

needle, or through a slit made with a scissors. Under favorable conditions, the point may be fitted into one of the ostia. The India ink is now slowly injected, and the progress of the ink watched through the transparent vessel walls. In this way, a student can realize what is meant by blood pressure, peripheral resistance of capillaries, physiological pathways open at the time of death, delicacy of capillary beds, as well as the course of the main blood vessels. There is an added advantage, in that one is able to "feel" the resistance of the vessels and capillaries, as well as to see the fluid as it passes through. The addition of a mercury manometer between the bulb and the glass tube may be of use in making quantitative or comparative studies. The advancing stream of black is carefully watched and the order in which the vessels are filled is noted. A very good idea of the relative strengths of the vessels is obtained by watching for extravasations. After these points have been observed, the injection still remains and can be studied, considerable dissection being possible without leakage. In case the ink runs on to the tissues, it can be washed off under the hydrant. The brilliant contrast of black and white is of course obvious.

A particularly instructive study can be made by injecting the venous system of the crayfish. The carapace is removed from a freshly killed specimen, and the gills exposed. The ink is then slowly injected into the ventral sinus of the abdomen. The advancing stream can be followed from the different parts of the body (well seen in the transparent joints) to the gills, through them, back to the body wall, and to the pericardial sinus. The picture seen on clearing one of the gills in glycerine has a new interest to the student, he having watched and controlled the process of filling them.

This method, besides presenting many anatomical structures from a physiological point of view, has a wide range of application. A truer, safer and more graphic picture is obtained by injecting a duct or opening, than could be secured by probing it. This is of value in some animals in tracing the bile and pancreatic ducts, as well as those of other

glands. It has been successfully applied in some cases to formalin material. Thus the stomach and radial canals of *Gonionemus medusa* can be demonstrated very well, as can also the pharynx of *Amphioxus* and its relation to the atrial cavity. Formalin specimens of tapeworm show the longitudinal and connecting excretory canals very clearly. The living earthworm is very resistant to injections of the blood vessels, a point easily correlated with the fact that on cutting the worm, contraction of the vessels prevents bleeding to death. In the grasshopper, the connections between the alimentary canal and gastric ceca can be well shown by injection per os. In some cases water serves the purpose of the ink, as in studying the path of the water in the nasal aperture of the dogfish, or the change of the relations of the parts of the digestive tract when full and empty, or the resistance their inner folds presents to the passage of the food.

In these injections it should be borne in mind that the process is the part desired, not necessarily the finished product. Furthermore, the student should realize that the condition of the preserved specimen merely represents one set of conditions in the life of the animal, and the injection should therefore be considered as showing graphically the physiological condition of the animal at the time of death only, with such subsequent changes as naturally follow. This is well shown by the different amounts of ink flowing into each vessel, and the ease with which they are filled. The details noted above, while probably including points now in use in many laboratories, are given here, as we have found that the use of this technique has given the elementary student a simple means of studying, in the animals dissected in the laboratory, some of the more fundamental problems of the dynamics of organs.

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THE POISONOUS CHARACTER OF ROSE CHAFERS

I WAS particularly interested in the article on this subject in SCIENCE, January 28, 1916,

because for many years past there has occurred a serious loss among the brook trout (and I think also the rainbow trout) of Pine Creek, at Long Pine, Nebraska. They have floated down stream dead, in large numbers, and stuffed with live rose chafers. The theory to account for this has been the same as stated by the above writer, namely, mechanical, though no real mechanical damage has been observed. I have no doubt of the poisonous character of the beetle, and add this note to extend the knowledge of its effects on a very different order of life. The chafers, it should be said, feed on the willows, chiefly *Salix fluviatilis*, that overhang the stream, sometimes stripping them bare.

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SCIENTIFIC BOOKS

British Antarctic (Terra Nova) Expedition, 1910. Zoology, Vol. I., No. 2, *Natural History of the Adelie Penguin*, by G. MURRAY LEVICK, M.D., R.N.; No. 3, *Cetacea*, by D. G. LILLIE, M.A.; Vol. II., No. 2, *Oligochaeta*, by H. A. BAYLIS, B.A.; No. 3, *Parasitic Worms*, by R. T. LEIPER, D.Sc. and E. L. ATKINSON, M.D., R.N.; No. 4, *Mollusca*, Pt. 1, by EDGAR A. SMITH, I.S.O.; No. 5, *Nemertinea*, by H. A. BAYLIS, B.A.; British Museum Nat. History, 1915, 4° with many plates and text-figures.

Notwithstanding financial stringency caused by the war, and the absence of many of the younger men of science in the hospital or the trenches, British scientific institutions have been able, as a rule, to continue publication though in restricted measure. The various papers based on material collected by the *Terra Nova* expedition have been coming out separately at intervals during 1915, without reference to the order in which they are intended finally to be bound up.

Dr. Levick's account of the habits of the Adelie penguin, illustrated by twenty plates, is most interesting and some of their proceedings, especially their habit of unanimous "drilling" in large masses like a regiment of well-trained soldiers, are inexplicable on any hypothesis.

Lillie's account of the whales relates chiefly to subantarctic species mostly observed at whaling stations in New Zealand. He is disposed to regard several of the species, especially the humpback (*Megaptera nodosa* Bonaterre), as identical with boreal species. However the coloration and proportions as figured differ markedly from the north Pacific species (*M. versabilis* Cope) and the species of *Cyamus* infesting them are distinct. He indulges in some speculations in regard to what the whalers call the "high-finned killer," individuals with a higher dorsal fin than the others of the same school, but in the north Pacific there is always at least one of these with every school of killer whales and there is little doubt that these individuals are the old parents of the family group which forms the "school."

Baylis describes a new species of *Oligochaeta* found in the gill-chamber of a land crab (*Geocarcinus lagostoma* M. Edw.) collected at S. Trinidad Island in the South Atlantic. This is the second species known to inhabit such a *situs*, and does not appear to have been materially modified by its parasitic habit. Two new Nemertean are described from the Antarctic Sea, a *Baseodiscus* and a *Lineus*, and two known species of *Amphiporus* were also obtained, while three other species were obtained in New Zealand waters.

The parasitic worms described by Leiper were chiefly obtained from seals and fishes, the birds proving almost free from parasites. A free living Nematode was dredged in McMurdo Sound in 250 fathoms. The species are well illustrated and the paper concludes with a summary of the species collected by previous Antarctic expeditions.

The Prosobranch, Scaphopod and Pelecypod mollusca are described with his usual care by Edgar A. Smith and illustrated by two excellent plates. Fifty-eight species are enumerated from the Antarctic region of which twelve are new.

The expeditions of the *Discovery* and *Southern Cross* had previously obtained a large proportion of the fauna of the region visited by the *Terra Nova*. Nothing very striking appears among the novelties except one or two