halide grains through which it passes developable. The quality of the resulting track depends upon the nature of the particle and upon the characteristics of the particular photographic emulsion used. All the photographs in this exhibit were made from tracks obtained in Nuclear Research Plates specially made for use with this technique by Ilford, Ltd. The exhibit contains examples of records of alpha particles, protons, tritons, and the products of disintegration and fission. Neutrons cannot, of course, be recorded by this means because of the absence of charge, but protons ejected by neutron bombardment provide enlarged tracks some 3 ft. long (1·4 mm. actual). Alpha-particle tracks are produced both by bombarding the plate at grazing incidence with alpha-particles from polonium, and by bathing the plate in a solution of a thorium compound. Alpha-particle and triton tracks are produced by disintegration of lithium atoms incorporated in the emulsion during manufacture and bombarded with 9 MeV. neutrons. Uranium fission tracks are produced by bathing and bombarding with slow neutrons. The photographs are accompanied by adequate captions, and the whole exhibit is covered by an excellent descriptive folder attached to the case.

The exhibit of Mlle. Y. Cauchois from the Laboratoire de Chemie Physique, Paris, illustrates a new technique in the production of X-ray spectra. A crystal is bent into the arc of a cylinder and acts towards X-rays in the manner of a cylindrical lens. This provides the possibility of focusing a beam of X-rays, and the technique is illustrated with X-ray emission and absorption spectra and X-ray shadowgraphs of small objects irradiated by X-rays and 'imaged' on a photographic material by means of such a 'lens'.

The Kodak Laboratories show a picture of molecules of hexamethyl benzene and phthalocyanine by an X-ray diffraction method at a magnification of 250 million. The details of the method used are not specified; but the groups of which the molecules are composed are shown as diffuse dark areas in a clear ground.

In the X-ray field must be mentioned the exhibit by J. A. Fairfax Fozzard, which has been awarded the Rodman Medal. This illustrates, by means of a series of X-ray studies, the shell deposition in the egg of the domestic fowl. Radiographs have been made at intervals during the period of about twenty-six hours between the laying of one egg and the next. The shell of the egg has a greater opacity to X-rays than the surroundings, particularly around the circumference where the distance traversed through the shell material is greatest, so that the boundary of the egg is clearly seen.

High-speed photography is nearly always represented in the Exhibition, and this year there are several particularly interesting examples. The National Physical Laboratory shows a shadowgraph of a modern wing section in a 650 m.p.h. air stream at an exposure of one microsecond; also a series of shadowgraphs of a projectile in flight at different velocities. The latter shows the variation of wave pattern with velocity, from 0·86 to 2·51 times the velocity of sound, in five stages. There are two interesting high-speed radiographs shown by the Research Laboratories of the Westinghouse Electric Corporation. One shows a 20-mm. shell and the other a model bomb both just after bursting. The distribution pattern of the fragments is clearly shown.

Some of the research in air photography carried out during the War is illustrated by a number of exhibits from the Royal Aircraft Establishment, Farnborough. The value of movement compensation in night photography is illustrated. The film is moved in the focal plane at a rate based upon the speed and altitude of the aircraft, so that the image remains substantially stationary during exposure. This technique is particularly valuable for night photography since it permits longer exposures. The same principle is used in very low-altitude air photography in daylight, when the image movement is so great that exceedingly short exposures would be required to give sharp pictures. In the exhibits shown the image moves over a slit in the focal plane and the film is moved at the appropriate speed behind the slit. No camera shutter is required.

These are but few of the one hundred and sixty-four exhibits in the Scientific Section. The Natural History Section contains more than one hundred and fifty prints, and for relaxation there are some two hundred prints in the Pictorial Section, also lantern slides and stereoscopic photographs, etc. There is no doubt that this is the finest exhibition the Royal Photographic Society has organised, at least for many years. It is partly due to the increased space available, to the release of material after the War, and to the convenience of the lay-out which has been made possible by holding it in a gallery of the Science Museum.

During the period of the Exhibition there are six lectures and film shows open to the public. Admission to these is free but by ticket only. Particulars and tickets may be obtained from the secretary of the Royal Photographic Society, 16 Prince's Gate, London, S.W.7.

OBITUARIES

Dr. William Payman

WILLIAM PAYMAN, a principal scientific officer of the Safety in Mines Research Board and known at home and abroad for his researches on flame and explosives, died on August 10 at the age of fifty after a short illness. He leaves a widow and two sons.

After graduating at the Manchester College of Technology in 1915, Payman began a post-graduate study of the inflammation of gas mixtures under the guidance of Dr. H. F. Coward, with whom he was again to become associated in later years. He pursued this field when in 1917 he joined the staff of the Home Office Experimental Station at Eskmeals, Cumberland, an organisation devoted to an examination of the explosion hazards in coal mines and later expanding into the Safety in Mines Research Board, with stations at Buxton and Sheffield. During his early years at Eskmeals, Payman developed rapidly under the stimulating direction of the late Prof. R. V. Wheeler, and here was formed the nucleus of what was to become the Sheffield school of flame research when Wheeler became also professor of fuel technology at Sheffield. Payman's contributions are recorded in numerous papers in the *Journal of the Chemical Society*, notably in the years 1919–22, and he formulated his 'law of flame speeds in mixed gases', the cause of a sharp controversy with the school which had grown up under the late Prof. W. A. Bone at the Imperial College.

