In Memoriam

Jean-Pierre Carbonnel
Jean-Pierre Carbonnel, Research Director at the Centre National de la Recherche Scientifique (CNRS), passed away on 10 April 2002, at the age of sixty-five years. He had formally retired two years earlier, but he still continued in his key scientific posts, particularly within the Comité National Français des Sciences Hydrologiques (CNFSH) and the Institut Géologique Albert de Lapparent (IGAL).

Born on 13 March 1937, Jean-Pierre Carbonnel spent his youth in Normandy. After his baccalaureate, he embarked on higher studies. As a student of L. Dangeard, at the University of Caen, he obtained a degree in geology. In the perspective of a career as oceanographer that he couldn’t materialize because of the lack of adequate structures, he carried on his studies under the direction of J. Bourcart at the Faculty of Sciences of the Sorbonne in Paris and defended his thesis in 1962. Having entered the CNRS a short time before his oral examination, he left it in order to go to Cambodia with his wife Roseline and their children Rozenn and Christophe, within the framework of the Technical Cooperation. As an expert with the Mekong River Committee he was in charge of preliminary studies for a project being developed concerning the lower Mekong River. In the context of this work he founded a sedimentology laboratory and set up the first hydrometeorological network of the Great Lake basin. The collected data allowed him to establish a first sedimentological baseline for the continent of Asia. For the first time, radioactive tracers were used in order to determine the movement of solid substances in the water. A second mission, jointly CNRS-ORSTOM (Office de la Recherche Scientifique et Technique Outre-Mer) (the goals of which were to establish a first baseline of chemical erosion and to continue the study of the Cambodian Quaternary) permitted him to complete his research and to collect the material for his future thesis. In the course of his prospecting work, Carbonnel discovered a fauna of the final Mid Pleistocene era with a human presence. The new stratigraphical level took the name of Loangian. He also travelled to neighbouring countries (Vietnam, Laos, Thailand) where he took an interest in quaternary geology and erosion. With his many interests in a variety of Earth science fields, as well as human-based sciences, he demonstrated an unusually enquiring mind that was to endure throughout his career.

From 1967 till 1970, Carbonnel worked in Paris, again at the CNRS, at the Laboratoire de Géologie Dynamique. This would remain his base in France. There he wrote up his work on Cambodia and also his doctoral thesis “The Cambodian Quaternary, Structure and Stratigraphy”, which he defended on 7 November 1970. Also from this period date numerous articles concerning the use of original physical techniques (use of radio-elements as sediment tracers, dating by fission traces of uranium, geochemistry of zircons, exoscopy of quartz, thermoluminescence of zircons) applied to diverse problems and environments.
He was ready to return to Cambodia but the situation there was deteriorating and he had to renounce any plans to go back. However, his attachment to this country remained strong. Ten years after his stay there, he was still publishing papers on the Mekong, in particular in *Nature*, and in June 1995, he travelled as an invited lecturer to an international conference at Siem Reap. His scientific work in Cambodia remains the cornerstone of research in his field. He subsequently undertook brief research missions to Mauritania and Senegal in West Africa. His publications focusing on these areas deal with the gullying of the dunes in the Sahelian environment, the discovery of Neolithic burial places, and the population of the Atlantic Sahara in the Holocene. However, it was elsewhere that he found the material to inspire a completely new line of research.

