to $3·8 million in 1968–69, and the table shows the most significant increases in other fields over the year 1967 68.

Various aspects of chemical research have been cut back during the past year, in particular in applied chemistry, chemical physics and chemical engineering. There has, however, been a new onslaught on the problem of finding insecticides of low mammalian toxicity, and a new laboratory has been commissioned in Sydney at a cost of more than 2 million dollars to house the expanding research on mineral chemistry.

A new microbiology unit has been established at Long Pocket Laboratories in Brisbane to investigate infectious diseases of livestock in northern Australia. Several other major building projects have been started during the past year, including the $340,000 extension to the Cunningham Laboratory in Brisbane for the study of tropical pastures and the new agronomy laboratory and administrative building at Canberra for investigating plant industry. CSIRO is also to have a new head office in Canberra by the end of 1970, at a cost of nearly one and a half million dollars. Two buildings opened in the past year are the structure testing laboratory in Melbourne, which will be used to test building structures and components under loads of several hundred tons, and the extension to the Meat Research Laboratories in Brisbane, where research has now been started on mutton and lamb.

A meteorological research centre is to be set up in Australia under the auspices of the CSIRO and the bureau of meteorology. It will undertake studies of the atmosphere and means of weather forecasting.

PALAEONTOLOGY

Archive for Data

A PLAN for an archive of palaeontological data in Great Britain was discussed at a recent informal meeting of the Palaeontological Association. Although the meeting heard a great deal about "the information explosion", the shortage of government funds for the publication of research findings and the costs and benefits of various publications, traditional and otherwise, the organizers were more specifically concerned with problems such as the need for proper records of all palaeontological collections, channels of communication for identifying such collections and records and ultimately methods for retrieving the information.

The organizers propose a system of "Palaeontological Data Records", each referring to one or more fossil specimens from one locality and rock division, and containing information such as the name of the collector, the grid reference, the horizon, a description of the material and its taxonomy and so on. The consensus of opinion seemed to be that some sort of data bank would be a good thing provided it was complementary to and did not replace the traditional journals, which were useful for browsing and for publishing illustrations of collections.

There would obviously have to be some sort of alerting service. One probability is that the records would be stored, publicized and distributed on request by the National Lending Library. A more likely starting point is the computerized data bank for palaeontology being started by the Institute of Geological Sciences.

Dr W. H. C. Ramsbottom, of the Leeds regional office of the Institution of Geological Sciences, said that it hoped soon to start processing standardized records for a computer file, starting with collections from the Carboniferous in England and Wales. Finance permitting, the service would be extended to palaeontologists outside the IGS so that a central data file open to all could be formed. This store, he said, could be used for data not at present being published. The IGS system would naturally have limitations, but there is obviously room for further discussion. Palaeontologists could also pick up a tip or two from the Biological Records Centre, and from the New Zealand Geological Survey, which has been operating a central file of palaeontological data for some years.

MEDICINE

Computers by the Bedside

DOCTORS and nurses are in danger of being left behind as automation finds its way into the clinical world. The need to devise an organized programme of instruction is stressed by a report (*Computers in Medicine*) from a working party of the British Medical Association Planning Unit, which concludes that this aspect of medical education "has so far scarcely been faced". Many of the existing courses in medical computing whether run by the computer industry or by other private firms, are under attack for involving too many vested interests.

Where training is most needed is for the simple task of information retrieval. Doctors and nurses will need to be taught how to retrieve a patient's medical history out of a computer and how to read in the details of his treatment. Instruction of this kind should be given on university medical courses, but medical qualifications are not required to include any knowledge of computers. Further, with the prospect of computers to aid screening and diagnosis, there will have to be appreciation courses for bringing qualified doctors up to date. The one-day courses run by the British Medical Association have made a start here, but they are already over-subscribed.

The report regrets that there has been no lead from the Department of Health and Social Security, which is supposed to be allocating large sums of money to the Health Service for the introduction of computers to hospitals. In a foreword to the working party's report Dr Henry Miller, director of the BMA Planning Unit, predicts that its findings "will do little to allay the suspicions of some health service workers that the generosity of government in this matter may be intended primarily to serve the purposes of a national computer industry rather than the interests of the health service". The report urges that the University Grants Committee should provide "the necessary finance" for medical schools to develop computer facilities.

A different hazard of medical automation is the reactions of the patient. The authors of the report believe that records will be, if anything, more confidential when stored in a computer than in a cumbrous set of files. To the charge that computer-aided diagnosis will tend to dehumanization the report answers briefly that "the individual doctor and patient in confrontation is the basis of medical practice". Although Professor J. G. Scadding, chairman of the working party, has said that he cannot see the computer reducing the work of the general practitioner, it would do no harm

if someone were to proclaim publicly that automated screening is just a useful tool on the same level as mass radiography, which does not itself seem to have raised any great outcry.

MEDICINE

Fight for Sight

THE Institute of Ophthalmology of the University of London celebrates its twenty-first anniversary with pleas for more money to help maintain its existing lines of research into eye disease and the causes of blindness. Since its foundation in 1948 the institute, working in close association with Moorfields Eye Hospital, has become one of the largest and most comprehensive centres for research, treatment and postgraduate teaching in ophthalmology. But the money the institute receives from the university covers only expenditure on maintenance and teaching; the rest of its budget (more than £400,000 last year) has to come from outside sources. The "fight for sight" campaign launched by the institute in 1965 has now raised £700,000 towards the target of £1 million.

