XXIX. *Some Account of the Island of Tristan da Cunha and of its Natural Productions. By Captain Dugald Carmichael, F.L.S.*

Read December 16, 1817.

The British Government having judged it expedient to take possession of the island of Tristan da Cunha, a military detachment, consisting of about fifty men, with a captain, two subalterns, and a medical officer, was sent to occupy it from the Cape of Good Hope. Motives of curiosity led me to apply for permission to accompany this expedition, which embarked on board His Majesty's ship Falmouth on the 2d of November 1816. A liberal supply of agricultural instruments, with a team of labouring oxen, and some cattle for breeding, was sent on board at the same time. We sailed from Table Bay on the 3d, and two days after encountered a heavy gale, during which, our cattle, standing unsheltered upon deck, were so much injured by the rolling of the ship, and by the sea washing over them, that they all died before we arrived at our destination. The westerly winds, which usually prevail in the high southern latitudes, protracted our voyage to the 28th of November: but we had the good fortune to come to anchor in fine weather, and landed all the stores without loss or damage.

Tristan da Cunha is situated in 37° 6′ south lat. and in 11° 44′ west long. The whole island is apparently a solid mass of rock in the form

of a truncated cone, rising abruptly from the sea, and ascending at an angle of 45 degrees to the height of three thousand feet. This mass is surmounted by a dome upwards of five thousand feet high, on the summit of which is the crater of an old extinguished volcano.

The island is of a circular form, and about nine leagues in circumference. In various places the sea beats home against the salient angles of the mountain, rendering it impossible to walk round the island. Between those points a narrow beach has been formed, by the gradual accumulation of the fragments of rock daily precipitated from above; and is covered in some few places with a layer of fine black sand resembling gunpowder, which is, however, kept in constant motion, being washed away by one gale, and cast up again by the next.

The face of the mountain, as far up as the base of the dome, is mostly covered with brush-wood, intermixed with fern and long grass, which veil its native ruggedness. In many parts, however, it is completely bare, and presents to view the edges of a vast number of strata arranged horizontally, or at slight degrees of inclination. These strata are in general from five to ten feet in thickness, and vary essentially in their internal structure. The greater number are of solid rock, of a blueish-gray colour and extreme hardness, in some instances homogeneous, in others exhibiting crystals of hornblende, felspar, and olivin sparingly scattered, or forming more than a moiety of the compound mass. Between those are frequently interposed beds of scoria cohering from the effect of partial fusion; of tufa studded with crystals of augite; or of ashes condensed by the pressure of the superincumbent mass. The latter, still retaining in a great measure their friable nature, moulder gradually away, and leave the more compact strata in projecting shelves.

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The mountain appears to have been rent asunder by some violent convulsion, and the fissures filled up by a hard stony mass of a blueish or a reddish colour, and of the nature of trap, forming regular veins, the ramifications of which can be traced by the eye to a great height in the face of the rock. The sides of these veins, where they come in contact with the rock, are invariably in a semivitrified state, and exhibit obscure marks of crystallization.

Along the north-west side of the island there runs a belt of low land about six miles long, varying from a quarter of a mile to a mile in breadth, and presenting to the sea a perpendicular front from fifty to three hundred feet in height. The whole of this plain is a confused assemblage of stony fragments, scoria, and other volcanic products, resting on a bed of lava. All these matters are in a progressive state of disintegration, and the greater part of them reduced to mere nuclei imbedded in their constituent elements in the state of a black indurated earth.

The northern extremity of the plain is in a great measure cleared of its wood. By setting fire to the grass the trees have been so far scorched as to destroy their vegetation; but they still lie strewed along the ground, and it will cost some labour to remove them. The rest is still in a state of nature, covered with an impenetrable copse.

The surface of the plain, though apparently smooth and even while clothed with its native herbage, is in fact extremely irregular, being every where broken by small ridges of loose stones concealed under a mere scurf of soil. Between those ridges, however, the soil is pretty deep, and consists for the most part of the remains of decayed vegetables, with here and there a substratum of alluvial earth approaching to the nature of clay. It is soft, spongy, retentive of moisture, and possesses most of the characters of peat. This soil has been found admirably adapted for the

production of culinary vegetables, but is far too light to support the weight of trees or large shrubs.

This plain is the only part of the island that is in the least susceptible of cultivation; and serious obstacles oppose the conversion even of this to the purposes of agriculture. With the exception of the few spots already mentioned, where the earth washed down by the rain has accumulated, the whole of the ground, before it will be fit to receive the plough, must undergo a regular trenching in order to remove the loose stones, and to loosen the hard earth which lies immediately underneath the surface, and incorporate it with the vegetable mould. After this preliminary operation, there can be no doubt that the soil will yield a fair return in all sorts of European grain.

The ascent to the peak is practicable in sundry places; but the undertaking is attended with serious difficulties, and not free from danger. I went up on the 4th of January, accompanied by Dr. Evers, a couple of servants, and a guide, who had been up some days before. We experienced some obstruction at the outset in making our way through the long grass (*Spartina arundinacea*) which grows along the lower part of the mountain in close entangled tufts. As we advanced, our progress was retarded by the extreme steepness of the ascent, and the loose incohesive nature of the rocks, which we could hardly venture to touch, lest these fragments should fall upon our heads; nor did we run less risk in availing ourselves of the branches of the arborescent *Phylica* to support our weight; for the greater proportion of these being rotten, it was necessary for us to choose with caution, as a mistake might prove fatal. After a laborious effort of three hours, however, we gained the table land, and there discovered to our mortification, that the upper region of the mountain was completely obscured. Urged by a strong west wind, the cloud broke from

from time to time against the sides of the dome, and gave us a transient glimpse of the peak at a height and distance that were by no means encouraging. After resting, however, for a few minutes, we proceeded across the base of the dome, trusting that the cloud would be dissipated by the meridian sun; nor were we in this respect altogether disappointed. In the mean time, we found the ground as we advanced a perfect swamp, studded with tufts of small rushy plants, that gave way under the slightest pressure. Here also we had to pass through extensive patches of fern (*Lomaria robusta*), the stems of which, like junks of old cable, trail along the ground, and cross and recross each other in such an intricate manner, that it required all our circumspection to avoid stumbling over them. Further on, the ground becomes more firm, but is perforated in all directions by the various species of Petrel, which resort in myriads to the island during the season of incubation, and burrow in the earth. The weaker tribes of these birds are devoured in vast numbers by the Skua gulls, which pounce upon them as they come out of their holes in the evening, and leave nothing but the bones and feathers to attest the havock made among them.

