

Partnership between Fish and Anemone

THE association between large anemones and brightly coloured fish is so common in all the Indo-Pacific area that it has been noted many times, though strangely Rüppell, who described both the fish and the anemone of the Red Sea in 1828, does not note their association. The latest mention by Yonge in "A Year on the Great Barrier Reef" describes and illustrates the association between the fish *Actinicola percula* and the anemone *Stoichactis*, but here, in the vicinity of the Biological Station of the University of Egypt in the Red Sea, both species are different, the fish being *Amphiprion bicinctus* (Rüppell) and the anemone *Actinia quadricolor* (Rüppell).

The fish are apparently allied species, but the anemones are very different, *Actinia* having large tentacles which can attain a length of 6-8 cm. with a thickness of 1 cm., the body being 20 cm. or so in diameter. Rüppell's drawing was made from a much-contracted specimen. The anemone is found in any part of the harbour reefs where coral is growing from just under L.W.S. to 2 fathoms, and wherever either partner is seen the other will be found within a yard or so, often two fish to each anemone. Occasionally the same fish is partner to a much smaller, grey coloured anemone.

As both fish and anemone will live for weeks in the laboratory, I am able to add to the known habits of the commensals. The fish spends most of its time among the tentacles of the anemone, but should any object be put into its tank it immediately attacks it. If the object is a small fish, such as a 'sardine' (*Atherina*), the *Amphiprion* attempts to seize it by the tail. As the *Atherina* is half again as long as the *Amphiprion* this attempt is fruitless until the prey has come into contact with the anemone's tentacles, which cause instant paralysis, the *Atherina* taking a vertical position, motionless but for a greatly accelerated breathing, at about 240 gasps per minute. The *Amphiprion* attacks again, and after several contacts with the anemone even so comparatively large a fish as *Atherina forskali* is overcome, and is dragged back to the anemone and engulfed.

Amphiprion is thus an active hunter for its host, but its share of the prey seems to be small. The bones of the fish are ejected by the anemone after some hours, and are then picked by the *Amphiprion*, which also nibbles at the anemone's mouth, apparently obtaining some of the half-digested food. It has been stated that *Amphiprion* actually enters the coelenteron of the anemone, but this has not been observed here, though it can become quite invisible among the tentacles. It has been seen to bite off and eat the end of a tentacle.

The anemone is also more active than expected, the long tentacles are often in motion and changes of shape are frequent. The most interesting observation is that the animal alters its position in the aquarium in order to come beneath the inflowing water jet, and if this is moved the anemone moves correspondingly.

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Infant Self-Help

BRAVO, Infant. Miss Chick and others, through Austrian sufferings, have taught us that, "crying for the light" you make use of it to do your own D-ing. Now comes the welcome news¹, that you are not to be outdone even by the rat: that "mewling and pewking in [your] nurse's arms", you can yet C—alone; in fact, make your own *Antiscorbutic Acid*, from birth up to about five months old—a time at which the doctrine "them 'aves what we 'aves" more or less naturally comes to your aid. Nature, it seems, still favours the now unpopular practice once so powerfully advocated by my old neighbour, the late Samuel Smiles. At the moment, however, the newspapers are full of prayers offered up by headmasters, even in Royal Presence, on prize day, that your dear brothers shall be kept on at school—I suppose to continue learning to be led and that they may develop a full measure of swollen head: they will not even have had enough 'science' put into them to understand the wonderful example you are setting of self-helpfulness. Of course, I assume that the report is no mere report.

I have long been wondering whether milk, at its best, may not be an incomplete food for the mammalian infant: whether Nature may not have arranged to supplement the mother's care. I have sought to learn how early the young of herbivorous animals begin to nibble grass: probably they do so very early in life; the young guinea pig, I believe, at once. I can obtain very little trustworthy information upon this subject.

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¹ NATURE, 134, 142, July 28, 1934.

Physiological Studies of Fungi

IN his review of my "Researches on Fungi", vol. 5¹, Mr. J. Ramsbottom, referring to the well-known Smut fungus, *Tilletia tritici*, by an unfortunate slip states that I have interpreted "the secondary conidium of Brefeld as a special type of primary sterigma borne by the basidium-body (promycelium)".

As a matter of fact, I have interpreted Brefeld's secondary conidium as a true basidiospore. The secondary conidium of *T. tritici*, in its asymmetrical form and drop-excretion mode of discharge, exactly resembles the basidiospore of every mushroom and toadstool and of every Rust fungus.

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¹ NATURE, 134, 80, July 21, 1934.

I MUST apologise to Prof. Buller and to your readers for the *lapsus calami* which will be obvious to anyone referring to the preliminary account in NATURE mentioned in the review.

In my opinion Prof. Buller is probably right in regarding the secondary conidium as a basidiospore. What I intended to question was his use of the term primary sterigma for the structure which Brefeld called a primary conidium or basidiospore.

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