mentioned of the types of problems tackled under his direction. Most of the leading dairy bacteriologists in Britain, and many of those in other countries, have engaged in research for longer or shorter periods in his laboratory. His training there of these young and not-so-young postgraduates laid the essential foundation for the advisory bacteriological branch of the National Agricultural Advisory Service. Mattick retires from a strong, active department, now of fourteen graduates and twenty-four assistants, not only as the acknowledged doyen of British dairy bacteriologists but also with a world-wide reputation as an outstanding research worker in pure and applied microbiology. His able successor as head of the Bacteriology Department at Shinfield is W. A. Cuthbert, until recently a senior bacteriologist in the National Agricultural Advisory Service.

Preventive Medicine at Sheffield : Prof. John Knowelden

Dr. John Knowelden has been appointed to the chair of preventive medicine and public health in the University of Sheffield. Educated at King's College, London, and St. George's Hospital Medical School, London, Dr. Knowelden qualified in 1942, and after a short period as house surgeon at St. George's Hospital, he was a surgeon lieutenant in the R.N.V.R. during 1942–46. In 1947 he graduated M.B., B.S., in the University of London and was also awarded the D.P.H. with distinction. In the same year he was awarded a Rockefeller fellowship in preventive medicine, which he held during 1948–49 at the Johns Hopkins School of Hygiene and Public Health, Baltimore. In 1949 Dr. Knowelden was appointed to his present post of lecturer in the Department of Medical Statistics and Epidemiology at the London School of Hygiene and Tropical Medicine. Dr. Knowelden is a member of the Medical Research Council Statistical Research Unit and has been secretary of a number of committees of the Medical Research Council, including the Poliomyelitis Vaccines Committee which planned and executed the 1956 field-trials of British poliomyelitis vaccine. Dr. Knowelden is a joint editor of the *British Journal of Preventive Medicine*.

American Geographical Society : Awards

The following awards have been announced by the American Geographical Society : *David Livingstone Centenary Medal*, awarded by the Society "for scientific achievement in the field of geography of the southern hemisphere", to William E. Rudolph, of New York City, former chief engineer of the Chile Exploration Company and now managing consultant of Dorr Consultants ; *Cullum Geographical Medal* to Dr. Albert P. Crary, chief scientist for the U.S. Antarctic Research Project, for geophysical research in both the North and South Pole regions, and for geographical discoveries ; *Daly Medal* to Dr. Richard Hartshorne, professor of geography at the University of Wisconsin, for his contributions to political geography and to "the history and methodology of geographic thought".

University Grants Committee : Appointments

To fill vacancies on the University Grants Committee, the Chancellor of the Exchequer has made four new appointments. The new members, whose appointments will expire on December 31, 1964, are : Sir Eric Ashby, master of Clare College, University of Cambridge ; Prof. F. W. Rogers Brambell, Lloyd Roberts professor of zoology, University College of North Wales, Bangor ; Prof. C. H. Philips, professor of oriental history and director of the School of Oriental and African Studies, University of London ; and Prof. J. Monteath Robertson, Gardiner professor of chemistry, University of Glasgow. The retiring members of the Committee are : Prof. R. H. Matthew, professor of architecture, University of Edinburgh ; Prof. P. B. Medawar, Jodrell professor of zoology and comparative anatomy, University College, University of London ; Prof. A. Robertson, previously Heath Harrison professor of organic chemistry, University of Liverpool ; and Sir George Thomson, master of Corpus Christi College, University of Cambridge, and emeritus professor of physics, University of London.

Zenith Reactor commences Operation

The *Zenith* reactor at the Atomic Energy Establishment, Winfrith, Dorset, started operating for the first time on December 19. The final stages of commissioning the plant will be carried out during the next few months. The reactor has been built to operate under temperature conditions similar to those expected in a high-temperature gas-cooled power reactor. The reactor core consists of a nearly cylindrical assembly of 235 fuel elements, 8 ft. high and 4 ft. in diameter, in the form of graphite cylinders, containing pellets of fissile uranium oxide, fertile thorium oxide and graphite. The ends of the fuel elements are made of graphite which, with a 3-ft.-thick graphite annulus surrounding the fuel, form a reflector to return some of the neutrons escaping from the fuel into the core, so reducing the quantity of fuel used. The reactor core is enclosed in a pressure vessel through which nitrogen is pumped in a continuous closed circuit. The nitrogen is heated by a 200 kW. heater as it enters the core : the hot gas raises the mean temperature of the core to 800° C. At the top of the core the hot nitrogen is mixed with cooler gas before passing through the reflector : thus the reflector is kept at a mean temperature of 400° C. The reactor pressure vessel and associated plant are enclosed in an airtight containing building. The reactor itself will be operated at a peak neutron flux of 10^8 neutrons/cm.^{2}/sec. at a maximum nuclear power of 100 W. : the nuclear heat produced is thus negligible in comparison with the energy used to heat the core.

Zenith is controlled by neutron-absorbing rods in the graphite reflector. There are 30 control rod holes disposed in a ring around the core : 20 of these are occupied by motorized control rods and fixed absorbers may be loaded into the other 10 holes. Six flux-measuring chambers are arranged in other holes at the inner edge of the reflector. There are four pulse-counting fission chambers, two for use at high power and two at low power, and also two current fission chambers feeding shut-down amplifiers. Activity in the fuel elements will be at a low level because the reactor power will not exceed 100 W. ; this permits easy rearrangement of the core. The reactor cost approximately £400,000, including design, construction and commissioning. For the first two years after commissioning *Zenith* will be used to check reactor physics design calculations for the *Dragon* high-temperature gas-cooled reactor experiment (see *Nature*, **183**, 507 ; 1959).