The surface of the dome is furrowed on every side with ravines, which take their rise among the scoria of the peak, deepen as they descend, and open in tremendous chasms on the edge of the precipice. The various portions of the surface thus cut off in a great measure from all mutual communication, grow narrower and narrower as you approach the base of the peak, and dwindle at last into bare ridges of scoria, so sharp and so steep, that the wild goats of the mountain dare hardly venture to thread them. That ridge in particular over which we must either have passed or returned without accomplishing our object, is for at least fifty yards not more than twelve inches in diameter. The wind blowing

ing in violent gusts at the time, rendered it the more difficult to maintain that strict equilibrium of body, the slightest bias from which, either to one side or the other, would precipitate any of us in an instant to the depth of several hundred feet. We got safely over it, however, though with some trepidation, and in a manner as various, I believe, as the number of our party would admit of.

A short way beyond this ridge vegetation ceases; not so much, however, owing to the elevation of the ground, as to the total want of any kind of soil wherein plants could fix their roots. From this point to the summit, a distance of about a mile and a half, the whole is a mass of scoria, fragments of cellular lava, and all sorts of volcanic refuse, constantly slipping under your feet, and rendering the toil of ascending excessive. For nearly a mile we walked along a ridge of blue lava, which seems to have been at one time covered over, but afterwards left exposed by the gradual recession of the loose matters which covered it. In grain and colour it resembles the veins which intersect the island mass; but is disposed on the slightest stroke to break into small amorphous fragments.

The crater is nearly a mile in circumference: its border is irregular, the south side being two or three hundred feet higher than the north, by which we ascended. At the bottom of it there is a pool of water about 150 yards in diameter, to which the descent by the north side is gradual and easy. Its depth appears to be inconsiderable, as we could discover the bottom more than half way across; and its border is covered with rounded fragments of cellular lava, which float about at the humour of the breeze. The water is pure, and untainted with any mineral solution. From the peak we could see the distant ocean on all sides over the cloud which still shrowded the lower part of the dome; but no part of the low land can be seen at any time, being covered by the

the projection of the table land. I found several mosses on the summit of the peak and some lichens, among others the *L. paschalis*. There was also a large patch of snow a considerable way down its side, and another within the crater.

Besides the principal crater, which terminates the peak, there are several others scattered over the declivity of the dome, which must have rested for ages quiescent, as they are now covered with verdure. Two of these are situated near the edge of the table land, looking down on the landing-place.

As we walked down the mountain on our return, we passed among flocks of albatrosses engaged in the process of incubation, or tending their young. There are four species of them that breed on the island, none of which hatches more than one egg at a time; the *Diomedea spadicea*, *exulans*, *chlororynchos*, and *fuliginosa*: the two former give themselves no trouble in constructing their nest, merely choosing a dry spot of ground, and giving it a slight concavity to prevent the egg from rolling out of its place. The egg is white, very large, and of a peculiar shape, being uncommonly long in proportion to its diameter, and equally thick, or nearly so, at both ends.

The black albatrosses (*D. fuliginosa*) are at this season gregarious, building their nests close to each other. In the area of half an acre I reckoned upwards of a hundred. They are constructed of mud, raised five or six inches, and slightly depressed at the top. At the time we passed, the young birds were more than half grown, and covered with a whitish down. There was something extremely grotesque in the appearance of these birds standing on their respective hillocks motionless like so many statues, until we approached close to them, when they set up the strangest clattering with their beaks, and, if we touched them, squirted on us a deluge of fœtid oily fluid from the stomach.

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The *D. chlororynchos* builds its solitary nest in some sheltered corner, selecting in particular the small drains that draw the water off the land into the ravines. There it runs up its nest to the height of ten or twelve inches, of a cylindrical form, with a small ditch round the base. A curious circumstance with regard to this bird is, that when irritated the feathers of its cheeks are separated, so as to display a beautiful stripe of naked orange skin, running from the corners of the mouth towards the back of the head.

All of these birds nourish their young by disgorging the contents of their stomach. They are never observed to carry any article of food in their bill: those matters, indeed, from which they derive the chief part of their sustenance, the blubber of dead whales, seals, and sea-lions, would melt away if carried in the bill to any distance. We could not help admiring the utter unconsciousness of danger displayed by them on our approach: they never showed the least disposition to move out of our way: even when kicked or pulled off their nests, they made not the smallest show of resistance; but quietly returned to their post, or stood still until we passed on. Their plumage is in the finest order, copious, and without the slightest stain. They find great difficulty in getting on wing, and must run twenty or thirty yards along the ground with expanded wings before they can get fairly under way. We had the curiosity to take one of them by the point of the wings and fling it over the rock; yet, though it had several hundred feet of a clear fall, it never recovered itself, but dropped down like a stone. On this account, when not engaged with their young, they usually rest upon the edge of the precipice, from which they can launch at once into the air; and on entering again upon that difficult part of our route, we had to kick upwards of a dozen of them to the right and left of us before we could get on.

We

We arrived at the cantonment about sun-set, after a most fatiguing journey of fourteen hours.

In viewing the general structure of the island, and comparing its diminutive size with the great number of spiracles crowning its summit, and which must all have been at one time or another in a state of activity, there can remain little doubt that the whole of it is of igneous origin. The solid foundation on which it stands is undoubtedly lava. The platform which forms the plain is also a sheet of lava; and though the face of it at one part breaks into prismatic columns, after the manner of basalt, yet the bed of semivitrified rock on which it rests seems to leave no room for doubt with regard to its origin. An entire hill, seven or eight hundred feet high, near the centre of the plain, is composed of nothing but stratified tufa. The plain is encumbered with large detached masses of porphyritic stone, and with others, inclosing crystals of sulphur or of augite, which seem to have been ejected in their present state from the interior of the mountain; and in one instance I met near the base of the mountain, and under one of its strata, with a specimen of the convoluted lava, so common in the Pays-brûlé of the island of Bourbon.

