manufacture is already undertaken where the work involved provides valuable experience for students, and the College is well equipped to accept suitably qualified students for research in various branches of design, development and production applicable to instruments, fine mechanisms, horology, automatic control and so on.

UNIVERSITY COLLEGE OF THE WEST INDIES

DEPARTMENT OF ZOOLOGY

By PROF. N. MILLOTT

THE West Indies have always formed a fruitful area for the prosecution of zoological research, and now, as in the past, excellent work is being done by the Institute of Jamaica and a well-established Natural History Society. In recent years the facilities for such studies have been increased by the establishment of a Department of Zoology in the new University College of the West Indies. Though facilities have been in existence from the inception of the College in 1948, it is only recently that they have been fully realized by the housing of the Department in permanent accommodation.

The Department is situated in the University grounds of some seven hundred acres and is readily accessible, being seven miles from Kingston. It is designed and organized for both teaching and research. As a teaching unit it is responsible for the training of undergraduates for degrees in science, and the intermediate and First M.B. examinations of the University of London, with which the College is privileged to maintain a special relationship. Provision has also been made for the training of post-graduate students for higher degrees.

The buildings were designed by the University College architects, Messrs. Norman and Dawbarn, of London, in conjunction with the head of the Department, and they were completed in October 1952.

Mostly on one level, the laboratories include a large elementary and a smaller advanced teaching laboratory, suitable for the study of systematic

zoology, animal morphology, histology, etc. In addition, there are an experimental laboratory for physiological studies, a small museum, an aquarium room, offices, a photographic dark room and a lecture room. Two research laboratories are provided. All the laboratories are fitted with the usual services, and in addition, both the experimental laboratory and the aquarium room have compressed-air mains. Very shortly a salt-water circulator will be installed in the aquarium room. The furnishings are executed in local woods and were designed and constructed on the University College site.

The laboratories have been equipped and staffed, so far as possible, for a comprehensive study of zoology, rather than for highly specialized studies of particular aspects. In this way it is hoped that the Department will not only be able to give its students an adequate training in the ever-widening sphere of zoology, but will also provide a type of research centre that has long been required in the central Caribbean.

From the first the Department has aimed at encouraging visiting research workers to use its laboratories and in this a real beginning has been made, the Department having already accommodated research workers under the Fulbright scheme and two members of the staff of the University of Glasgow. It is hoped that other institutions and organizations will encourage investigators to use the facilities now available.

Since the beginning, members of the teaching staff of the Department have been actively engaged in research, and the existing programme falls into six main divisions. A study of the Collembola of Jamaican soils is being undertaken, which, initially, will involve the determination of species, and later, studies of population density and distribution. The Nuffield Foundation has generously offered financial assistance for this study. A second division consists of evolutionary studies on snakes and lizards. These have involved investigations of the details of speciation in Jamaican reptiles, comparative anatomical studies including a special study of the retina, and distributional studies which bear on the evolution of higher taxonomic categories and the problem of the origin of snakes. Researches on the thymus of

Zoology Laboratories University College of the West Indies

reptiles and mammals, particularly primitive forms such as the sloth, are being pursued, and studies are also being made of the anatomy of the rare, beaked whale *Mesoplodon*, two individuals of which were recently washed up on nearby shores. Hitherto undiscovered platytenid ctenophores have raised interesting problems in connexion with their phylogeny and distribution, which are now being tackled in the Department. Lastly, a study of local echinoids has revealed in certain forms a striking sensitivity to light. Since they lack morphologically defined photoreceptors, their mechanism of perception is clearly of great interest and it is being analysed in detail in one species. Rather unexpectedly, the study has yielded interesting results in relation to melanogenesis in this form, and the research has recently received the support of the Rockefeller Foundation.

Visiting workers have undertaken research on the taxonomy and distribution of Jamaican frogs, the effect of thyroid inhibitors on the development, and that of phenylthiourea on the pigmentation, of *Eleutherodactylus*. The bionomics of black widow spiders and scorpions, and the feeding processes of bivalve molluscs, have also been investigated.

The geographical location of the Department is admirable for zoological studies, since the surrounding collecting grounds are readily accessible by good roads. Seaward, some ten miles distant, lies Kingston Harbour with fertile collecting grounds afforded by cays, lagoons, mangrove swamps and innumerable bays and inlets. The north coast of the island with its accessible coral reefs is some thirty miles away, and nearby salt ponds, periodically land-locked, offer a worthy opportunity for ecological studies. Landward, there are areas showing diverse climatic, topographical and geological conditions. From dry plains, mountains clothed in forest rise in succession to 7,000 ft., and most areas are accessible by road.

