

of the National Institutes of Health, United States Public Health Service. The facilities include laboratories for quantitative microchemical analysis of histologically defined samples; optical, X-ray absorption and histology laboratories; and constant-temperature instrument, cold and animal rooms. Research and training programmes will be conducted at both the pre- and post-doctoral levels.

Energy of Ultrasonic Waves

DR. S. PARTHASARATHY and his colleagues of the National Physical Laboratory, New Delhi, have recently published a series of papers on the equivalence of ultrasonic and thermal energies in a liquid (for example, *Ann. der Phys.*, 12, 8; 1953). The method is to send progressive waves into a trough containing the liquid, to measure at various points the radiation pressure on a disk exposed to the radiation (from a 5-Mc./s. quartz oscillator) and to extrapolate the measurements back to the source to calculate the intensity there. The heat generated in the liquid after thirty minutes irradiation is also noted from the overall rise of temperature in the liquid by means of a special mercury thermometer which can be read to 0.025 deg. C. Correction is made for dielectric heating which is of the same order as that due to ultrasonics, both averaging half a degree rise in half an hour. From pairs of results, values of the mechanical equivalent of heat are deduced. The average value works out at 4.19 joules/cal. to $\pm 3\frac{1}{2}$ per cent.

The Silicon Alloy Diode

A RECENT product of the extensive research programme on transistors carried out at the Bell Telephone Laboratories is the silicon alloy diode, details of which have now been published (*Bell Lab. Rec.*, 31, 361; 1953). As the electronic equivalent of a tiny one-way switch, it is capable of operating thousands of times faster than its mechanical counterpart, and its use may result in significant advances in telephone switching devices and in several types of electronic computers. A specially grown silicon crystal containing controlled traces of an impurity is used, and in the process of preparation the normal high electrical resistance of the mineral is reduced, enabling rectification to occur. The back leakage is claimed to be less than in any previous diode. Like the germanium transistor, the silicon alloy diode has no filament, vacuum or warming-up period, but, in addition, it can be operated quite successfully under high temperatures.

Determination of the Variations of Eclipsing Variable Stars

THE results of the investigations made by R. Szafraniec on the variations of period of the eclipsing variables *RZ Cas*, *TY Boo* and *TU Boo* are given in *Acta Astronomica* (published in Cracow; Ser. b, 2, 86; 1953). The observations were made at the astronomical station of the National Astronomical Institute, Lubomir, during 1934-35, and at the Astronomical Observatory of the Jagellonian University, Cracow, during 1947-51. A total of fifteen thousand observations were made, and 1,371 of these were used in the paper. The author made use of the results of other observers in the investigations of the variations of the periods, or worked out their observations *de novo*. In determining the times of minima, different methods, partly new, were used in the reductions of observations, and the

second part of the paper deals with the comparison of these different methods. It is interesting to know that the tracing-paper method was not only the most convenient but was also superior as regards results to all other methods. A detailed description of the application of the least-squares method is given. Light curves of the three stars and a number of tables provide a very convenient summary of the author's work, the results of which are compared with those of others, and the opinion is expressed that in order to establish the causes of the variations of period it is necessary to carry out joint investigations of a greater number of stars on the basis of sufficiently ample material.

Growth and Morphogenesis in Forest Species

It has been ascertained by G. H. Duff and N. J. Nolan (*Canad. J. Bot.*, 31, 4, 471; 1953) that the anomalous character of the annual rings of young trees, as in *Pinus resinosa*, is attributable to a remarkably thorough organization of ring width, and therefore of cambial activity, under the impact of intrinsic factors. The latter are thought to include nutritional gradients in the axis. The authors describe the system of observation adopted, and indicate that the complex relation between the responses of the cambium and those of the apical growing-point to random extrinsic factors can be referred to the discontinuity of terminal growth introduced by the winter pause between bud formation and axial extension. These two stages of terminal growth are influenced by the external factors of two different years. The effect on the cambium is somewhat simpler, but is directly related to that on the apical growing-point. It is held that the results obtained should help to prepare the way for the use of young trees in studies of the factorial control of growth.

Scholarships for One-Year Courses in Personnel Management

UNDER the arrangements set out in the White Papers (Cmd. 8776 and 8918) for expenditure of Counterpart Funds on advisory services, research and education (see *Nature*, 172, 528; 1953), the Government proposes to make funds available to the Institute of Personnel Management for the award of a small number of scholarships for one-year courses in personnel management at certain universities and colleges. The courses are for men and women, not less than twenty-four years old, who already have had experience in industry or commerce in Great Britain or Northern Ireland, and are primarily intended to assist them to attend courses of training in personnel management which would otherwise not be available to them. The scholarships will be worth £300, with a dependants' allowance of £100 for a married candidate with one or more children, and in special circumstances an additional grant not exceeding £50, and will be available for the academic year, beginning in October, at one of the following: London School of Economics; College of Technology, Manchester; Glasgow and West of Scotland Commercial College and Royal Technical College (jointly); University College, Cardiff; University of Liverpool (postgraduate course in industrial sociology). Further information regarding the content of the courses is available in the booklet "Training for Personnel Management", which is obtainable from the Institute (price 1s. 6d.) or direct from the universities concerned. Application forms can be obtained from the Secretary, Institute of Personnel Management,