The climate of Tristan da Cunha is so mild, that the herbage remains unimpaired throughout the year. Snow is never seen on the low land; and the only indicaton of winter is a transient sprinkling of hoar frost, too slight to give any serious check to vegetation. The thermometer during summer rarely ascends beyond 74 degrees in the shade, and stands at about 110° when exposed to the meridian sun. At night it occasionally falls as low as 48 or 50 degrees.

If we may give credit to the information of a man of the name of Currie, who has lived on the island for the last six years, its climate may be regarded as one of the most rainy in the world.

According to his account, the months of January, February and March are the only period throughout the year in which fair weather may be expected with any degree of certainty. During the other nine months the rain, he told us, is almost perpetual. How far the latter part of this statement may be correct, remains still to be proved; but it was our misfortune so far to experience the fallacy of the first, that from the 28th of November, the day on which the detachment landed, to the 30th of March, when I quitted the island, it rained on an average every second day.

This excessive humidity is not however entirely chargeable to the latitude in which the island is situated. Of this we had frequent and tantalizing proofs; for, at the very time that the rain poured heaviest down, we could plainly distinguish from under the skirts of the cloud which hung over us, the distant horizon illuminated by the rays of the sun.

The power which high mountains possess of condensing the moisture of the atmosphere, and precipitating it in the form of rain, is no where, indeed, more apparent, or more unremittingly exerted than on this island. The upper region of the mountain is usually involved in a thick cloud, which not only obscures the whole island, but extends its shade to some distance over the surrounding ocean. From this cloud the rain descends in heavy and protracted showers, for the most part on the lower grounds only, but occasionally on the summit also. In the latter case its fall is announced by the sudden appearance of torrents of water pouring in a hundred channels over the edge of the precipice, dashing down from cliff to cliff, and forming a series of cascades the most magnificent, perhaps, on the whole face of the globe.

With such a moist climate, and such frequent rains, it is a circumstance worthy of remark, that the island is but scantily supplied with running water. The only permanent stream of any magnitude

magnitude in the whole island, is one which gushes out at the base of the mountain immediately behind the cantonment. Excepting this brook, you meet with nothing from one end of the plain to the other but the dry beds of mountain torrents, impetuous, indeed, while they flow, but ceasing with the shower to which they owe their existence.

This singular deficiency of springs may, perhaps, be attributed to the nature of the rocky mass of which the island is formed. Though regularly stratified, the rock is cracked and split in all directions, and the rain transmitted through the spongy, absorbent soil, penetrates easily through its fissures, and sinks down at once to the level of the sea, where it may be seen along the shore gushing out through the sand on the reflux of every tide.

Notwithstanding the frequency of the rains, the climate appears to be abundantly healthy. Not a symptom of sickness appeared among the soldiers during the four months I remained on the island.

The spot pitched upon for the cantonment is at the northern extremity of the plain, about half a mile from the landing-place, and within range of cannon-shot from the anchorage. It is plentifully supplied with excellent water from the stream already mentioned, which runs close by it, and which, even during the hottest days of summer, maintains the low temperature of 50 degrees. This stream, after running its course for about half a mile, precipitates itself in a cascade over the face of the rock into a small sandy cove, where boats can easily put in to supply shipping with wood and water.

The prevailing winds off Tristan da Cunha blow from the westward and southward. Strong gales are frequent, but rarely continue above twenty-four hours. They never blow quite home on the island, but incline upwards at some distance from the shore,

and striking against the face of the mountain, are beat back on the low land in furious whirlwinds.

The sea immediately round the island is fathomable to the distance of a mile and upwards. The bottom is every where rocky, and covered with a gigantic species of sea-weed (*Fucus pyrifer*), which, after growing from the depth sometimes of twenty fathoms or more, stretches along the surface of the water, and preserves it in some degree smooth and unruffled during even the highest winds. This is a circumstance of the more importance, as the coast abounds in a variety of excellent fish, which will prove a valuable source of subsistence should the island come to be permanently inhabited. Among these are several species well known at the Cape of Good Hope. The Snook (*Scomber serpens*), the Horse-mackarel (*Scomber Trachurus*), the Roman fish (*Sparus*), and the Jacobeever (*Scorpæna Capensis*). The best fish, however, and fortunately the most abundant, is a species of *Chætodon* I should think, but which is figured by Forster as a New Zealand fish, under the name of *Sparus Carponemus*. To the genus *Sparus* it has certainly no affinity, if the form and disposition of the teeth are of any weight in the character. This fish usually grows to the weight of five or six pounds: and is remarkable for this circumstance, that when pulled up by the hook it discharges from its vent a great quantity of air, which follows it up in large bubbles. A large species of *Perca* is sometimes caught in the deep water. Among the rocks are found an undescribed species of *Callionymus*, and a most beautiful *Labrus*. I saw one *Exocœtus exiliens* that dropped on board a ship while at anchor, and which measured eighteen inches in length. The only shell-fish I observed were a *Chiton*, a diminutive *Cardium*, a *Patella*, and two *Buccinums*. A large crawfish is found in abundance and of a good quality. The *Sepia octopoda*, and an *Echinus*, with a small land insect

sect belonging to the old genus *Cancer*. Several species of *Corallina* are common on the rocks.

Two species of the Seal are the only quadrupeds on the island that can be considered as strictly indigenous, the wild goats and hogs having been introduced subsequently to its discovery by the Europeans.

The Bottle-nosed Seal, or Sea-lion (*Phoca Leonina*). The colour of this animal is blueish-gray along the back, approaching to white on the belly. It sheds its hair once a year, which falls off in large irregular patches, and gives the animal at that season a most ragged and uncouth appearance. The full-grown male measures from twenty to twenty-five feet in length, and yields seventy gallons of oil. The female is considerably smaller. When irritated it has a curious manner of protruding its snout, and inflating the skin over its nose; but there is nothing like the crest with which the head of this animal is ornamented in Shaw's *Zoology*. The whole figure is in truth a complete caricature, without the slightest resemblance to the original.

