RODENTS

Guinea-pig Relatives

from a Correspondent

THE thirty-fourth Symposium of the Zoological Society of London, held on June 7 and 8, dealt with the biology of hystricomorph rodents. The guinea-pig is the best known hystricomorph but the delightful display of large photographs of some of its near and distant relatives was indicative of the variety of species represented in the programme. The meeting was organized by Drs I. W. Rowlands and B. J. Weir, of the Wellcome Institute of Comparative Physiology, which is part of the "zoological complex" in Regent's Park. Much of the work at the institute concerns the reproductive physiology of South American hystricomorph rodents and the breeding of about ten species has been for some years an outstanding feature of the research of this small but active unit.

The classification and phylogeny of the suborder Hystricomorpha are somewhat controversial. Taxonomically, the group is defined and classified according to a few anatomical features, chiefly those related to the insertion of the jaw muscles. The meeting began with a battle of taxonomic giants—Professor R. Lavocat (Université des Sciences et Techniques, Montpellier) and Professor A. E. Wood (Amherst College, Massachusetts) on the nature and origins of hystricomorphs under the chairmanship of Professor G. G. Simpson (Tucson, Arizona). Succeeding speakers all attempted to relate their findings to the taxonomy of the group, although they dealt with such widely differing aspects as cephalic arteries and chromosomes, patterns of behaviour and audiograms of animal noises, the ecology and the economic value of the African grasscutter (a coypu-like creature prevalent in Ghana), reproductive characteristics, embryology and placentation, progesterone synthesis and metabolism, and the structure of hystricomorph insulins.

It became clear that these rodents share a characteristic placental structure and that they seem to maintain a high level of circulating progesterone, necessary for pregnancy, by a method which is peculiar to them. They produce unusual and variable insulins, they possess complex ovaries and are renowned for their slow foetal growth and long gestation periods. One species, the plains viscacha (*Lagostomus maximus*), has a bizarre reproductive habit in that it ovulates between 200 and 800 eggs from ovaries that look more like those of a fish than a mammal. Only about six or eight eggs are implanted after a short period of delay and twins are invariably delivered after a gestation of 5½ months; the excess embryos are resorbed at a predictable time according to their order of implantation.

Little is known of hystricomorph ecology, but some films showing the diverse habitats of some of the animals indicated the importance of an awareness of their natural habits. Such knowledge has undoubtedly contributed to the success with which hystricomorph rodents have been bred at the Wellcome Institute.

GRAVITATIONAL RADIATION

The Ten Year Test

from a Correspondent

PROFESSOR J. WEBER is now detecting what may be gravitational waves at a rate of seven events per day. This was announced by Weber (University of Maryland) at a meeting "Ondes et Radiations Gravitationelles", organized by CNRS, and held in Paris from June 18 to June 22. Although much of the programme was devoted to reports on the solution of relativistic field equations and on the interaction of gravitational waves with various media, interest centred on the discussion of new experimental work.

Weber's most recent data—obtained from about one month's running of the Argonne and Maryland cylindrical detectors in coincidence—have been analysed by a new and simpler computational method, and for the first time have been backed up by calibration tests with artificial pulses. He reports that the coincidences observed correspond to an increase in energy exceeding $kT/100$ in each detector (>one hundreth of the mean thermal energy per normal mode in the detector). Weber has obtained time delay histograms showing a strong excess of coincident pulses over those expected by chance in experiments involving two simultaneous and separate methods of data recording. In one of these all the data were recorded at Maryland with a telephone line relaying the Argonne information and in the other the data were recorded separately at each site. The coincidences seem to be better defined in time than before, all being recorded within the central 0.1 s time interval in the distribution.

But other experimental groups had little in the way of positive results to present. Dr R. Drever reported the work of a group at the University of Glasgow which has been operating two split bar detectors placed 50 m apart in coincidence for about a year, these devices being arranged to be most sensitive to pulses of a few milliseconds duration or shorter. From seven months of analysed data a limit of 1 ± 3 coincident events per month has been set for short pulses which could deposit more than $kT/4$ energy in each detector; however, one very unusual coincident event has been recorded in which both detectors were excited in exactly the manner expected for a short burst of gravitational radiation. Although the Glasgow detectors are smaller than those of Weber these experiments make it seem unlikely that the events which Weber was detecting a few years ago were gravitational pulses of millisecond duration.

There are now three detectors of similar design to that of Weber in Europe, one being operated by Dr S. Bonazzola at Meudon Observatory near Paris. The other two detectors, developed by Dr H. Billing at the Max Planck Institute, Munich, and by Dr K. Maischberger at Frascati, are operated in coincidence; Dr P. Kafka (Max Planck) reported that for 18 days running in April no coincidences were observed above chance at an excitation of more than $kT/4$ in the devices. Although this result was not claimed to be in conflict with Weber's present observations it was suggested that there might be some disagreement with his earlier results recorded with poorer sensitivity. But Weber replied that he could make no guarantee as to the constancy of the source. Kafka described a theoretical optimization procedure for both the Munich/Frascati and Weber's detectors and predicted a poorer sensitivity for the Argonne/Maryland devices than Weber has measured. In answer to this Weber disagreed that Kafka's ideas were an optimization and stated that when he tried such a procedure his sensitivity was poorer. It is to be hoped that the sensitivity question can be resolved soon because it is so fundamental to the interpretation of experiments.

The uncertainties in the experimental situation should be helped by a reported agreement by Weber to exchange magnetic data tapes with some of the experimental groups at the conference. This should allow a clearer comparison of the different experimental procedures as well as introducing the possibility of long baseline coincidence experiments.

Professor M. Rees (University of Sussex) recalled the theoretical difficulties in explaining a flux of gravitational waves at Weber's level (see also *Nature*, **243**, 61; 1973). Although considerations of energy loss from our Galaxy, together with beaming mechanisms, might just be stretched to accommodate these results he reaffirmed his views that in order to observe a few events per year from well known astrophysical processes a detector must be sensitive enough to detect supernovae in the Virgo cluster. This requires an improvement of about 10^8 over the present level of sensitivity. But he pointed out that an improvement of only 10^4 may enable the patient experimentalist to observe a pulse rate of at least one per 30 years

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