PERSONAL PROFILE

Hugues Faure
President
of
INQUA

Prof. Hugues Faure is the President of the International Union for Quaternary Research, one of the largest and most active affiliates of IUGS. Quaternary science, in the view of INQUA, provides a multi-disciplinary approach to many problems of the earth sciences including those involving the oceans, the atmosphere, the hydrosphere and the biosphere. The overall aim is to reconstruct the physical, chemical, biological and human changes that have taken place during the last million years of earth history.

Hugues Faure is a geologist whose broad career began with work on the Precambrian and Phanerozoic, continued in hydrogeology, and now centers on the Quaternary and recent evolution. His career has been devoted to the geology of Africa, and the importance of his work to that continent was recently recognized when the Geological Society of Africa named him a Fellow in a ceremony during which he was designated an "African geologist!"

Hugues Faure's passion for earth sciences began before the age of ten, as he collected flint and fossils from the Chalk of the Paris Basin where he was born. He pursued his secondary school studies in mathematics and then went to the Sorbonne. After a year there he enlisted in the overseas division of the French geological survey (BRGM), and, at 21 years of age, was sent to Morocco. Here he resolved the mystery of the intermittent springs in the Jurassic of Beni-snassen and defended his diploma as a "geological prospector" with Profs. Cuvillier and Barrabe. He was then assigned to Niger where he spent the next 15 years mapping one-half million square kilometres to fill in a large blank in the geological map of western Africa.

As Prof. Faure says, in mapping such an extensive and unknown region - this was in the early 1950s - "one expects to make many discoveries." One was the great extent of the widespread mid-Cretaceous marine deposits from the Ténéré to the north of the Sahara. Other discoveries included a tectonic rift more than 500 km long extending from the Aïr massif toward Lake Chad, major fractures of Cretaceous and Tertiary age, deposits containing dinosaur fossils and extending more than 140 kms, and a new ring structure.

The migration of marine and continental facies throughout the course of time was taken as evidence for an epeirogenetic undulation that was responsible for displacing the sedimentary basin from the northwest toward the south-east. Later he interpreted the speed of displacement of these late intra-cratonic basins (1.7 cm per year in the Cretaceous) as a possible measure of movement of the African plate above a mantle "cold spot." Such a mobilist vision was very surprising in Africa at this time.

In Niger, Prof. Faure also developed many new views on the geochemistry and palaeogeography of the sedimentary and residual formations of Cretaceous and Tertiary age, including a thick Eocene weathering mantle with kaolinite, bauxite, alunite, etc. and covered by deposits of ferruginous oolites to form an immense African province. It seemed to him that the interpretation of all of these Mesozoic and Cenozoic

sediments could only be achieved through a study of more recent formations. Thus he began to look carefully at the Quaternary deposits that covered the great plains of this region. This work led to the recognition of widespread diatomaceous lacustrine deposits.

The first radiocarbon dates that he obtained indicated that the southern Sahara had been occupied by lakes between 9 000 and 7 000 years ago. The rapidity of great climatic change was thus measured for the first time. Yet prior to this humid period, the dunes of the Sahara had advanced more than 400 km toward the south. This concept of a climate changing repeatedly between arid and humid on the scale of thousands of years was a new one to be applied to the tropics. One result was that the origin of the groundwater recharge from depth was to be sought in time and not in space!

The idea of repeated and rapid climatic changes led Prof. Faure to discover similar changes on the scale of centuries, through a study of evaporites requested by the government of Niger in 1963. The exploitation by local inhabitants of inter-dune natron generated by the rise of phreatic water during humid years explained how each generation must have been aware of a humid-arid cycle, for this controlled the migration of population from the north to the south and back again.

Throughout this long period in Niger, every two or three years Hugues Faure would return during his holidays to university in France. Without taking a day of rest upon his arrival in Paris, he would register at the Sorbonne and continue work on his studies in geology, petrology and geophysics. He received much assistance and encouragement from many well-known geologists including Pierre Pruvost, George Millot and Raymond Furon. In 1962 he was awarded the Doctorat d'Etat degree.

After the defence of his thesis and a last BRGM mission to Niger, Hugues Faure joined the University of Dakar in Senegal. Here he taught for five years and had the opportunity of training many of the best francophone geologists in Africa. "Sadly," he notes, "many of them now have positions so important that they cannot put their knowledge to use in the field."

Figure 1: Coarse gravel of a raised beach deposit representing the high sea level of the last interglacial (circa 125,000 yBP), overlain by muddy colluvial beds deposited under periglacial conditions during the last glacial stage. Santana beach, Corsica. (Photo by D. Grant)

While at Dakar, Hugues Faure and some 30 colleagues working on the Quaternary of Senegal, Mauritania and other parts of West Africa created, in 1964, the Senegalese Association for the Study of the African Quaternary (ASEQUA). This is now a very active organization within INQUA and publishes a journal of which some 70 numbers have appeared to date.

