The collieries of the province recorded 154 accidents for the year—31 fatal, 61 serious, 62 slight—a greater number than has occurred since 1902.

Falls of coal were responsible for 8 fatal accidents. Mine car fatal accidents reached the same number and both serious and slight accidents due to this cause, exceeded those from all other individual causes. Explosions of gas caused but one death. There were 6,059 persons employed and 2,219,608 tons of coal produced.

ORES AND ROCKS OF THE COBALT REGION.

By R. E. Hore.

The exploration of the larger areas of silver and Cobalt bearing rocks has disclosed new types of deposits, and has afforded additional information regarding the origin of the deposits and of the rocks containing them. It is the purpose of this article to give some results of study in field and laboratory.

In Coleman township interpretation is difficult on account of the variety of formations—Lower Huronian sediments, Keewatin volcanics, and Post-Middle-Huronian Diabase—in which the silver-cobalt deposits occur. In other parts of the area a less promiscuous distribution of the ore has been found.

The deposits in Casey Township are in Lower Huronian, a few hundred feet from diabase. Those of Pense and Ingram townships are confined to diabase, as are also those in the Elk Lake and Anvil Lakes districts of the Montreal River Mining Division, and the deposits of Portage Bay and Anima Nipissing. Lately discovered deposits south of Lorrain township are said to be in rocks of Keewatin age.

The Diabase.—The intimate connection of the ore deposits with this rock becomes more and more apparent as prospecting advances. For some time it has been the "nishishin sini" of the prospectors. It occurs for the most part in large sills of a few hundred feet in thickness. In the Temagami Reserve the writer has examined a large number of diabase hills which stand from one to two hundred feet above the surrounding country. In several instances the contact with greywacke slate was found, and in all cases it is near the base of the hills. Since the texture of the diabase at the summits is generally quite coarse, it is probable that the original thickness was at least double the height of the present hills.

For the most part the sills are dark grey in color and holocrystalline, the chief minerals being plagioclase feldspars labradorite in many cases) and monoclinic pyroxene. Quartz and ilmenite are frequently present. Near the edge of the sheet it is very fine grained and ophitic texture is more pronounced; but the grain becomes quite noticeable a few feet from the contact. In more coarsely grained portions, often pink in color, quartz is more abundant and generally is found in micrographic intergrowth with feldspars. In petrographical character and in its relation to the Huronian sediments, the diabase is remarkably similar to those of Lake Superior which are regarded as Keweenawan,[1] being the plutonic contemporaries of the copper bearing lavas, or as post-Keweenawan in age.[2]

Veins in the Diabase.—Veins in these sills are not common, and quartz veins are more abundant than calcite. In Coleman township the rich veins have little gangue mineral, in some cases native silver occurring simply in thin sheets along the joint planes; but what little gangue there is is calcite. In other areas some of the quartz veins are cobaltiferous; but the valuable deposits as a general rule have calcite gangue. Argentiferous galena occurs in some of the quartz veins west of Wakmika Lage, along with pyrite and chalcopyrite and a later filling of pale pink calcite. In the Elk Lake district barite veins are said to be argentiferous. All the veins are vertical or nearly so, and probably represent fillings in tensional joints due to cooling and contraction of the igneous sheet.

Intrusives in the Diabase.—There occur in the sills small dikes, some more basic, others more acid than the main mass. In Coleman township there are fine grained dark colored dikes of olivine diabase, while near Temagami there are narrow dikes of diabase porphyry.

More frequent, and of greater economic interest are the light colored aplites. The width of most of these is to be measured in inches, while in length, they are but a few hundred feet. They are frequently mineralized, pyrite, chalcopyrite and galena being present in many, while silver and cobalt minerals have been found in them in the Elk Lake area. They are composed largely of quartz, orthoclase and acid plagioclases; but the proportions vary considerably in the same dike. There is considerable chlorite in darker colored portions, and calcite fills interstices between the other minerals. Small crystals of titanite and apatite are inconspicuous but characteristic constituents.

Disseminated Ore in the Diabase.—In the diabase which extends westward from Anima-Nipissing to Lady Evelyn Lake there are numerous showings of cobalt minerals, both in calcite veins and as disseminated crystals in the rock. There is generally little or no surface indication of the presense of the latter; but on fresh fractures traces of cobalt bloom are found. One deposit, west of Diabase Lake, is associated with an aplite vein. The vein contains some pyrite, but little smaltite. Parallel to the vein for a few feet from its walls the diabase contains disseminated crystals of smaltite, which are more concentrated near joint planes. The chief primary constituent of the ore-bearing rock is feldspar. The smaltite crystals are embedded in calcite and chlorite, and are accompanied by small crystals of titanite.

Another cobaltiferous specimen from this region shows some kernels of augite still undecomposed, and a remarkably high percentage of ilmenite.

Origin of Disseminated Ore.—To the naked eye the detection of smaltite in the diabase suggests the possibility of its being an original constituent. The altered character of the ore-bearing portions and the association with aplite, suggest that the ore had its origin in the gases or hot solutions which accompanied these late secretions of the cooled differentiated magma.

Microscopic examination shows that the smaltite is embedded in secondary minerals and seldom in the undecomposed feldspar. In the latter case high magnification shows numerous small cracks in the feldspar. Some of these are filled with calcite and apparently have acted as channels to introduce the smaltite, so that the latter is secondary.

The absence of augite and the presence of chlorite, which is probably the result of decomposition of the former, suggests that the augite is cobaltiferous; but a specimen of the rock showing augite cores was found to contain no trace of cobalt.

Lower Huronian.—These rocks, like the slate-conglomerate of the original Huronian area north of Lake Huron, represent the result of disintegration and de-