

OBITUARIES

Prof. Leif Tronstad, O.B.E.

THE death of L. H. L. Tronstad on active service in Norway, while leading a daring operation in March 1945, has deprived his country of one of its most outstanding men of science, and his collaborators in all parts of the world of a valued friend.

Leif Hans Larsen Tronstad was born in 1903 at Baerum, near Oslo; his father, a farmer, died the same year. He studied chemistry in the Oslo Technical School and the Norwegian Technical University at Trondheim, obtaining brilliant successes despite the fact that he was at the same time working as a teacher and in support of his widowed mother and sister. His first important research was carried out at Berlin, during 1928-29, in Prof. Freundlich's laboratory. A qualitative method of detecting thin oxide films on metals, based on changes in the ellipticity of polarized light, had already been worked out by Freundlich, Patscheke and Zocher. Tronstad succeeded in developing the method to give quantitative measurements of thickness, and showed that, when iron was made passive by anodic treatment, the film thickness increased, while during cathodic activation the thickness diminished. This work not only supplied valuable information as to the causes of passivity, but also suggested a new method of ascertaining the thickness of invisible films, and the nature of the film substance.

After further work on films resulting from electrochemical treatment, carried out in Prof. Benedick's laboratory at the Metallografiska Institutet, Stockholm, for which he received his doctorate at Trondheim, Tronstad proceeded in 1931 to the University of Cambridge. There he improved the method further, testing its accuracy by the study of monolayers of fatty acids, the thickness of which could be measured in other ways; part of this work was carried out in collaboration with C. G. V. Feachem.

Later Tronstad returned to Norway and was elected in 1934 to a temporary professorship in technical inorganic chemistry at the Norges Tekniske Högskole; this chair was made permanent in 1936. He was one of the youngest professors in the country, popular alike with students and colleagues, and enjoyed the reputation of being a first-class teacher. At this stage he was joined by A. B. Winterbottom, and the polarized light method of studying films on metals was developed further. Although not well known to-day, its value is likely to become increasingly appreciated as time passes, especially as it can be employed for just that range of thickness where alternative methods are least useful. Moreover, the method can be used for the continuous study of a film *in situ* during its growth in almost any environment.

Tronstad's interests were by no means confined to the study of films. He played a leading part in the organization of the Rjukan hydrogen plant of Norsk Hydro, for the large-scale separation of heavy water, large quantities of which were supplied for scientific research in Great Britain. Determinations of the physical constants of several deuterium derivatives were made by Tronstad and his associates at Trondheim and Rjukan. Tronstad's electrochemical knowledge was of the greatest value to the Norwegian industries, especially those connected with steel, ferro-alloys, nitrogen, refractories and aluminium; he also carried out researches on the effect of minor

elements on the corrosion of aluminium and iron. His published scientific papers number about sixty.

Tronstad was greatly attached to Great Britain, where he had many friends. His modesty, sincerity and cheerful good-humour were appreciated by all who met him. He had numerous interests outside science; for example, he was a fine athlete, being in his student days a member of the relay team which set up a Norwegian record for the 4 × 400 metres distance; he was also a lover of natural beauty, and took pride in Norwegian country folk and customs.

During the War, Tronstad was engaged in daring and dangerous work for his country, which led, on the eve of victory, to his death in action. Details of his many-sided war activities must not be given; but it may perhaps be stated that the results achieved, which demanded the highest courage, organizing capacity and scientific skill, contributed directly to the speedy victory of the Allied Nations, besides saving the region which came to be known as 'Southern England' from an even longer and more severe ordeal than it actually endured. He received the Order of the British Empire for his outstanding services.

We would like to thank Mr. A. B. Winterbottom and Capt. J. H. Reimers, as well as the Royal Norwegian Government Information Office, for kind assistance on many points.

E. K. RIDEAL.
U. R. EVANS.

Don Ignacio Bolivar y Urrutia

WITH the death in Mexico on November 20, 1944, of Don Ignacio Bolivar y Urrutia, the world has lost one of the most eminent Spanish naturalists of a generation belonging as much to the last century as to the present. Ignacio Bolivar was born on November 9, 1850, a member of a noble and ancient family. Although interested from an early age in natural history, young Bolivar had to take up law studies, since his parents hoped that these would provide him with a better livelihood; but he took a degree in natural sciences as well. Before he was twenty, Bolivar became an ardent member of a small but very active group of young Madrid entomologists, and spent much of his free time in exploring the Spanish fauna.

When the Sociedad Espanola de Historia Natural was founded in 1871, Bolivar became its vice-secretary, and in 1872 his first scientific paper was published by the Society. In 1875 he joined the staff of the Madrid Natural History Museum as an assistant in the Zoology Department, specializing in entomology. The whole subsequent career of Bolivar was passed in the Museum, of which he eventually became director, and which grew from a small establishment to an imposing scientific institution and a centre of research. In 1877, Bolivar was also appointed to a chair in the University of Madrid, where he continued lecturing in zoology until 1922, and his combined work in the Museum and the University served to make him one of the leading naturalists in Spain and a teacher of more than one generation of Spanish biologists.

