engage in the many other important problems which await investigation.

With the example set by the parent union at its 1946 assembly, many of the International Union's associations have had meetings of their own executive committees and councils to put their post-war houses in order and to make plans for the next general assembly, which will be held in Oslo during August 19–28, 1948. Partly in anticipation of that assembly and partly to renew and extend interest in the work of the Union, a pamphlet describing its organisation and scientific activities and those of its constituent associations and commissions has just been published by the Union's Bureau (at present at Kew Observatory, Richmond, Surrey), where copies can be obtained.

THE SWEDISH DEEP-SEA EXPEDITION

By Prof. HANS PETTERSSON

THE Swedish Deep-Sea Expedition left Göteborg on July 4 on board the 1,400-ton motor-schooner *Albatross*, which had been specially fitted out for the purpose at the Lindholmen shipyard with air-conditioned laboratories and accommodation for the scientific staff, dark rooms, workshops, cold-storage room, electric winches, etc. The main purpose of the cruise, which is expected to last for fifteen months, is to investigate the deep ocean bed and its deposits by means of new methods developed in Sweden during the war years. The first part of the cruise, between Madeira and Panama, has now been completed. Some of the results are here briefly summarized.

A new and powerful echo-sounding equipment has been constructed for the *Albatross* by the Marine Instruments, Ltd., of London (formerly Henry Hughes and Sons, Ltd.), in order to get detailed and continuous records of the depth down to at least 7,500 metres. The records so far obtained go down to more than 6,000 metres and are very interesting. They prove that older views of the deep-sea bottom as a smooth, perfectly level surface, especially in the depressions, are radically wrong, at least as regards the part of the Atlantic Ocean which has been traversed. Such surfaces extending over several miles of our course were comparatively rare. Instead, the depth curve moves incessantly up or down, generally by gentle undulations but quite often rising or falling by distinct steps, 100 to more than 300 metres high and from less than one nautical mile to a few miles broad. The change in depth is sometimes so abrupt that the recorder cannot follow it, thus indicating nearly perpendicular walls hundreds of metres in height. One gets the impression of fault lines stretching more or less obliquely across the course. In other cases the slope is steadier, rising or falling by as much as 1 : 10, or even steeper. In certain places where the record tends to become confused, the bottom appears to be covered with small hills or hummocks, the record showing three or more convex lines, partly overlapping or intersecting at one point.

Crossing the central Atlantic Ridge, where the bottom was pronouncedly uneven and rich in steps or hummocks, its highest point found by us, quite close to the place where the Admiralty chart has the depth of 934 fathoms, in lat. 23° 10′ N., long. 45° 10′ W., has a minimum depth of only 786 fathoms or about 1,440 metres. Evidently a close net of echograms will be required for any detailed study of the morphology of the Atlantic bottom.

In the Caribbean Sea the depth curve along our course from Martinique to Panama was much steadier than in the open Atlantic, hummocks and steps in the curve were rare, and the depth remained constant to within a few fathoms over distances of 50–100 nautical miles or even more. It is interesting to note that bottom features similar to those of the Caribbean were found also between Algiers and the Tyrrhenian Sea by the Swedish Expedition to the Western Mediterranean on board the *Skagerak* in 1946.

This surprising unevenness of the deep Atlantic bottom proved a serious complication in our attempts to measure the thickness of the sediment carpet by the method developed by Prof. W. Weibull of Bofors, who accompanied the Expedition to Panama. By means of depth charges detonating at depths of 500, 2,500 or 4,500 metres below the surface, echoes are set up from the bottom itself as well as from reflecting surfaces deeper down in, or below, the sediment. Hydrophones of special construction suspended from the ship convert the sound-waves into electric impulses which are recorded on an oscillograph. Where the bottom profile is rough, diffuse reflexions obscure the oscillograms, whereas over a smooth bottom 'deep echoes' may be recorded. The values found (uncorrected for the somewhat higher velocity of sound in the sediment than in water) vary in the open Atlantic between 300 and nearly 2,500 metres.

In the Caribbean Sea, with its much smoother bottom, the oscillograms are very clear and give values which increase from east to west, from 250 metres to a maximum of 900 metres. The total depth of the reflecting surface, presumably the rocky floor beneath the sediment carpet, thus varies between 4,800 and 7,800 metres in the Atlantic and between 2,900 and 5,600 metres in the Caribbean Sea. In the western Mediterranean the maximum depth of a reflecting surface found in 1946 right in the centre of the Tyrrhenian Sea was 2,600 metres at a water depth of 3,600 metres. It will be of interest to continue these measurements also in the central Pacific Ocean, where we intend also to use depth charges exploding in the sediment itself.

Dr. B. Kullenberg, by means of his piston core-sampler, has taken some dozen cores from depths between 4,000 and 5,600 metres, most of them 10–15 metres long. Some of those taken in the open Atlantic in depths of 5,000 metres or more consist of red clay, which becomes very compact and takes on a deep chocolate-brown colour in the lower levels. Occasionally layers rich in Foraminifera are found intercalated in the red clay. Assuming the latter sediment to increase in thickness by 8 mm. in 1,000 years in the Atlantic Ocean, the lower strata of a core 15 metres long should have been deposited nearly two million years ago, or before the end of the Tertiary Age, when the deep ocean water is generally assumed to have been considerably warmer than during the Quaternary Age. This would seem to make it difficult to uphold an opinion prevalent among oceanographers, namely, that the lime-dissolving effect of the ice-cold Antarctic bottom current is the main or only agency capable of converting calcareous ooze into red clay.

