obituary

Bernard Gregory, 1919–1977

BERNARD GREGORY died on 24 December 1977, the victim of a heart attack at the age of 58. His untimely passing is a great loss for the European scientific community. Active in both teaching and research, he mainly became a great scientific administrator, excelling in a role which assumes particular difficulty and importance now that scientific research demands large resources, often concentrated in big laboratories or managed on a national scale.

He was marked out by an intellect of the highest order and a deep sense of justice. His sure judgement, the result of exceptional gifts of analysis and synthesis, coupled with the simplicity and warmth with which he knew how to listen and to persuade, was the key to remarkable accomplishments at European level in the organisation of research in high energy physics, the field of his own original work. The European Organization for Nuclear Research (CERN) benefited particularly from his influence: he was its Director-General from 1966 to 1970, and, having been elected President of the Council of the Organisation, was to have taken up his duties in January 1978. In France, as Director-General of the Centre National de la Recherche Scientifique from 1973 to 1976 and later as Délégué Général à la Recherche Scientifique et Technique, he had a profound impact on many aspects of the scientific life of his country.

Bernard Paul Gregory was born at Bergerac on 19 January 1919. In 1938 he entered the Ecole Polytechnique in Paris, but his studies were interrupted by the war. He was taken prisoner in 1940 and remained in captivity for the duration of the conflict. After returning to Paris, he graduated top at the Ecole Polytechnique and qualified as an engineer in the Corps des Mines. He was drawn to scientific research and spent three years at the Massachusetts Institute of Technology, working under Professor Bruno Rossi on nuclear reactions caused by cosmic rays. He defended his doctoral thesis in 1950.

Back in Paris, he devoted himself to fundamental research, working at the Ecole Polytechnique laboratory directed by Professor L. Leprince-Ringuet. In this classical period of the study of cosmic rays with Wilson cloud chambers, the team led by Gregory and

Charles Peyrou built one of the most powerful detectors then known, with two cloud chambers in tandem, and set it up for operation on the Pic du Midi in the Pyrenees. With it, a large number of results were obtained on the decay of strange particles, notably the demonstration of the muon-neutrino decay mode of the K meson, whose existence played an important part in the understanding of the weak interactions.

This type of research, however, was shortly to undergo a radical change with the advent of the big particle accelerators. Bernard Gregory was the architect of this change in the laboratory of the Ecole Polytechnique. After a year spent at the Brookhaven National Laboratory, in the United States, to master the technique of bubble chambers, he took in 1958 the initiative for the construction of a hydrogen chamber 81 cm in length. This detector, one of the most powerful of its day, was built at Saclay and installed at CERN, in Geneva, where the 28 GeV proton-synchrotron, the PS, had been commissioned in 1959. Between 1961 and 1971, the 81 cm bubble chamber was to provide over 16 million photographs for the benefit of a number of European laboratories. Bernard Gregory played an active part in the scientific exploitation of the detector, which was succeeded at CERN by larger detectors, most recently the two giant chambers now mostly devoted to neutrino physics — Gargamelle, also built at Saclay and the Big European Bubble Chamber (BEBC) built at CERN. It was with Gargamelle that a new form of weak interaction, that of the so-called neutral current, was discovered in 1973.

With CERN, Europe once more played a leading role in the development of high energy physics; and at CERN Bernard Gregory's exceptional organising abilities achieved rapid and widespread recognition on the European scene. Coming first to the laboratory as the leader of a French experimental team, he was appointed Directorate Member for Research in 1964, and then Director-General of CERN, succeeding Professor Victor Weisskopf on 1 January 1966. His five years as Director-General were very fruitful for CERN and European physics.

They were years which saw major developments at CERN, notably the construction of the Intersecting Storage Rings (ISR) and of the big bubble chambers already mentioned. But there were difficulties too. With the great variety of phenomena to be studied, Europe needed a new proton-synchrotron of much higher energy than the PS — a project that was to materialise later as the 400 GeV SPS (super proton-synchrotron), inaugurated in 1977. Its success, acclaimed today, was the outcome of the patient and delicate negotiations which marked the years of Gregory's leadership and in which he played a decisive part together with Edoardo Amaldi and John Adams. Europe owes him a great debt for the success of the SPS, which has become its main research tool in particle physics.

But Bernard Gregory was not only a research scientist and a great scientific administrator: he was also an outstanding teacher, whose contacts with pupils were direct and fertile. Having taught physics at the Ecole des Mines in Paris from 1951 to 1958, he took up a Professorship at the Ecole Polytechnique in 1959, where he was a prime mover in the revision of the physics course. When he left CERN in 1971, he returned to teaching at the Ecole Polytechnique, succeeding Leprince-Ringuet as head of the physics laboratory.

His successful achievements at European level brought him to a leading role in the French scientific community. In 1973 he was appointed head of the Centre National de la Recherche Scientifique, the main funding agency for scientific research in France, of which he had been a directorate member from 1963 to 1971. Though he was not long in this post, his influence was strong. Fundamental reseach was his great love, and he defended it vigorously through years of financial difficulties. He was the architect of better links between basic research and applied research, strengthening their interface (the so-called transfer sciences), and he developed interdisciplinary research, in particular on new sources of energy.