Although primarily a taxonomist himself, Bolivar was always a champion of the study of living organisms, and it was due to his efforts that a marine biological station was established in Santander, while the Estacion Alpina de Biologia in Sierra de Guadarrama, also founded by him, was a somewhat unique

centre where Spanish and foreign biologists were able to find modest accommodation and good laboratory facilities amidst unspoilt Nature. This long and fruitful activity was rudely interrupted when at the age of ninety Bolivar became an exile, followed by a group of his colleagues. It was characteristic of Ignacio Bolivar and his younger followers that in Mexico they should take a most active part in the scientific life of the country of their adoption, and are contributing greatly to its scientific exploration. A monthly journal, *Ciencia*, launched by them, rapidly became a widely known medium of biological knowledge in Latin America.

Although Bolivar published some papers on the Hemiptera, on other insect orders and on Crustacea, he specialized from his earliest days on the systematics of the Orthoptera, a group particularly well represented on the Iberian peninsula, where it includes a high proportion of endemic genera and species. The total number of papers published by Bolivar was about two hundred and thirty, and he described more than two hundred new genera and about a thousand species of Orthoptera. His work on this order partly coincided in time with that of Brunner, Saussure, Pictet and Redtenbacher, and he is to be included with them as a creator of the modern system of Orthoptera.

While a great deal of Bolivar's work was purely descriptive, we owe to him also a series of revisions and monographs, and his works on the Tetrigidae, Pamphaginae, Pyrgomorphinae, Truxalinae and Ephemigerae, still remain indispensable for a taxonomist. From the faunistic point of view his main contribution was, of course, to the study of the Iberian fauna, but he ranged widely in his work, from India to the Seychelles and from the Congo, Angola and Spanish Guinea to South America.

Most present-day orthopterists regard Ignacio Bolivar as their master and it was a great and touching occasion when in 1935, during the Sixth International Entomological Congress at Madrid, a group of some fifteen orthopterists of various nationalities gathered round him for a 'family' celebration. For those who knew Don Ignacio personally, it was impossible not to fall under the spell of his vital personality, full of noble and simple charm. His energy was prodigious, and I shall never forget an excursion to the highest peak of Sierra de Guadarrama, when Don Ignacio, then well over seventy years old, led the way on foot for several hours.

The value of Bolivar's work was recognized by the Entomological Societies of London, Belgium and Prague, which elected him honorary fellow, while the Zoological Society of London included him among its twenty-five foreign members. Among many other academic distinctions, he was a doctor *honoris causa* of the University of Pittsburgh. B. P. UVAROV.

Dr. G. C. Robson

GUY COLBORN ROBSON, whose death occurred on May 17, 1945, after a long illness, was born at South Woodford, Essex, on February 11, 1888. He obtained a Classical Scholarship at New College, Oxford, where he entered into residence in 1906. He took Classical Moderations, and then changed over to science, reading for honours in zoology, in which he obtained a first class, and afterwards spent a year in Naples, where he studied the fat-metabolism of crabs infested with *Sacculina*. He joined the staff of the British Museum Natural History in 1913 and was put to

work on the Mollusca under Edgar Smith. He became a well-known authority on this group and devoted much attention to their anatomy, as well as the 'conchology' on which earlier classifications were mainly based. He published numerous papers, mainly on the Cephalopoda, including perhaps his most important work, a monograph on the Octopoda, published by the British Museum in two volumes (1929 and 1932). He also studied the biology of *Paludestrina jenkinsi*, a parthenogenetic freshwater snail introduced into Britain some time during the eighties of last century, and now widely distributed throughout Britain.

Robson was attracted to zoology from the philosophical side and it is doubtful whether he was entirely happy in his museum life. His intellectual interests were many and varied—artistic, literary, sociological, philosophical. The latter bent is best shown in his two books, "The Species Problem" (1928) and (jointly with O. W. Richards) "The Variation of Animals and Plants in Nature" (1936). His artistic gifts are evident in the illustrations to his papers and also in his water-colours.

During the War of 1914–18, he served first with the Red Cross and then with the Royal Garrison Artillery and was attached to a coast defence unit. He was bombed during an air attack, and, after spending a year in hospital suffering from shell-shock, was invalided out of the service. He returned to the British Museum, where he spent some of the most productive years of his life and became a deputy keeper. Unfortunately, he never seemed to have recovered fully from his illness, and in 1935 had another nervous breakdown necessitating his resignation from the Museum. He spent the last few years of his life in retirement. E. HINDLE.

Some Czechoslovak Men of Science

NEWS has just reached London that several more Czechoslovak professors, displaced when the Germans closed the universities of that country in 1939, have died in concentration camps. They include Prof. V. Dolejšek, Prof. F. Ulrich and Prof. J. Štorkán. Prof. F. Slavík, a mineralogist well known in Britain and now sixty-nine years old, was rescued from Buchenwald by the Allies just in time, and has now been able to travel to Prague. The fate of Prof. F. Závěrka, the physicist, is unknown; he has not yet been traced.

It is now known that Prof. A. Šimek, whose death has already been referred to in *Nature* (152, 69; 1943), was executed at Mauthausen concentration camp.

Prof. Dolejšek was a distinguished physicist who worked for a time with Prof. Manne Siegbahn in Uppsala. Some of his work on X-ray spectra was first published in *Nature*, and he is perhaps best known for his discovery of the *N*-series of X-ray lines. He died at the Terezín camp in January last.

Prof. F. Ulrich had carried out many mineralogical investigations of considerable local interest and had made important petrographic and geological studies. He was also the author of several authoritative treatises on geology and had been elected honorary foreign member of numerous European scientific societies.

Prof. Štorkán had a distinguished career as a zoologist and was an authority on the Central European fauna. He was only fifty-four at the time of his death. G. DRUCE.