During this period Prof. Faure studied variations in sea-level, guided an interdisciplinary team to the Chad basin with Michel Servant, and began new research in the Afar in Ethiopia with the team of H. Tazieff and G. Marinelli. In 1968 he began work on Cenozoic geodynamics in the Danakil depression of the northern Afar rift. Radiometric dating of coral formations soon demonstrated the importance of the vertical component in the history of opening of the Afar. The sedimentary infilling of the continental and marine evaporites mirrored that associated with the opening of the Atlantic Ocean. Prof. Faure also discovered the traces of large lakes, which existed 9 000 years ago with important fluctuations of level, as in the Sahel. The study of sedimentation in the rifts is still being pursued in collaboration with Dan Livingstone and with petroleum companies like Elf Aquitaine within the framework of CEGAL, an international project of drilling in African lakes (see Episodes, 1983/1, p. 18).

In 1968 Hugues Faure moved from Senegal to the University of Paris, where he spent nine years at the Laboratory of Dynamic Geology first at the Sorbonne and then at Jussieu. Here his scientific contacts were particularly rich, for example with L. Glangeaud for geodynamic methodology and J.C. Fontes who demonstrated the importance of isotopes in Quaternary research.

Prof. Faure then succeeded Henriette Alimen as Director of the CNRS Laboratory of Quaternary Geology in Paris, which she had created. At this time, staff scientists like M. Taieb

were discovering new fossil deposits of Plio-Pleistocene age in Ethiopia, confirming the great importance of the East African rift in studies of the Quaternary and in human palaeontology. The laboratory was moved to new quarters at Luminy in Marseilles where there were facilities to accommodate visiting scientists from many countries. Here new techniques like palaeomagnetism and the systematic study of lacustrine cores have been utilized.

The success of results obtained in the Chad basin by the Quaternarists in the multidisciplinary operation that he had proposed was such that Hugues Faure became President of the ORSTOM Technical Committee on Geology. For twelve years now he has endeavoured to coordinate the work of different geological researchers in the tropical zones, studies have covered surface geochemistry, coastal geology, sealevel changes and neotectonics and geodynamics. Of special importance has been a multidisciplinary study on the Quaternary of Lake Titicaca in Bolivia, by a research team under the leadership of M. Servant. Their work, now extended to Brazil and Mexico, has helped to improve our overall view of worldwide sealevel fluctuations and climatic changes in the tropical zone since the last glaciation.

In the course of the last twenty years Hugues Faure and his team have established a new approach to the understanding of physical changes to the surface of our planet during the past hundreds and millions of years. As Prof. Faure says, "this multidisciplinary approach to the study of natural phenomena at time scales is essential, for it helps us to understand better the evolution of man and the changing of his environment since the Pliocene and Pleistocene. It also allows us to evaluate better the effect of human activity in modifying the environment. Through such studies, which I call Quaternarism, (an extension of the concept of actualism), it should even be possible in the course of the next century to construct a scientific method for futurology."

RECENT HONOURS TO:

J.C. Briden (University of Leeds) - the Geological Society of London Murchison Medal for distinguished work in paleomagnetism.

C. Downie (University of Sheffield) - the Geological Society of London Prestwich Medal for outstanding research in palynology.

Kenneth Hsu (ETH, Zurich) - the SEPM William H. Twenhofel Medal for excellence in sedimentary geology. and the Geological Society of London Wollaston Medal for distinguished work on stratigraphical problems in mountain belts.

Xavier Le Pichon (University of Paris) - the AGU Maurice Ewing Medal for contributions to the understanding of processes in the ocean.

Helen T. Loeblich (University of California, Los Angeles) - the SEPM Raymond C. Moore Medal for excellence in paleontology.

Marcel Nicolet (Free University of Brussels) - the AGU William Bowie Medal for outstanding contributions in fundamental geophysics and unselfish cooperation in research.

Walter C. Pitman III (Lamont-Doherty Geological Observatory) - the SEPM Francis P. Shepard Medal for excellence in marine geology.

Asher Shadmon (Jerusalem) - The Israel Museum's Sandberg Grant for research and development on stone technology.

D.J. Shearman (Imperial College, London) - the Geological Society of London Lyell Medal for outstanding work on evaporite sequences.

B.P. Tissot (Institut Français du Pétrole) - the Geological Society of London William Smith Medal for distinguished work in petroleum geochemistry.

RECENT DEATHS:

Boris Choubert, in Nice, December 3, 1983, at the age of 77. Born in St. Petersburg, he settled in France in 1927. For much of his distinguished career, he concentrated on West Africa and NE South America, with major contributions to the geology of Gabon and French Guiana, where he founded and directed an interdisciplinary research institute linking France and tropical America. In 1961 he became Director of Research for CNRS at Fontainebleau and then Nice, where he produced his well-known work on the evolution of igneous rocks.

Richard H. Jahns on December 31, 1983 at the age of 68. His was a long and fruitful career with periods at the USGS, (1937-48), California Institute of Technology (1949-1960), Pennsylvania State University (1960-65), and Stanford University (1965-1979) where he was Dean of Earth Sciences. A national expert on earthquakes, Jahns was an inspiring teacher and many of his former students are now leaders in the U.S. geological community.