

SOME HINTS ON KEEPING HYDRA. (FRESH-WATER POLYPPES).

BY MISS M. K. SPITTAL.

The Brown Hydra, *H. vulgaris*, can truly be said to be a native of Hampshire, as it may be found in almost all the still ponds and ditches on whose surface grow duckweed and water ranunculus.

The Green Hydra, *H. viridis*, is smaller and not so common. The ancestor of those which figure in my drawings came originally from a pond near Guildford.

Both species are well worth keeping under observation, for there are still many facts concerning them which have not so far been recorded in any book or journal. Howe's "Atlas of Practical Elementary Biology" gives very good outline drawings of Hydra, highly magnified; and Vol. I. of the "Cambridge Nat. History" contains an article by Professor S. J. Hickson, F.R.S., headed:—

COELENTERATA.

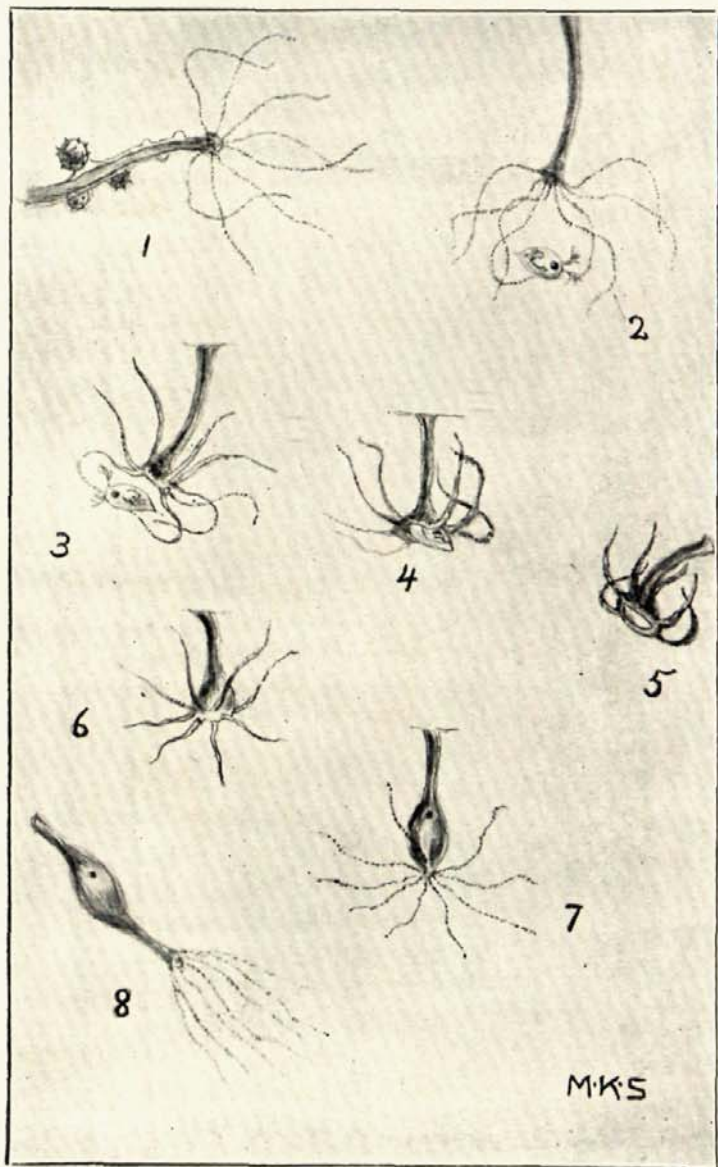
Class I. Hydrazoa.

Order I.

Eleutheroblasta.

The following is an extract:—" . . . Tubular body wall built up of ectoderm and endoderm, enclosing a simple undivided coelenteric cavity. Mouth on summit of conical hypostome, and at base of this, crown of hollow tentacles."

My sketches, being all done under a two-in. lens, do not show the interesting fact which a high power reveals, *i.e.*, that the tentacles are studded with pear-shaped cells barbed at the thin end, and containing a wound-up thread. At the approach of any soft-bodied animalcule included in the Hydra's dietary the thread



Magnified *Hydra vulgaris*. Natural size about $\frac{1}{2}$ inch.

