have been broken in two, and rent to splinters, by lightning. The first tree which he mentions, however, suggests very forcibly that the "explosion" must have occurred at the core of the tree, for long wedge-like splinters of the wood have been forced outwards, and are now projecting from the stem. The fact, also, that the whole of the bark was in each case torn off, and projected in every direction round about the trees, can be accounted for only by an impulse proceeding from the middle of the stem southwards. One feature of the case which Mr. Griffith did not mention is the twisting which seems to have occurred with the second tree: the portion which is nearly broken off appeared to have been twisted through about 9c°, and the portion of the stem which is left standing is also considerably twisted in the same direction; as to the stem, however, it is difficult to estimate how much of the twisting may be due to the growth of the tree.

That any part of the effects are due to wind, is, I think, quite out of the question. It is indeed a curious sight to see two sound oak-trees, some 6 or 8 feet in circumference at their base, broken off, twisted, and torn to splinters, as if they had been so much matchwood; but one of the most remarkable features of the case appears to me to be, that there are *two* trees which have been treated in almost exactly the same manner. If it were the effect of one shock, that shock must have divided itself into nearly equal portions, and must have struck two trees which are some 30 yards apart, which do not stand in any isolated position, and which are separated from each other by several other trees, all of which remained untouched. On the other hand, it is quite inconceivable that two shocks of such an exceptional character should have occurred within a few yards of the same spot, and should have produced identical effects of such an extraordinary character.

The case is one which certainly deserves investigation.

Harpenden, August 18. SPENCER PICKERING.

Some Lake Ontario Temperatures.

THERE are, among the great lakes of the St. Lawrence, exceptional opportunities for observing the effect of heat and cold upon large bodies of fresh water. The vast area and depth of the lakes, the different latitudes in which they lie, and the extremes of heat and cold of the Canadian seasons, all combine to render observations of interest.

It thus far appears that, in their main expanse, Lake Superior and the Georgian Bay (the eastern basin of Lake Huron) constitute, in midsummer, great bodies of colder water—the former registering at the surface as low as 39½° F. (Hind), and the latter at 10 fathoms indicating 45° F., and, at the bottom, even lower than 39½° F. (Boulton). On the other hand, the lower lakes, including Ontario, are shallower than Superior, lie in warmer latitudes, have some affluent streams from even farther south, and may be said to have perceptible, though light, currents through them. The temperatures of their waters are thus very different from those of Lake Superior and the Georgian Bay. Thus, on May 6 of this year, at 4.15 p.m., Commander Boulton, R.N., found the surface of the water off Griffiths Island, in the Georgian Bay, 35° F., and the bottom, at 60 fathoms, 35½° F.; whilst on May 23, at 11 a.m., near the outlet of Lake Ontario—my first soundings there—I found the air (the day being calm and cloudy) 55° F., the surface-water 52¼° F., and the bottom at 13 fathoms 50¼° F., and this was after a cool and exceptionally windy spring.

Some general results, which seem warranted by very numerous thermometer-readings near Kingston, may be of interest. The north-east end of Lake Ontario here does not usually exceed 20 fathoms in depth, but through it flow into the St. Lawrence all the waters of the great lakes.

Areas of Water of Different Temperatures.—At the surface the water is not uniform in temperature, even at points relatively near each other, and which appear to have the same conditions—the variations being generally from 1° to 3°. At different depths down to the bottom there are equally marked variations. In the tributary streams similar results appear. In a shallow creek fully exposed for an eighth of a mile to the sun's rays, and slowly flowing over a succession of limestone ledges, the mercury, in 1½ inch of water on a warm June afternoon, could be seen rising and falling between 81° and 83° F. Here there were exceptional causes, but in the line of outflow from the lake to the St. Lawrence the fluctuations are to be ascribed rather to the great evaporation at the surface, and the cooler waters beneath ascending to supply the place of the evaporated water. As the evaporation would be irregular, varying with the passing clouds, and the gusts of wind, the ascending currents would also be irregular. These ascending waters would give rise to an inflow at the bottom from the deeper and cooler parts of the lake to take their place, and both these currents would be affected by the general light onward flow of the lake waters towards the entrance of the St. Lawrence.

Gradual Absorption of Heat.—The general rise in the temperature of the Lake Ontario waters as the summer advances is at first slow compared with the general rise in the temperature of the air, but as midsummer is reached, the rise is more rapid both at the surface and at the bottom. A comparison with temperatures from Lake Erie will, eventually, better explain this. The circumstance, however, has its bearing on the well-known modifying effect of great bodies of water on the climate of the immediately surrounding land. In illustration of it, on June 14, at noon, when the air indicated 79¾° F., the surface water in the main channel—2 miles from Kingston—was still as low as 57½° F., or only 5° higher than on May 23. On July 5, the readings in the same place had increased to 69½° F., with the air at 79° F., and on July 10 to 74¾° F., with the air at 92¾° F., the thermometer always being in the sun. The most marked change was between June 25 and July 5, when the advance registered was 9°. The bottom temperatures indicate somewhat similar results. On May 23 at 13 fathoms the deep sea thermometer registered 50¼° F.; on June 14 at 12 fathoms, 52° F.; on July 10 at 17 fathoms, 53° F.; and on July 25 at 12 fathoms, 67° F.

The absorption and retention of the sun's heat is, however, most noticeable in the small streams and quiet pools. There we find well illustrated the general proposition that in high temperatures the surface of comparatively still water, where unaffected by deep under currents, absorbs and retains the heat of the sun to a much greater degree than the immediately overlying air. A marked example of this was observed in the shallow lightly flowing stream already referred to, where on June 14 at 3.15 p.m. the air at 3 feet above the water indicated a slight breeze 73° F., and at the surface 76°, whilst the water at 1½ inch registered 83° F., at 4 inches varied between 79½° and 82½°, and at 7 inches on the bottom fell to 72½° F. The records of other creeks did not indicate such extremes, but showed that each stream in its current, bottom, and surroundings, may have circumstances which vary the temperature. In very shallow, still pools, exposed freely to the sun and breeze, the difference between the air and water surface temperatures is even more marked, the water on sunny afternoons in June and July showing about 11° higher range. In such shallow, still pools, however, the water, though indicating some variation, is tolerably uniform in temperature, even to the bottom.

Effect of Channel Currents.—Near Rockport, among the Thousand Islands, there is a broad and deep channel where the current down the river runs at about 2 miles an hour. Here at 37 fathoms, in different localities, the deep sea thermometer gave the same readings as the surface thermometer, showing that the water was completely churned up.

Another illustration was in the Gananoqui River immediately below the falls. The temperature at the bottom here on June 10 was 62¾° F.; a quarter of a mile down stream at the outlet to the St. Lawrence, it was 61½° F.; in the St. Lawrence, 150 yards off the outlet, 57° F.: and 200 yards further up the St. Lawrence, 54¼° F.; the surface water at each of these points varying only between 62¼° and 63° F. These records show how the deeper and colder waters of the St. Lawrence gradually asserted themselves on coming into contact with the Gananoqui River waters. A. T. DRUMMOND.

The Yahgan.

THE tribe in Tierra del Fuego described by the Rev. C. Aspinall are called the Yahgan (Jahgan being a German form and not the English). The missionaries have translated the Gospels into Yahgan with some interpolations of special English terms. There are two or three other distinct languages for the scanty population. It can be seen that the Yahgan is a language of Old World roots, and words can be recognized that philologists determine to be typical Aryan roots. The variety of languages is a fact noticeable among small exogamous communities, and it is a matter of interest to find such variety at the extremity of the New World. H. C.

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