

Contents lists available at [ScienceDirect](#)

China University of Geosciences (Beijing)

Geoscience Frontiers

journal homepage: [www.elsevier.com/locate/gsf](http://www.elsevier.com/locate/gsf)

Review paper

## How everything started: A retrospective



Jacques Touret

Institut de Minéralogie, de Physique des Matériaux, et de Cosmochimie (IMPMC), Sorbonne Universités – UPMC Univ Paris 06, UMR CNRS 7590, Muséum National d'Histoire Naturelle, IRD UMR 206, 4 Place Jussieu, F-75005 Paris, France

### ARTICLE INFO

#### Article history:

Received 22 December 2013

Received in revised form

30 December 2013

Accepted 8 January 2014

Available online 24 January 2014

#### Keywords:

Granite controversy

Metamorphic petrology

Fluid inclusions

J. Touret

Granulites

### ABSTRACT

Recalling some of the most important events and persons during his education and career, the author sketches his growth from a young engineer, educated in the sanctuary of solid state reactions, to an involved fully devoted scientific career for the study of fluids in the deep Earth. Most important in this respect was the discovery of CO<sub>2</sub> inclusions in granulites, which triggered years of discussion on fluid-absent or fluid-assisted granulite metamorphism. To some extent, this debate is a continuation of the former granite controversy, but it shows also how the famous battle of “soaks against pontiffs” could have been easily avoided.

© 2014, China University of Geosciences (Beijing) and Peking University. Production and hosting by Elsevier B.V. All rights reserved.

### 1. Introduction

About 10 years after my official retirement in Amsterdam (see for e.g. [Andersen et al., 2001](#)), I feel very honored and, to say the truth, extremely happy that younger colleagues, who now have the future of our discipline within their hands, took the initiative to organize another special issue in this rapidly growing journal, *Geoscience Frontiers*. Daniel Harlov asked me to write a general paper on recent developments in the field of metamorphic petrology. I tried, but found rapidly that so much was to be said that any paper of decent size would be grossly biased and incomplete. Discussing with colleagues and former students, a number of them present in this issue, I had the feeling that much is known about my activities in Holland, less about the first part of my career, in Nancy and Paris. Funny enough, these two parts- of approximately equal duration, each slightly more than 20 years- correspond also to some change in my name: Jacques Touret in France (the French use only the first name), J.L.R. Touret in Holland (the Dutch write exactly

what stands on your identity card). This has not a major importance, except possibly for bibliographic markers like citation index, luckily unknown at this time. But feeling that only few friends knew about my early days has induced me to put on paper the reasons which led me to devote a great part of my scientific life to the study of minute bubbles in rocks issued from the most extreme depths of our mother Earth.

### 2. The Ecole de Géologie (ENSG) in Nancy (France)

When I ended my secondary education in 1953, in the Lycée Chanzy of Charleville (Ardennes), I was rather undecided about the follow-up of my studies. My parents were school teachers in a small village, almost on the Belgian border, and I had spent all my youth in a rural environment, also in a region which, since the “Siècle des Lumières”, had provided the slates covering a number of European palaces. My first decision was to cope with the rather peculiar Napoleonic system of higher education, namely to enter either a university or a *Grande Ecole*. In France, the *baccalauréat*, final exam at the end of the last year in a “Lycée”, opens freely the doors of any university. Napoléon, who owed much to the education that he had received in the Collège de Brienne, wanted above all that the elites of his empire would not be in too close contact with universities, that he considered as dangerous assemblies of “*libre penseurs*”. But he wanted also to have the very best in his own service, admitted after a rigorous selection in few high-education institutions. Almost

E-mail address: [Jacques.Touret@impmc.upmc.fr](mailto:Jacques.Touret@impmc.upmc.fr).

Peer-review under responsibility of China University of Geosciences (Beijing)



unique in any country, these did not depend on the Ministry of Education, but on any ministry according to their specialty. The best coveted *Grande Ecole* is the Ecole Polytechnique, intended in the mind of Napoléon for the formation of army officers. Almost no students from the Ecole Polytechnique enters the army today, but the Ecole is still headed by an army general, and is funded by the Ministry of Defense. The best students in the *Lycée* were allowed to enter a preparatory school (*Classe Préparatoire*), also located in the *Lycée* and run by its best professors. Napoléon himself was a skilled mathematician, being elected a regular member of the Academy of Science after having solved what is now known as the Napoléon problem, namely how to find the center of a circle with a pair of dividers only. One of his closest collaborators and founder of the Ecole Polytechnique was Gaspard Monge, Comte de Péluse (1746–1818), inventor of descriptive geometry and one of the greatest mathematicians of the time. The programs of the *Classes Préparatoires* relied then firstly on mathematics, and secondly on other sciences, such as physics and chemistry. In 1953, they had not changed much since the time of Napoléon.

