

however, a few groups of fossils still virtually untouched by the Society, and certain monographs need revision; these defects are being remedied as specialists become available and willing to undertake such work. Preparation is being made for the issue of nomenclatorial supplements to early monographs, and a new monograph on Carboniferous Crinoidea is promised publication in the near future.

The Society came into being when there were many collectors anxious to identify their finds, and the membership remained between five and six hundred during the first fifty years of the Society's history; there was, however, during that time a steady rise in the proportion of library subscribers. In the first thirty years of the present century, there was a marked fall in numbers of personal members, but the figures have lately shown a slight rise. The fall in membership as well as the rise in cost of printing has resulted in a decrease in thickness of the annual volume, because it was thought desirable not to increase the original subscription rate.

The Society has had ten presidents: Sir Henry De la Beche (1847-55); W. J. Hamilton (1856-67); Dr. J. S. Bowerbank (1867-77); Sir Richard Owen (1877-92), who was responsible for eight monographs on fossil Reptilia and Mammalia; T. H. Huxley (1893-5); Dr. H. Woodward (1896-1921), who wrote three monographs dealing with Palæozoic Arthropoda, one in association with T. R. Jones; E. T. Newton (1921-28); Dr. F. A. Bather (1928-34); Sir Arthur Smith Woodward (1934-44). The treasurers have been seven: S. V. Wood (1847-80); S. V. Wood, jun. (1880-84); R. Etheridge (1884-1904); Dr. G. J. Hinde (1905-14), who wrote a monograph on fossil sponges; R. S. Herries (1914-38); W. E. F. Macmillan (1938-46). The secretaries, who also serve as editors, have been five: J. Morris (1847, for a few weeks); J. S. Bowerbank (1847-63); Rev. T. Wiltshire (1863-1900); Sir Arthur Smith Woodward (1900-34), who during this period completed two monographs on fossil fishes. The present office holders are: President, Prof. H. L. Hawkins (1944-); Treasurer, Dr. A. J. Bull (1946-); Secretary, Dr. C. J. Stubblefield (1934-). C. J. S.

OBITUARIES

Brigadier H. St. J. L. Winterbotham, C.B., C.M.G.

HAROLD ST. JOHN LLOYD WINTERBOTHAM died on Tuesday, December 10, 1946, at his home at Sutton Courtenay at the age of sixty-eight. He was the second son of Canon R. Winterbotham, was born on February 5, 1879, educated at Fettes and the Royal Military Academy, Woolwich, and commissioned in the Royal Engineers in 1897. He was awarded the Queen's Medal with three clasps for his services in the South African War, and when the War ended was appointed garrison adjutant at St. Helena. After a short period of home service he returned to South Africa in 1908, where he carried out a topographical survey of the Orange Free State.

In 1911 he joined the Ordnance Survey at Southampton, where he was placed in charge of the Trigonometrical and Topographical Division. Some doubts had been expressed about the accuracy of the Principal Triangulation of Great Britain, which had been carried out about a hundred years before. It had already been decided to carry out a check, and a new base had been measured at Lossiemouth before Winterbotham arrived. He took charge of

the remaining operations required to complete the check of the old work, and published an important professional paper describing the results. This indicated that the Principal Triangulation was comparable in accuracy with work carried out on the Continent by the most modern methods.

Soon after the outbreak of war in 1914, Winterbotham left Southampton for France in command of the Ranging Section R.E., a small unit intended to be used for fixing the position of an aeroplane at the instant that it dropped a smoke signal over a hostile target. This small unit was the nucleus which, in conjunction with "Maps G.H.Q.", grew into the large military survey organisation which existed in the field in 1918. In this organisation Winterbotham served first in command of the 3rd Field Survey Company and later as technical assistant to the Officer in Charge of Maps G.H.Q., with a short interval during which he was in charge of Survey at G.H.Q. Italy. For his services he was mentioned three times in dispatches, was made a C.M.G. and received the D.S.O. and the brevet of lieutenant-colonel.

In 1920 Winterbotham returned to his old post in the Trigonometrical Division of the Ordnance Survey. In 1922 he became chief of the Geographical Section, General Staff, a post which he retained until 1929. During this time he was jointly responsible with Colonel (later Sir Charles Arden) Close for the production of the third edition of the "Text-Book of Topographical Surveying", and he also published "Survey Computations", a book of great value to the field surveyor whether military and civil.

At this time a revolutionary alteration in the design of theodolites had been made on the Continent, and British models were in danger of being completely outclassed. It was on Winterbotham's initiative that a conference was called at Tavistock to consider the design of a new British instrument. This was attended by representatives of the Services and of the leading survey instrument manufacturers, and led to the production of the Tavistock theodolite by the firm of Cooke, Troughton and Simms, to the great advantage of British surveyors in the Second World War.

During his term at the War Office, Winterbotham's interest in geodesy not only led him to take an active part in the affairs of the International Union of Geodesy, but also he was responsible for sending a party to Africa to complete the geodetic observations of a section of the arc of the 30th meridian. During this time, too, he was one of the original founders of the Field Survey Association, the success of which owed much to his energy.

Following his term at the War Office he carried out an inspection of Colonial survey departments, and included in his tour a visit to the party of Royal Engineers which he had been responsible for sending out to carry out the trigonometrical observations of the arc of the 30th meridian in Africa.