In general, these areas yield an abundance of animal forms for systematic, ecological and physiological studies. Echinoderms, molluscs and many insects occur in spectacular quantity. The embryologist will find much of interest in the abundant eggs of lizards, geckos and anurans with direct development. For those interested in migration problems, it is appropriate to note that the island is visited not only by migrant birds but also by migrant butterflies.

In the past it was necessary for many visiting research workers to limit their activities largely to collecting and preserving. Such drastic limitations are fortunately no longer necessary, and with the facilities of modern, well-equipped laboratories at their disposal, they may now undertake experimental work no less readily than microanatomical or cytological studies, for the Department is equipped with a comprehensive range of research microscopes, rocking, rotary, sliding and freezing microtomes, kymographs, thermostatic baths, Warburg apparatus, centrifuges, pH meters and a Beckman spectrophotometer.

Finally, it might be mentioned that library facilities are available, not only in the University College, which maintains a first-class library with a microfilm service, but also in the nearby library of the Institute of Jamaica, the staff of which render invaluable assistance to visiting research workers. It is hoped that with these added facilities many zoologists who hitherto have demurred will seize the opportunity of extending the horizon of their animal studies and make use of the facilities that are now available in this supremely fascinating part of the earth.

ATOMIC ENERGY AND MORAL ISSUES*

OWING to the controversial nature of the subject of the moral issues involved in the utilization of atomic energy, two speakers, Prof. Kathleen Lonsdale and Sir George Thomson, were asked to express their views. Their respective methods of approach to the subject, which to a large extent centred around the morality of war, may be summarized in Prof. Lonsdale's words: "I believe that all war is wrong, with whatever weapons, because it is made up of hatred, falsehood and savagery; and because it perpetuates these things. . . . But even if these fundamental objections to war *as such* are set on one side, I still see in an atomic war, or indeed in any other form of future world war based on scientific super-weapons, a menace to every kind of decency towards one another as human beings that we have painfully achieved throughout the ages. Men die horribly every day; buildings decay and become ruins. What is more horrible is that we ourselves, whether as a means of offence or of retaliation for aggression, should deliberately let loose hell on earth; and that is what atomic warfare would be, no matter how much we may deceive ourselves into supposing that we can ameliorate it with the deep shelters, protective clothing and Geiger counters of civil defence". And in Sir George Thomson's words: "Two societies, or the same society at different times, may with perfect honesty have different codes and judge differently what is right in different circumstances. This is, partly at any rate, the answer to the question of expediency. Right and wrong exist quite independently of expediency. But a code which does not consider expediency is a bad one and will not last. The consequences of acts *do* matter for moral judgments. It is permissible to indulge in the alkaloid contained in tea, but not in that contained in heroin simply because the long-term consequences are different".

Prof. Lonsdale rejected the doctrine of expediency and appealed to Christianity as a standard by which the rightness or wrongness of any course of action may be judged. "I know," she continued, ". . . it is not possible to *prove* that there are any *absolute* standards. Certainly none of us can claim that ours are the only true standards. We know, indeed, that our standards as scientists have at least different priorities from those of some other people. . . . Yet whatever our priorities we do know that there is for us and for all men a 'moral law within', however much we may ignore it or attempt to rationalize it away. Truth, generosity, brotherly love, justice, mercy, integrity are recognized as good, and the Golden Rule 'As ye would that men should do to you, do ye even so to them' still has a compelling force for us which is its own authority. . . . Very often the choice that confronts us in issues relating to Atomic Energy is one between a *certain* wrong to other people and a *possible* injury to us or to our nation. When this is so then I submit that it is morally wrong to put a possible or probable wrong to ourselves, or even to those we love, before an absolutely certain injury to others.

* Summary of lectures by Prof. Kathleen Lonsdale, F.R.S., and Sir George Thomson, F.R.S., being the sixth of a series of public lectures arranged by the Atomic Scientists' Association and the Department of Extra-Mural Studies, University of London (see also *Nature*, February 27, p. 886; March 13, p. 477; March 27, p. 573; April 3, p. 621; and April 10, p. 668).