Although he always retained his active interest in flame, Payman transferred his attention in the early 'twenties to a more pressing problem, one aimed at ensuring the safe use of explosives in coal mines. Little was known regarding the intrinsic safety of the 'permitted' class of explosives when fired in contact with firedamp, nor of the means whereby gaseous mixtures were ignited by explosives, whether by contact with flame, hot gases or incandescent projected particles or by adiabatic compression in the shock wave. He set out with characteristic vigour and determination to study these possibilities, while at the same time approaching the problem more directly from its practical aspects. In this work he was aided by a team of research workers whom he imbued with his own enthusiasm and whose judgment and ideas he valued. These researches are described in the *Proceedings of the Royal Society*, in papers of the Safety in Mines Research Board, and in various mining journals. Payman's individual and original researches were recognized by the award of the D.Sc. degree by the University of Manchester in 1929.

Payman believed strongly in the value of fundamental research in the study of practical problems. His resuscitation and development of *Schlieren* photography due originally to Töpler were mainly responsible for its extensive modern usage, and many of the photographic techniques developed by Payman and his co-workers have been duplicated in other countries. Much of the mining research carried out by Payman and his co-workers was interrupted in 1939 and remains unpublished; even so, he contributed more than sixty papers to the scientific and technical press. He was also joint author with Prof. I. C. F. Statham of a monograph on "Mine Atmospheres". He achieved international recognition in 1938 when he was appointed president of the Explosives Section of the Congress of Applied Chemistry held at Nancy. He was also for some years secretary of the informal Explosives in Mines Research Committee of the Safety in Mines Research Board.

It seemed fitting that the main effort of the explosives section of the Board's staff should be diverted during 1939–45 to war-time problems, and it was here that Payman was at his best, directing with unflagging energy a variety of researches connected with the Service use of explosives, and serving on committees of the Ministry of Home Security and of the Scientific Advisory Council of the Ministry of Supply. It is too soon to write in detail of this contribution to the national effort and much will inevitably remain unpublished; it is sufficient to say that Payman derived an intense personal satisfaction from his efforts and those of his staff, from whom he received loyal support. The end of the War found Payman replanning for the Safety in Mines Research Board the organisation of his section to cope with a full renewal of its peace-time function in addition to a continuation of some of the war-time researches; these plans were coming to fruition when illness intervened.

Despite his aptitude for experiment, Payman gained greater satisfaction from co-ordinating and guiding the researches under his control; he had the rare ability of controlling without interfering, and his quiet manner quickly won him the confidence of those with whom he dealt. This was evident both in technical committee and during talks with the many large parties of miners, sometimes sceptical of the experiments they were witnessing, who visited the research station at Buxton. It may truly be said of Payman that his work was his life. His confidence and his friendship, not lightly given, were valued highly by his friends and colleagues, many of whom were associated with him during more than twenty-five years of joint effort to achieve safety in mines.

F. V. Tideswell

We regret to announce the following deaths:

Prof. M. Camis, formerly professor of physiology in the Universities of Parma and Bologna, on August 28, aged sixty-eight.

Mr. H. J. E. Peake, president during 1926–28 of the Royal Anthropological Institute, on September 22, aged seventy-eight.

Dr. Hassan Suhrawardy, during 1939–44 adviser to the Secretary of State for India, formerly vice-chancellor and dean of the Faculty of Medicine of the University of Calcutta, on September 18, aged sixty-one.

Mr. George Tickner, an authority on British birds, aged seventy-eight.

NEWS and VIEWS

Atomic Scientists' Association: International Contacts

The desirability of setting up an international federation of atomic scientists was discussed at the conference held by the Atomic Scientists' Association at Oxford during July, at which foreign men of science were present. Because of the diverse forms in which atomic scientists were or might be organised in different countries, and of the difficulties of getting one central body to speak on behalf of scientific men scattered over the world, it was decided that it was not warranted at present. The need for international contacts, however, was stressed, and one man of science from each of the foreign countries represented (France, Holland, India, Norway, Sweden, Switzerland and the United States) volunteered in a personal capacity to be responsible for liaison and for the exchange of published literature between the Atomic Scientists' Association and any bodies already existing or which might be set up with similar aims in their own countries. To extend this, a letter setting out the aims of the Association—"To maintain in Great Britain an informed public opinion about atomic energy, in order that all possible steps shall be taken to secure, in the words of the Washington Declaration of November 1945, international control to the extent necessary to insure its use only for peaceful purposes"—was afterwards sent to the academies of science and various scientific men in countries not represented at the conference, with a request that it might be brought to the notice of the scientific workers of their country and, if possible, a correspondent be appointed with whom the Atomic Scientists' Association can keep touch. The countries circularized were the Argentine, Australia, Belgium, Brazil, Canada, China, Czechoslovakia, Denmark, Jugoslavia, New Zealand, Poland, South Africa and the U.S.S.R.