

IN MEMORIAM
JEAN PHILIPPE MARCOUX

(8 October 1940–17 June 2008)

by A.M. CELÂL ŞENGÖR

Même quand l'oiseau marche on sent qu'il a des ailes
Antoine-Marin Lemierre



Jean Philippe Marcoux

Professor Jean Philippe Marcoux of the Institut de Physique du Globe de Paris of the Université de Paris 7 passed away in Paris on 17th June 2008. In Marcoux's person not only the geology of the Tethyan regions and the stratigraphic studies of the Permian–Triassic boundary, but also Turkish geology lost a great researcher, an indefatigable and selfless worker and a dedicated, enthusiastic teacher. Turkey also lost a great friend, a great furtherer of her reputation wherever Jean Marcoux went.

Jean Marcoux was born in Marseille to well-educated parents. His father Camille Marcoux was a classicist, a friend of the great Louis Robert, the great master of the historical geography of Anatolia in antiquity, the immortal author of *Villes d'Asie Mineure*. Camille Marcoux had been educated in the much coveted École Normale and was *agrégé de Lettres Classiques*, not an easy rank to attain in France. He taught in the Lycée Henri IV in the preparatory classes. Marcoux's mother was also *agrégé de Lettres Classiques*, for Latin, Greek and French.

Marcoux spent his early childhood in the great Mediterranean metropolis of his birth, imbibing the culture of the great sea along the shores of which human civilisation had originated. He spent his childhood in a home where that civilisation was matter of daily conversation, and not infrequently in the original languages of its birth!

Marcoux's grandmother had a house in the gorgeous countryside of the Provence and it was there that young Jean acquired a taste of observation in rustic surroundings and a love for Nature, especially entomology (one wonders whether he developed his sharp eye for fossils then, finding and collecting insects?). It was in the paradisiacal world of southern France that the future great naturalist was probably born in the tender heart of the young boy from Marseille. The young man used to divide his vacation time between the Provence and the Briançonnais, in the high Alps, the classic country of an Émile Haug or a Pierre Termier, where also his mother had her roots. In one of the more picturesque centres of the French winter sports, Le Monétier les Bains, young Marcoux used to scale the more abrupt and forbidding walls of the Pelvoux Massif, especially La Meije in the Montagnes de l'Oisans in which, nearly a century-and-a-half earlier, his great countryman Élie de Beaumont had laid down the principles of the palaeogeography and the dynamics of the mountain ranges, subjects to which

Marcoux was to devote his life. One wonders whether the young man, with his fiancée Noëlle Mercier (who eventually became Mrs. Marcoux, his life-long companion and the mother of his two children) at his side, ever looked at the Doigt de Dieu (=the finger of God), one of the most breathtaking peaks of La Meije, and saw his future in the direction it was pointing! Whatever the thoughts of the young man in his twenties may have been at La Meije, Noëlle Marcoux says that it was there that the young naturalist had decided to become a geologist.

Marcoux's parents had moved to Paris where he had attended his secondary schools. He started university also in Paris and decided to read natural sciences. It was there that he met his future wife and, in 1967, the two of them then went on to Orsay, one of the delightful banlieues of Paris in the beautiful Valley of the Bièvre, where the newly-founded Université Paris XI was located.

I think it was a great piece of good luck both for Marcoux and for the geological science that there he met not only Professor Jan Houghton Brunn, but also the circle of his able students. Brunn was an extraordinary man. Son of a Polish Jew and a Canadian artist mother, he was born and raised in England. He then moved to Paris with his mother and became so French that even his mother tongue acquired a French accent and in the seventies he had to ask Bruce Purser to translate a paper he and his students had written into his own mother tongue! Brunn had become naturalised after the war and eventually became a professor of geology in Orsay.

If Brunn's background was unorthodox, his scientific ideas and methods of teaching were even more so. He was a liberal and encouraged his students to think for themselves, which was unusual in the continental European university tradition in the sixties. Not one of his students later developed into a copy of Brunn, but they all became successful independent researchers.

Brunn had earlier spent a good deal of time in Greece (where he in fact had done his own thesis) unravelling the structure of its mountains (it was there that he created the term 'ophiolitic suture' in 1960) and believed it was time to go across the Aegean to see how the structures of the Hellenides might continue eastward. It was to that decision that Marcoux owed his future direction in geology.