About half the blindness in England and Wales is caused by senile cataract and retinal degeneration. Retinal disease usually involves damage to the nerve cells or to the small blood vessels that feed them, in cases of high blood pressure, for instance, and in diabetic retinopathy. The institute is trying to identify the primary mechanism causing the damage—possibilities are muscle spasm in the case of hypertension or organic changes in diabetes. One immediate application of a technique of measuring electrical potentials in the visual cortex is the early detection of retinal damage. At Moorfields Hospital, records of the changes of potential in response to visual patterns are used to detect damage in young or mentally handicapped children and also in unconscious patients.

The continual growth of the human lens predisposes the eye towards diseases such as presbyopia and glaucoma, and may also be a factor causing senile cataract. Dr Mary Voaden is studying the factors that affect the growth rate of lens cells and is isolating a protein from rabbit eye lenses which inhibits cell division in the presence of adrenalin. There is a considerable amount of evidence to show that this is the same as a chalone which is thought to control cell division in mammalian skin (*Nature*, **220**, 134; 1968). If this mechanism can be shown to be operative in the human lens, it may lead to a way of regulating the growth of lens cells.

One of the most important eye diseases in Britain is glaucoma, the condition in which the pressure within the eye increases, usually insidiously but occasionally suddenly, and begins to destroy optic nerve tissue. If the aqueous humour which is produced continuously cannot drain away effectively, glaucoma results. Work at the institute has shown that the fluid may be transported into the outflow canal (Schlemm's canal) by a particular type of vacuolated endothelial cell which may fail to function in "simple" glaucoma.

Although corneal transplants have by now become almost routine operations, it is still difficult to judge in advance the suitability of corneal tissue. The transparency of the cornea is maintained by the action of a single layer of cells lining the undersurface. If these are damaged, a graft will not function. Research in the Pocklington Unit at the institute indicates that there may be a non-destructive test based on the effect of temperature reversals on the pumping action of these cells.

SOVIET SCIENCES

October Honours List

THE State Prizes of the Soviet Union in science for 1969 were awarded for the following works:

Research on radiation spectra in thermal neutron capture, to Leonid V. Groshev, Anatol' M. Demidov and Vladimir I. Pelekhov of the "I. V. Kurchatov" Institute of Atomic Energy.

Research on nuclear magnetic fields and the polarization of atomic nuclei, to Boris N. Samoilov, Vadim V. Sklyarevskii, Vladimir D. Gorobchenko and Evgenii P. Stepanov of the "I. V. Kurchatov" Institute of Atomic Energy.

Studies of boundary value problems for linear and quasi-linear parabolic equations, to Olga A. Ladyzhenskaya of the Leningrad Branch of the "V. A. Steklov" Mathematical Institute of the Academy of Sciences of the USSR, and Nina N. Ural'tseva of the Leningrad State University.

The preparation of a 1 : 5,000,000 tectonic map of Eurasia and the monograph *Tectonics of Eurasia*, to Aleksandr L. Yanshin, Aleksandr V. Peive, Mikhail V. Muratov, Radim G. Garetskii, Nikolai S. Zaitsev and Yurii M. Pushcharovskii of the Geological Institute of the Academy of Sciences of the USSR, to Nikolai P. Kheraskov and to Gleb. B. Udintsev of the Institute of Oceanology of the Academy of Sciences of the USSR.

Research on the primary structure of valyl-transfer RNA, to Aleksandr A. Baev, Andrei D. Mirzabekov, Rakhil' I. Tatarskaya and Tat'yana V. Venkstern of the Institute of Molecular Biology of the Academy of Sciences of the USSR.

Scientific study "Poetics of Old Russian Literature", to Dmitrii S. Likharev of the Institute of Russian Literature of the Academy of Sciences of the USSR.

Monograph "The Agrarian Revolution in Russia", to Pavel N. Pershin of the Institute of Economics of the Academy of Sciences of the Ukrainian SSR.

Works "Physiological Principles of the Increase in Sugar Content of the Sugar Beet" and "Physiology of the Sugar Beet", to Arkadii S. Okanenko of the Institute of Plant Physiology of the Academy of Sciences of the Ukrainian SSR.

In technology, the fifteen State Prizes awarded in 1969 acknowledge the development of a plant operating at 7·3 atmospheres, the production of nitric acid, the development of a method of countering hailstorm damage by the use of rockets and missiles, the organization of treatment facilities for myocardial infarction, innovations in the welding industry, the automation of cold-rolling mills and petroleum industry in Azerbaijan, the introduction of computers into the national economy and in the manufacture of non-wire carbon resistors, developments in microelectronic control devices, the development of more efficient techniques in coal mining, the design of a large scale production unit for converter steel, improvements in copper smelting, the construction of the Ostankino television mast 533 metres high, a "spindle torque machine" for the textile industry and "developments in the scientific organization of labour forces".