

of the properties of turbulent flow. He devised an exquisite technique in which tiny spots of hot air were produced by minute electric sparks at various points in the field of flow to be examined, and the subsequent motion of these 'hot spots', as he called them, was observed by cinema-photography. By these means he was enabled to follow the details of the turbulent motion, and the results of his investigations have been of great value in the subsequent development of the subject. He was a brilliant experimenter, one of those rare men who can improvise apparatus out of almost nothing, fit it up with their own hands, and produce important results by its use. This characteristic showed itself also in his private life, for one of his favourite hobbies was the invention and construction of very clever, but very simple, mechanical toys, some of which reached the Patent Office and the general public.

In 1937, Townend left the National Physical Laboratory and joined the staff of the Admiralty as an adviser on aerodynamic problems. The nature of his work was now completely changed, and instead of making experiments himself on a particular subject, he found himself supervising the experimental work of others and taking a broad view of the whole field of aerodynamics as it affected the problems of the Fleet Air Arm. That he was as successful in this as he had been as an original investigator is ample testimony to his great gifts and his clear vision. He maintained a very close contact with the National Physical Laboratory and was a frequent visitor to his many friends and former collaborators there. He had a delightful personality, and was a very interest-

ing conversationalist. His many friends will feel a deep personal loss, and the science of aerodynamics has undoubtedly lost one of its most brilliant exponents.

WE regret to announce the following deaths :

Dr. J. J. C. Bradfield, C.M.G., Australian representative on the Council of the Institution of Civil Engineers during 1936-39, formerly chief engineer of the Sydney Harbour Bridge, aged seventy-five.

Prof. A. E. Bunge, professor of statistics in the University of Buenos Aires and director-general of national statistics, aged sixty-three.

Mr. Paul R. Crimp, student probationer at the Laboratory, Plymouth, and whaling officer, Ministry of Agriculture and Fisheries, in North Africa, aged thirty-one.

Prof. H. Lundborg, professor of racial biology in the University of Uppsala.

Prof. J. M. MacFarlane, emeritus professor of botany in the University of Pennsylvania, aged eighty-seven.

Dr. E. J. H. Mackay, the well-known archaeologist, on October 2, aged sixty-three.

Prof. Peter Mühlens, director of the Bernard Nocht Institute for Naval and Tropical Diseases, Hamburg, aged sixty-seven.

Prof. A. A. Read, emeritus professor of metallurgy in the University College of South Wales and Monmouthshire, Cardiff, on September 24, aged seventy-five.

NEWS and VIEWS

Fisheries of Mauritius: Appointment of Dr. J. F. G. Wheeler

DR. J. F. G. WHEELER, lately director of the Bermuda Biological Station for Research Incorporated, has been appointed marine biologist in Mauritius. Dr. Wheeler was assistant lecturer in zoology at the University of Bristol and during 1924-31 was naturalist on board the R.R.S. *Discovery* engaged on whaling investigations in the Antarctic, before taking up his duties at Bermuda. The object of the Mauritius appointment is to obtain for Mauritius the services of an expert to examine the marine and freshwater fisheries with a view to the possible establishment of a permanent fisheries control organization to improve existing nutrition standards of the islanders. It is hoped that Dr. Wheeler's researches may be a prelude to the establishment of a Fisheries Department for Mauritius as a permanent institution. The present scheme for the development of the island's fisheries has been made possible by a free grant up to £4,500 under the Colonial Development and Welfare Act, 1940.

Copernicus

THE Selby Lecture, delivered on May 27 by Sir Harold Spencer Jones, the Astronomer Royal, at Cardiff was on Copernicus (Cardiff: Univ. of Wales Press Board. 1s. 6d. net). The lecture covers much the same ground as the article by the Astronomer Royal contributed to NATURE of May 22, but a few additional points are worth noticing. For a long time after the publication of "De Revolutionibus",

it was believed that Copernicus was the author of the prefatory note which stated that it was not necessary that the hypotheses advocated should be true or even probable; it was sufficient that they should lead to results in agreement with observation. Although Osiander wrote the prefatory note without Copernicus's knowledge, this was not known at the time, and there was a widespread belief in the sixteenth century that Copernicus had advanced his theory merely as a mathematical device which he did not consider corresponded to any physical reality. Another very interesting matter should be mentioned. Although Copernicus accepted the value for the solar parallax found by Hipparchus, namely, 3', which implied that an astronomical unit was about one twentieth of its true value, yet the relative mean distances of the planets from the sun, obtained by Copernicus, were remarkably accurate when compared with the most recent determinations. Objections to the Copernican system arose *inter alia* on the question of the distance of the stars, and opponents contended that Copernicus had assumed a great distance for the stars merely to obviate the serious difficulty that they showed no parallax. This was the main reason for the rejection of the Copernican system by Tycho Brahe, and his substitution of a geocentric system in which the sun and moon revolved round the earth, but all the other planets revolved round the sun. Copernicus would not commit himself to any definite statement regarding the infinite distance or otherwise of the stars, and Bruno is usually regarded as the pioneer of the conception of an infinite universe and an infinite number of