Brunn selected a handful of very able young men and put them around the frame of the Gulf of Antalya to do

their theses, in agreement and with the assistance of the Mineral Research and Exploration Institute (the 'MTA') in Ankara. André Poisson in the east on the Bey Dağları, Jean Marcoux to Poisson's east in the Antalya-Kemer area (of all the Brunn students, Marcoux got the best piece of real estate from the viewpoint of sheer beauty and Alpine morphology!), the late lamented Marcel Gutnic to the north at the apex of the Isparta Angle, Jean-François Dumont to the north of the Pisidian Taurus, and Olivier Monod, the son of the great Nobel laureate biologist and philosopher Jacques Monod, to the east, in the area of the Beyşehir-Hoyran nappes.

Regrettably, Marcel Gutnic died in a car crash early during his work and could not complete his thesis. Poisson, Marcoux and Monod all produced superb theses of *Doctorat d'État*, a degree higher than the PhD of the German and the Anglo-Saxon systems. Those theses, together with an earlier product of the Brunn school, Pierre Charles de Graciansky's thesis on the southern edge of the Menderes Massif and the northernmost parts of the Lycian Nappes, have become permanent contributions to the geology of Anatolia that really initiated Turkey into the modern era during the plate tectonics revolution. Dumont finished only a *Thèse de Doctorat 3^e cycle*, which, however, was nevertheless an important contribution that established the presence of various Cambrian facies in the basement of southern Turkey and illuminated my path when in 1989 I discovered there with Alfred Kröner the very first Archaean ages in Turkey on detrital zircons!

In the years 1965 to 1966 we see Marcoux in active military service. He did it much like his contemporaries in Turkey in those days: a full 18 months under uniform. In 1968 he obtained both his wife and his *Maîtrise de Géologie* (Orsay) and in 1969 his DEA in structural geology (also at Orsay). In 1969, we see him already an assistant (equivalent to a graduate student+assistant professor in the present-day American jargon) in Orsay in Brunn's laboratory, a position he occupied until 1981. It was in this capacity that he continued working in Turkey towards a *Doctorat d'État*.

His first major publications were a series of papers in 1970. He had begun studying the Antalya nappes, first named by Lefèvre in 1966. In 1970 he established that the volcanic rocks in these nappes were Carnian in age and published the first stratigraphic and structural outline of these nappes together with Lefèvre. In the same year

he was one of the authors of the great Brunn et al. paper published in the *Bulletin de la Société Géologique de France*. The English version of that paper came out a year later in the book edited by A.S. Campbell, entitled *Geology and History of Turkey* (translated by Bruce Purser). Céline, the first offspring of the young Marcoux family was also a product of the same year, arriving on 21st January.

Already in these earliest publications, the extremely complex structure and history of the Antalya nappes are apparent. Their authors were puzzled by the fact that whereas in the north, in the now-classical Isparta Çay area the Aquitanian covers the upturned radiolarites of the Antalya Nappes with a sharp unconformity, in the south the Antalya Nappes are thrust onto the Miocene near Finike. Nevertheless, Marcoux joined the crowd in those days in thinking that the Antalya Nappes had been emplaced from the south in a multi-stage thrusting process. But this was not a happy conclusion, because everybody had remained puzzled: what were these oceanic rocks doing in such an external position in the orogenic belt, in complete contrast to Brunn's and anybody else's model in the Hellenides, just across the Aegean Sea?

The years until 1974 passed with a detailed study of the Antalya Nappes, their various fossils and their ophiolites and what all that meant in terms of the palaeogeographic position of the ancestral basin in which the material of these nappes had originated. These studies, together with those of Brunn's other students, were the first of their kinds in Turkey and were already opening the eyes of at least some of the Turkish geologists to modern methods of stratigraphic/sedimentological/structural work.

Amidst this activity the second child of Jean and Noëlle was born on 25th September 1974 in Orsay and was named François.

In 1975, Marcoux joined another member of the Brunn team, Luc-Emmanuel Ricou, then working on the Neyriz ophiolites in Iran, in producing one of the greatest geological papers ever written on the geology of Turkey, a paper that sits on a par with İhsan Ketin's great 1948 paper that had announced the discovery of the North Anatolian strike-slip fault and with Ketin's 1966 paper that outlined the major tectonic units of Turkey. It is customary in Turkish geology to begin the 'modern era' in Turkish geology with the *Tectonophysics* paper I

published with Yücel Yılmaz in 1981 on the Tethyan evolution of Turkey. I would disagree. I think it was the Ricou, Marcoux, Argyriadis paper on 'L'axe calcaire du Taurus' that first removed the mist that had until then hovered over Turkish geology.