In 1973, Abbot Albert de Lapparent, first Director of the Permanent Mission N° 1 of the CNRS in Afghanistan, proposed to Carbonnel that he should set up this Mission and undertake its management. Carbonnel agreed, settling with his family in Kabul and becoming a permanent resident. After the death of Albert de Lapparent in 1975, he became Director of the Permanent Mission. He proved to be a remarkable organiser. Due to him, the mission had at its disposal sufficient means and was able to obtain first-rate scientific results, with IGAL as one of its main players. He also negotiated a cooperation protocol with the Afghan Ministry of Mines. Scientists from France and other countries, from a variety of disciplines (geologists, soil scientists, palaeontologists, geophysicists, geographers, agronomists) and from varying levels — senior scientists to Ph.D students — took part in the endeavour, and all remember being well received by Jean-Pierre and Roseline. A French programme prospecting for oil, and a project for a trans-Afghan railway also got Carbonnel’s support. He took part in many research projects regarding the recent geology of Afghanistan, and published on, for example: the discovery of a Quaternary carbonite; evidence of Mesozoic palaeopters in Central Afghanistan; and the discovery of the first Neocene deposits of fossil mammals. He was the first to delimit the Indian plate in Afghanistan, thus demonstrating his knowledge of the novel concept of plate tectonics. Carbonnel remained in Afghanistan until the time of the Soviet invasion. Forced to bring his fruitful and multi-faceted activities to an end, it was with bitterness that he left for good a country that had become dear to his heart. Loyal to the friendships built up in the course of this period, he endeavoured to facilitate the integration into Europe of young Afghan scientists who chose the path of exile.

After a stay at the Laboratory of Dynamical Geology and some publications, Jean-Pierre Carbonnel was seconded for eighteen months with the Mission des Études et de la Recherche du Sécretariat d’État à l’Environnement, in charge of the Programme “Soil and Solid Waste”. His reflections upon the structure of this ended in an important planning seminar. Within the new structures he also attempted to encourage the development of multidisciplinarity. He soon became acquainted with the hydrological community. There are many who met him during this time while serving on committees of
experts, or at the symposia that he organised. In 1983, he was given a two-year contract with the French Foreign Relations Ministry where he was appointed as technical Advisor with the Direction Générale de la Recherche Scientifique et Technique in Burkina Faso. Here he was in charge of the research programming and relations with foreign scientific bodies. He took a particular interest in the analysis of the causes of the recent droughts in the region, and followed up the organisation of the Research Network on resistance to the drought. On several occasions, under the framework of UNDP-WMO (United Nations Development Programme - World Meteorological Organization) and the EDF - the instrument for financing cooperation set up with the African, Caribbean and Pacific Group of States -, he installed and secured the management of a raingauge network. From this period date his papers on Sahelian precipitation, drought and climatic changes, as well as on fractal techniques adapted for data management, and on the fragmentation of time-series in order to assess non-stationarities. At the same time, as the official representative for Africa with the Direction des Relations et de la Coopération internationale du CNRS, he went to Senegal, Mali and Niger and edited a report on Research in Africa.

In 1988 he joined the hydrological research team that Gh. de Marsily set up in Paris and which took the name Sisyphe (Sisyphus). There, he carried out important scientific work, continued his research on precipitation, and was the promoter of several doctoral theses. In addition to this, he was the leader of the CORDET project, also known as the REMMI project (Water-Magna Relations in the Intertropical Environment). From 1991 onwards, Carbonnel worked again for the Ministry of the Environment; this time in charge of the SRETIE (Service de la Recherche, des Études et du Traitement de l'Information sur l'Environnement) under the aegis of the Mission Continental and Marine Waters. In this regard, he set up a Committee on Reflection, Programming and Specific Evaluation, two large programmes on technological research, and reactivated relations with the public research organisations. At the same time he was in charge of a DEA (Diplôme d’Études Approfondies) in hydrogeology and worked in cooperation with southeast European countries. Working from his Laboratory of Hydrogeology at the University Pierre and Marie Curie in Paris, under the auspices of the Foreign Relations services, Carbonnel was in charge of the coordination of cooperation with Romania and Bulgaria. In 1991, the contacts established with Romania resulted in the organisation of Franco-Romanian hydrological meetings with a first session taking place in the month of September. This was the start of fruitful cooperation with Romanian scientists. This cooperation was expressed further by the organizing of a European Union Tempus programme teaching water and environmental sciences at the DEA level in Bucharest; renewed under the form of a DESS (Diplôme d’Études Supérieures Spécialisées). This was the starting of a large research programme, supported by the French Foreign Relations Office, concerning modelling of both surface water and groundwater systems supplying the town of Bucharest. At the same time, Bulgaria signalled its desire to develop a large research programme together with France. This was OM2, or the Mountain Observatory at Moussala. The aim here
was to set up a high mountain observatory helped by the creation of a multidisciplinary team. Together with Professor Jordan Stamenov, Jean-Pierre Carbonnel was the co-organizer of this team. The results of the different expeditions that took place from 1994 to the present are collected in eight volumes published by OM2.