Having obtained the right to apply for a *Classe Préparatoire*, not in the small *lycée* of the Ardennes (which did not have any), but in the greater institution of Lille Nord, my first choice was to prepare the entrance examination of the Institut National Agronomique, which is for agriculture what the Ecole Polytechnique is for the army. This preparation lasted for 2–3 years, depending on the success in the exam. Again, the strongest disciplines were mathematics and, to a lesser extent, physics or chemistry, considered less as a necessary background for further studies than as the easiest, most objective way to ensure a drastic selection. As far as the *Grandes Ecoles* were concerned, the only significant change, which had occurred since the time of Napoléon had been the addition, after World War II, of a number of institutes depending on the Ministry of Education. These cover disciplines formerly considered as relatively minor, not important enough to justify the formation of specialized engineers. This was notably the case for geology, which during the war had demonstrated its importance in finding new mining resources. The Ecole Nationale Supérieure de Géologie (in a typical French fashion, the complete name is quite large, Ecole Nationale Supérieure de Géologie Appliquée et Prospection Minière) was created in Nancy in 1946, under the direction of Marcel Roubault (1905–1974), with his regular co-author René Perrin (1893–1966), one of the leading figures of the transformist school and stubborn tenant of solid state reactions in petrology (Fig. 1).

With only about 25 students each year, the Ecole de Géologie was too small to have a separate *Classe Préparatoire*. The preparation was the same as for the Institut Agronomique, with a separate entrance examination. It happens that when I was in the second year of the *Classe Préparatoire* in Lille, 4 of my fellow students wanted to apply for the exam for the Ecole de Géologie. But the local center required at least 5 applications. I was relatively young and thought that I would not have any chance of success anyway, either to the *Agro*, or to the Ecole de Géologie. The average duration of the preparation in the whole country was close to 3 years, and only one student in Lille had succeeded to enter one of the two Ecoles since the creation of the *Classe Préparatoire*, some 10 years ago. So I decided to join, first of all to spare my colleagues a strenuous trip (almost one day by train) and difficult stay in Paris. We were apparently a rather strong group. To the surprise of our professors, 3 of the 5 were accepted in both Ecoles. Marcel Roubault, who had a strong sense of communication, came in person to the oral examination. He described the adventurous life of an exploration geologist, at a time when France was desperately searching for the riches of its threatened colonial empire. He was so convincing that I forgot about agronomy and chose geology instead. It is fair to say that I had been influenced by a number of persons,



**Figure 1.** Marcel Roubault at his desk in the Ecole de Géologie, Nancy, c.a. 1960. (Archives Ecole de Géologie)

who, during my youth, had introduced me to the wonders of Nature. The first was a priest in Esperaza, southern France where, during the war, my parents had fled to escape the battles raging in northern France. He had shown me human and other fossils. I was only about 6 years old then, but remember perfectly the broken jaw and rounded balls, which I realized many years later were dinosaur eggs. This region is now known to host Mesozoic fossil deposits of worldwide importance. Another person, who greatly influenced me, was my natural history teacher in the Ardennes. He was in charge of a local *Société d'Histoire Naturelle* (natural history society) and led excursions during the weekends to the classical outcrops of the Meuse valley.

### 3. Ingénieur Géologue and Licencié es Sciences

I entered the Ecole de Géologie in the fall of 1955, with the equivalent of a bachelor in Sciences, without having had a single lesson in geology. The Ecole at this time was a part of the University of Nancy. Basic courses in mineralogy, petrology, stratigraphy or paleontology were offered. Applied geology and mining, from ore geology to mining and civil engineering, were exclusive to the Ecole. Marcel Roubault, who had made long expeditions in the deserts of Algeria during his early career, had even included courses in survival techniques and automobile mechanics. After three years, those who had passed the many exams successfully received two degrees, viz. *Ingénieur Géologue* (geological engineer) and *Licencié des Sciences*, roughly equivalent to a masters degree in the Anglo-American world. I got both degrees in June 1958 and, alone among all my classmates, decided to continue my career in the university. This means in fact that I gave up all advantages linked to my title of engineer. It was then a time of economical boom, the very beginning of the *glorious sixties*. The first traces of oil had just been discovered in the Sahara, and trained geologists were in great demand. I remember that, during my last year of study, I was proposed a *pre-salary* to work for an oil company in Gabon, exceeding by a factor of 3 what I would receive one year later as university assistant. But I wanted above all to do research in petrology. I developed my interest in this discipline not so much during the scarce courses given by

Download English Version:

<https://daneshyari.com/en/article/4681674>

Download Persian Version:

<https://daneshyari.com/article/4681674>

[Daneshyari.com](https://daneshyari.com)