the lectureship (1791–1817) which included many exciting advances in the subject; an era much given to portraiture and cartoon has left no traceable reproduction of the lineaments of William Irvine; memorialists have often concentrated on the various medical chairs which were held concurrently or successively by the lecturers in chemistry. Enough remains to afford a reasonable pride in associations with hermetic antiquity.

Lavoisier and Dalton were to find paladins in Hope and Thomas Thomson, but Boerhaave and Stahl were the first pedagogic exemplars. If alchemy were never countenanced, the 'Four Elements' and the *Tria Prima* were topics of critical discussion in the earliest lectures. From that point onwards the making of modern chemistry is mirrored in the teaching and researches of its exponents at Glasgow, and in the later activities of those thousands whose names have been enrolled in the class of chemistry since 1747.

TAXONOMY OF AQUATIC INSECT NYMPHS AND LARVÆ

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ALMOST any collection of freshwater animals will contain a high proportion of insects in the larval or nymphal stage, and a number of these cannot, at present, be named with certainty. The work of many biologists, whether their interest be in ecology, physiology or the food of fish, is affected by this gap in our knowledge, and the importance of closing it need not be stressed. It is the belief of the Freshwater Biological Association that, with sufficient co-operation from workers in other parts of the country, it should be possible, within a few years, to produce keys for the identification of the aquatic stages of all the important groups, except the Diptera. The purpose of this article is to appeal for this co-operation, to which end it includes brief notes on the existing systematic literature of the various groups and a short account of some of the methods of rearing adults from their nymphs or larvæ.

It is hoped that some workers in other laboratories may be induced to turn their attention to systematic studies, and the Freshwater Biological Association is prepared to give all the assistance it can. Others may be able to help by breeding out the species occurring in their own neighbourhood and sending the material to Wray Castle to be described.

The Ephemeroptera and Odonata are under investigation at the moment at Wray Castle. The most urgent need is the description of those species at present not described in any language; but it is also desirable to redescribe and figure some of the species already known, as almost all the existing literature is based on Continental material and the illustrations do not conform to a uniformly high standard.

The Coleoptera and Hemiptera, which are aquatic throughout life, are considered of less importance at the present moment. The position of the other main orders with aquatic nymphs or larvæ is as follows:

Plecoptera. Hynes[1] has described twenty-six out of the thirty-four probable British species, and two have been described since.

Ephemeroptera. Schoenemund's[2] key to the German species includes thirty of the forty-seven British species. Descriptions of some of the remaining seventeen are scattered through the literature. The biggest gap is the genus *Baëtis*, common and widespread in Britain and an important element in almost any stream or river. There are nine British species, but the nymphs of only three have been described, and one of these is probably associated with the wrong adult.

Odonata. Lucas[3] gives a key to the nymphs of all the British species, but experience at Wray Castle suggests that some of the species are distinguished on insufficient material, and the key does not always give the right answer. May[4] states that sufficient information to make a key to the subfamily Agrioninæ or the genus *Sympetrum* is not available. The group clearly requires further study.

Trichoptera. The most complete key, that given by Rousseau[5], is somewhat out of date. A revision of the larvæ of the group is being undertaken by Dr. N. E. Hickin, who has so far described some twenty of the British species (see Hickin[6] for list of references).

Diptera. Complete keys to some of the smaller families, for example, Culicidæ[7] and Simuliidæ[8] exist; others are among the least known of all the aquatic animals. The outstanding gap is the Chironomidæ, a very large family and one of great importance in freshwater biology. In spite of detailed work in Germany most larvæ can only be separated into species groups. Reference may be made to Goetghebuer and Lenz[9]. Separation into groups can also be effected by the use of Johannsen's[10] keys, although this author is primarily concerned with the American fauna.

Many Ephemeroptera and Plecoptera live in flowing water which is always cool and well oxygenated. Hynes[1] describes a technique for rearing the nymphs which are collected in such places, and the apparatus is figured by Worthington[11]. Series of flat enamel dishes are placed on sloping shelves one below the other. Water entering the top dish of each series from a tap drips from one dish to another. Each dish is provided with stones for the nymphs to cling to and is covered with a sheet of mosquito netting on a wire frame. It is necessary to transfer newly emerged Ephemeroptera to a small tube for a day or two, in order to allow the imago to emerge from the sub-imago. Both nymphal skins and adults should be preserved in 2½ per cent formalin, the adults being first wetted in 70 per cent alcohol.

Stream-dwelling Ephemeroptera have, however, been reared in stagnant conditions where a supply of river water was immediately available. Useful collections have also been made by catching emerging sub-imagines in the field. A large collection of nymphs is made; those which, from their silvery appearance, are evidently about to emerge, are sorted into a dish, the collection is then watched, and each sub-imago is caught as it emerges.