These animals pass the greater part of their time ashore, never quitting it unless when disturbed, or when, urged by hunger, they repair to the reef to feed on the sea-weed. They may be seen in hundreds lying asleep along the sandy beach or concealed among the long *Spartina* grass which borders the sea-shore. These huge animals are so little apprehensive of danger, that they must be kicked or pelted with stones before they make any effort to move out of one's way. When roused from their slumber they raise the fore part of their body, open wide their mouth, and display a formidable set of tusks, but never attempt to bite. Should this however fail to intimidate their disturbers, they set themselves at length in motion, and make for the water; but still with such deliberation, that on an expedition we once made to the opposite side

side of the island, two of our party were tempted to get astride upon the back of one of them, and rode him fairly into the water.

The Falkland Island Seal (*Phoca Australis*). This species grows to the length of five or six feet. The fur on the back is dark-brown, intermixed with long hairs tipped with white. The throat and breast are cream-coloured, the belly rufous. The vibrissæ of the male are white, very long, some of them twelve inches, and hang down over its breast. The fore-feet are placed near the centre of the body, which enables it to sit erect, in an attitude much resembling that of a penguin. Though these animals herd occasionally with the sea-lions, they are much more shy in their nature, and speedily forsake those parts of the island where they are liable to intrusion. They bark like a dog, and are of a bold, ferocious disposition.

The wild hogs secrete themselves in the deepest recesses of the wood, where it is impossible to pursue them. Their ordinary sustenance is from the roots of the wild celery and of the *Pelargonium*: but they occasionally prowl along the sea-shore, and feed on the dead carcasses of seals and sea-lions when they fall in their way.

The wild goats have retreated to the highest ridges of the mountain, where they are equally secure from disturbance. From the very small number, however, that has been seen there, it may be inferred that they have not greatly multiplied.

The only land birds on the island are a species of thrush (*Turdus Guianensis?*), a bunting (*Emberiza Brasiliensis?*), and the common moor-hen (*Fulica Chloropus*). These birds have spread over the whole island, and are found on the table-land as well as on the low ground. The *Fulica* conceals itself in the wood, where it is occasionally run down by the dogs; the others fly about the cantonment, and are so tame as to suffer themselves to be caught with a hand-net. The latter proved extremely destructive to our garden,

garden, nipping off the young plants as soon as they appeared above ground: but their ordinary food are the larvæ of certain species of *Phalæna*, and the berries of the *Empetrum* and *Nerteria*.

Of aquatic birds there is great abundance. I have already mentioned four species of *Diomedea*. There are six species of *Procellaria*, among which are the *P. gigantea*, *cinerea*, and *vittata*. The last, and the other three, which are smaller, are night birds, never appearing on wing until after sun-set. They may be caught in any number by kindling a large fire of wood. Attracted by the light, they approach and flutter round it, like so many moths round a candle, till at length the greater number of them, dazzled by the glare, plunge into the flame and perish. The *Larus Cataractes* is the common tyrant of all the smaller birds, and destroys them in multitudes. There are two species of *Sterna*, the *S. stolida*, and one which varies very little from the *S. Hirundo*. The former builds in the trees, and lays a solitary egg. I never saw the nest of the latter.

The Crested Penguin (*Aptenodytes chrysocoma*) conceals itself among the long grass, and in the bottoms of the ravines where they open upon the shore. Here they assemble in countless multitudes, and keep up a moaning noise which can be heard at a great distance; and, combined with the roar of the surge re-echoed from the mountain, and the bold inhospitable coast around you, is calculated to excite a train of ideas by no means pleasant. It is owing perhaps to the scantiness of its plumage that the penguin swims heavier than any other bird, no part of it except the head appearing above the water. This gives it undoubtedly a peculiar facility of diving and pursuing its prey under the water. With the same view, perhaps, its eyes appear to be uncommonly sensible to the stimulus of light. In every bird that I had an opportunity of examining the pupil was contracted to a mere dot.

There are no reptiles of any kind on the island: and the only insects

insects I observed are three small species of *Curculio*; four of *Phalæna*; one of *Hippobosca*; two of *Musca*; one of *Tipula*; one of *Sphæroma*; and one of *Oniscus*. The latter has multiplied astonishingly in the soft vegetable soil, and proved a great nuisance to us, creeping up the roofs of our tents, and dropping thence upon our beds during the night. The common window-fly of the Cape was not observed until two months after our arrival; but before I left the island it had begun to be troublesome.

The Flora of Tristan da Cunha is as copious perhaps as the extent and situation of the island would warrant us to expect; but with the exception of the cryptogamous class of plants, it offers nothing that is possessed of any peculiar interest.

The only plant on the island that approaches to the size of a tree is a species of *Phylica*. This plant occupies not only the whole of the plain, but has also spread over the face of the mountain, wherever its roots could insinuate themselves into the crevices of the rock. In favourable situations it grows to the height of twenty feet and upwards, measuring from twelve to eighteen inches in diameter. Its trunk is extremely crooked and twisted, but the wood is hard, close-grained, and, according to the report of a ship's carpenter, who examined it, would make excellent timbers for vessels of sixty ton and under. Its bark possesses a slight degree of astringency. Owing to the lightness of the soil, and the frequency of high winds, these trees rarely stand upright, but lean against the ground, and cross each other in such a manner, as to make it a business of extreme difficulty to penetrate to any distance through the wood.

Besides the *Phylica* there are only two shrubby plants on the island, both of which belong to the genus *Empetrum*, and may be only varieties of one and the same species. They possess no quality to recommend them, but that they grow on the most barren spots, where no other plant could vegetate.

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Of the herbaceous plants, the most remarkable is a gigantic species of *Spartina* (*S. arundinacea*). This grass overruns the whole of the island, from the upper edge of the table-land down to the seashore, accommodating itself to all soils and situations. It springs up in large close tufts which, when full grown, are borne down by their own weight, and lean upon each other in such a manner that a person may roll himself over them without any danger of sinking. Its stems grow to the length of six or seven feet, and are of a solid, almost ligneous, texture, and covered with a profusion of leaves. This grass makes an excellent and durable thatch, and the young leaves are eaten by horses and oxen.

The wild Celery grows in abundance over all the low ground, and attains a great size, its stem sometimes measuring upwards of three inches in diameter. It possesses in a high degree the flavour of the garden celery, and by proper management might be brought to equal it in every respect.

