

these dorsal streaks are not the result of youth, and vanish as the animal increases in size, as is the case with the *Siren*.

5. While on these animals, I may observe, that Dr. Garden's specimen of *Siren* that was originally described by Ellis, which is now in the British Museum, shows a number of lines of mucous pores on the chin and on the head, the latter not being so distinct as the former, and a very distinct series of oblong white spots, forming an interrupted line along the upper part of the sides of the body, and continued to the middle of the sides of the tail; the spots on the hinder part of the body and tail being larger, more distinct, and closer. These spots evidently represent the lateral lines in *Tritons* and fish, and I have seen them mentioned in the modern descriptions of the animal.

MISCELLANEOUS.

On the Vitality of Seeds transported by Marine Currents.

By M. C. MARTINS.

BOTANISTS, struck by the facts establishing the transport of seeds by marine currents, have thought that the latter must have played a great part in the diffusion of the disjointed species of plants which form isolated colonies upon islands or continents separated by vast extents of sea. Geologists, surprised at the uniformity of the vegetation of the great archipelagos scattered in the ancient seas, were still more disposed to consider marine currents as the principal agents in the dissemination of seeds upon the surface of the globe. These *à-priori* conclusions have never been directly verified by experiment;—it has never been tried (1) whether many seeds are sufficiently light to float upon salt water; and (2) whether these seeds, after floating for a long time at the surface of the sea, still retain their germinative faculty.

To settle this question experimentally, the author selected some fresh seeds, of which the germination never fails, taking them from the principal families, and generally preferring those of large size, furnished with a hard and thick epispem, or those of littoral plants. The former should resist the action of salt water, from their volume and the impermeability of their envelopes; the others should have more chance of germinating if they fell upon a sandy shore.

Of 98 species, 55 floated, and 39 were specifically heavier than the water of the Mediterranean, the density of which, off Cette, is 1.0258. Four seeds had a specific gravity equal to that of salt water; these are, *Nelumbium speciosum*, *Datura Stramonium*, *Juglans nigra*, and *Gingko biloba*. Thus, of a certain number of seeds taken by chance, we may say that two-thirds float.

To try the action of sea-water upon floating seeds, the author endeavoured to place them in the same physical conditions to which they would be subjected when floating at the surface of the sea. A

wrought-iron box, measuring 0·30 m. square by 0·03 m. in depth, divided into 100 equal compartments, received 98 species of seeds; each compartment contained 20 seeds of the same species. Of some large seeds there were only 6, 12, or 18, and of the small ones a large pinch was put in. The lid was then soldered on, and the walls of the box pierced with small holes, through which the water could pass easily.

The apparatus was fixed upon a buoy at the entrance to the harbour of Cette. By the rising and falling of the buoy, the box was alternately raised out of and immersed in the water, so that the seeds were exposed to the action of air and water, as if they were floating on the surface of the sea. The box remained attached to the buoy from the 14th February to the 1st April, 1856, or for six weeks; 41 of the 98 species of seeds were completely rotten. The other 57 were immediately sowed in pots of turf-mould, and placed under frames. Only 35 germinated, and from these 17 must be deducted, which, being heavier than salt water, could not have floated at the surface; this reduces to 18 the number of seeds which, after six weeks of floating, would be capable of germinating when placed in the most favourable circumstances. These are,—*Cakile maritima*, *Nelumbium speciosum*, *Linum maritimum*, *Paliurus aculeatus*, *Cucurbita pepo*, *Eryngium maritimum*, *Scabiosa maritima*, *Xanthium macrocarpum*, *Asclepias Cornuti*, *Rumex aquaticus*, *Salsola Kali*, *Beta vulgaris*, *Euphorbia paralias*, *Ricinus communis*, *R. africanus*, *Gingko biloba*, *Ephedra distachya*, *Pancratium maritimum*, and *Asphodelus cerasiferus*. These are the species which, after a navigation of six weeks, would have had some chance of establishing themselves upon the shore.