Turkish neotectonics had been pretty well-understood thanks to Ketin's papers that began with his 1948 classic. That was not the case for the immensely more complicated palaeotectonics. Ketin's 1966 paper had outlined the palaeotectonic units and pointed out that orogeny in the Alpide structures had marched generally from north to south, but he had not managed to set that historical evolution into a general tectonic framework using actualistic analogues of the environments or comparative anatomy of other mountain belts. The famous Dewey et al. 1973 paper on the plate tectonic evolution of the Alpine System had taken Ketin's work as a basis and that is why its authors could not make heads or tails of Turkish tectonics, because it lacked a structural framework.

That framework was masterfully provided by the 'l'axe calcaire' paper. The northern ophiolitic zone in that paper appeared as a suture, the metamorphic massifs as structures similar to the high Himalayan crystallines produced by overriding nappes, and the ophiolite nappes as the former oceanic crust and mantle expelled from what is now the suture zone. The Lycian nappes were clearly the imbricated continental margin and with a single stroke this paper now incorporated the Antalya Nappes as a far-travelled equivalent of the Lycian Nappes, not dissimilar to the Préalpes that also had marched as far as the external part of the orogen. Obviously, the magmatic rock-rich Pontides to the north was the opposing active continental margin. The palaeotectonics of Turkey suddenly made sense.

I have no doubt that that great paper would have never been written without Ricou's daring. But neither could it have been written had Marcoux not pointed out the root problem of the Antalya Nappes and had he not had such a mastery of the detailed geology of not only his own area, but the whole of the geology of Turkey and indeed the Tethyan regions in general. And neither could the paper have been so convincing without Marcoux's restraints on Ricou's flights of imagination. Clearly, it was a superb example of a teamwork, but the father of the problem was Marcoux.

Between 1981 to 1984 Marcoux was *maître assistant* in Reims and became a *maître de conférences* of the first class (= associate professor) in the University of Paris VII in 1984.

The creation of the epoch-making 'l'axe calcaire' paper also allows us to gain insight into two important characteristics of Marcoux as a scientist. One is his incredible command of both the field data and the regional literature. Marcoux not only used to make great observations rapidly, but he always prepared his mind, so to say, by his voracious reading. He was always up-to-date with the newest developments. He learnt what he read and went to the field to see whether it was true. He had an incredibly critical mind. He read a lot, believed little. That is why I always made a point of sending him everything I wrote, because I knew that he would come back with some useful criticism and often with advice as to what else I needed to read or to see.

Another important characteristic of Marcoux the scientist was his what I call 'explorer's spirit.' Jean Marcoux did science because he enjoyed discovering things. Once the discovery made, he would lose interest and move onto the next problem, the next item to be explored. That is why he wrote so little. In this aspect I compare him with the late Robert Shackleton, another towering field geologist. An announcement in an abstract was sufficient for Marcoux to make a discovery known. He felt that he would either work it out in such detail as to satisfy himself completely (which has never happened; not even in his life's work on the Antalya Nappes) or that he would not encumber the literature with papers, whose contents could really be made known in a paragraph. In this he was thoroughly honest and thoroughly selfless. Appointments, promotions, awards ...all meant nothing to Marcoux. His interest was truly in geology, not in what geology might gain for his vanity.

I have once become eye witness to an extreme manifestation of this side of Marcoux's character: It was during his thesis defense in front of a most formidable jury including Claude Allègre, Jean Aubouin (then president of the French Academy of Sciences) and his old professor Jan Houghton Brunn. During the question-and-answer period of the defense, Allègre asked an aggressive and loaded question, accusing Marcoux of not having considered actualistic analogues more carefully of the complex emplacement mechanism of the Antalya Nappes. It was the only time in my life I saw Marcoux become

really angry and he told Allègre point blank that he did not know what he was talking about and that had he bothered to visit him in his field area or even inspected his map, he would not have said what he had said. Most of us were shocked and—even more shocking—Allègre seemed to be cowed into agreement! A hush came over the entire hall! Many in the audience must have thought that Marcoux had been finished then and there because of his abrupt response to Allègre, especially when he was a member of his examining committee. To the contrary, however, and much to his own credit, Allègre appointed Marcoux a professor in his great institute shortly thereafter. A great man knows a great man when he sees one, and even his enemies would not accuse Claude Allègre of being a small man! Marcoux was a professor of the second class from 1989 to 1993 and one of first class from 1993 until his untimely death.

