

full egg-cases attached to their abdomens. I put several individuals into different aquaria, and was much annoyed to find that they fell victims to various enemies during the night. A *Dytiscus* beetle, the presence of which had been forgotten, accounted for four, and four more were apparently devoured by insignificant fresh-water snails. Those, however, that were placed in a tank by themselves are alive and well, and feed on the green algæ supplied to them. The males are about $1\frac{1}{2}$ inches long, the females rather smaller.

When the river comes down in flood experience shows that it is time to be on the look-out for zoological curiosities. Perhaps *Apus* itself may reappear once more now that *Cheirocephalus* has shown the way!

Eton, March 5.

M. D. HILL.

The Formation of Large Drops of Liquid.

THE following experiment, based on the temperature-density relations between aniline and water, serves to illustrate to an audience the various shapes through which a drop passes in the course of its formation. A glass beaker, about 9 inches in height and $4\frac{1}{2}$ inches diameter, is filled to about 7 inches with distilled water, and about 80 c.c. of aniline are added. The beaker is then placed on a burner, and the temperature raised until the aniline floats to the surface of the water. On spreading out at the surface the aniline is cooled, thereby becoming denser than the water beneath. A large drop, 1 inch or more in diameter, then detaches itself from the mass at the surface, the formation being so slow that the altering shapes of the drop, the drawing out of the neck of liquid, and the thinning of the neck in two places may easily be observed. The large, detached drop falls to the bottom of the beaker, and is there re-heated, thereby again becoming lighter than the water, and rising to the surface, when a second drop is formed. By maintaining the temperature about 80° the formation of drops continues indefinitely in the manner described. The slightly pink colour assumed by the aniline enables the experiment to be seen clearly from a considerable distance, and the many beautiful shapes assumed by the drops lend an added interest to this simple method of demonstrating their formation. CHAS. R. DARLING.

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The Fertilising Influence of Sunlight.

THE letters of Mr. and Mrs. Howard and of Dr. E. J. Russell in recent issues of *NATURE* point to the conclusion that the partial sterilisation of the soil improves its fertility. In connection with this subject, I would like to record that the effect of heating the soil has been observed here for some years. It has been the practice to collect all the refuse of the place that cannot be rotted, such as hedge cuttings, tree prunings, &c. These are placed on a vacant space in the kitchen garden and a fire made of them in winter. The fire is generally a large one, burning fiercely all day, and the larger branches keeping it going all night.

In the following summer the site of the fire is well marked. The rows of vegetables where they pass over it are more than a half stronger than at other parts, though they do not keep that proportion to the end of the season. The increased growth seems to be due to the heating of the soil, and not to the large amount of wood ashes left by the fire, as these are either lifted and used as a top dressing for borders where the spade cannot be used, or are spread over the vegetable ground, the site of the fire being generally left quite bare of ashes.

Ardenlea, Falkirk, March 8.

JOHN AITKEN.

MOLES AND MOLEHILLS.

LIKE that of other common animals, the complete life-story of the mole has yet to be written, exceedingly little being really known. The difficulties of observing the habits of a subterranean dweller of a most retiring disposition are patent but not altogether insuperable, and the wonder is that field naturalists have been content to read and take for granted the information handed down for the last century without any attempt to confirm it.

NO. 2106, VOL. 83]

During the winter months one cannot help noticing in the open fields here and there a mole-heap conspicuously larger than the rest. This is a male mole's winter habitation, but at present we do not know whether he lives alone or with his wife, or if the female ever constructs these "fortresses," as they are called. Probably he lives alone, and probably females make "fortresses" slightly more simple in construction and smaller in size than those of the males. If we take a spade and carefully slice away the top of a fortress, we shall find several hollow tunnels or runs, which may be opened up and followed to the base of the "fortress," whence they lead away into the field. Slicing further under these into the "fortress," and

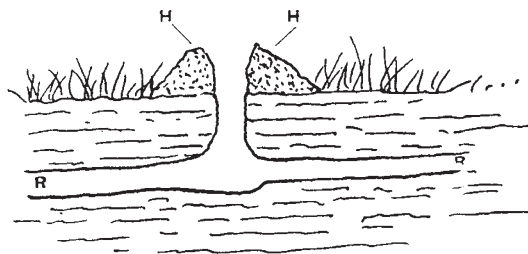


FIG. 1.—First stage of the fortress—sectional view. R R, Mole's run below the surface; H H, heap of ejected earth.

just below the ground-level, we come upon a large circular cavity filled with a bundle of grass or dead leaves; this is the mole's nest in which he sleeps. If he has lately quitted it the interior will be quite warm to the hand; the mole himself, however, will never be caught in the nest. When the nest is removed and the cavity examined, it will be found about a foot in diameter and worn smooth by the mole wriggling about as he wraps his nest round him, for that is his method of arranging himself within it. Two or more tunnels will be found leading away from the nest-cavity into the field. One of these is particularly noteworthy, as it is found in nearly every fortress;

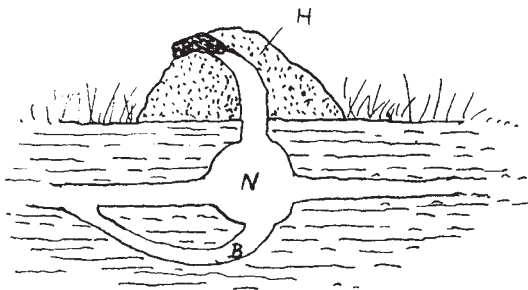


FIG. 2.—Second stage of the fortress—sectional view. N, Nest-cavity; B, bolt-run; H, heap of ejected earth.

this exit leads from the bottom of the nest perpendicularly downward for about a foot, then, turning upwards, it joins another run. Its origin and use are uncertain, but it is usually regarded as a sort of sally port, and is known as the "bolt-run."

It is extremely unlikely that the mole deliberately selects the site of his fortress, as he is practically blind; probably he sets to work whenever the impulse seizes him, and proceeds in the following manner. He commences to enlarge a nest-cavity, ejecting the earth which he has loosened with his powerful claws out of a hole in the roof; this he does with the top of his head in little jerks. The quiet observer may see a sausage-shaped mass of earth issue from below