OUR VISIBLE SUPPLY OF BRICK.

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The manufacture of clay products is probably the oldest industry on earth, for if we go back in thought to earliest man, we find him fashioning various articles both useful and ornamental from clay. This homely industry has been much ignored by scientific men in favor of other mineral industries that appeal more readily to the imagination, speculation, or cupidity; but the eye of the economist in all countries, is now being turned in the direction of this very old yet new industry.

In the selection of structural material we must admit that timber is already, or will very soon be, a thing of the past. Steel and iron, with various forms of clay products is now playing a most important role, but the days of cheap steel and iron will soon be over also. Even in this new American continent we can already estimate our iron ore reserves, and long before these are exhausted, the use of iron will be prohibitive, except for such purposes as will not be served by any other material. That being the case something must be found to take the place of timber and iron as structural building materials to a very large extent. That substitute will undoubtedly be clay products of various forms, including cement. Indeed this industry is already the most important mineral industry in almost every country in the world. Even in this our own Dominion, whose virgin timber is very largely untouched yet, by comparing the last mineral statistics of Ontario, whose mineral products are the most widely exploited and records kept most carefully, we can see that clay products including cement form one-quarter of the value of the whole mineral output, metallic and non-metal, and employ more men than the total metallic production.

Deposits of pure clay or kaolin, the results of normal rock decomposition, are practically unknown in Canada. Glaciation has removed our residual clays, and much of our rock materials as well, but has left in their stead enormous deposits of glacial material both sorted and unsorted. The sorted clays ensure an unlimited supply of structural material in almost every part of the country. My description of the clays will apply only to the eastern part of Canada, say east of Winnipeg. Whether it applies west of Winnipeg or not, I cannot say as I have had no work with clays west of that point. My work east of Winnipeg has extended over four years, two of which were spent in a study and report entitled "Clays and Clay Industry of Ontario for the Bureau of Mines." Report part II., 1906.

Four distinctly different clays are used in Eastern Canada in the manufacture clay products. I am not including the shales here, which are used exclusively in the manufacture of pressed brick, terra-cotta, sewer pipe, and paving brick; I refer only to the loose accumulations of clay, lying almost everywhere upon our glaciated rock surfaces. Those four clays are named Erie, Red Top, Leda, Saugeen. The Erie clay yields white goods, all the others yield red.

If a line be drawn roughly from Prescott on the St. Lawrence River in a northwesterly direction, through Perth, Ottawa, Arnprior, across the Ottawa River, it will mark approximately a former height-of-land, and the position of a great ice dam, which formed about the middle of the glacial period. The waters west of this dam were all fresh, and drained through the Hudson River Valley of New York State. East of this dam the waters were salt, and the valleys of the St. Lawrence and Ottawa rivers were filled with backed-up salt water from the Atlantic to a depth estimated at 600 feet above the present water level. The great glacial moraines were being sorted by water and west of this line we find a clay called Erie clay, high in calcium carbonate, and carrying a few fossils of fresh water organisms. East of this line, however, a contemporaneous clay, looking in every respect like the Erie, but low in calcium carbonate, and carrying only fossils of marine organisms: this clay is called Leda clay.

The Erie clay is widespread in Ontario. In Geology of Canada, 1863, we find a note on the Erie clay, as follows: "The Erie clay, with few interruptions, runs along the north shore of Lake Erie from Long Point westward to the Detroit River, and appears to underlie the whole country between this part of the lake and the main body of Lake Huron. It is again found at Owen Sound, and occurs along the Nottawasaga River, and along the shores of Lake Ontario, and as far east as Brockville." Even at that time the Erie clay had been sufficiently studied to show that it was of great extent in Ontario; but during my examination of the clay deposits of the Province, I have found the Erie clay in every county west of the line mentioned above as extending from Prescott to Ottawa, showing that the whole of Western Ontario is covered by a mantle of Erie clay which varies in depth from one foot to 130 feet, and in many places is no doubt thicker still.

The Erie clay is of a deep blue color when wet, and of an ashy-gray color when dry. It is highly calcareous, as will be seen by the analysis given below, so much so that it effervesces freely when moistened with acid. Some specimens, especially from the more westerly parts of the Province, contain as much as 30 jer cent. of carbonate of lime. Most of the Erie clays which are used in the manufacture of clay products do not exceed 18 per cent. lime, but even this is sufficient to counteract the effects of as much as 6 per cent. of ferric oxide and cause the brick to burn to ferrous compounds which give the white clay. All the white brick, white tile, hollow block, etc., made in Ontario, are from the Erie clay.

Red Top Clay.

What I have here named the Red Top clay is not a separate formation, but is simply a weathered zone on the top of the Erie blue clay. It is given a new name because it is an extremely important formation in Ontario and so far as I am aware, it has not been described before. The Red Top clay is of a dark chocolate color when wet, and is found lying immediately on top of Erie clay wherever exposed. It burns to a rich red color, instead of a white or buff color as does the Erie clay from which it undoubtedly formed through weathering.

It was formerly thought that all the red brick, tile, etc., made in Ontario, were from the Saugeen clay, or from the various shales. But this is not the case. The greater part of the red brick made in the Province, is simply the product of this upper weathered band of the Erie blue clay. The weathering extends to a very un-