The scientist Marcoux was also a great teacher. I know that also from personal experience. The first time I really understood the structure of my own country was when I trailed Marcoux during the 1977 field excursion he led to the Antalya Nappes and up to Tahtalı Dağ (one of the three Olympuses of the Greek mythology). He made us climb to the magnificent exposures of serpentinite/limestone thrust contacts and explained both the local geology and its implications in terms of the structure of Anatolia in its western cross-section. Afterwards he sent me a bundle of his papers and when I later visited Orsay he always generously explained things to me at length.

The 1975 paper of 'L'axe calcaire' had announced that Marcoux had changed his mind as to the provenance of the Antalya Nappes. He now thought that they had an internal root much like the Lycian nappes.

The years between 1975 and 1978 were spent in refining the geology of the Antalya Nappes, correlating their structure and stratigraphy with other, what Marcoux thought homologous tectonic/palaeogeographic elements in the Eastern Mediterranean (e.g., the Mammonia, Kızıldağ and the Baer Bassit ophiolites and mélanges). The versatility of Marcoux's interests were breathtaking: From micropalaeontology to vertebrate palaeontology, from structural geology and regional tectonics to event stratigraphy, he worked on most diverse problems and collaborated with a wide spectrum of specialists. When he made a discovery, Marcoux always

knew enough to appreciate its significance and also with whom he had to collaborate to take the discovery further.

It was also in the mid-seventies that he became involved in Himalayan geology. I remember the joy I experienced when he sent me his paper on the discovery of the extensional structures of Triassic age in the Himalaya. He and his friends had discovered neptunian dykes in neritic Permian blocks filled with earliest Triassic pelagic rocks, thus timing precisely not only the extension, but also the foundering of the peri-Gondwanian continental margin. Anybody who knows the geology of the Eastern Alps would recognise the similarity (although the Alpine neptunian dykes disrupt Upper Triassic neritic rocks and are filled with Lower Jurassic sedimentary rocks) and Marcoux knew that I was going to begin a PhD thesis on a similar problem in the Alps. In his own kind and gentle way, he was teaching me at a distance!

Later in 1980, when the French-Chinese collaborative effort began on the Tibetan Plateau, Claude Allègre made sure that Marcoux was made a part of the French team and Marcoux later became a co-signatory with Allègre on one of the important products of that collaboration.

In the meantime problems had begun arising about the internal origin of the Antalya Nappes: Both in the western and in the central Taurus sections were discovered that spanned intervals from the Mesozoic into the Cainozoic, which would make a Cretaceous passage of nappes impossible. Also other work showed that the Mammonia Nappes in Cyprus and the Antalya Nappes had such similarities that it was difficult to let them root into two entirely different oceans. On the basis of these new observations, Yücel Yılmaz and I decided to adopt Marcoux's and his colleagues' earlier interpretation of an external origin of the Antalya Nappes in our 1981 paper.

Marcoux disagreed mainly because of the great similarity of the stratigraphy of the Antalya Nappes and the Lycian and equivalent Nappes and because a single root origin appeared much less complicated (like Einstein, Jean Marcoux disliked complicated solutions). He and Ricou thought the Eastern Mediterranean a young basin, not yet formed in the Triassic and therefore they did not believe it could have been the site of origin of any of the ophiolitic nappes. Especially later Israeli work showed, however, that the Eastern Mediterranean margins could not be much younger than medial Jurassic, but Marcoux did not think that these observations could solve the

problem of the origin of the Antalya Nappes. He instead concentrated his efforts in mapping the very detailed stratigraphy and the structural geology of the Antalya Nappes themselves and he also brought paleomagnetism to bear on the problem. He showed with his colleagues that the meso-scale structures indicated a north-to-south transport and hoped that the palaeomagnetic data would corroborate this. When his student Hervé Théveniaut's results showed that the Antalya Nappes not only came from the south, but from next to Somalia, he was deeply disappointed. Not because the results had not corroborated what he had expected, but because they were so bizarre and really uninterpretable! He had asked me to be on Théveniaut's jury and even as a partisan of the 'southerly origin of the Antalya Nappes' I had to admit that the palaeomagnetic results reported by Théveniaut were unusable. Clearly there was something wrong with the data. During that defense, once more I admired Marcoux's unbending honesty in the face of data. He was troubled (he could hardly sit down during the defense), only because he could not understand the data (nor could anybody else, for that matter), which was extremely painful for him.

