PAUL TCHERNIA (1905-1986)

Honorary Professor at the Museum d'Histoire Naturelle, Paris,
Deputy Director of the Laboratoire d'Océanographie Physique,
Honorary Deputy Director at the École Pratique des Hautes Études (3_e *section*)

Professor Paul Tchernia, who died suddenly during the night of 12-13 March 1986, was an outstanding figure in the field of physical oceanography in France during the postwar period. He will be sadly missed by his family and by his many friends and colleagues at home and abroad.

Trained as a biologist, Paul Tchernia had only just completed his higher education when his passionate interest in the oceans and polar regions first took shape. In August 1930, he joined in a Baltic cruise on board Commandant Charcot's "Pourquoi Pas?"; not long afterwards, in the course of his military service, he participated as naturalist and oceanographer in the expedition mounted in connection with the International Polar Year (1932-1933) and spent two complete years at Scoresby Sund, on the east coast of Greenland, gathering observations and biological specimens that were to form the basic material of a number of publications. His employment as Lecturer with the Laboratory of Biological Chemistry at the *École des Hautes Études* was interrupted by call-up into the Navy in September 1939, with postings first to Cherbourg and then to Dunkirk. Released after a period as a prisoner of war, he joined the *Office des Pêches* (Fisheries Office), working there from 1941 to 1944, when he was called up again and appointed to the staff of the French Admiralty; he served there until 1955 in a scientific capacity, carrying out, *inter alia*, studies on the detection of fish shoals and investigations of the "deep scattering layer".

From 1947 to 1962, in company with *Ingénieur Général* H. Gougenheim and H. Lacombe, he was on the Permanent Secretariat of the *Comité d'Océanographie et d'Études des Côtes* (COEC), a body placed under the authority of the Navy but including non-naval members concerned with the development of oceanography. Among the latter was Professor Louis Fage, who was able, thanks to the prestige acquired by COEC, to set its ideas before the Ministry of National Education and to secure not only the creation of teaching posts but also the establishment of laboratories at Marseilles and—with the efficient assistance of Professor Roger Heim—at the *Museum* in 1954.

Meanwhile, from 1948 to 1950, Paul Tchernia had gone back to sea and to the polar regions, taking part in two cruises by the naval research ship "Commandant-Charcot" to Terre Adélie in Antarctica; this gave him the opportunity of carrying out further oceanographic work, notably in the Indian Ocean; despite the inadequacy of his equipment, he obtained hydrological observations of great interest, the analysis of which—together with earlier and for the most part British data (Dr. G. E. R. Deacon)—formed the basis of one of the first major French contributions to physical oceanography, which he jointly prepared with J. Le Floch and H. Lacombe. Important collections were also brought back from this cruise.

Increasing interest on the part of the Navy resulted in a more systematic approach to oceanographic studies: from 1951 onwards and until 1955, in winter and summer alike, Paul Tchernia worked on board the naval vessel "Élie Monnier" in the Western Mediterranean, where his findings revealed the importance of deep water formation and its significance as a "scale model" of the behaviour of the oceans in this respect.

Paul Tchernia's appointment to the post of Deputy Director of the Laboratory of Physical Oceanography at the *Museum* in no way signified an interruption of these studies, which the Laboratory pursued in the Mediterranean on board the "Calypso". During the International Geophysical Year (1957-1958), he embarked once again for the Indian Ocean, this time on board the "Norsel", which had been chartered by the

Expéditions Polaires Françaises to transport teams of French polar explorers to Terre Adélie. On his return, he engaged in study of the water exchange between the Mediterranean and the Atlantic, working in 1960-1961 in the Straits of Gibraltar. In 1961 and 1962, he took part in winter cruises in the Western and Eastern Mediterranean on board the American research vessel "Atlantis". After the commissioning of the "Jean Charcot" in 1966, and with greater resources becoming available, winter cruises in the North West Mediterranean (the Medoc cruises) were intensified in 1969, no fewer than five ships were operating simultaneously off the French coast, including the British "Discovery", with John Swallow, and the American "Atlantis II", with Henry Stommel and other scientists. In 1970, and again in 1972-1975, findings from these cruises threw a great deal of further light on the mechanisms of deep water formation, confirming that—at least to some extent—the Mediterranean model could be applied to other oceanic regions, including the polar and sub-polar regions.

In 1972, in collaboration with the *Expéditions Polaires Françaises*, Paul Tchernia launched a project whose successful completion owed much to his numerous contacts in the world of polar studies. With particular assistance from the *Laboratoire de Météorologie Dynamique* and the CNES (*Centre National d'Études Spatiales*) beacons placed on Antarctic icebergs were tracked ower hundreds of days as the icebergs drifted in regions virtually inaccessible to research vessels the information obtained shed new light on the pattern of Antarctic circulation and more particularly on the convergence of currents moving in a generally westerly direction close to the Antarctic continent with the main Antarctic current, the so-called West Wind Drift, which flows uninterruptedly towards the East. Only a few weeks before his death, Paul Tchernia was still engaged in the spectral analysis of the movement of icebergs and the distances they travel.

Besides a prominent scientist, Professor Tchernia was also a distinguished teacher. His carreer as a lecturer began as early as 1950, when he was entrusted with a course on regional oceanography for trainees with the Naval Hydrographic Service. Later, junior researchers with ORSTOM (*Office de la Recherche Scientifique et Technique Outre-Mer*) as well as university students in physical oceanography (3^{e} cycle) and those working for the certificate in general oceanography and students at the ENSTA (*École Nationale Supérieure des Techniques Avancées*) also benefited from his teaching; the course material, which has been translated into English and published, is highly appreciated in other countries as well.

Both in France and abroad, Paul Tchernia held positions of responsability in scientific bodies too numerous to be mentioned in detail here. Suffice it to say that the lasting links which he forged with a great many colleagues, notably in Great Britain, the United States, Germany, the Soviet Union and Canada, were a source of mutual enrichment to which he frequently alluded.

In his own country, his many friendships with colleagues in the Navy and the *Museum* flourished against the background of his constant devotion to both institutions.

Paul Tchernia held many distinctions: *Officier de la Légion d'Honneur* (Navy), *Croix de Guerre*, *Chevalier d'Académie*, *Chevalier de Mérite Militaire*; his most outstanding work was acknowledged by the *Académie des Sciences* with the award of the Binoux and Tchihatcheff Prizes in 1952 and 1965 respectively.

All those who, after the end of the war, joined with Paul Tchernia in the long struggle to revive the discipline of physical oceanography, which in France had fallen into a state of neglect, appreciate the extent of his contribution to this task. First, during the period 1946-1955, at favourable and unfavourable moments alike, he persisted in lobbying the Navy on its behalf. Later, following the creation—thanks to the efforts of Louis Fage and Roger Heim—of the *Laboratoire d'Océanographie Physique*, of the *Comité Exploitation des océans* at the DGRST (*Délégation Générale à la Recherche Scientifique et Technique*) in 1961, and of CNEXO (*Centre National pour l'Exploitation des Océans*, now IFREMER) in 1967, he took part in what was an exalting phase of the development. On more than one occasion, he remarked to the author of these lines how much we were indeed lucky to have lived throught that twenty-year period, and to have lived through it together as part of a team which included all the members of the *Laboratoire d'Océanographie Physique*. Such expressions of friendship are impossible to forget.

H. Lacombe
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