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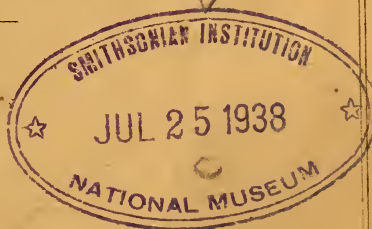
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Campylopus Schwarzi, Schimper (Schwarz's Moss), was also observed in considerable abundance on Muckish Mountain, county of Donegal, by me last September. It had not been found previously in the North of Ireland.

After which was read the following paper—

ON THE STINGING PROPERTIES OF THE PHYSALIA, OR PORTUGUESE MAN-OF-WAR. By ARTHUR WYNNE FOOT, M.D.

IN the summer of 1864 I had an opportunity of observing the urticating powers of the Physalia, or Portuguese Man-of-War, under the following circumstances:—From on board a large schooner yacht, which was drifting with the tide in a dead calm, about fifteen miles west of Cape Ortegal, a Physalia was observed at a little distance, with its bladder, pneumatocyst, fully distended, and shining like an immense opal; the bladder was surmounted by a beautiful purple corrugated crest, and one end of it was shaped like the beak of a bird. With the view of capturing it for examination, the dingy was lowered, with two hands in it, and sent in pursuit. As the yacht was drifting faster than the Physalia, the latter was some distance astern by the time the boat had been lowered and pulled up to it; the animal did not collapse on the approach of the boat; it was seized, and hastily deposited in the bottom of the boat. As the dingy was pulling up to overtake the yacht, I observed the man who had caught the animal, and who was one of the most able of the crew, to be alternately wringing his hands and washing them over the side of the boat: when they got on board he went forward at once, not waiting to lift his prize out of the dingy. Going forward to the fore-part of the vessel to see what had happened, I found him lying on the deck, writhing with pain, and with tears in his eyes; the right hand was already swollen, and the back of the hand and wrist red, as if taken out of scalding water; both hands had still a great deal of the mucus, with which the Physalia covers those who handle it, adherent to them; the right one was the most hurt, being the one which had most come in contact with the animal; the hands were washed with hartshorn and fresh water to remove the mucus, and wrapt up in rags steeped in laudanum and water, while a liberal allowance of brandy was served out as an internal remedy. When asked what the pain in his hands was like, he said they were "burning as if in a fire." In fifteen minutes after he came on board pain was shooting up along the arms into each armpit, and he had a lightness, "like an ache," across his chest. He could not keep the cloths on his arms, preferring to dip the hands in a bucket of seawater to anything else. In less than half an hour after he had been stung, a papular rash came out on the front of his right wrist and forearm, extending nearly to the elbow, of a pinkish colour, slightly elevated. A thermometer placed at this time between the swollen fingers of the right hand stood at 93°, while one in a similar position, in the less injured hand, marked 89°; the comparative lowness was due to the hand being just taken out of

the bucket of salt water, but it shows the relative difference of temperature, which was very perceptible when the parts were touched. The pain began to get less in about an hour, ceasing first in the chest and shoulders; his pulse did not exceed 76 at any time. The men had various experiences to relate in reference to the effects of meddling with Portuguese Men-of-War. The captain predicted confidently that the pain would cease entirely at sunset; the mate said it would last three hours, because he had once kicked one of "them stingers" with his bare foot as it lay stranded on the sea shore, and the pain had lasted that length of time. The captain's prediction was nearer the truth, as the man was stung at 6 P.M., and by sunset, which was about 7.40, the pain was very much less; but he had a bad headache, and was quite unable to make any use of his hand. Next morning the rash had disappeared; the hand was swollen, and could not be closed; the fingers were "numb," and upon testing the sensibility of the skin, I found that it was really absent; he could not haul a rope properly with the right hand for a couple of days. On going to look at the animal, which had done all this mischief, about half an hour after it had been caught, I found the *Physalia* with the bladder still distended, though shrivelled and quivering; the beautiful colours, which it had shown when afloat, were dimmed and disappearing, and the long fringed tails were sticking to the bottom of the boat, as was a quantity of mucus which they had discharged; it was difficult to get the air out of the bladder, even when stabbed with a knife. The men very willingly heaved it overboard, and mopped out the boat well, correctly believing that the mucous secretion from the animal long retained its stinging properties.

