

the fostering care of public instructors and the advantages of free libraries in so many of her cities—polytechnic institutions and public lecture rooms—have become more perfected, and scarcely a month elapses without there appearing in some of her illustrated papers or periodicals the portrait of some self-made man, who raised himself to wealth and position and benefitted his country by the efforts of his mechanical genius, which, without the advantages of a technical education, whether acquired at a public school or self-taught and perfected through knowledge obtained through the various channels of information which are so multifarious in the States, would have remained dormant, or at least never have developed itself to perfection. Doubtless, we have many amongst us within whose brains lie dormant the germs of genius and talent from the sheer want of education to develop them.

The skilled workman of Great Britain, although not so fertile in resources or in the same favorable position with respect to education and encouragement he may receive from his employer, is still far in advance of us in the details of particular branches of his trade, because he has become skilled in some particular line of work from the fact that in England he must serve a long apprenticeship to his trade. Unfortunately for Canada, a young man is seldom bound by any obligations of the sort, and often starts on his own account when he has barely learned to properly use the most ordinary tools of his trade, therefore at the point of information he had arrived at, at the time he left his master's workshop, at that he remains all his life-time, making no advance, in fact frequently retrograding. The number of *botch* mechanics we have in the city of Montreal, particularly in the plumber's trade, who foist themselves off upon people as good workmen, until tried and found out, is a disgrace to the trade they profess to belong to; a great deal of the unhealthiness of this city has arisen from employing these inefficient workmen.

As this is the only scientific journal published in the Dominion, there is no reason why we should not make it, in time, equal to any published in other countries, and in fact all that is really wanted to do so is a more general support. Therefore, at the commencement of a new year we most urgently appeal to the public for that support to enable us to continue our improvements.

Although from the present title of the *MAGAZINE* (which we contemplate changing) many may suppose that it is purely a mechanical journal, we can assure the reader that its contents are varied and such as will be found highly instructive in almost every household. We believe that the programme for the coming year submitted to us by our Editor, and the inducements he contemplates offering to subscribers, which will appear in our next number, will largely increase our subscription list.

**ENGRAVINGS.**—We are prepared to furnish all kinds of mechanical engravings at very low prices. We can always give an estimate of the cost in advance, and those who are intending to have engravings made will do well to get our prices before employing others. We make a speciality of "Photo-Engravings," which we can furnish much cheaper than wood-cuts, and which for ordinary purposes are fully as good.

In writing for Estimate of Cost, send us a Photograph, Drawing, Model, Sample, or Patent Drawing, state what kind of engraving you prefer, and about the size you wish it made, and we will give you the exact cost by return mail. We can furnish specimens when desired. Address "The Burland-Desbarats Lith. Co., Montreal."

## ICE WATER AT THE BOTTOM OF THE SEA.

### THE "CHALLENGER" DISCOVERIES.

At the last meeting of the Liverpool Geological Society, Mr. T. Mellard Reade read a paper in which he pointed out the geological bearings of the information gathered by the *Challenger* expedition by deep-sea soundings and dredgings. As is well known from these physical observations, the basins of the great oceans are occupied in their lower depths with ice-cold water extending over the whole northern and southern latitudes, and consequently under the equator. This Mr. Reade considered to be a remarkable physical fact, and proved that the secular cooling of the earth must be exceedingly slow, as the heat of the earth, apparently, did not influence the temperature of these vast ocean tracks, which are fed with cold water from the poles. It was also pointed out that the temperature of the ocean, decreasing with the depth, was the opposite to that of the solid earth, in which observations in mines and wells prove a general but varying increase of temperature downwards, so that at a zone 3,000 fathoms from the surface the temperature of the water is at freezing point; while on the land, in cases where the increase is 1° per 60 feet, on the same zone the temperature would be considerably above that of boiling water. Not the least interesting of the discoveries announced is that of the oceans bottoms below 2,000 fathoms being occupied generally—nay, almost universally—with a deposit of red clay containing pieces of pumice and nodules of peroxide of manganese, together with sharks' teeth and ear and other bones of whales; while the depths not exceeding 2,000 fathoms are largely occupied with foraminiferal ooze. These facts, it was considered, truly inferred a very great age for the present oceans, as, from a calculation which cannot be detailed here, Mr. Reade considers it will take a minimum of 20,000 years for a deposit of foraminiferal ooze of an average depth of one foot to accumulate over the whole of the area occupied by it; while the red clay, the result of decomposition of volcanic products, must be an exceedingly slow accumulation, probably not at the rate of one-tenth that of the ooze, but this rate is at present difficult to calculate.

### JAPANESE INGENUITY.

A correspondent writing from Tokio on the prospects of a trade with that country in American manufactures, says:

"During and after the Philadelphia Exhibition, the Japanese Commission bought a large quantity of agricultural implements, and so anxious were the dealers to open a trade with Japan that they sold these sample articles at less than wholesale figures. In due course of time the things arrived here, and the sharp-eyed mechanics went to work to copy them. They are now making cast-iron plows just as cheaply as we can make them in America, and at less price than it would cost to deliver them here. Harrows, cultivators, seed sowers, and similar simple implements they are copying to perfection; they may buy a few now and then in America, but it will be solely that they may use them as models. With reapers, mowers, and similar intricate constructions, they have not succeeded as yet, but are confident of doing so in time, and, in any event, the character of the country and its agriculture, and the low price of labor, will prevent a large demand for this sort of labor-saving machinery. Hoes, shovels, and other hand tools they have not attempted to any great extent, and thus far they have not been able to get the peculiar strength and flexibility which is the boast of the American maker. The Japanese laborer is a conservative being, and will not readily surrender the implements of his ancestors. Doubtless he may do so in time, and when he does he will purchase our productions, provided, in the meanwhile, a home-made article of equal excellence does not come to light. There are no patent laws in Japan, and the inventor has no protection if the native mechanics can succeed in copying what he has created. A young American came here recently with fond hopes of making a fortune out of a refrigerator, the invention of an enterprising countryman. But he found in the first place that the Japanese made no use of the article he brought; and, second, they would copy them."

**PRINTING PICTURES FROM PRINTS.**—The page or picture is first soaked in a solution of potash and then in one of tartaric acid. This produces a perfect diffusion of crystals of bitartrate of potash through the texture of the unprinted part of the paper. As this salt resists oil, the ink roller may now be passed over the surface, without transferring any ink except to the printed part.