A species of *Chenopodium* (*C. tomentosum*), of a strong balsamic odour, is common around the cantonment. An infusion of the dried leaves of this plant is used as a substitute for tea by the Hottentots sent down in charge of the cattle. The soldiers use for the same purpose the leaves of the *Pelargonium*, which hardly yield to the others in strength of odour.

The low ground is overrun with a species of *Acæna* (*A. sarmentosa*), a plant of no apparent utility, but an intolerable nuisance to such as have occasion to walk over the ground where it grows. Its fruit is a sort of bur, which on the slightest touch fixes itself on one's clothes, and falling in a hundred pieces, covers him all over with an unseemly crust of prickly seeds, not to be got rid of without infinite labour.

Description of Four Species of Fish found on the Coast of Tristan da Cunha.

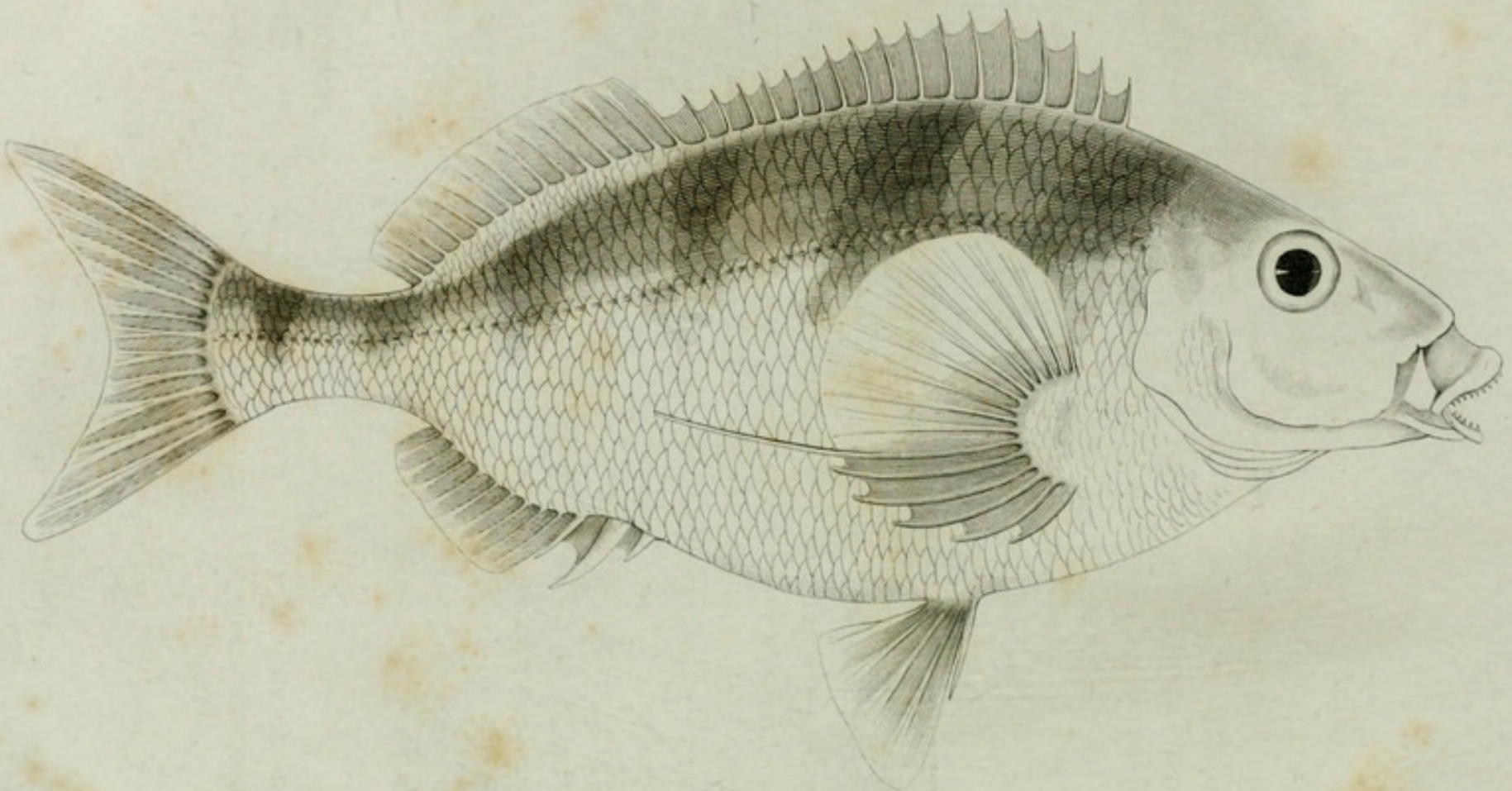
1. CHÆTODON MONODACTYLUS, subolivaceus dorso transversim nigro fasciato, spinis dorsalibus 17; ventralibus 6: intima elongata.

TAB. XXIV.

Length eighteen inches. Body oval, compressed. Head sharp; front sloping; mouth small, retractile; lips fleshy; jaws equal; teeth subulate, crowded in the fore part of the jaws, diminishing to a single row behind. Eyes large; iris amber-coloured. G. plates scaly; membrane six-rayed. Dorsal fin 17-24, soft part fleshy and scaly at the base. Pectoral fan-shaped, fifteen-rayed; six lower rays simple, the rest bifid; the sixth ray from the bottom twice the length of the others. Ventral 1-5, triangular considerably behind the line of the pectoral fin. Anal fin fleshy, and scaly at the base, 3-12, the second ray very strong. Tail forked. Scales large, smooth. L. line parallel with the back. Colour varying from olive to bronze, with six broad, obscurely-marked black bars across the back, reaching half-way down the sides. Fins blackish; pectoral amber-coloured, extremely delicate.