In later years he continued working in Tibet, in Oman and in the Taurus and he became increasingly more interested in the Permian-Triassic boundary problem and the events that clearly marked that boundary. He also became one of the main pillars of the French Tethys project under the able leadership of Jean Dercourt, creating almost single-handedly the Permian map (I remember visiting him several times when he was working on it). Every time the French project would generate a product, I would receive a copy from Marcoux, in some cases annotated. He had met me when I was a beginning student and I guess he never ceased to consider me as such, much to my benefit.

Jean Marcoux has always taken an active interest in furthering the work of the international scientific community. He was a member of the French and the Swiss geological societies, of the European Union of Geosciences, of the American Association of Petroleum Geologists. He was also a member of the French Sedimentologists' Association and of the Subcommittee of the Stratigraphy of the Triassic and of the working group on the Permian-Triassic boundary of the IUGS.

His editorial duties included being the editor-in-chief of one of the oldest and most venerable periodicals of our

profession, namely the *Bulletin de la Société Géologique de France* for the interval 1997 to 1999. He was an editorial board member of the *Ofioliti*, of the *Mémoires de Géologie de Lausanne* and of the *Geodiversitas* of the *Museum national d'Histoire Naturelle*. He was also named a member of the Committee of the Geological Map of France in 1999.

Marcoux also served on various national and international committees both in and outside the university.

His scientific work earned him the prestigious Fontannes Prize of the Geological Society of France in the first round. Had he lived longer, I have no doubt that many other prizes and medals would have come his way.

It is difficult to stop writing about Marcoux: Clearly, his life work cannot be fitted into an obituary, not even in summary form, because it was so prolific and so diverse. He was never a man of one theory, or one model, or one region, or even one subject! He was a great geologist, a true explorer and scholar (one of the very last of the Humboldtian school) squeezed into one very kind and very generous person, a superb and selfless teacher and a colleague and an extremely loyal friend.

Marcoux was a many-sided personality. It befitted his inclinations that he loved reading the travel literature (a hobby he shared with Eduard Suess!) He greatly enjoyed jazz and in classical music preferred Bach and Schubert. He was a great photographer and a serious student of the recent Turkish literature (both novels and poetry) and the movies. (He used to embarrass me by asking questions concerning them, none of which I had read or seen; then he used to chide me for not taking an active interest in the current culture of my own country.) He regularly read many daily newspapers (the internet had made it easier for him) and took an active interest in the political and cultural events of his times.

We Turks owe him a great deal, probably more than most other nations in which Marcoux functioned: he not only contributed to the knowledge of the geology of our country, but he also took care that we were informed of his results. He made sure that his friends and colleagues received his papers. I know that he attended more geology meetings in various parts of Turkey than many a Turkish geologist. He certainly took to the field with him more Turkish students than I ever did. He showed us that he cared about us. He had a great affection and respect

for the Turkish people. He had learnt Turkish in the remotest parts of the Taurus Mountains and thus spoke a peasant dialect. When I used to make fun of that, he always countered telling me seriously how proud he was to speak the tongue of those kind, generous and honest Turkish peasants. I have always felt that Marcoux knew my own people better than I did. He was interested and, I must confess, he had a hugely larger capacity for empathy.

He also had an uncanny physical resemblance to the famous surgeon of Sultan Abdulhamid II, Marko Pasha, whose bronze bust stands in front of the Kızılay Building in Ankara. He was accordingly known as Marcoux Pasha in Turkish geological circles. Now when I reflect back, I think there was more to his epithet than just a joke: Jean Marcoux really had all the attributes of a true Pasha, a title the Turkish people associate with authority, wisdom and trust. With his death we may have lost our last foreign pasha... But was Jean Marcoux really a foreigner in Turkey? As far as I know, he neither behaved as one, nor was received as one, to the point of signing himself now and then as Marko Paşa!

A Partial List of Jean Marcoux's Scientific Publications Prepared by Aymond Baud

(The following list is only partial and does not comply with the style of this journal, because Marcoux never bothered to keep a complete list of his own publications. To many of us this may seem odd, but it is yet another clue to his explorer's spirit. Let us remember that Alexander von Humboldt never possessed a complete set of his own greatest work on South America. Like von Humboldt, it was the thrill and joy of discovery that used to make Marcoux tick. Once the discovery made, he would move to the next problem and leave the previous discovery to others to publish).

1970

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1971

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