Six weeks being a very short time compared with that which some seeds must occupy in their voyage from one continent to another, the author resolved to replace in the sea the 35 seeds which had germinated after six weeks' exposure; of each of these 20 were placed in the same box, which was fastened to the buoy on the 17th June, 1856, and remained attached to it until the 18th September, that is to say, 93 days, or three months. At the end of this period, 11 seeds were rotten. The remaining 23 were sowed under frames, when 9 germinated; but from these 2 must be deducted, viz. *Acacia julibrissin* and *Canna gigantea*, which do not float upon sea-water. There remain therefore 7 species which might float upon the surface of the sea for three months without losing their germinative power, and these are only $\frac{1}{14}$ th of the total number operated upon. They are, *Cucurbita pepo*, *Xanthium macrocarpum*, *Rumex aquaticus*, *Beta vulgaris*, *Ricinus communis*, *R. africanus*, and *Ephedra distachya*.

Considering the extraordinary concurrence of circumstances necessary to enable a seed thrown upon a shore to fructify and become the centre of a vegetable colony, we may conclude with Alph. DeCandolle that this mode of transport, which is so frequently referred to, can have taken only a very small part in the diffusion of the plants of the present and geological epochs; and yet the number of identical spe-

cies separated by vast seas, and which marine currents alone could have transported from one continent to another, is so considerable, that the idea of the multiplicity of centres of creation will every day acquire more probability.—*Comptes Rendus*, 24 Aug. 1857, p. 266.

Description of a new Norwegian Star-fish. By M. Sars.

Astropecten arcticus.

Sinubus inter brachia rotundatis; diametro minore ad majorem (in $1\frac{1}{2}$ pollicari) = $1 : 2\frac{1}{5}$; scutis marginalibus 25; tuberculis conicis brevissimis undique obsitis, superioribus spatio paxillifero quater vel quinquies angustioribus, inferioribus latitudinem superiorum ter superantibus. Color pallide miniatus vel aurantiacus.

Size a little more than $1\frac{1}{2}$ inch. Colour pale minium- or orange-red on the dorsal surface, passing to bright yellow towards the margins of the disk and arms. The paxillæ and marginal plates are bright yellow; the spines of the ventral and adambulacral plates are bright, and the feet the same. Four individuals were taken at Öxfjord, at a depth of 100–150 fathoms, on a muddy bottom. It belongs to the third division of the genus, according to Müller and Troschel, in which there are tubercles in place of spines on the marginal plates of the back.—*Fauna Littoralis Norvegiæ*, livr. ii. p. 61.

Description of a new Tanager. By PHILIP LUTLEY SCLATER, M.A., F.L.S., ETC.

Euphonia Gouldi.

♂. *Supra olivacea, æneo induta: pileo usque ad oculos cum fronte flavis: subtus, gula et cervice flavescenti-olivaceis, abdomine medialiter castaneo, hoc colore flavo utrinque marginato; lateribus olivaceis flavo mixtis: crisso castaneo: rostro et pedibus nigris.*

♀. *Supra mari similis sed dilutior, fronte et pileo antico rubris: subtus flavescentis, abdomine medio cum crisso dilute castaneis, lateribus flavido-olivaceis.*

Long. tota 4.1, alæ 2.2, caudæ 1.0, tarsi 0.7.

Hab. In Guatemala et Mexico Meridionali.

Gould's *Euphonia* does not sufficiently resemble any other of the known members of the group to render it liable to be confounded with them. It may, I think, be most naturally placed at the head of the section containing *Euphonia pectoralis*, *E. rufiventris* and others (which has been denominated *Iliolopha* by Prince Bonaparte), and will serve to connect them with the yellow-headed species which precede them in my arrangement. I have suspected its existence for some time, but these examples are the first good ones I have seen of it. I have had for several years in my possession a bird which I now find to be an immature individual of this species; and M. Sallé's collection comprised a single specimen not in very good condition, which he obtained in Southern Mexico. I gave a short description



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