

and Dr S. Shone from Sheffield Regional Hospital Board.

Rabbits by Radio

SOME Australian rabbits are being fitted with miniature radio transmitters to reveal their movements. This and other wildlife research—aimed at the control or conservation of a variety of mammals and birds—is described in the latest annual report of the CSIRO Division of Wildlife Research. A recurrent problem in the control of rabbits is re-infestation, and the animal's movements are being studied to find out how far they can travel. Detailed recording of movements at night—previously difficult in large enclosures or field conditions—will be much easier now that transmitters small enough, and an effective means of harnessing them to the rabbit, have been developed. Transmitted signals are picked up by receivers with directional aerials.

The division's largest single research programme—on the biology of rabbits—also includes investigations into the activity and use of the odoriferous glands which have shown that the sub-mandibular and anal glands are primarily used for territorial marking, while the inguinal gland is associated with sexual attraction. While a rabbit is engaged in social activities, such as examining an object which carries the scent of another rabbit, it drops pellets with the strong odour of the anal gland. This odour is much fainter, or absent, when the rabbit is engaged in non-social activities. This knowledge may help to explain the significance of the "dung-hills" which are found in rabbit territories.

As part of a long term study of fluctuations in numbers of nematode parasites in rabbits in Queensland and New South Wales the CSIRO are looking for the reason for a striking increase in nematodes in females during the breeding season, while at the same time there is a decrease in the parasites in males. Experimental results suggest that the state of susceptibility of a rabbit—particularly a female—to the nematode *Trichostrongylus retortaeformis* is closely associated with its hormonal status. Luteinizing hormones given to does at eighteen day intervals to cause ovulation decreased their susceptibility to the nematodes, while cortisone increased the susceptibility of bucks. The CSIRO feel that this work could lead to the use of hormones in controlling parasites in domestic stock.

Dissemination of Tumours

from a Correspondent

THE greatest problem in the treatment of cancer is the ability of cancers to invade surrounding tissues and form metastases. Despite this, little attention has so far been paid to the development of screening tests which will detect compounds which affect tumour dissemination or the growth of newly formed metastases. The Committee on Experimental Chemotherapy of the International Union against Cancer recently organized a one day meeting to discuss the possibility of designing such tests.

The meeting opened with a description of the mechanism of cell adhesion and how the altered surface charge of tumour cells decreases their adhesiveness by affecting the properties of the cellular membrane. The importance of this loss of adhesiveness in the shedding of

individual cells from a tumour was discussed. This first stage of tumour dissemination from the point of view of a physical chemist was then supplemented by accounts from biologists of the various steps in the formation of secondary deposits. Tumours penetrate surrounding tissues by invasion or infiltration or may be intravasated by mechanical pressure. Then follows dissemination through the circulation followed by lodgement and growth. The ability of various organs to trap disseminated tumour cells varies greatly. Intracerebral inoculation of tumour cells to rats or mice is followed by the appearance of these cells in the lung and liver and only later in the kidney. The presence of malignant cells trapped by tissues can be demonstrated by a number of techniques including tissue bioassay, isolated organ perfusion and plating techniques. But even if an organ is efficient in trapping disseminated tumour cells, this is no indication that a secondary tumour will eventually appear. Injection of rodent tumour cells into chick embryos has shown that particular tumours are trapped most efficiently by liver, spleen and kidney, with brain the least efficient organ, but it is only in the brain that tumours appeared. The site of tumour growth in the chick embryo depends on whether or not the injected tumour cells have lost their strain specificity or on the degree of malignancy of the tumour. Time did not allow the presentation of the majority of papers on the factors affecting cancer dissemination and metastases, although evidence was presented that known chemotherapeutic agents could influence the behaviour of tumours, probably by affecting immunological mechanisms.

The actual test systems available for studying the effect of compounds in inhibiting cancer dissemination or the growth of metastases are few. Three dimensional growth of tumours or embryonic tissue in a matrix consisting of cellulose sponge coated with collagen enables the study of tissue architecture and of the interaction between tumours and embryonic tissue. Such a system would enable an investigation of the effects of chemical agents in preventing tumour invasion or infiltration which is usually the first stage of dissemination. The technique of intracerebral tumour implantation is already in use as a system to detect agents which might prevent the systemic spread of the tumour. A subcutaneously transplanted tumour which leads to the formation of metastases in the lung is also used for the same purpose.

The conclusion of the meeting was that this important aspect of experimental cancer chemotherapy should be extended. Although it was agreed that the tests available at present were very few, there was every hope that new tests could be designed. In order to stimulate further interest in the subject the Experimental Chemotherapy Committee of the UICC plan to hold a symposium in 1969.

Hormone Insecticides

from a Correspondent in Cell Biology

WILLIAMS and his collaborators at Harvard are doing some very exciting work which shows that insect juvenile hormone and naturally occurring and synthetic analogues can be used as a potent insecticide for the control of some very noxious insects. The group's latest finding (Vinson and Williams, *Proc. US Nat. Acad. Sci.*, **58**, 294; 1967) is that synthetic juvenile hormone