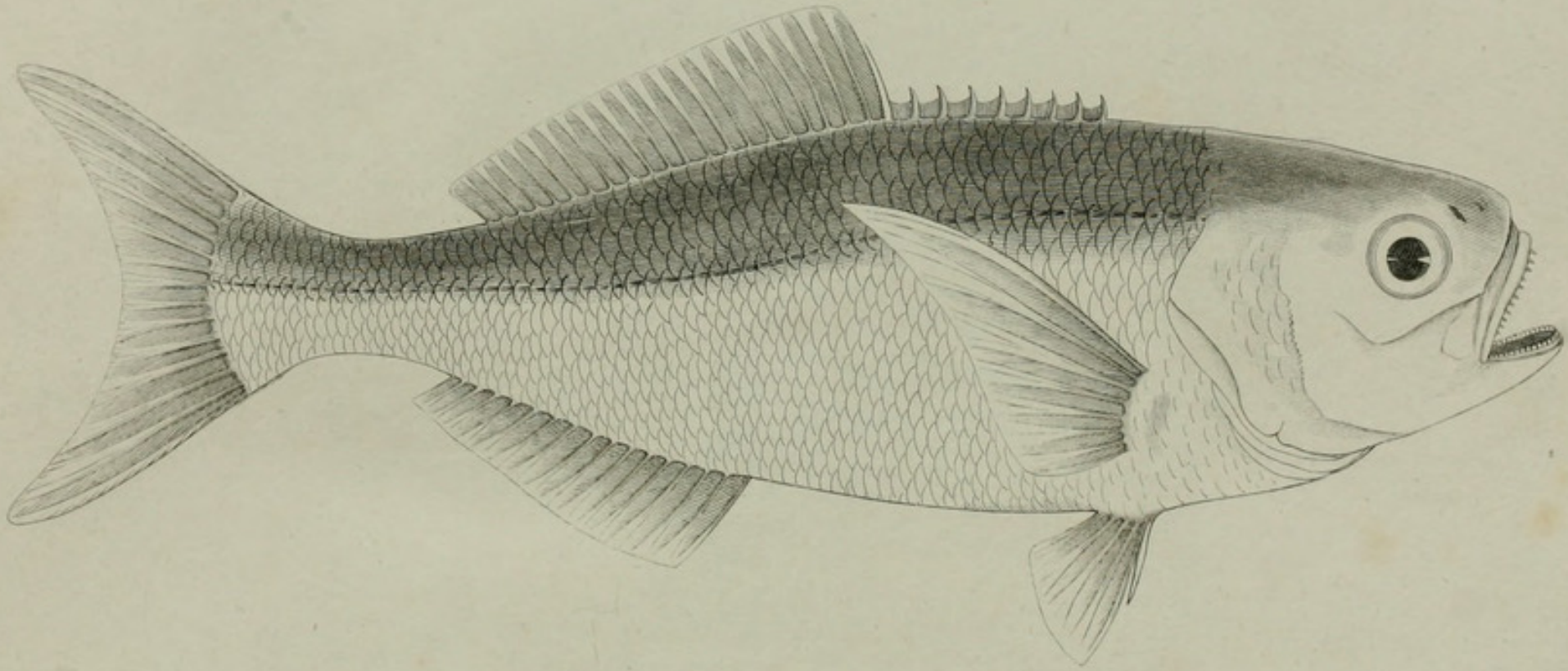
This fish is very common on the coast of Tristan da Cunha, and feeds on the leaves of the *Fucus pyriferus*, such of them especially as are covered with serpulæ. It takes the hook freely.

I have called this fish *Chætodon*, as coming nearer to that genus than to any other that I am acquainted with. Among Forster's drawings in the collection of Sir Joseph Banks, a figure of it is given under the name of *Sparus Carponemus*; but the form and disposition of the teeth exclude it from that genus. The specific name was suggested by the uncommon form and length of the fifth



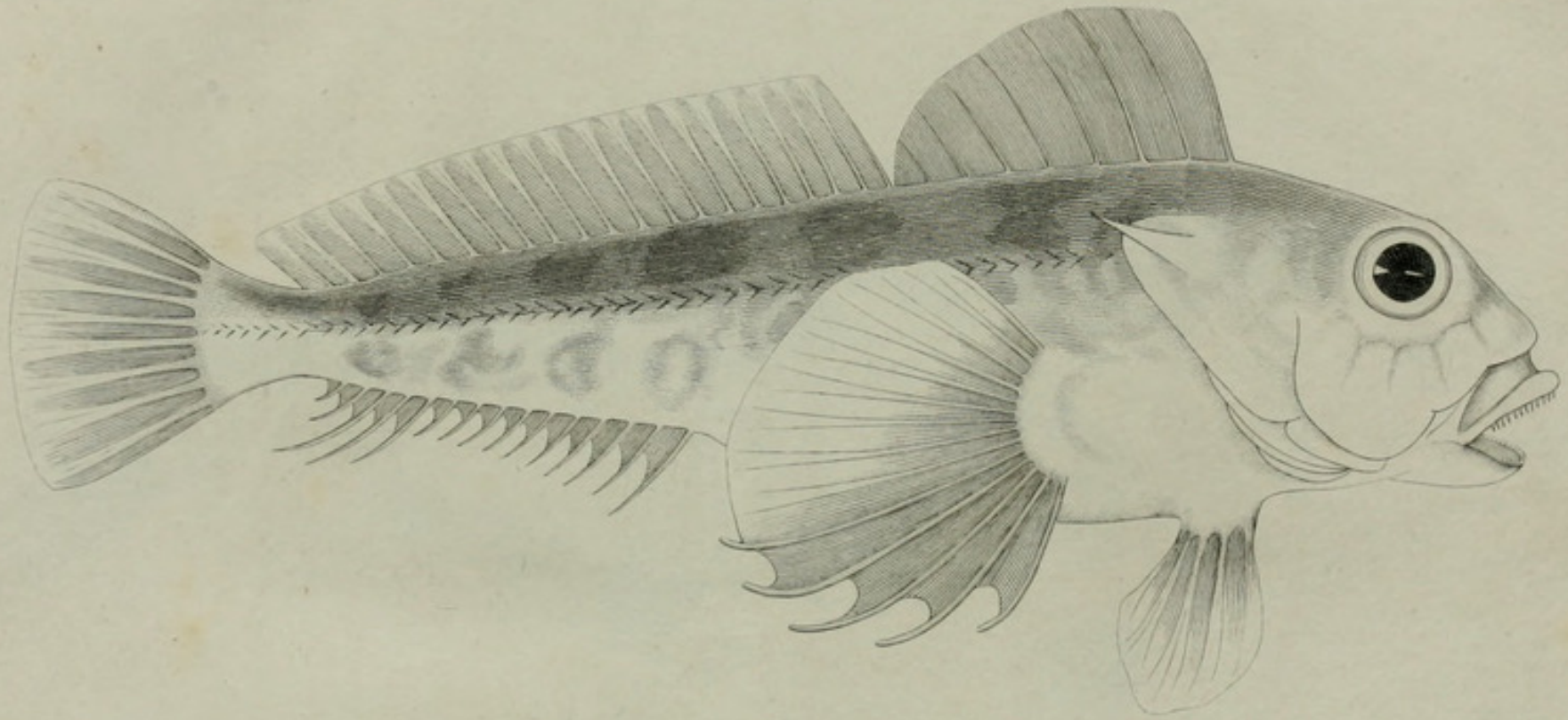
Chaetodon monodactylus.