In a 15-metre long core taken from a depth of nearly 4,900 metres at the centre of the Caribbean

Sea, the sediment has a strong greenish hue and displays an interesting stratification, with layers alternately rich and poor in calcareous shells. Dr. Fred Phleger, of the Woods Hole Oceanographic Institution, who was the guest of the Expedition between Martinique and Panama, sampled this core for Foraminifera and also collected plankton from the uppermost 1,000 metres of water by means of tow-nets of special construction.

Hydrographic soundings with temperature observations, also by means of the bathythermograph, and with water samples for chlorine and oxygen determinations were made across the Caribbean. Large-volume samples were taken from various depths, both in the open Atlantic and in the Caribbean, for measurements of uranium and radium. Such measurements have become of especial importance owing to the light they may shed on the ionium precipitation in the sea, which is supposed to be responsible for most of the radium present in deep-sea deposits.

The cores hitherto taken by the Expedition are being sent back to Sweden for analyses by various specialists. The *Albatross* now leaves for the Pacific part of the cruise, with the Galapagos Islands as the nearest goal.

OBITUARIES

Dr. S. H. Daukes, O.B.E.

By the death of Sidney Herbert Daukes, the medical profession has lost its leading authority on the modern medical museum. Daukes died on September 3 after a short illness. The son of the Rev. S. Whitfield Daukes, vicar of Holy Trinity, Beckenham, he was born on April 20, 1879. He was educated at Lancing College where he distinguished himself in various sports, and at Caius College, Cambridge. He took a second class in the Natural Science Tripos in 1900 and then studied medicine at the London Hospital. He qualified M.R.C.S., L.R.C.P. in 1905 and in the same year graduated M.B., B.Ch., Cambridge. After several years spent in hospital appointments and in general practice, he took his D.P.H. in 1912 and in 1913 the D.T.M. & H. By the outbreak of the First World War he had held a post as assistant school medical officer at Leeds and was chief assistant school medical officer for Norfolk.

In the War, Daukes served first as a special divisional sanitary officer in France. In the winter of 1917–18 the War Office established the School of Army Hygiene at Leeds, and Daukes was made responsible for its organisation and administration. He was mentioned in dispatches and received the O.B.E. in 1920. He wrote "A Manual of Sanitation Applied to Military Life", and he contributed the chapters on hygiene to the official medical history of the War.

After the War, Col. Andrew Balfour—later Sir Andrew Balfour—who was director of the Wellcome Bureau of Scientific Research, invited Daukes to become curator of the Museum of Tropical Medicine which had been established by Sir Henry Wellcome. Under Daukes' guidance its scope expanded, and in 1926 it became the Wellcome Museum of Medical Science, with Daukes as its first director.

Daukes held very strong views on the importance of visual education, and he organised his museum with this end in view. Each disease was dealt with as an entity, and in the bays devoted to it, the student could follow out the latest views on etiology, pathology, clinical features, treatment and prevention, each branch being illustrated by photographs, charts, pathological specimens, paintings and other visual representation which was calculated to impress the point in question on his mind. The Museum became an important teaching unit, and it was visited by many medical men from overseas, by practitioners proposing to specialize in tropical medicine, by medical students and by nurses and health visitors. In the years immediately preceding the Second World War, approximately 10,000 persons visited the Museum annually. The Ministry of Health included a demonstration of tropical diseases in the Wembley Exhibition in 1924, and this was largely planned by Daukes acting as organising secretary of the appropriate committee. Similar exhibits were sent to the Wembley Exhibition in 1925, to Antwerp in 1929 and to Paris in 1931. In 1928 Daukes graduated M.D. at Cambridge with a thesis on the medical museum. This thesis was later expanded and published as an important monograph. In 1940 Daukes was asked to take over, as a temporary measure, the administration of the Wellcome Historical Museum, the directorship of which had been held by Sir Henry Wellcome himself until his death.

Daukes was well known, under his pen name "Sidney Fairway", as a novelist with a wide popular appeal. His novels generally dealt with some aspect of medical life, his best known being "The Doctor's Defence" and "The Cuckoo in Harley Street". His last novel, "He Loved Freedom", was published a week or so before his death. His reminiscences will be published shortly with the title "A Pillar of Salt".

He married Emma, daughter of William Kempsell of Reigate, who died in 1944. In 1945, he married Ethel Maud, widow of E. J. T. Hoyle of Doncaster. He is survived by his widow and a son by the first marriage, Lieut.-Colonel Whitfield Daukes, R.A.M.C.

E. Ashworth Underwood

Prof. V. Ulehla

The many-sided Czechoslovak man of science, Vladimir Ulehla, died on July 3 at the age of fifty-eight. His father had taken a prominent part, years ago, in securing educational reforms in Moravia, and Vladimir's interest in science was further developed under Prof. B. Němec at Prague and at the University of Strasbourg. After 1919, Dr. Ulehla became professor of plant physiology and biology at the newly founded Masaryk University of Brno. His original contributions to science relate mainly to a study of protoplasmic movement in lower organisms, and the influence of various ions on cells and their protoplasm. The borderline of plant and animal life, and the infusoria especially, interested him and he made some physico-chemical investigations on plant colloids and on turgor. Ulehla also wrote two books in Czech of a philosophical nature, "Reflexions on Life" and "Beyond the Veil".

But Ulehla's special merit was his skill in interesting the general public of his country in science and culture. His first great opportunity came when he was the organiser of the remarkable Brno Contemporary Culture Exhibition of 1928. Moravia was then a centre of archæological interest on account of the recent discoveries concerning the prehistoric mammoth hunters. Thanks to Ulehla's organising ability the exhibition, which attracted international atten-