I was hardly in a position to deny the allegation; but candor compels me to own to having had a suspicion that while there may have been a mote in the biological eye, a microscope of sufficient power might possibly have revealed something very like a beam in that of the systematists of the time. However that may have been, it is undeniable that at that period, or a little later, a lack of mutual understanding existed between the field naturalist and the laboratory workers which found expression in a somewhat picturesque exchange of compliments, the former receiving the flattering appellation of the "Bug-hunters," the latter the ignominious title of the "Section-cutters," which on some irreverent lips was even degraded to that of the "Worm-slicers"! (For the sake of completeness, it may be well to add that at a later period the experimental morphologists fared no better, being compelled to go through the world under the stigma of the epithet "Egg-shakers.") I dare say there was on both sides some justification for these delicate innuendoes. Let us, for the sake of argument, admit that the section-cutter was not always sure whether he was cutting an *Ornithorhynchus* or a pearly *Nautilus*, and that at times perhaps he did lose sight of out-of-doors natural history and the living organism as he wandered among what Michael Foster called the "pitfalls of carmine and Canada balsam;" but let us in justice mildly suggest that the bug-hunter, too, like Huxley's celebrated old lady, was sometimes a trifle hazy as to whether the cerebellum was inside or outside the skull, and did not sufficiently examine that hoary problem as to whether the hen came from the egg or the egg from the hen, and by what kind of process. The lapse of time has in truth shown that each had something to learn from the other. The field naturalist came to realize that he could not attain right conclusions in the investigation of the larger problems before him without more thorough studies in anatomy and development. The laboratory morphologist learned better to appreciate the fact that his refined methods of technique are, after all, but a means toward the better understanding of the living organism and its relation to its environment. On both sides, accordingly, the range of common interests and sympathies was extended; and some of the splendid monographs of recent years bear witness to the value of the results that have flowed from the combination of anatomical, embryological, systematic and ecological research.

(To be continued.)

THE TETE-ROUSSE GLACIER.

On July 12, 1892, there occurred in France a terrible catastrophe, in which an avalanche of mud blotted out part of the villages of Bionna and Fayet, together with the Baths of Saint-Gervais. This accident was caused by the sudden outburst of a pocket of water situated inside the Tête-Rousse glacier, which is at an altitude of 10,725 feet. A mass containing 3,546,100 cubic feet of liquid matter, traveling at the rate of 45 feet per second, or perhaps 30 miles an hour, carried down to the plain of the Arve and into the gorge of the Baths more than 35,461,000 cubic feet of all kinds of material torn from the south side of the Rognes Mountain from the lateral and frontal moraines of the Bionnasset glacier, as well as from the watershed of the little brook of Bionnasset.

After the catastrophe annual explorations were made by the forestry and glacier service of the Tête-Rousse. In 1893 it was noted that the passage through which the pocket emptied was almost completely closed ; 1894 this passage was closed and cakes of ice were seen floating on the water which had collected in the cave of ice.

Since 1895 the pocket has been gradually filled by snow falling directly upon it or being driven in by the wind, and by avalanches descending the escarpments of the Gouter Needle (12,732 feet), which dominates Tête-Rousse. In 1897 the glacier had again assumed its normal aspect.

The fear, therefore, of a new sub-glacial lake, hidden from view by a covering of ice and snow, and ready to descend as another deluge in case of the sudden rupture of the frontal side of the glacier was a natural one. This fear, besides, was not chimerical; in the huge mass of Mont Blanc even pockets of water exist in the glacier of the Bossons, the rupture of which has been observed several times.

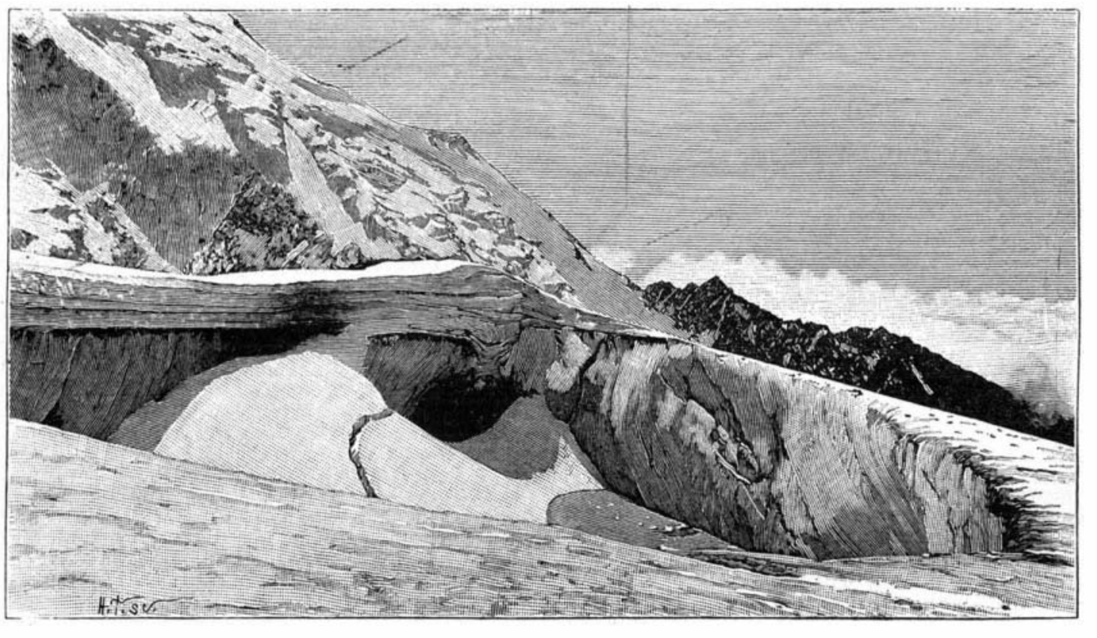
To prevent the repetition of a catastrophe like that of 1892, the Administration of Forests and Waters thought it best to stop the sudden eruption of water and check its further accumulation by making a permanent exit for it. They, therefore, decided to run a tunnel 43 square feet in cross section in the rocky ridge which supports the Tête-Rousse glacier and separates it from that of Bonnasset, situated about 500 feet below. With this tunnel as an outlet, the water, whatever might be its volume, would pass off harmlessly and without undermining action in the crevasses of the Bionnasset glacier.