J. Curtis sculp.



Perca antarctica.

J. Curtis sculp.



Callionymus diacanthus.

J. Curtis sculp.

fifth pectoral ray. I have in my possession the figure of another fish from the Cape of Good Hope, nearly akin to this, with the four lowest rays of the pectoral fin lengthened.

2. Perca antarctica, nigro-cœrulea subtus argentea, spinis dorsalibus novem: 8 abbreviatis fossula reconditis; ventrali unica.

Tab. XXV.

Length thirty inches; weight fifteen pounds. Head large, abrupt, punctured, naked. Mouth large, ascending. Jaws equal, armed with a single row of small teeth. Palate rough. Eyes large. G. covers scaly, slightly serrated. Membrane seven-rayed. Dorsal fin 9-18, the eight anterior rays very short, lodged in a groove; soft part covered with small scales. Pectoral falciform. Ventral fins 1-6, triangular. Anal 18, scaly at the base. Tail concave. L. line parallel with the back. Scales smooth. Colour dark blue above, silvery underneath.

This fish was caught by one of the officers of the Falmouth, while the ship lay at anchor off Tristan. We never took any afterwards. Flesh not remarkably good.

3. Callionymus diacanthus, olivaceus maculis virescentibus punctisque albis marmoratus, pinnæ dorsalis prioris radiis (8) corpore aliquoties brevioribus, pectoralis radiis 5 inferioribus spinosis.

Tab. XXVI.

Length seven inches. Body round, tapering from the head. Belly flat. Front depressed. Mouth large, armed with numerous small teeth. Palate rough. Jaws equal. Eyes approximated; iris brown. G. covers marked with tortuous streaks, terminating in two strong, subulate spines, that stand upright when the gills are expanded. G. membrane seven-rayed. First dor-

sal fin eight-rayed. Second twenty-rayed. Pectoral fins rounded, fifteen-rayed; five lowest rays simple, curved; the rest divided. Ventral fins distant, five-rayed. Anal fin sixteen-rayed. Tail convex. L. line raised, parallel with the back. Scales none. Colour olive, marbled with green blotches and white dots. Skin mucous.

This fish is very common among the rocks, and takes the bait greedily. Flesh delicate.

4. LABRUS ORNATUS, olivaceus corpore pinnisque fasciis longitudinalibus azureis.

TAB. XXVII.

Length eight inches. Body oblong, compressed. Head small, naked. Mouth very small, armed with a single row of subulate teeth. Eyes small; iris flame-coloured. Cheeks scaly. G. membrane five-rayed. Dorsal fin the length of the body, twenty-two-rayed, a few of the anterior rays spinous. Pectoral fan-shaped, twelve-rayed. Ventral six-rayed, lanceolate. Anal sixteen-rayed. Tail rounded. Scales large, deciduous. L. line parallel with the back. Colour olive, with four azure stripes along the sides, and three along the dorsal and anal fins. Head variegated with azure stripes; four bars of azure across the tail. Dorsal and pectoral fins, with the upper half of the tail, purple.

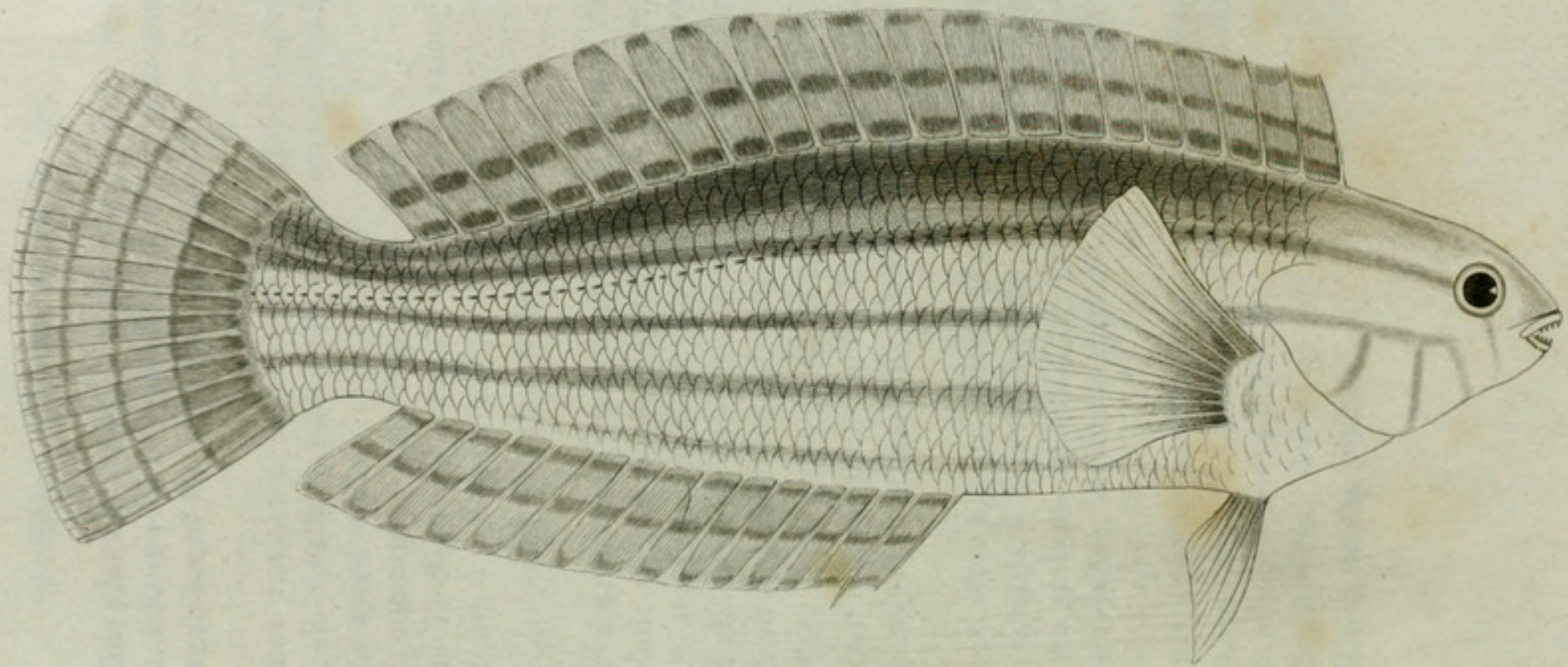
A very rare fish. Caught off the rocks.

