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François Gros, my boss

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Abstract: This article shares the author's memories of his collaborations with François Gros when the latter was Professor at the University of Paris 7, then Director of the Institut Pasteur, then President of the Pasteur-Weizmann Council. He underlines the major contributions of "his boss" in the exercise of these functions.

Keywords: François Gros, Institut Pasteur, Pasteur-Weizmann Council, Memories

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I did not have the opportunity to collaborate in the research work of François Gros. And yet I walked for a long time by his side, sometimes even in his footsteps, in many of my professional activities. It is therefore not laboratory memories or scientific exchanges that I will evoke here, but rather a few moments experienced within the framework of the three institutions where I was called upon to work under his direction: the University, the Institut Pasteur and the Pasteur-Weizmann Council.

1. The University

My first contacts with François Gros date back to the start of the academic year in 1968. Appointed in September of that year to the Faculty of Sciences of the University of Paris, I began to interact directly with him, as a colleague, within the UER (Teaching and Research Unit) of Biochemistry at the University of Paris 7. In 1969 he was elected, if I remember it correctly, the first chairman of this UER and it was during the meetings of its council that I saw him for the first time in the role of my “boss”. He led these meetings with a gentleness, a patience, a flexibility, which contrasted surprisingly with the stormy, aggressive, sometimes verbally violent atmosphere of this “post-sixty-eight” period. I was surprised then at his ability to listen to everyone with a benevolence, a very visible attention, which contrasted with the abruptness of the words of some young assistants. I never saw him raise his voice, or refuse the floor to a speaker, or interrupt another, which led to the meetings dragging on well beyond the scheduled time. And yet, from these interminable palavers, François succeeded in extracting a proposal which calmed the spirits and committed to a new action.

He occupied, at the University, the chair that Monsieur Monod had vacated when he was appointed to the Collège de France. There he taught the “queen” discipline of molecular biology (meaning by this the biology of nucleic acids and gene expression). When he, in turn, was appointed to the Collège de France in 1973, he left the University. Although my teaching focused on quite different disciplines (“physical chemistry of biological macromolecules” and “physical chemical enzymology”), I was promoted to this prestigious chair. This is how, for the first time, I succeeded François Gros.

2. The Institut Pasteur

The second opportunity I was given to work under François’s chairmanship was within the framework of the Institut Pasteur. In the spring of 1976, we learned with infinite sadness of the death of the Director of the Institut Pasteur, Jacques Monod, who was both our master and friend. And it was this sad event that led me into a totally unexpected experience. A “search committee” was set up to identify personalities likely to succeed Mr. Monod. This commission was led by the eminent immunologist Jacques Oudin who then chaired the Scientific Council. It was a surprise for me that Jacques Oudin asked me to participate in the work of this committee. Several names were mentioned. Those of Elie Wollman and François Gros were retained. But the committee feared it would be difficult to convince François to accept the charge. It therefore mandated three of its members, Jacques Oudin, Léon Le Minor and myself, to meet François Gros and convince him to accept being proposed as Director. During this meeting, I particularly insisted on the promise made by the members of the committee to help him in this task by all their means. When I was done came a second surprise. Without showing the slightest hesitation, François Gros told us that, shortly before his death, Monsieur Monod had asked him to succeed him as Director of Pasteur and had prepared him for that. François therefore accepted that his candidacy would be announced. The rest of the process took place without any other surprise, and François Gros was elected Director of the Institut Pasteur in the fall of 1976.

Shortly later, the new director asked to meet me, told me of his intention to form his management team very quickly and, third surprise, asked me to be associated with his team as Scientific Advisor. I should support the Scientific Director, Yves Chabbert, by taking charge of the so-called fundamental research units, Yves Chabbert taking care of the biomedical units. Nothing prepared me for such a job. Neither my Pasteurian career nor my training and my knowledge of biology. Aware of my unpreparedness, I refused on the spot. However, with that sweet and convincing smile that was customary for him, he put forward two weighty arguments: the first was

that Monsieur Monod himself had advised him to do so. The second, even stronger, was to remind me of the promise I had made to him to help him in any way we could. I couldn't not honor my promise. I was trapped and ended up accepting, but on the condition that my initial commitment would be for a period of three years only. Period after which I would evaluate the impact of this load on the functioning of my laboratory before deciding whether I would continue until the end of the six-year term of the direction team. The deal was made.