1. Showing germ-cells in summer.
2. et seq: Catching and eating a Daphnia (water-flea).
Note eye of Daphnia in 7 and 8.

suddenly shoots out and either paralyzes or poisons the victim. If the latter escapes from the Hydra's embrace it usually sinks to the bottom of the tank, and never gets up again.

The Hydra's method of budding, or "gemination," is shown in the plate. In a few days the bud separates and becomes another Hydra, but this youngster is able to catch a water-flea and eat it while he is still attached to his parent. See Fig. 5 in the Green Hydra plate.

When food is plentiful budding proceeds rapidly. A Green Hydra which was isolated for special study produced 46 buds in the course of its life—a period of eighteen months and ten days.

In summer they also produce egg cases, large in proportion to the Hydra's size, and containing the germ-cells. A specimen of *H. vulgaris* bearing these cells is shown in the plate. The so-called egg is orange-coloured and studded with brown prickles. The whole is attached to the Hydra by the white membrane, but presently breaks away from this and falls to the bottom of the pond or tank.

I kept eleven of these pretty spiny balls, measuring about $\frac{1}{16}$ inch in diameter, which had been deposited in May by five *H. vulgaris*. At the beginning of October a little Hydra emerged from each of them, resembling the newly-budded ones, except that they were more colourless and less lively.

Apropos of the Hydra's colour, the brown ones are variously named *H. fusca*, *H. grisea*, etc. Dr. Carpenter, F.R.S., who writes in "The Microscope and its Revelations," states that "the *H. vulgaris* is usually orange-brown, but sometimes yellowish or red, according to the nature of its food." Even the colour of *H. viridis* can be changed. Last Christmas I fed a tankful of bright Green Hydra on some beautiful coral-red cyclops, and the Hydra all turned that colour and remained so for a few weeks, gradually resuming their characteristic green as their food became neutral-tinted again.

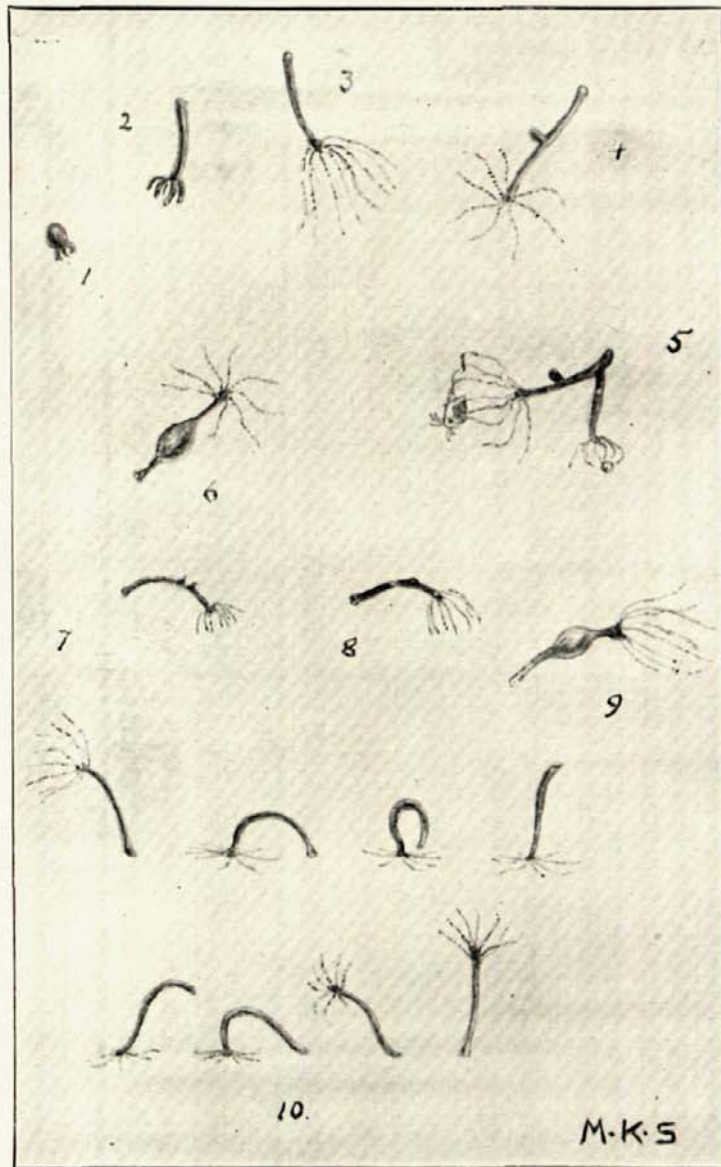
The manner of a Hydra's moving is most interesting to watch. It can glide along like its big cousin the sea anemone, or let go

