THE SECOND U.K. *SCOUT* SATELLITE

THE British National Committee on Space Research, the U.K. Steering Group on Space Research and the U.S. National Aeronautics and Space Administration have agreed on the scientific instrument payload for the second U.K. *Scout* satellite to be launched by the U.S. National Aeronautics and Space Administration. The scientific instruments, as in the first British *Scout* satellite, will be designed and provided by British scientists.

The experiments are designed to measure radio emissions from the Galaxy at wave-lengths too long to penetrate the Earth's atmosphere; to measure the vertical distribution of ozone in the regions of the atmosphere in which it is being formed; and to measure the number and size of fine dust particles encountered by the satellite. In addition, the galactic radio equipment is designed to gain information on the electrical condition of the high atmosphere.

It is expected that the satellite will be launched in about two years time. The orbit will probably pass over the United Kingdom and the United States, and it should be possible to receive radio information both in these countries and at stations in the British Commonwealth.

As for the first British *Scout* satellite, this one will be launched by a four-stage rocket system using solid propellants. It is expected that the satellite orbit will range between 300 and 2,000 km. from the Earth. The instrumentation is being so arranged that the satellite will supply information on Galactic noise, atmospheric ozone and micrometeorite flux.

Galactic Noise

A project to measure the galactic noise in the frequency-range 0·75–3 Mc./s., and the exploration of the upper ionosphere, is to be carried out by Dr. F. Graham Smith, Mullard Radio Astronomy Observatory, Cavendish Laboratory, University of Cambridge.

Dr. Smith will have three objectives in mind: (*a*) to measure the intensity of the galactic background at as low a frequency as possible under known conditions of receiver sensitivity and under known conditions of ionospheric effects on propagation and aerial impedance; (*b*) to watch for temporal or spatial variations of galactic radiation; (*c*) to explore the electron density in the upper *F* region.

Atmospheric Ozone

Measurement of atmospheric ozone is under the direction of Dr. R. Frith and Dr. K. H. Stewart (Air Ministry, Meteorological Office, London). This will be carried out by two methods: (*a*) a spectrum scanning method; (*b*) a method in which a broad band of the spectrum is observed.

Dr. Frith's experiment will have as its main objective the measurement of the vertical distribution of ozone in the Earth's atmosphere as often and in as many places as possible. These measurements should add to our knowledge of the processes forming and destroying ozone, of the air motions which distribute it and of the effects of ozone on the thermal equilibrium of the upper atmosphere. Measurements will be made of the intensity of the radiation received from the Sun at selected wave-lengths in the ozone absorption region in the ultra-violet at times when the satellite is entering or leaving the Earth's shadow and the solar rays have to pass through the Earth's atmosphere to reach the satellite.

Micrometeorite Flux

The measurement of the micrometeorite flux is is being organized by Dr. R. C. Jennison (Nuffield Radio Astronomy Laboratories, University of Manchester, Jodrell Bank, Cheshire).

Dr. Jennison's experiment has as its objective the detection and measurement of micrometeorites encountered by the satellite. He will use a technique in which the holes formed in a thin metallic film by the impact of micrometeorites will be detected by an optical method. Sunlight passing through the holes will fall on a photosensitive strip of solar cells and give a signal from each hole in turn from which the number and size of the holes, and hence of the micrometeorites, can be deduced. The sensitivity is such that the holes formed by the particles, 1μ in diameter or greater, may be detected.

THE BRITISH AGRICULTURAL HISTORY SOCIETY

THE annual conference of the British Agricultural History Society was held during April 5–7 at Seale Hayne Agricultural College. On the first evening members heard papers from Mr. Peter Holmes, the County agricultural officer, and Dr. W. G. Hoskins, of Oxford. Mr. Holmes described the farming regions of Devon and did his best to disabuse his audience of the idea that Devonshire was entirely composed of the good red soils associated with the 'Glorious Devon' of the travel posters. He emphasized the importance of the hill-farming economy and explained also that there were large areas of indifferent shale soil in the north and north-east which were difficult to farm and not immensely productive.

Dr. Hoskins has recently been engaged in a study of the types of farmhouse on Dartmoor and made an appeal for more field work in the area for, as he said, "The history of the moor is as yet largely unwritten". He outlined briefly what is known of the earlier settlement of the moor and discussed its recolonization at the end of the Middle Ages. There are, he explained, still to be found many sixteenth- and seventeenth-century 'long houses' or buildings of the type that had both human dwelling and cattle stalls under one roof with a common doorway and central dividing passage.

The following day Dr. Hoskins led an excursion over the moor and showed the conference examples of this type of house. The party also visited a deserted village site below Hounds Tor which has recently been discovered by members of the Ordnance Survey. About twelve house sites, thought to be identified with seven or eight farms, are clearly visible from the rubble remains, but nothing is yet known of the date of settlement or of desertion; excavation on the site will start this summer.