In order to carry out this plan it was necessary to run a mile path 6 feet wide a distance of 4,100 feet from the Belleview pavilion (altitude, 5,800 feet) to the plateau of Pierre-Ronde (altitude, 9,288 feet) across the crest of the Rognes Mountain; and then a footpath 3 feet wide by 8,495 feet in length along the ridge which forms the watershed of the valleys of Montjoie and Chamonix. This path is the one most frequented by tourists who wish to ascend Mont Blanc, and it quite merits all their favor, since it enables them to save considerable time, avoid much fatigue, and reach at length, via terra firma and solid rock, an altitude of more than 12,500 feet.

A sheltered hut for the use of the foresters and superintendent was built on the plateau of Pierre-Ronde behind the crest of the Rognes; and as soon as these accessory works were completed, work was commenced on the subterranean gallery, which was started at an incline of 10 in 100. After having dug through 36 feet of moraine, which were stoned up and timbered, the workmen struck rock. Instead of being a compact mass, however, the rock appeared, even at the greatest depths, in the form of blocks soldered together by inclusions of ice. The heat caused by the mining operations, the lamps, and the bodies of the workmen themselves, caused this ice to melt; and more or less voluminous fragments of stone dropped from the roof of the gallery, so that it was found necessary to timber it to prevent accidents. After tunneling for 200 feet ice was reached—the old, hard, dry, sonorous kind, yielding well to dynamite. At 370 feet from the opening the character of the ice changed to the soft, white kind, full of air bubbles and inert under explosives—in a word, the snow changed into ice. Soon, the 30th of June, 1900, water oozed from the sides of the gallery more and more abundantly. Lateral soundings made a little farther along released powerful jets of water, which obliged the laborers to stop work, and some small cracks opened in the ceiling. From vertical soundings made in the floor the water gushed forth, bubbling. The flow at the mouth of the tunnel reached 31,900 cubic feet a day.

In order to explore all the cavities of the glacier several new tunnels at an incline of 2 in 100 were started from the point where the gallery passed from the rock into the ice. One of these branches came out exactly at the opening observed in 1892, 1893 and 1894 and showed that almost all the space was filled with grained snow-ice, frozen at the surface. Another branch—the longest—was directed toward the lake observed in 1894. A number of vertical soundings showed that there was no longer any accumulation of water in the pocket which was so suddenly emptied in 1892. The soundings also gave the exact contour of the bottom of the pocket, which could not heretofore be determined by surveys.

All this work was carried out with great difficulty at a considerable altitude where the cold, the rarefaction of the air, and the dryness of the atmosphere sorely tried the laborers, anæmiating them, and causing them to lose all appetite, so that the period throughout which one set of men could stand the strain was three months at the most. As a result of the work, the Forestry Commission has concluded that pockets of water no longer exist in the Tête-Rousse glacier, and that consequently the fears formulated in the note communicated to the Academy of Science, August 14, 1893, on the subject of the "reoccurrence in the near or distant future of a catastrophe like that of July 12, 1892," can be entirely disregarded.



