than a hundred miles from land. Under these conditions many hundreds of insects were captured, both by day and at night, indicating an enormous population of floating and drifting insects in the air at least a hundred miles away from any locality where they could have been carried up by air currents. More insects were found when the easterly winds were blowing from the Continent of Europe than with westerly winds from Britain. Attempts were made to obtain from air trajectories the possible origin and routes taken by the insects captured on particularly good and particularly bad days. These indicated that many insects had drifted for more than twenty-four hours and had come several hundred miles in their involuntary flight. Since the Second World War, Prof. Hardy has made experiments with nets trailing behind a helicopter flying over the English Channel at heights of 500–1,000 ft.; but the results were disappointing, and work from the masts of ships has been resumed instead. It appears possible that insects over the sea are at a lower level than those over the land.

Dr. C. G. Johnson described his recent studies of the insect drift in the upper and lower air by means of net-traps hung from the cables of barrage balloons at Cardington Airfield in Bedfordshire, with the excellent co-operation of the staff. Nearly every day in the summer, and also on many nights, balloons were flown with a series of traps at intervals up to 2,000 ft., or occasionally to 4,000 ft. The numbers of small insects caught were surprisingly great; on some hot summer days as many as twenty Aphidæ per hour were caught in a single net about three feet across and about 2,000 ft. above the ground. Since only a microscopic proportion of the air passes through the nets, the number of small insects at about this level must be enormous. All the insects were alive and apparently uninjured, and when they again fall to the ground, they could continue to lay eggs and start colonies or outbreaks of pests.

The nets hanging from the cables suffer from the disadvantage that the amount of air sampled varies with the wind velocity, and when the air is calm, as is often the case during the night, few or no insects are caught; but this is no proof of the absence of insects from the air. To overcome this difficulty, Dr. Johnson has developed a suction trap in which a fixed amount of air is blown through a vertical net by an electric fan. The volume of air thus sampled is independent of the wind velocity, at least up to wind speeds of about fifteen miles per hour, and so the results can be expressed as numbers of insects per 1,000 cubic feet of air, and become capable of mathematical treatment and comparison. Using these traps at ground-level, a very definite diurnal periodicity in the number of Aphidæ in the air has been shown to exist. There are one or two peaks during the day and very small numbers at night. It is hoped next year to have these traps attached to the barrage balloons, and so to get a correct estimate of the relative numbers of insects during day and night at the higher levels. This work is being carried out at Rothamsted with special reference to the long-distance distribution of injurious Aphidæ and particularly the black fly of beans (*Aphis fabæ*).

The last paper of the series was a description by Mr. P. S. B. Digby of a wind tunnel constructed recently for the experimental study of flight behaviour of insects. In this instrument wind speed, light, temperature and humidity can all be independently controlled, and the insects can be kept under direct observation during the tests. The criterion used is the rate of wing-beat of the insects as measured by a stroboscopic technique.

In the discussion which followed, the effects of turbulence and convection currents, and the difference between them over land and over sea, were considered by various speakers; the general conclusion was that insects are likely to gain height during the day-time over the land, and to fall steadily both by night over the land, and by day and night over the sea. There might, however, be a cushioning turbulence effect near the surface of the sea, which would prevent the majority falling into the sea under normal conditions. Heavy rain at sea, however, would bring down a large proportion of the aerial population.

C. B. WILLIAMS

NEWS and VIEWS

Nobel Prize for Physics for 1949: Prof. H. Yukawa

PROF. H. YUKAWA, who has been awarded the Nobel Prize for Physics for 1949, is best known for his theory of nuclear forces which, in 1935, first postulated the existence of a particle a few hundred times heavier than the electron. The nuclear forces would then bear the same relation to the possible emission and absorption of such a particle as the electromagnetic forces in an atom bear to the emission and absorption of light. The discovery of the meson in cosmic rays appeared to be a confirmation of Yukawa's prediction, but the study of its properties gradually led to the conviction that it could not be identical with the particle required for Yukawa's theory. It was not until 1947 that Powell and his collaborators demonstrated the existence of a second short-lived particle, the π-meson, which is known to be the parent of the cosmic-ray meson, and which is strongly linked to protons and neutrons. This provided a brilliant vindication of Yukawa's idea. The detailed theory of the relation between this particle and the nuclear forces is still in its infancy; but, whatever the outcome, all thought about nuclear forces for the past decade and for many years to come is entirely dominated by the ideas of Yukawa. Since this first pioneer work, Yukawa has contributed much to other problems in fundamental theory and has built up an important school of theoretical physicists. As the editor of the new journal, *Progress of Theoretical Physics*, he has helped to provide an outlet for the great wealth of important contributions from his own school, as well as that of his colleagues. This new journal has already found a prominent place in literature on modern fundamental quantum theory

Aeronautics at the University of Glasgow: Prof. W. J. Duncan, F.R.S.

PROF. W. J. DUNCAN, who has been appointed to the new Mechan chair of aeronautics and fluid mechanics in the University of Glasgow, is the son of a Glasgow shipbuilder, and, after completing his education at Dulwich College and University College, London, he spent seven years in his father's firm. He then joined