On the second evening of the conference members heard a paper from Prof. Slicher van Bath, head of the Department of Rural History at Wageningen in the Netherlands. Prof. Slicher van Bath discussed the use of farm accounts as material for investigating farm management and agricultural output between the Middle Ages and the eighteenth century. He outlined the results of a study he had made of extant accounts in several countries, including those of the English early seventeenth-century farmer, Robert Loder of Harwell (Camden Third Series, 53, 1936).

On the last morning of the conference there were papers from Mr. J. Z. Titow of Cambridge and Prof. Beresford of Leeds. Mr. Titow discussed his recent work on the types of manors to be found on the Winchester estates in the thirteenth century. It had, he said, been assumed that the descent of villein property was mainly from father to son, but he produced substantial evidence to support a plea for considering more seriously the position of widows. On many of the Winchester manors it was clear that holdings were often left to the widow and that a kind of 'widow cycle of inheritance' was thus set up. A young man in search of a holding would therefore seek a widow with one. As a result of this a widow might remarry and leave the holding on her death to her second husband who in his turn remarried, leaving it on his death to his widow who might then marry again; direct descent to the eldest son appeared to be relatively uncommon.

Prof. Beresford set out some provisional ideas on the development of the unusual settlement pattern in fourteenth-century Cornwall. He explained that a great deal more work was required on Cornish settlement patterns, and that potential workers would be encouraged to know that from the material in the Duchy of Cornwall archives it was possible to trace the occupation of Duchy holdings from the fourteenth century to the early nineteenth. Dr. Hoskins, in his concluding remarks as chairman for Prof. Beresford, said he hoped members, as a result of the conference, would be more conscious of the need for work in south-west England and the rich material that awaited them. He was glad, too, that the Society had met in the highland zone, for, in his opinion, the British highlands had been neglected by agrarian historians. J. W. Y. HIGGS

DISEASE TRANSMISSION BY TICKS

THE papers presented at the recent sixth symposium of the Zoological Society of London on "Some Aspects of Disease Transmission by Ticks", held in London on March 8, revealed how some of the pieces of this complex jig-saw puzzle are gradually being filled in, but at the same time it was indicated that there are major deficiencies in our knowledge. Dr. J. MacLeod, by reference to a very interesting mechanical analogue of the forces at work, showed that the disease associations of ticks represent meshes in the food web of a biotic community which includes the pathogens, their tick vectors, the vertebrate hosts and the vegetational environment which supports and/or shelters them all. In this connexion it is worth noting that the physical relationships of tick distribution in Britain to the type of ground-cover are known for only one of the nineteen species of ticks; the biotic relationships, with two exceptions, are practically unknown. So far as British ticks are concerned, *Ixodes ricinus* has been the species most thoroughly investigated, principally because of its known disease relations. One of these diseases, Scottish louping ill, like other viruses of tick encephalitides, appears to have a casual rather than an intimate association with its hosts, which are principally sheep in Britain. Although the ease with which this disease can be transmitted by non-British ticks, for example, *Rhipicephalus appendiculatus*, suggests that any of the mammal-infesting British ticks would be capable of transmitting it to any British mammal; the infection has been demonstrated in *I. ricinus* from sheep in Nature, both by inoculation and infection.

Clinically, louping ill resembles poliomyelitis of man, and the virus multiplies primarily outside the central nervous system and during the fever, which precedes clinical signs, the pathogenic micro-organism can be detected in the blood. Dr. W. S. Gordon's experimental results indicate that most sheep on a louping ill farm eventually become infected. Many develop only a fever, recover and are afterwards immune, but a small proportion develop clinical signs of infection of the central nervous system. In these cases lesions of an encephalomyelitis can be demonstrated and virus recovered from the brain and the spinal cord. On a world scale, according to Dr. C. E. Gordon Smith, there are thirteen known tick-borne animal viruses transmitted by five genera of hard ticks and one of soft ticks. All these viruses, except one, cause disease in man or domestic animals which are usually incidental hosts of the viruses. Their long-term natural maintenance depends on the geographical and behavioural association between vector tick and ground-frequenting mammal, and bird species, in the blood streams of which the virus inoculated by tick-bite can circulate adequately to infect further ticks. Because tick populations are adequate only where suitable vegetation provides the appropriate microclimate, infections occur in restricted foci. Wild vertebrates do not usually show the disease, but can be infected and circulate virus only once because of antibody formation, and accordingly their population turnovers must supply enough new susceptibles annually. Movement of these viruses to new areas probably depends on the carriage of infected ticks by large mammals or migrant birds. A stable enzootic disease changes to epizootic or epidemic mainly because of population-changes in ticks or vertebrates, or introductions by man of domestic animals or introduction of virus to new areas.

A second febrile disease of sheep and cattle in Britain is tick-borne fever, which was discovered during the investigation of louping ill by Gordon