Flora of Tristan da Cunha.

1. ACÆNA SARMENTOSA, diandra hermaphrodita, aristis quatuor, capitulis globosis, foliolis argutè serrato-incisis: supra glabris venosis; subtus sericeis, stipulis indivisis.

Ancistrum sarmentosum. *Aubert du Petit Thouars Flore de Tristan d'Acugna*, p. 44. *in Melanges de Botanique.*

This



Labrus ornatus.

T. Curtis sculp.

This plant grows all over the low ground; never, however, taking root as is implied in the specific name. The extremities of the branches are ascending.

2. Isolepis sulcata, capitulo laterali globoso polystachio, spiculis ovatis, squamis latè ovatis nervosis margine scariosis apice calloso.

Scirpus sulcatus. *Aubert op. cit.* p. 36.

Culmus 1—2-pedalis, nudus, compressus, sulco exaratus. Stamina 3. Stigmata 3.

It grows on the plain in large tufts.

3. Isolepis bicolor, culmis angulato-filiformibus, foliis canaliculatis angustissimis, capitulo terminali, spiculis (5—7) ovatis teretibus, squamis margine coloratis, involucro subdiphyllo: foliolo altero erecto capitulum superante; altero deflexo spiculam vix æquante.

This plant grows in moist situations, both on the low ground and the table-land. It collects in tufts, rising from a spongy base resembling a rotten stalk.

4. Isolepis squarrosa, culmis angulato-filiformibus indivisis basi foliatis, foliis canaliculatis angustissimis, capitulo terminali globoso, spiculis (12—20) ovatis, squamis margine concoloribus, involucro diphyllo: breviore deflexo.

5. Isolepis prolifer, culmis angulatis ramosissimis, foliis fasciculatis, capitulis passim proliferis, spiculis oblongis teretiusculis, involucro diphyllo.

Scirpus prolifer. *Aubert op. cit.* p. 36.

Grows on the plain.

6. Spar-

6. SPARTINA ARUNDINACEA, spica communi teretiuscula; partialibus arcte imbricatis, valvula minore glumæ exteriorem oblique truncatam perianthii superante.

Ponceletia arundinacea. *Aubert op. cit.* p. 36.

Culmi plurimi, fasciculati, suberecti, solidi, 5—8-pedales. Folia longitudine culmi, linearia, plana, externe nitida, interne glauca profundè sulcata, margine scabra. Spathæ striatæ, superne ventricosæ. Spica vix emergens, stricta, cylindracea, sexpollicaris, e spiculis pollicaribus undique imbricatis composita.

7. POLYPOGON INTERMEDIUS, panicula coarctata lobata, glumis subulatis pubescentibus, seta perianthii terminali valvula quadridentata breviore.

Phalaris mollis. *Aubert op. cit.* p. 37?

Culmi plurimi, 1—2-pedales, fasciculati, adscendentes. Folia linearia glabra, vaginis glabris, suprema ventricosa. Panicula vix omnino exserta, nutans.

This grass grows in spreading tufts, chiefly confined to the clear ground. It is greedily devoured by cattle.

8. AGROSTIS RAMULOSA, culmis filiformibus ramosissimis, foliis setaceis, panicula simplicissima, glumis acutis glabris: carina supra denticulata, perianthio glabro sessili: setula apicis brevissima.

9. AGROSTIS MEDIA, culmis filiformibus ramosis, foliis setaceis, panicula simplici rara, glumis acutissimis pubescentibus: carina longitudinaliter denticulata, perianthio sessili imberbi: seta terminali valvulam subæquante.

Both these species of *Agrostis* are found on the high part of the mountain, forming the chief part of its herbage: a few

few straggling tufts are met with on the low ground, along the bottom of the ravines, where the seeds have been washed down by the torrents.

10. Nerteria depressa. *Willd. Sp. Pl.* i. p. 705.
Erythrodanum alsineforme. *Aubert op. cit.* p. 42. *tab.* 10.

Grows in the plain in the most barren spots.

11. Nerteria assurgens. *Aubert l. c.*
Erythrodanum majus. *Aubert op. cit.* p. 42. *tab.* 11.

Flowers pale yellow, very small. Berry scarlet, the size of a pepper-corn. It grows on the plain.

12. Convolvulus Soldanella. *Linn.?*

This plant is found on the south-east side of the island, growing in the sand close to the shore, and confined to a single spot. It appears to be of recent introduction, having in all likelihood been wafted to this shore by the currents.

13. Phylica arborea, foliis sparsis ovato-lanceolatis aveniis subtus tomentosis, capitulis axillaribus lanatis.
Phylica arborea. *Aubert op. cit.* p. 45.
Truncus arboreus, cortice cinereo. Ramuli albo-tomentosi. Folia conferta, semipollicaria, subtus albo-tomentosa, juniora supra pilosa apice barbata. Bractea longitudine florum. Calyx lanatus. Petala squamuliformia, subrotunda, concava. Capsula corticata, ovata. Flores sæpe abortientes.

14. Chenopodium tomentosum. *Aubert op. cit.* p. 38.

Common on the plain.

15. Hy-