

the fundamental biochemistry of all compounds of physiological importance to insects, including the hormones, pheromones and insect attractants, which could well become the third generation pesticides. At Cambridge, work will chiefly be concerned with neurophysiology and neuromuscular physiology. The two teams hope to be able closely to integrate their research programmes in spite of their geographical separation.

For the first year, the ARC has given the unit £100,000 to cover capital costs and £21,140 for running costs, salaries apart. The nucleus of the Cambridge section is already in existence and the Sussex group will start work at the beginning of September when at least part of it will have been recruited. In the immediate future, the ARC expects a total staff at the two universities of about fourteen scientific officers, ten experimental officers and a supporting staff of technicians.

#### AUSTRALIAN SCIENCE

### CSIRO Miscellany

ANNUAL reports for 1968 from assorted divisions of the Commonwealth Scientific and Industrial Research Organization of Australia which are beginning to appear reflect the government's emphasis on the solution of problems of immediate economic importance. The division of chemical engineering, for example, estimates that about a quarter of its effort is concerned with basic applied research while the rest is directed to the practical implementation of successful processes. Most of the work of the division is connected with the process industries such as minerals, food processing, pulp and paper and petroleum, as well as the chemical industry, and the programme is centred around selected operations in the fields of particle mechanics, transport processes and process development. During 1968, a major project for producing high calorific gas cheaply by the direct hydrogenation of coal had to be scrapped because recent extensive discoveries of offshore natural gas in Victoria will make such a process unnecessary for several decades at least.

Another of the five divisions of the CSIRO Chemical Research Laboratories—applied chemistry—is chiefly concerned with synthesizing new chemicals and isolating naturally occurring ones that could be effective as insecticides or plant growth regulators. Conventional hydrocarbon insecticides like DDT are being improved and a novel class of steroid hormones seems to hold promise of controlling insects by interfering with their moulting. Many of the compounds being investigated are automatically screened for pharmacological effects such as anti-tumour activity. The division is putting considerable effort into developing a novel ion-exchange process for removing salt from brackish water which promises to provide a large scale desalination process which could be competitive with other methods. It is also looking at combustion phenomena in connexion with the control of bush fires, methods for reducing water losses by evaporation from reservoirs and the mechanism of ice-formation in super-cooled clouds.

The report from the division of mineral chemistry describes the major research programmes of mineral exploration, mineral treatment, fuel technology and

solids and surfaces. An interesting project is the use of neutron irradiation as an analytic tool to reduce the cost of exploratory drilling programmes. The divisions of nutritional biochemistry and dairy research are concerned respectively with digestion in sheep and the production of cheese, butter and recombined dairy products.

#### CANCER

### Sloan-Kettering's Year

THE most conspicuous event last year for the Sloan-Kettering Institute for Cancer Research, New York, was the reopening of its fourteen storey Howard Laboratory after a complete refurbishing, started in February 1967. The institute now seems to have enough accommodation for its twenty-five research divisions. That and the expenditure in 1968, \$10,024,497, gives some idea of the scale on which the institute works. Federal Government agencies provided \$5,004,274 of the total expenditure and another \$3,774,424 came from donations and foundations. This, of course, left it \$1.246 million in the red on its current account, but the institute seems to be accustomed to living with deficits.

Unlike many other cancer research laboratories, the Sloan-Kettering has the advantage of being a postgraduate and postdoctoral teaching institution. It enrolled 31 PhD candidates in 1968 and awarded three PhDs, all of whom are supported by the institute. But it is at the postdoctoral level that most teaching takes place. During 1968 there were 92 postdoctoral fellows, 64 of whom were paid by the institute and over half of whom came from overseas.

The Sloan-Kettering Institute more or less covers the whole spectrum of cancer research and is justly proud of the part it played in the discovery that certain cancer cells, including some leukaemias, are dependent on a supply of the amino-acid asparagine which normal cells can synthesize for themselves. By depleting the amount of asparagine in the blood with the enzyme asparaginase some leukaemias have been successfully treated. The institute is also involved in the immunology of cancer, especially those forms induced by viruses. And there is increasing evidence that viruses which induce cancer in animals as disparate as frogs and man share some antigens. It may prove possible in the short term to diagnose cancer at an early stage by immunochemical techniques, and eventually to harness the body's immune system for treatment and prevention of the disease.

For many years, scientists at the Sloan-Kettering have been trying to show differences between the DNA of cancer and normal cells, but they have recently found evidence to suggest that DNA or chromosomes from cancer cells can transform normal cells to cancer. They have also discovered that bridges arise between cancer and normal cells grown in mixed cultures through which cell material including DNA passes from the cancer cell to the normal but never in the reverse direction.

At the other end of the spectrum, surgeons have been experimenting with organ transplantation as a treatment for cancers restricted to an organ. They have also developed, using dogs, a successful technique for vascular implantation, increasing locally the blood