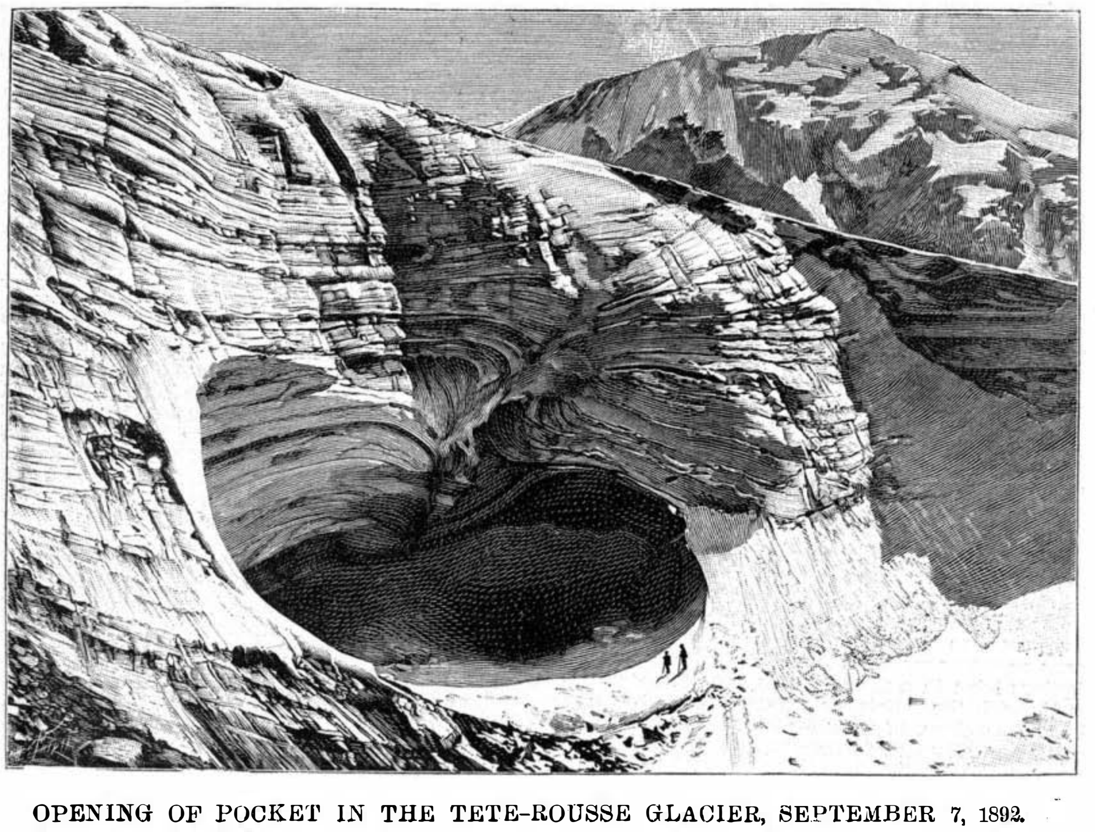
END OF TUNNEL OVER SNOW-FILLED OPENING OF POCKET, AUGUST 8, 1894.

The work will also be of great service in the study of glaciers. The future investigations of the forestry service will bear on the following points:

1. To measure the speed of the glacier at its surface and at different depths.
2. To note the supply of the glacier.
3. To determine by means of new soundings the relief of the bottom of the basin in which the glacier rests.

When once obtained, these data will doubtless permit of establishing the relations which exist in the glacier between its slope and its supply.

Thus, after having given security to the inhabitants of a whole valley, and after having opened a convenient road up Mont Blanc, the forestry agents will try to bring a new contribution to that part of science which has for its object the determination of the laws which govern the glaciers.—La Nature.



OPENING OF POCKET IN THE TETE-ROUSSE GLACIER, SEPTEMBER 7, 1892.

PLANT STEMS UNDERGROUND.

Mr. R. Lloyd Praeger, in the course of an interesting article on "Flowering Plants," in the current number of Knowledge, says: "Subterranean stems may conveniently be grouped similarly into those which produce leaves and flowers throughout their length, or at intervals. In the subterranean stem a further modification takes place as compared with the erect stem. Most erect stems—and prostrate stems, too—are colored green with chlorophyl, that they may assist the leaves in the manufacture of plant-food. The underground stem has no opportunity of doing this, owing to the absence of daylight, and it is usually white, or of the dull colors that most roots affect. Underground stems have likewise little need of strength, except the quiet but well-nigh irresistible strength of growth, by which the apex of the stem forces its way through the soil. Their surface, too, being buried in damp earth, is less exposed to heat and dryness, and need not guard against excessive evaporation; hence we find that underground stems are frequently brittle, with a very thin epidermis or skin. These stems are excellent places for the storage of food-materials, which is the more necessary in such plants, since, the stem being below ground, the leaves and flowers have to grow up often to a considerable height above the surface to secure a due amount of light and air, and perfect the fruit; hence subterranean stems are frequently thick and fleshy—look at those of the butter-bur, for instance. An extreme case of the storage of food in stems is found in tubers, such as the potato. In these, a great amount of food material is stored around a few buds, which lie dormant during the winter, and use the food-store in their rapid growth during the following season. Stems may altogether supplant leaves, and undertake the manufacture of the whole food of the plant. The gorse furnishes a well-known example. The seedling gorse has little trifoliate leaves, like the Genistas, to which it is related, but as the young gorse increases in size these leaves disappear, and the green stems carry on the work of leaves, and in addition undertake the defense of the plant against grazing animals by means of the stout thorns in which the branches terminate."