some very belatedly and not until his findings had been rediscovered in other places).

In December 1922, Ginetzinsky gave an important communication at the thirty-seventh Physiological Congress in Petrograd, describing the effect of sympathetic nerve fibres on fatigued muscle. He showed that stimulation of sympathetic nerves can influence and, under certain conditions, restore the force of muscle contraction evoked by motor nerve impulses. The work was done, I believe, at the suggestion of Ginetzinsky's teacher; but there is no doubt from Orbeli's writings that his pupil had played a very prominent part in this discovery, which for some reason is commonly referred to in the non-Russian literature as the 'Orbeli phenomenon'.

In 1935, Ginetzinsky and N. I. Michelson reported that in muscles which had been completely paralysed by curare, a nerve impulse still evokes a small electric response in the region of the nerve-muscle junction. This was the first description of a phenomenon which became known, and intensively studied, several years later under the name of the 'end-plate potential'.

In 1942, Ginetzinsky and N. M. Shamarina published a most interesting paper the main findings of which were rediscovered seventeen years later in Sweden and in Great Britain. It confirmed the well-known fact that 'adult' skeletal muscle fibres are not very sensitive to acetylcholine except in a narrow region around their nerve-muscle junctions. The authors proceeded to show that, a few days after birth, the whole length of the muscle fibre reacts to low concentrations of acetylcholine, and that the final state, of a locally restricted sensitivity, is not attained until later. Furthermore, when adult muscles are deprived of their nerve supply, their acetylcholine sensitivity again begins to spread, from the nerve-muscle junction along the whole length of the muscle fibres.

During the last years of his life, Ginetzinsky's principal interests had turned to problems of kidney physiology, especially the control of water excretion and the mechanism of action of the anti-diuretic hormone. In 1958, he published a note in *Nature* (182, 1218; 1958) in which he put forward a new theory, namely that the re-absorption of water in the renal tubules is controlled by a local release of hyaluronidase which causes a temporary breakdown of the intercellular 'cement substance' in the wall of the distal and collecting tubules and so opens up channels for osmotic water flow. His evidence indicated that a hyaluronidase is released from the kidney cells under the influence of anti-diuretic hormone, and that the action of the free enzyme raises the water permeability of the tubular wall. This novel hypothesis has aroused much interest and some controversy; but its main features have been greatly strengthened by subsequent work done in Britain and by Ginetzinsky himself.

I had the pleasure and privilege of meeting Prof. Ginetzinsky in Moscow in 1961 and, like many of our colleagues, I was greatly looking forward to his intended visit to Britain in 1963, when he was to have given a series of lectures in the University of London. Ginetzinsky's contributions to physiology took a considerable time to cross the language barrier: if recognition outside his own country was belated, it fortunately did not come too late, and I like to think that he derived a good deal of satisfaction from it during the last years of his life.

BERNARD KATZ

Academician A. V. Topchiev

ACADEMICIAN A. V. TOPCHIEV, a noted organic chemist, a skilful administrator and a clever '*cultur*' diplomat, died in Moscow on December 27.

Born in 1907, Alexander Vasilievich Topchiev graduated at the Moscow Institute of Chemical Technology in 1930. After his graduation he made rapid progress and soon achieved eminence as a scientist and as a specialist in the field of petroleum chemistry. His numerous papers, a number of them dealing with petroleum hydrocarbons, earned him world-wide recognition. He also played an important part in the creation and development of the Soviet petroleum, chemical and polymer industry. Among his publications one may single out a few of the more outstanding ones, such as one on the nitration of hydrocarbons, another on boric fluoride as a catalyst and one on radioactive isotopes, the last paper being presented at the Congress on the Peaceful Uses of Atomic Energy held in Geneva in 1958.

In 1947–49 he acted as deputy Minister of Higher Education. In 1949 he was elected a member of the Soviet Academy of Sciences, and eventually he was entrusted with the key post of scientific secretary of the Academy. He was also director of the Institute of Petroleum-Chemical Synthesis. He received the Stalin Prize and the Order of Lenin for his work. As a very active member of the Communist Party, he was a deputy in the Supreme Soviet of the Russian Federation. His abilities as an administrator and a diplomat ensured his election to a number of committees and he was often sent abroad.

Topchiev was a frequent visitor to England, since his first visit in 1955 when he came to London as the leader of a group of Russian scientists attending a conference on nuclear energy. At this meeting he spoke with much feeling of the desire of the Russian scientists to restrict nuclear energy to peaceful uses. In 1956 he again led a party of Russian scientists attending the opening of Calder Hall. He was known as a most active fighter for peace and international scientific co-operation, and he was one of the founder members of the Pugwash peace movement at its first conference in 1957. At a scientific gathering in the United States in 1961, Topchiev again spoke eloquently about problems of peace and international co-operation. He was also a frequent and eloquent expositor of the Russian space programme, a circumstance which suggests that he had an important part to play in this.

To sum up, one may say that Topchiev was an outstanding scientist, an outstanding administrator, an organizer of international scientific and cultural co-operation and a most popular ambassador of his country, greatly admired by his fellow delegates and by his hosts for his frankness of speech, sincerity of purpose and good humour.

S. I. TOMKEIEFF

Dr. J. Howard Dellinger

DR. J. HOWARD DELLINGER, formerly chief of the Central Radio Propagation Laboratory at the National Bureau of Standards, U.S. Department of Commerce, died on December 28.

Dr. Dellinger, who initiated radio research at the Bureau in 1911, was also known for his work at national and international conferences on radio problems. He is credited with the discovery of the simultaneous occurrence of solar eruptions and radio effects (the Dellinger effect). He also investigated the ionosphere and high-frequency radio propagation and supervised the development of many basic radio aids to air navigation, and the initiation of the U.S. standard frequency broadcast service (*WWV*).

After retiring from the Bureau in 1948, Dr. Dellinger continued his work as a radio consultant and adviser.

Dr. Dellinger joined the staff of the National Bureau of Standards in 1907. He began working on the determination of the conductivity of copper for a few years. He was appointed chief of the Radio Section in 1919.

During the Second World War, Dr. Dellinger was selected by the Armed Services Joint Communications Board to direct the work of the Interservice Radio Propagation Laboratory. It was the task of this group to draw together accumulated research knowledge and data from which to make radio propagation predictions for the Armed Services. In 1946 this organization became