

the same as at the other islands, but is more changed, and possibly contains some mineral other than calcium. The most interesting feature was the presence of big pits, some very deep, all over the island. The rock seems to be honeycombed with holes, sometimes covered in and sometimes open through the falling in of the superficial layer. Further, in three of these pits I found mangroves growing, all of very great age. Two contain *Brugiera* and one *Cerriops*. I thoroughly explored all these holes, digging where possible. In one mangrove hole the bottom was guano; I dug 18 inches, but water came in so quickly that we could go no further. The water was salt. The crowbar showed at least 5 feet more "guano mud." The hole was about 8 feet deep, and so there must have been at least 13 feet altogether. There was plenty of mangrove (*Brugiera*) seed, but very few young trees. This hole was on the eastward side of the island, near the sea. In another hole, just west of the centre of the island, the trees were also *Brugiera*. This hole was very deep (25 feet to 30 feet), with pools of brackish water (undoubtedly from the sea). Digging again was hopeless, and the crowbar found no bottom. I found some shells in the mangroves, most of which were dead. In another hole (north of the island) there were *Cerriops* trees. The hole was 12 feet deep, the bottom wet and muddy, salt water standing on one side (and fluctuating with the tide). We tried digging here with more success, the water coming in from the sides, and not the bottom. We got down two holes 15 feet, and then found a great lump of coral, which the crowbar broke off. The water got so high that I could not tell whether this was a coral lump tumbled off the walls and fallen by chance in a natural position, or whether it was the bottom of the hole. So I dug another hole, and at a depth of 6 feet came to a soft, white ooze rock; how much of it there was I do not know, as we could only grovel for bits broken off by the crowbar in 4 feet of mud and water. How the mangroves got into these pits I cannot imagine. There is certainly nothing more than a free percolation from the sea. The only suggestion I have is that there have been two elevations, and that after the first the island was only a foot or two out of the water, possibly with protecting sand round the edge, and that it was covered with mangroves.

In one hole I found the remains of land tortoises, which are certainly extinct now. Is there any historical evidence?¹ I send all I could find to try and ascertain the species, or rather to see if it is the same as the Aldabra one. I also send some things found by the manager in the guano which look like eggs of these tortoises. I heard that the same had been found also at Cosmoledo.

The deepest hole was 45 feet deep, and contained 23 feet of water, which in all cases was salt. I tried to think if a lagoon formation could take place this way, but do not quite see it yet. The holes are certainly increasing in size owing to erosion and weathering, but must at the same time get shallower. There are some high dunes, 70 feet, at the south-east; wherever there is sand on the east of an island a dune is formed; as a rule, however, this side is bare rock, as the sea is very heavy, and keeps it clear of sand.

The vegetation of Assumption differs slightly from that of the other islands in that there are numbers of tanghai (*Euphorbia abbotii*) and la fouché (*Ficus*) trees, which give the land a different appearance. Of animals, I caught two species of bat, from which I got some *Nycterobia*.

J. C. F. FRYER.

THE ORIGIN OF THE POTATO.

IT is a curious fact that the origin of the potato of commerce, *Solanum tuberosum*, that is, the wild species from whence it was derived by selective cultivation, has hitherto baffled research, none of the many wild species of that genus agreeing sufficiently closely in character to be identified with any of the innumerable varieties existing. This in itself might have been of little

importance had not the outbreak of the potato disease in the last century suggested the wisdom of finding the original wild species, and by crossing it with the cultivated forms, of infusing fresh vigour into the latter, and thus to some extent fortify them against that destructive plague. To this end Mr. A. W. Sutton, of Reading, collected as many of the wild species as he could from the native habitats in Chili and Peru, and also from outside sources in North America and elsewhere, but none of these could be accepted as the parental form of the potato of commerce, and though many experiments were made in the way of hybridisation, the results were entirely negative so far as obtaining an improved strain was concerned, and the trials consequently ceased.

A fresh impulse was given to Mr. Sutton's researches by the alleged appearance in France of a "sport" from a wild species known as *Solanum commersonii*, which "sport" was declared to be fully equal to good varieties of the potato of commerce, though it had arisen, as the presumed raiser asserted, from a tuber of the wild species named. Not only, however, did this "sport" resemble closely a cultivated potato in all its characters, but investigation proved to all practical potato growers and experts that it was identical with a well-known variety, and that, in point of fact, it must have originated from a tuber or part of a tuber of that variety which had accidentally been in the soil in association with the wild tubers. The renewed research to establish this fact had, however, the result of re-directing Mr. Sutton's attention to another wild species called *S. etuberosum*, which had been grown in Mr. Sutton's ground for some twenty years, but which until 1906 had not been observed to produce any seed-berries, and had consequently not lent itself to seminal culture, but during that period its tubers, originally small and about the size of marbles, but white and edible, had increased to 2 inches to 3 inches in diameter, and when cooked resembled closely an ordinary potato. In 1906, however, one seedberry was observed, and the opportunity of sowing was immediately seized upon. Hitherto all the recognised wild species when sown yielded true offspring, that is, no variation at all was observed, and Mr. Sutton's surprise may therefore be judged when the twenty plants produced from this seedberry were not only of very varied character in foliage, flowers, and tubers, these last being of many colours and shapes, but they were diverse on precisely the lines of a batch of seedlings of the common potato, from which, indeed, they could not be discriminated even by an expert. The idea consequently arose that this might be due to cross-fertilisation with one of the ordinary potatoes in the vicinity, and though Mr. Sutton's experience led him to doubt this, he proceeded to check these results by a second sowing in 1908 from several seed-berries which had been successfully self-fertilised by hand, and were consequently free from suspicion. The resulting plants, however, were equally diverse, and on the same lines. A second suggestion was then made that the parent plant, *S. etuberosum*, was not really a wild species, but an escape from cultivation; but here, apart from the original smallness of the tubers, the botanist steps in, for all the wild species examined have pollen grains of a symmetrically oval or elliptical shape, and *S. etuberosum* has them of same form, while all pollen grains examined of cultivated potatoes are extremely irregular in size and shape, and no true elliptical ones are seen. The true specific character of *S. etuberosum* is thus established, while the identity of its offspring with that of the commercial potato equally establishes the fact of its being the original wild species.

Finally, a most important economical fact remains to be mentioned. For more than twenty years *S. etuberosum* has entirely defied the potato disease in the Reading grounds, though year after year subjected to infection by closely adjacent plants. The result originally aimed at when the experiments commenced is thus more than achieved, since there is no necessity for cross-fertilising with the ordinary potato, which is susceptible to disease, and consequently we have all the vigour of the wild type without any taint whatever in the new strain of disease-proof or disease-resisting potatoes which, it is hoped, has now appeared.

CHAS. T. DRUERY.

¹ No.—J. S. G.