I will not say much about this period, except that it weighed very heavily on me, that it was undoubtedly the most painful of my professional career. Especially since after a year, Yves Chabbert had to leave his position as Scientific Director and since "quite naturally", François Gros asked me to take over this responsibility. He did not imagine, I think, the extent of my ignorance of biology, and particularly of microbiology. The trust he then placed in me seems to me to be a faithful reflection of this character trait that he had of giving more importance to the strengths he thought he could attribute to a colleague than to his shortcomings. I had to, and this is undoubtedly the most positive aspect of this experience, learn everything. I learned, during these three years, infinitely more than I had done during my first fourteen years as a researcher. I discovered the immense wealth of Pasteurian research. I discovered modest men and women, whom I had never heard of, whose work brought honor to our house. I also discovered the vanity and careerism of some others. I shuddered to have to scientifically judge researchers with whom I did not come close. I suffered from having to deny resources to those I felt I had to support, and from having to give them to teams for which I had little esteem, because my director and I had not always the same views on what should be the priorities of the Institut Pasteur. François believed that the institute should be present on all fronts of biology. My feeling, on the contrary, was that priority should be given to laboratories engaged in research—whether fundamental, medical or applied—relating to microbiology and immunology, the two fields on which the reputation of the Institut Pasteur was anchored. And this resulted in difficult trade-offs. Because despite the successful financial rescue of the institute a few years earlier by Jacques Monod and Simone Veil, our resources were very limited. We had to operate with a constant workforce, and the distribution of resources was a painful exercise during which our differences sometimes manifested themselves. It is indisputable that François's long-term vision largely contributed to the transformation experienced by the Institut Pasteur over the following decades, leading to it becoming a multidisciplinary center with excellent research on development, neurobiology, hearing, oncology, structural biology, bioinformatics.

Among the major projects that marked François Gros's tenure as Director of the Institut Pasteur, three particularly noteworthy should be mentioned: the construction of the immunology building, that of the biotechnology building and the emergence of structural biology.

The construction of the immunology building, now the Metchnikoff building, and the choice of the teams to be set up there have largely contributed to reviving fundamental research in immunology at the Institut Pasteur, with the arrival of a few leading researchers, the most famous of which was undoubtedly Roberto Poljak. His recruitment, in which I was led to participate very actively, was the occasion for one of those haggling between François and me which ended in a happy compromise. Roberto Poljak, one of the first to solve the structure of antibodies by X-ray diffraction, worked at the University of Baltimore. When I learned that he wanted, for personal reasons, to leave the United States and settle in Europe, it was easy for me to convince François of the interest there would be in "importing" to Pasteur his skills in the field of X-rays and protein sequencing. During the summer of 1977, I therefore met Poljak in Baltimore and, with the prior agreement of François Gros of course, suggested that he join the Institut Pasteur where he would have an entire floor of the new building to create, on the one hand, his X-ray crystallography laboratory and, on the other hand, a technical platform for protein sequencing. After a visit to Pasteur where he met François Gros, Roberto Poljak accepted the offer. A few months later, as the recruitments and allocations of premises were completed, there was a shortage of floor space and François Gros considered reducing the area allocated to Poljak to half a floor. Difficult negotiations ensued, at the end of which it was proposed that the sequencing platform would be entrusted, outside the new building, to the Protein Chemistry Unit headed by Borivoj Keil. Roberto Poljak, who did not like the responsibility of sequencing, gladly accepted this compromise by giving up a third of his floor. Although the implementation of protein sequencing in Pasteur suffered greatly from this "abandonment", the consequences

were hardly significant: very soon after, the development of DNA sequencing, much faster and less expensive, rendered obsolete direct protein sequencing.

