morning, 3rd January, Dr. W. L. Goodwin, Vice-President, in the chair.

THE SECRETARY read the minutes of previous meeting, which were confirmed; also a letter from the President, Mr. James Connec, M.P.P., regretting inability to be present.

Federation.

THE SECRETARY submitted the Report of the Mining Society of Nova Scotia on a scheme for the federation of existing Canadian Mining Associations.

MR. HAMILTON MERRITT also presented the report of the Committee of the Institute which had been forwarded to the Quebec and Nova Scotia Societies.

After considerable discussion the Report of the Mining Society of Nova Scotia was in the main approved, but the clause anent subscriptions was referred to a sub-committee comprising Prof. Goodwin, Prof. Nichol, Mr. A. Blue, Director of Mines, and the Secretary, to report at a later stage of the proceedings. This committee after due consideration recommended the following amendments to the consideration of the Quebec and Nova Scotia Societies:—"That each of the Societies in the Federation shall pay the expenses of printing and illustrating its own portion of the Proceedings of the Institute, the rate per page not to exceed one dollar and a half." (Or as an alternative.) "The Societies in the Federation shall each pay an annual subscription towards the expenses of the Institute of such an amount as may be determined upon at each annual meeting, but the contribution from each society shall at no time exceed in amount the sum of three dollars per capita."

Meetings and Student Membership.

THE SECRETARY tabled a notice of motion to amend the Constitution and By-laws so that two meetings of the Institute should be held in each year, instead of three as at present; also, so as to create a student membership at a nominal fee.

Legislation re Mining Engineers.

MR. HAMILTON MERRITT moved the appointment of a committee comprising Prof. Goodwin, Dr. Coleman and Mr. Merritt, to report upon the advisability and feasibility of legislation for the registration in the Province of duly qualified mining engineers. It was highly desirable, he thought, that where such educational institutions existed in Ontario as the School of Mining and the School of Practical Science, something should be done to prevent or to minimize the practice of quacks in the profession. It seemed to be the rule in Ontario that where people were engaged in an occupation in which life and limb were endangered they should be required to conform to a certain standard of qualification. The matter had been under consideration and had been discussed in Nova Scotia. Personally he thought that mining engineers had as much right to protection as doctors, dentists and lawyers.

MR. B. T. A. BELL thought that the motion might be tabled for discussion as to ways and means at a future meeting. While in sympathy with the principle involved he could not see how legislation would improve matters. He could mention cases in which the biggest frauds had been perpetrated by mining experts who had all the letters in the alphabet behind their names. Some of the ablest and most competent mine managers were men who had never seen a school of mines or taken a degree. A science course would never compensate for the absence of honesty or common sense.

PROF. NICHOL having seconded Mr. Merritt's motion, it was put to the meeting and carried.

New Members.

The following were elected to membership:—

Mr. John Donnelly, Kingston.	Prof. Carr Harris, Kingston.
Mr. B. H. Klock, Klock's Mills.	Mr. Bruce Carruthers, Kingston.
Mr. W. G. Kidd, Kingston.	Mr. T. L. Walker, Kingston.
Mr. Wm. Mason, Kingston.	Mr. J. Newlands, Kingston.
Prof. Dupuis, Kingston.	Mr. E. Musgrove, Kingston.
Mr. Fred. Burroughs, Napanee.	

The morning session then adjourned.

AFTERNOON SESSION.

The members re-assembled at three o'clock, Mr. W. Hamilton Merritt in the chair. Dr. Goodwin opened with an excellent address on "Nature's Concentration of Minerals," which we hope to reproduce in a future issue, together with the discussion that followed.

Diabase Dykes in the Sudbury Region.

MR. T. L. WALKER, M.A.

During the past few years the rocks of this region have received considerable attention. At the time of the construction of the Canadian Pacific Railway in 1884, Professor Bonney (1) of London visited the district and made a careful microscopic study of the rocks found near the railway lines. His attention was directed chiefly to the metamorphic rocks of the Huronian belt. In 1890 the late Professor G. H. Williams was entrusted by the Canadian Geological Survey with the microscopic study (2) of a collection of Sudbury rocks. This collection had reference principally to the rocks associated with the copper-nickel ores. Baron Von Foullon (3) of Vienna spent a few weeks during 1890 studying these rocks in the field, especially with a view to ascertaining the relative ages of the different rocks.