In 1930 Winterbotham was appointed director-general of the Ordnance Survey, and the following year became A.D.C. to the King. His time at the Ordnance Survey was one of severe financial stringency, when establishments were cut to the bone. Opportunities for carrying out any original work, or indeed anything but routine revision, were few. Fortunately for the Ordnance Survey, Winterbotham was able to find time for a study and overhaul of old records. His most important publication at this time was "The National Plans", which gives a very complete historical description of the large-scale plans of the Ordnance Survey. His work on this and other

publications came to be fully appreciated by those who had to restart the Ordnance Survey on its national work after the Second World War. With many files and records destroyed during the War and a seven years gap in the continuity of the work, the existence of those carefully prepared historical studies was an inestimable boon. In 1935, having reached the age limit, Winterbotham retired from the Army and from the Ordnance Survey. In the same year he was made a C.B.

But the energy which had so far been mainly directed to the execution of his official duties was now more fully available for that work for the International Union of Geodesy and Geophysics which had always been one of his principal interests. In the early general assemblies of the Union his professional co-operation had been much in demand by the Governments he had advised and assisted in survey work. At the third assembly in Prague (1927), we find him entrusted with the representation of South Africa, Australia and Canada, as well as the General Staff of the War Office.

Then in 1928, when Colonel (later Sir Henry) Lyons succeeded Sir Arthur Schuster as general secretary of the International Research Council and resigned the general secretaryship of the International Union of Geodesy and Geophysics, Winterbotham accepted an invitation to succeed him; and from the following assembly at Stockholm in 1930 until his death, Winterbotham's interests and enthusiasms were seldom far from the Union. There he guided and humoured successive presidents and executive committees and helped the secretaries of the constituent associations not quite so experienced or so expert in administrative matters as himself—all with a friendly kindness which did not stop him from frank expression of opinion when he considered the real interests and welfare of the Union to be at stake.

Winterbotham's wide experience of men and affairs stood the Union in excellent stead during the war years. Immediately after the Washington assembly in September 1939, from which he was recalled for official duties, Winterbotham took steps to safeguard the international interests and widely distributed funds of the Union and of its various associations. It is largely owing to his judgment and foresight that the International Union of Geodesy and Geophysics came through the war years ready to undertake fresh international scientific work. Meanwhile he had offered his services to the Government and had been employed, first as chief instructor in survey at the School of Military Engineering, and later under the Admiralty on the preparation of topographical reports.

Before the War had properly ended, Winterbotham set about gathering together again the broken threads of international geodetic and geophysical collaboration. At a meeting of the executive committee of the Union which he was instrumental in calling together in 1945, plans were discussed for early renewal of the Union's activities. By that time, unfortunately, Winterbotham had been advised that he must take things more easily, and it was with great regret that the committee accepted his resignation. At the subsequent extraordinary assembly of the Union in August 1946, Winterbotham was honoured by election as one of the two vice-presidents of the Union under the new statutes in the framing of which he himself had spent much thought and care. By this election the assembly hoped that his ripe experience and judgment in Union affairs would

continue at the disposal of the Union for many years; but, though not known to many, he was already a sick man, and he did not live to contribute still further to the Union's international prestige, which he had done so much to enhance during his long and active association with it.

There will be many people in many lands who will remember Winterbotham's sage counsel given in a characteristic and incisive style, and there will be many who will miss that counsel in the years to come. He leaves a widow, one son and two daughters.

G. CHEETHAM

Dr. C. T. Madigan

By the death of Cecil Thomas Madigan, Australian geology has been deprived of one of its most colourful personalities, a man who throughout his entire life had retained the youthful spirit of the true pioneer and explorer. Born on October 15, 1889, the son of Thomas Madigan of Renmark, South Australia, he was educated at the University of Adelaide, where he was known as a first-class oarsman.

Although elected to a Rhodes Scholarship at Oxford in 1911, Madigan did not go into residence until 1914, in the meantime having accompanied Sir Douglas Mawson as his second-in-command on the Australian Antarctic Expedition. On the outbreak of war not long after his arrival in Oxford, he was granted a commission in the Royal Engineers, with whom he saw four years service in France, being twice wounded and gaining a mention in dispatches.

On demobilization in 1919, Madigan returned to Oxford and obtained a first-class in the final honour school of geology. While carrying out research on material brought back from the Antarctic, he was appointed assistant Government geologist in the Sudan, where he spent two years before returning to Adelaide to become senior lecturer in geology, a post he held until his death. During the Second World War Madigan again joined the Forces, and with the rank of lieutenant-colonel was chief instructor of the School of Military Engineering at Liverpool, New South Wales, for three years.

The greater part of Madigan's work was devoted to the exploration of what Gregory had aptly termed the "Dead Heart of Australia". In 1929 he made the first aerial reconnaissance of this *terra incognita*, exploring an area of some 28,000 square miles which no white man had ever seen and which had previously baffled all attempts to cross it. He proved that the great lakes were dry, and that nothing lay within the area other than clay-flats encrusted with salt and everlasting sand-ridges; having had, in his own words, the somewhat melancholy satisfaction of saving the danger and expense of further exploration.

By this and subsequent journeys with car or camels, Madigan obtained a vast amount of valuable geological and topographical information, extending as far north as the MacDonnell Ranges and the area north of Lake Eyre, which he named the Simpson Desert; and the account he has given of this most inhospitable country in numerous papers published by the Royal Society of South Australia, the Royal Geographical Society and the Geological Society of London makes the most interesting reading. Some of his remarkable aerial photographs were recently published in the *Illustrated London News* (January 25, 1947).