From 1993 onwards, and until the autumn of 2001, Jean-Pierre Carbonnel was the head of the academic jury which ruled on admission of candidates and the issue of diplomas intended for IGAL. As always, he carried out this duty with a blend of the authority and informality that had served him so well in previous positions.

Carbonnel’s editing activities must be added to his panorama of achievements, especially with regard to the journal Nature, Sciences, Society, of which he was a founding member as well as being a member of the scientific committee. Within the Comité National Français des Sciences Hydrologiques, he was Chairman of the Committee for Terminology, the principal task of which was the compilation of a Dictionary of Hydrological Sciences, and which, in addition, every year publishes a volume of fundamental texts of hydrology. As well as the Proceedings of the Franco-Romanian hydrological meetings, he also edited pedagogical books for the Tempus programme in Romania (with the participation of numerous French and Romanian colleagues).

In spite of this intense activity, and his numerous missions abroad, Carbonnel found time to be instrumental in the smooth functioning of the UMR (Unité Mixte de Recherche) Sisyph and to take charge when its Director was absent. Towards the end of his official activity he formed a new and original idea; the suggestion that ancient deposits of guano from chiropters, in particular in the caves of Romania, could be dated by radiocarbon techniques. This led him to study in more detail the entomofauna, specifically the coleopters, vectors of the transfer of radio-elements in the food chain.

Made Doctor Honoris Causa of the University of Bucharest in February 1997, Jean-Pierre Carbonnel was knighted chevalier of the Legion of Honour in July of the same year. He retired officially in October 1999 but did not cease his scientific activities. He continued his publications and his last paper, dated April 2002, was number 243 in his publication list. This reflective article concerning the desert was prepared for the seminar “Deserts and Water” to which he had been invited to participate in Egypt in November 2000. In May 2001, in cooperation with the Centre for Climatological Research at the University of Burgundy, he organised the international Symposium OH2 Origins and History of Hydrology held at Dijon of which proceedings form the object of the present publication.

However, he was overtaken by the illness that, within a few weeks, sapped his tremendous energy. The hope of being able to recover reinforced his will to
live. Showing great courage and dignity, he welcomed those who came to see him a few days before his death, with bright eyes, a mocking smile, listing his chances to pull through, and talking about his projects.

A person out of the ordinary, with fields of interest worthy of an encyclopaedist, an innovator and original thinker who was never hesitant to stray off the beaten track in order to pursue a novel idea, Carbonnel was the model of free scientist. He was always independent, and removed from the cliques that the CNRS has been known to breed in bygone days. He taught his colleagues and students by his example, by his works, and by his generosity. Not just a man of science, he had broad interests. This is shown by the fact that he had a passion for art and antiques, as well as the fact that he was a talented sculptor himself. Jean-Pierre Carbonnel was a captivating personality, a friend whom one will never forget.

May we convey here, to his family and to his friends, to all those who knew and appreciated him, our deepest gratitude for the memory of him which lives in our heart.

Compiled after texts written by Ghislain de Marsily (University of Paris VI) and Christian Montenat (Geological Institute Albert de Lapparent)

Translated into English by Gaston Demarée (Institut Royal Météorologique de Belgique) and Astrid Ogilvie (Institute of Alpine and Alpine Research, Boulder, Colorado).

“It is not so much for having left behind a few books, but rather for having acted, and lived, and driven others to act and to live, that someone remains as an outstanding character”.

Johann Wolfgang Goethe (1749-1832)