The so called Sudbury region is composed of a belt of Huronian rocks striking north-east and south-west. The rocks to the south-east and north-west of this belt are chiefly granites and gneisses. The Huronian belt is here made up of hornblende schists, quartzites and slates, while associated with these and possibly of later age are areas of granite and greenstone. These latter rocks generally occur in lenticular areas whose longer axes agree with the strike of the Huronian rocks. The rocks to be considered here are the youngest in the district, and are found generally in dykes of diabase, which frequently have a strike nearly at right angles to the members of the Huronian belt.

One of the best representatives of this dyke series may be seen crossing the railway track several times between Sudbury and Murry mines. Its course can be easily followed for about three miles. The most eastern exposure is a little more than a mile from Sudbury where it cuts through feldspathic quartzites which are regarded as characteristic Huronian rocks. About a mile farther along the journey to Murry mines, just near a pit from which clay has been taken for furnace purposes, another good exposure occurs, but at this point the rocks intersected by the dyke are the greenstones with which the nickel ores of the district are commonly associated. A curve in the railway leaves the dyke on the north side, but it may be well seen again, at the village of Murry mines, just where the colonisation road, after passing east through the village, turns south-eastward to Sudbury. In this instance the rocks intersected are granites which Bell regards as of Laurentian age, but which instead can be shown to be younger than even the nickel-bearing greenstones which he regards as not older than Huronian. This dyke is again exposed just west of the smelter at Murry mines. Here the dyke cuts through the greenstone area with which the Murry mines deposit is connected. All the exposures of diabase along the Canadian Pacific Railway between Sudbury and Murry mines, are portions of the same dyke. Thus in following up this dyke for a distance of three miles it is seen to be of later age than any of the other rocks of the district. A second diabase dyke crosses the Canadian Pacific Railway one mile east of Worthington station. Its general direction is north-west. A third dyke crosses the railway about one quarter of a mile east of Worthington station and shews about the same general direction as the others. Many other examples occur, some of which are said to have other directions, but all those examined by the writer, have a general north-westerly direction. In width they vary from a few feet to fifty yards.

One thing characteristic of these dykes is the ease with which they are acted upon by hydro-chemical agencies. Near the Village of Murry Mines, the Government road passes for some distance between high walls of granite, which have become prominent by the weathering out of the diabase. The nickel bearing greenstones resist the action of atmospheric influences much better, and are generally greenish on weathered surfaces. In this they stand in contrast to the rocks under discussion, which become quite rusty on exposure. Spheroidal weathering is characteristic. When well exposed the diabase seems to be made up of ball-like masses, varying in size from a few inches to several feet in diameter. Decomposition is seen in the separation of concentric layers. Good exposures of this weathered rock often resemble walls built of cobble stones. With a view to understanding the reason for this concentric weathering, a thin section was made of a ball about three inches in diameter. No radial or tangential arrangement of any of the constituent minerals could be noticed. Mineralogically the centre of the ball did not differ from the portions nearer the surface. If these ball-like forms originated from the molten magma by crystallization beginning at independent centres, which afterwards became the centres of the balls, then we would expect the central portions to contain the more basic minerals. The microscopic examination of the large section did not confirm this anticipation. This structure has been regarded as due to contraction on cooling after solidification. Spheroidal weathering is very frequent in diabase. One of the exposures on the Canadian Pacific Railway, just east of Worthington station, shews phenocrysts of plagioclase from one to two inches long. This porphyritic phase is confined to a margin of from four to six feet along the wall. The rocks intersected show contact action, since, for three yards from the junction with the diabase the slates are broken into rhombohedral fragments. Just behind McGregor's house at Murry Mines a similar action is shewn. The granite, along the contact with the diabase, is shattered into layers parallel to the contact. Adjoining the diabase these layers are about one-third of an inch wide; the width of the successive layers gradually increases till a maximum of two and a half inches is reached at about two feet from the contact. A section from one of these layers of granite, shewed, under the microscope, that considerable limonite had been developed, and that the feldspar was somewhat kaolinised. Besides, the quartz grains appear to have been shattered by the heat;

(1) Quart. Jour. Geol. Soc., vol. 44, p. 32.

(2) Geol. Survey Canada. Report of Progress 1891, F, p. 59.

(3) Jahrb. d. k. k. geol. Reichsanstalt 1892, p. 276.