In 1976 he was appointed Délégué Général à la Recherche Scientifique et Technique. Here at very high governmental level, as earlier at CERN and the CNRS, he was the obvious choice as the man best suited to shoulder the vast responsibilities involved in the organisation of research in France. But his ties with the European scientific community remained very close: at CERN above all, where he was Chairman of the ISR Committee from 1971 to 1973, French Delegate to the CERN Council from 1971, Vice-President of the Council in 1976, and finally its President-elect, looking forward with intense interest to the start of these new duties on 1 January 1978; but also at the European Science Foundation at Strasbourg and in numerous international negotiations in the scientific field.

Well known also outside Europe, he was Chairman of the Commission for Particles and Fields of the International Union of Pure and Applied Physics and, from August 1977, first Chairman of the International Committe for Future Accelerators (ICFA), a body bringing together for the first time representatives of all the regions of the world active in the field of big particle accelerators — the United States, Western Europe, the Eastern European countries and Japan.

Bernard Gregory's work and influence were of lasting value. His was a personality in which intellectual power and dignity were combined with warmth and simplicity. His passing represents a great loss for France and for Europe.

M. Jacob
L. Van Hove

P. A. Sheppard

PROFESSOR P. A. SHEPPARD, CBE, FRS, the meteorologist, died on 22 October 1977 in his 71st year after some years of failing health. He was respected equally in the academic world and in the political world of scientific affairs.

He left Bristol University in 1929 as a physics graduate to start work at Kew Observatory preparing for the International Polar Year 1932–33 which he was to spend as a member of a small British expedition working in the Northwest Territories of Canada. This led Sheppard to some original ideas on atmospheric electricity and ionisation near the ground but his lifelong specialist interest began a little later when in 1934 he joined a team famous in meteorological history. This was set up by the War Office at Porton to study chemical warfare and led to extensive work on wind, temperature and humidity near the ground and especially their turbulent fluctuations.

In 1939 Sheppard joined Sir David Brunt in the Department of Meteorology at Imperial College and in 1952 succeeded him as professor, a post he held until becoming emeritus professor on retirement in 1974. During Sheppard's time the group at the Imperial College earned a world reputation as by far the most active and comprehensive university meteorological department in Britain—or the whole British Commonwealth for that matter—engaged mostly in research and postgraduate teaching.

Sheppard's specialist researches continued without break after the war and included an expedition in 1953 to Anegada, 18°N in the Virgin Islands, where a small group under his leadership made some unique observations of the conditions over the ocean up to some 1½ km height. Precision measurements over the waters of Lough Neagh were also obtained, a technically difficult operation spread over a number of years.

In a complex field attracting attention in a growing number of countries including of course the United States and the Soviet Union it is not easy to assign any particular theoretical advance unequivocally to one person but Sheppard was certainly acknowledged as a leading thinker. His forte lay in always stressing physical processes and accurate measurements in a subject much favoured by mathematicians but he did as much as anyone to clarify the applicability to the atmosphere near the ground of the logarithmic variation of wind with height and the associated von Karman's non-dimensional constant with value 0.4.

As a general meteorologist Sheppard was much interested in the basic importance of his boundary layer studies for the largest scale problems of weather systems and the general circulation—the basis of world climate—and in this context showed that the convenient assumption of a turbulent boundary layer of limited thickness (of order 1 km) was not a valid approximation when applied to the drag of the wind on the surface. Neither, he thought, was the square law of wind drag in all circumstances, especially over the sea. His talent for lucid analysis and physical interpretation was highly regarded, as exemplified by his Presidential Address of 1958 to the Royal Meteorological Society — a triumph of exposition.

As time went on Sheppard took on wider responsibilities and from 1965–71 was chairman of the Space Policy and Grants Committee of the Science Research Council, most of the time a member of the SRC, and chairman also of the Scientific and Technical Committee of the European Space Research Organisation. These were onerous duties which occupied more of his energies than he had anticipated but he remained a meteorologist primarily and was continuously a member and much of the time chairman of the Meteorological Research Committee which guides the Meteorological Office in its researches. In this capacity he was intimately involved in the whole story of the revolution in weather forecasting from the mainly empirical methods which lasted through the 1940s to the elaborate computer calculations of the present day using mathematical models of growing sophistication derived entirely from the basic physics and incorporating Sheppard's specialities. Although so far as I know he never made a weather forecast in his life, in the way of duty, and for many years seemed to be working in a corner of the science remote from the main business of meteorology, it was gratifying to see his ideas incorporated in the scientific prediction models of today.

In addition to his CBE of 1963 and his FRS of 1964 Sheppard's honours included an honorary doctorate of Leningrad University, a rare tribute, and Hon. D.Sc. of Bath, the city of his schooldays.

Peter Sheppard, to use the familiar adopted name, had wide cultural and intellectual interests. He was forthright in his opinions and severe in scientific criticism but tempered by a warm and engaging personality. With his wife Phyllis who died in 1975—for him a tragic loss—he shared a love of travel and the countryside, of hospitality, good living and bright conversation. He will long be remembered with affection throughout his profession in many countries of the world and by a wider circle of friends. He leaves two successful sons. *R. C. Sutcliffe*