Dr. George Bennett has described the effects of the sting of a *Physalia* upon himself, and they are so similar to those which I witnessed, that I prefer to quote his observations at length than to abridge it.* "On one occasion," he says, "I tried the experiment of its stinging powers upon myself intentionally, when, on seizing it by the bladder portion, it raised the long cables by muscular contraction of the bands situated at the base of the feelers, and, entwining the slender appendages about my hand and fingers, inflicted severe and peculiarly pungent pain, adhering most tenaciously at the same time, so as to be extremely difficult of removal. The stinging continued during the whole time that the minutest portion of the tentacula remained adherent to the skin. I soon found that the effects were not merely confined to the acute pungency inflicted, but produced a great degree of constitutional irritation; the pain extended upwards along the arm, increasing not only in extent but in severity, apparently acting along the course of the absorbents, and could only be compared to a severe rheumatic attack; the pulse was accelerated, and a feverish state of the whole system was produced; the muscles of the chest even were affected, the same dis-

* "Gatherings of a Naturalist in Australasia," p. 7.

trressing pain being felt on taking a full respiration as obtains in a case of acute rheumatism. The secondary effects were very severe, continuing for nearly three quarters of an hour; the duration of the pain being probably longer in consequence of the time and delay occasioned by removing the exciting and virulent tentacula from the skin, as they adhered to it, by the aid of the stinging capsules, with an annoying degree of tenacity. On the whole being removed, the pain began gradually to abate; but during the day a peculiar numbness was felt, accompanied also by an increased temperature in the limb upon which the stings had been inflicted. For some hours afterwards the skin displayed several white elevations, or wheals, on the parts stung, similar to those usually seen resulting from the poison of the stinging nettle. To remove the irritation, at first cold water was applied; but this, instead of alleviating, increased the evil; an application of vinegar relieved the unpleasant symptoms, and olive oil has produced a similar beneficial effect." Dr. Bennett observed that the irritative power is retained for some weeks after the death of the animal in the vesicles of the cables; and even linen cloth, which had been used for wiping off the adhering tentacula, when touched, still retained the pungency, although it had lost the power of producing such violent constitutional irritation.

Sir Hans Sloane (remarkable for having been the first medical practitioner advanced to the dignity of a baronetcy) has given a quaint account of his observations upon the Physalia in his large work, entitled "A Voyage to Jamaica," published in 1707. Sir Hans sailed to the West Indies in September of 1687, in the character of Physician to the Duke of Albemarle, who had been appointed Governor of Jamaica, and in his diary states, that when in forty-six degrees of northern latitude, he first saw what the seamen call a Caravel, or Portuguese Man-of-War; "They burn," he says, "more violently than the species of the North Sea," alluding, no doubt, to the stinging Medusæ of colder waters, several kinds of which are common in the Irish Channel, "and they do suck themselves so close to the skin that they do raise blisters, and cause sometimes St. Anthony's fire."

There are several species of this Acaleph, though not yet well distinguished from each other, found in the waters of the Mediterranean and Atlantic. The term Physalia (from *φυσαλις*, a bladder) was first employed by Lamarck; and the following account of its structure is taken from Eschscholtz:—"The very large swimming bladder is distended with air, in such a manner that its longest diameter is horizontal. In all the species there may be remarked at one end of the bladder a prolongation, also full of air, which is not provided with suckers, or prehensile filaments. In some species this part equals half the entire length of the bladder, while in others it is very short. The opposite end of the bladder, on the other hand, is, in all species, covered on one side with suckers, which, in young individuals, are much more imperfect than the others, which lie in the middle of the vesicle. Along the upper surface of the bladder there runs a plaited ridge,

which, in its common condition, is also filled with air; but the animal can, at will, press the air out of it, when the ridge collapses into a membranous fold, the bladder remaining distended. On the lower side of the bladder are the organs of nutrition, which consist of suckers and prehensile filaments; the former arise either singly from the bladder, or many spring together from a common stem; the prehensile filaments consist of rounded filaments, covered throughout their whole length on one side with a series of reniform acetabula, and on the other side supported by a narrow membrane, which accompanies them from the root to the point. At the root of each prehensile filament, of which there are many of different sizes on a single animal, is a long pointed receptacle of fluid, attracted throughout almost its whole length to the filaments, and only free at its apex. The acetabula of the prehensile filaments appear to be the organs which secrete the mucus which produces the irritation of the human skin, and by which animals which are seized are at once paralyzed."