Most Odonata inhabit stagnant waters and are easier to rear. They may be kept in pie dishes without running water, one nymph to a dish or they will devour one another. A stick or piece of reed should be provided for the nymph to crawl up before emergence. Each dish should be covered by a cage, though, if this is not possible, and the dishes are in a room, of which the doors and windows can be kept closed, it is seldom that an adult is lost or cannot be associated with the skin from which it came. The

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adult should be caged for several days after emergence, so that the colours may develop. The brilliance of wild specimens is never attained by captives, but the colours develop sufficiently for systematic purposes. Adults and nymphal skins should be preserved in 70 per cent alcohol and kept in the dark.

The cast skins of exopterygote insects are sufficient for taxonomic purposes, but it is always desirable to have some preserved nymphs from the same locality.

Detailed descriptions of rearing techniques are given by Galtsoff *et al.*[12].

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OBITUARIES

Prof. B. A. McSwiney, F.R.S.

In the sudden and most untimely death of B. A. McSwiney on March 8, physiology and physiologists have suffered a most grievous loss. At a time when enthusiasm, energy and wisdom are conjointly needed for the development of medical education and its safe progress in a period of transition, the University of London and the Medical School of St. Thomas's Hospital have lost a professor and a dean who possessed these qualities in abundance.

McSwiney's scientific career, apart from the war years, was largely orthodox. After a year as lecturer in Leeds, he became lecturer in experimental physiology in the University of Manchester and had the good fortune to work in that laboratory when, under the stimulus of A. V. Hill, it was awakening from a long sleep. His early publications reveal an interest in the development of apparatus for teaching and research which he never lost; but it was not until 1923 that he started working on two quite different subjects which eventually were to shape all his subsequent activity. With Crichton Bramwell and A. V. Hill he published a paper on the velocity of the pulse-wave in man, and a year later, with the late E. D. McCrea, J. W. Morison and J. S. B. Stopford, one on their work on the normal movements of the stomach.

The innervation of the stomach remained McSwiney's chosen interest, and into the morass of conflicting statements, bad experiments and misleading results which confuse the literature he plunged with unabated energy. His work has revealed many of the sources of error which have beset previous workers and has formed a firm scaffold of sound experiment within which others may build. It is of interest to follow the directions in which the problem of gastric innervation led him. He followed at one time the attractive by-path of the physiology of isolated smooth muscle; he developed an elegant nerve–smooth muscle preparation which permitted an approach to be made to the analysis of the peripheral interaction of vagal nerve volleys; and, at the other end of the scale, he and W. R. Spurrell developed a method of outlining the stomach so that its activity could be observed radiographically, without the disturbance and abnormality of an opaque meal.

But this was to take place some years hence. In the meantime, at Manchester, the University had decided to start an honours school of physiology, and it was in the intimate teaching of the chosen few that McSwiney reached his peak. He was obviously too good to last long as a lecturer, and in 1926 he was appointed to the chair of physiology in Leeds.

Here was a splendid opportunity; a relatively small department was ripe for development, and there was the prospect of the extension of the medical school at an early date. McSwiney set to with gusto to build a Physiology Department second to none in the provinces. The old building was reconstructed internally, and, in a few years time, a new building rose which bore the unmistakable stamp of the foresight, skill and energy of the prime mover in its completion. Yet in spite of this interest in bricks and mortar, he was building within his laboratory a research team of great potential. He paid the inevitable penalty of losing men as he made them, but it must have been a source of pride to him to know that eight of his staff at Leeds eventually went to chairs, or posts of equivalent rank. He paid again in the energy he expended, willingly and happily; but the result was a peculiarly happy and friendly laboratory.

It was towards the end of his stay in Leeds that McSwiney published a paper on the afferent fibres from the abdominal viscera. This was the first of a long series with a number of different collaborators, and in it McSwiney had obviously found the subject of his heart. The technique employed was apparently simple, suggesting that little more was needed than observation of the pupil and excitation of nerves by the homely pinch or an induction shock. It demanded, however, the exercise of the experimenter's full artistry to maintain the integrity of labile reflexes in animals exposed to extensive surgical interference, and a most rigid exclusion of a multitude of complicating factors. McSwiney and his colleagues were building a fine structure of knowledge on visceral afferent pathways, much of it with direct application to human medicine. It is to be hoped that his death has not brought the work to an end.

McSwiney left Leeds in 1936 to succeed the late John Mellanby as professor in the Sherrington School of Physiology, St. Thomas's Hospital, and here he set out to continue the work so successfully started in Leeds; but not for long, as he was soon involved in the turmoil of war and evacuation of the Medical School to Godalming. Ordinary research work came to a standstill, and his laboratory undertook practical problems of wound shock and oxygen therapy. With the return of peace his unflagging energies were devoted to the return of his medical school to its normal activities and to the repair of the spiritual and physical damages of war.

No comments on McSwiney's career would be complete without reference to the service which he

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