from the weed upon which it happens to be standing and float downwards, or (and it is the *H. viridis* which employs the following way most frequently) it will "loop the loop" as shown in my sketch, standing alternately on its head and its suctorial foot.

Professor Hickson says, in the above-mentioned article, that Hydra possesses remarkable power of recovery from injury and regenerating lost parts. Further, that it can be cut in pieces, and each piece gives rise to a new Hydra, provided that ectoderm and endoderm are represented. I have not gone so far as to mince up one of my Hydra, but I did accidentally cut one nearly in two with the pipette's sharp edge. In three days' time the wound had healed, and the patient was able to swallow a Daphnia as big as itself. (See sketch).

On the other hand, a Green Hydra was set upon by the larva of *Corethra*, a sort of gnat. This fierce creature worried the unlucky Hydra as a terrier would a rat; and though I pushed the enemy away with all haste, the Hydra was too much injured to recover, and shrank into a dark little lump which had, on the following day, completely vanished. I have never seen a *dead* Hydra. The isolated specimen to which reference has been made, and which attained the age of 18 months, was budded on February 5th, 1915. On July 1st, 1916, it appeared to have left off feeding, and from that date it grew gradually smaller and more colourless. It lost the power of holding on by suction, but could still move a little way up and down the glass. It was now so small that a strong magnifier was required instead of the usual pocket lens, and I dated its death from the 15th, by which day it had become quite invisible.

The creatures suitable for the Hydra's food are, of course, taken from the same pond, and can be kept in glass jars, and introduced, a few at a time, into the tank. Take care to exclude the voracious and multiform larvæ of the pond, or these will devour your Daphnia and Cyclops before the Hydra gets a chance. Small specimens of the last mentioned animals are the favourite food of *H. viridis*. *H. vulgaris* can naturally manage



Group of *Hydra viridis*, magnified, attached by "suctorial disc" to sides of tank. Natural size about $\frac{1}{4}$ inch.

1. Tentacles drawn in for protection. 3. Resuming normal attitude.
 4 and 5. Germination, or budding. 7-9. Rapid recovery from wound.
 10. The Hydra's mode of walking.

much larger ones, and he also eats the bivalved crustacean *Cypris*. The sketches show *H. vulgaris* catching and eating a Daphnia, the solitary black eye thereof being clearly visible through the Hydra's transparent body. The young Daphnia and Cyclops are both possessed of a pair of eyes, which become fused into one as the creature reached maturity. The eye of Cyclops is crimson and shining like a ruby, and the whole creature is beautifully coloured. Sometimes sea green, sometimes turquoise blue; and the female carries egg-bags which are often a lovely shade of violet. The eggs of those Christmas coral-tinted ones were burnt-sienna colour.

The Daphnia is yellowish white, and all its internal mechanism shows through. *Cypris* varies in shades of brown and green. There is a mischievous little red mite, of spider-like appearance, which must always be turned out. Also the little leeches, green and white, which undulate so gracefully through the water.

No snails should be left in the Green Hydra's tank; if quite small I do not think they would interfere with *H. vulgaris*.

The big *Corethra* must be an awful bogey in the water! Its body is transparent and would be invisible but for two dark blue or claret-coloured patches on its back. The eyes are black and the beak yellow.

All wriggly worms must be removed, and some of these are apt to make a burrow with the débris at the bottom of the tank, and lurk there unseen, unless removed by the Hydra's guardian.

If, after reading all this, the naturalistically inclined member of the Hants Field Club (with a pond of the right sort within reach) feels inspired to try Hydra-keeping, I shall be glad to give him hints on the necessary apparatus—a simple affair.

It is the fact of the ground being so untrodden which makes Hydra study so fascinating. All the time the naturalist, however amateurish he may be, is making records hitherto unknown.