One opinion as to the cause the of pain inflicted by these *Acalephæ* is, that the mucus from the tentacles, which is undoubtedly the vehicle of the irritation they cause, is possessed of some poisonous property; another, and the more received is, that the irritation is mechanical, due to the rupture of numerous cnidæ, or thread-cells, which cells, when ruptured, set free numerous fine barbed filaments, capable of penetrating the pores of the skin.

The *cnidæ*, or thread-cells, are ruptured under pressure or irritation, and the barbed filament or thread contained in the cell is brought in contact with the offender. These thread-cells are found unusually large in the *Physalia*, where they are spherical in figure, and attain a diameter of .003 of an inch.*

There are, moreover, reasons other than anatomical, for regarding the irritation of the skin from contact with these threads to be of a mechanical rather than of a poisonous or chemical nature. It has been shown by Kletzinsky that levigated asbestos rubbed upon the skin causes a rash, analogous to that produced by a nettle-sting, which is closely similar to that produced by the marine *Acalephæ*; and in the case of the nettle-sting, it has not been proved that the irritation is due to the assumed presence of formic acid in the leaves of this plant, while many think it more likely to be owing to the number of fine hairs from the leaf which enter the skin. Many setaceous larvæ, if handled, inflict severe so-called stings, followed by a rash and great irritation; the larvæ of the admiral butterfly, of the nettle tortoise-shell butterfly, of the gold-tailed moth, and of the procession-moth, have, in many instances, produced severe irritation of the skin, similar to that resulting from the hairs of the pods of *Dolichos pruriens*. In the case of some larvæ, as *Papilio urtica*, this stinging power has been illogically attributed to their feeding upon the leaves of nettles. Other

* "Manual of Cœlenterata," Greene.

marine productions, besides the hydrostatic Acalephæ, have urticating properties; Darwin mentions,* that he was a good deal surprised by finding two species of coral of the genus *Millepora* (*M. complanata* and *alcicornis*) possessed of the power of stinging; the stinging property seemed to vary in different specimens; when a piece was pressed or rubbed on the tender skin of the face or arm, a pricking sensation was usually caused, which came on after the interval of a second, and lasted for a few minutes; little red spots were produced on the tender skin of the arm, which appeared as if they would have formed watery pustules, but did not; the *Aphysia*, or sea-slug of the Cape de Verd Islands, a flexible coralline, allied to *Sertularia*, and in the East Indian Sea a species of sea weed, are said to be endowed with this power of stinging.

In connexion with this subject, I may be allowed to allude to the stinging power of some of the Medusæ of the Irish Sea. I have been stung myself by one of the species of *Cyanæa*, and had one leg and side covered with the nettle-rash, which generally results from contact with their long filamentary tentacles. The animal passed in front of me while swimming. It was moving horizontally through the water by the alternate contraction and dilatation of its umbrella-like disk, trailing its long appendages after it; not knowing its powers at the time, I swam across its path, dragging it up close to my side by doing so; though aware at once that it had stung me, the sensation was not in any degree painful until after I had come out of the water. The delicate skins of children, or tender parts, such as the mouth or eyes, suffer very much from contact with the stinging Medusæ of our seas. Dr. Tyrrell has published the case of a fisherman who lost the fore-finger of his right hand from mortification, consequent upon the sting of a Medusa. This man, in clearing out a net, took a Medusa from it, when he found a sudden stinging sensation run up his finger, which had been slightly wounded before. The pain gradually subsided, and he took no more notice of the matter for two days, when swelling and pain in the finger came on suddenly; in seven days after the receipt of the sting the whole finger was gangrenous, and had to be amputated in consequence.† The stinging Medusæ of our seas belong to the section of the Acalephæ, termed by Eschscholtz *Discophoræ*, from the shape of the upper portion of their bodies, which forms a hemispherical disk, and but two genera—*Aurelia* and *Cyanæa*—are endowed with this property in a marked degree. By those who, from a residence at the seaside, have had opportunities of observing the stinging effects, in autumn, of the *Aurelia aurita* and *Cyanæa capillata*, the application of an alkaline and stimulating lotion has been recommended: for example, a drachm of bicarbonate of potash, a drachm of sesquicarbonate of ammonia, dissolved in half an ounce of spirits of hartshorn, and six ounces of camphor mixture.‡

* "Naturalist's Voyage round the World," p. 464.

† "Dub. Quart. Jour. Med. Sci.," Aug., 1864, p. 210.

‡ "Brit. Med. Jour.," Jan. 5, 1861, p. 7.