It was during François's term as Director of the Institut Pasteur that the concept, and especially the word, of "biotechnology" took off in France, which was to hold the attention of politicians and investors. François Gros was able to make great use of it, helped in this by the talent as a communicator and popularizer of his deputy director in charge of research applications, Joël de Rosnay. While the Institut Pasteur was gradually abandoning its involvement in the manufacture and marketing of products resulting from its research (diagnostic products, serums, vaccines), François Gros was able to highlight the potential of Pasteurian research for future applications in biomedicine. This is what allowed him to obtain a major grant for the construction of a new building dedicated to biotechnology, the Fernbach building. The construction of this building began in 1983, shortly after François Gros left the management of the Institut Pasteur, but he was undoubtedly its initiator.

Apart from a few rare and small teams initially involved in "applied" research projects, very few of the units that were initially installed in this building were interested in biotechnologies. But its opening offered the necessary space for the expansion of fundamental disciplines hitherto restrained by the lack of premises. Basic research could have been criticized for having taken up too much space in this building, which was initially intended for biotechnology. This would be overlooking the decisive importance of fundamental research in the emergence of applied projects. And we must give François Gros credit for having played, both inside and outside the Institut Pasteur, a determining role in the change in mentalities which has led both researchers and the bodies that judge them to accept that applied research and collaborations with industry can be as rewarding as basic research.

The last project initiated by François Gros that I would like to mention, no doubt because it touches more closely on my own interests as a researcher, is that of structural biology and the modernization of research tools on campus. I mentioned above the recruitment of Roberto Poljak, motivated by the wish to establish at the Institut Pasteur the only tool—X-ray crystallography—which, at the time, made it possible to determine the structure of biological macromolecules at atomic resolution. Despite the extremely high cost of the operation, both in terms of equipment and qualified personnel, François Gros adhered without hesitation to the idea of this recruitment and did not skimp on the expensive equipment or the collaborators requested by Poljak. This was the first step towards the introduction of structural biology, a then promising discipline which has since become essential in both fundamental and applied research.

Another important step taken by the Institut Pasteur under the leadership of François Gros was the entry of this institute into the era of scientific computing. As early as 1968, a first computer, a DEC Linc-8, had been acquired at great cost by the teams of André Lwoff, François Jacob and Jacques Monod. This computer, using both punched tape and magnetic tape, had performances barely equivalent to those of a current pocket calculator, and was little used. However, it made it possible to introduce some of us to the use of computers and to show its immense possibilities. So much so that when the annual credit requests for 1977 were submitted, computers of various characteristics were among the urgent needs expressed by several teams. At the initiative of Henri Buc, a precise inventory of these needs was organized and ended up in the conclusion that it would be preferable to acquire a much larger computer, which would satisfy the immediate needs but also make it possible to cope with a serious increase in the use of scientific computing. This is how the Scientific Computing Unit was created there, soon to be placed under the responsibility of Jean-Michel Claverie. It was in this unit that the development of bioinformatics began in our institute, which today occupies a preponderant position at Pasteur. And it was also with the support of François Gros that, shortly after my departure from the Scientific Department, exceptional funds were released which made it possible to connect, by means of a high-speed (for the time) telephone cable, the computer of the Institut Pasteur to that of the École Normale Supérieure, allowing the Institut Pasteur to join in 1980 the inter-university network Bitnet, the precursor of the Internet. This support from François Gros for an emerging discipline, yet so far removed from his own scientific interests at the time, reflects his great open-mindedness and his ability to listen to others.

From my time "in business" under the direction of François Gros at Pasteur, and despite the deep displeasure

I felt, I have positive memories of having learned a lot about biology, the Institut Pasteur and researchers, of having relieved the Director of some chores, of having contributed effectively to some important events such as the construction of the Metchnikoff building, the recruitment of some remarkable teams (Roberto Poljak and Gérard Orth in particular), the implementation of X-ray crystallography, scientific computing and flow cytometry on the campus.

However, despite these positive aspects, the assessment that I drew at the end of my three years at the directorate did not seem satisfactory to me. The frustrated expectations, the financial constraints to which the Institut Pasteur was subjected and which reduced the management's capacity for action to very little, the difficult arbitrations which often ran counter to my hopes, and above all the future of my research group which was in danger made me throw in the towel. I therefore informed François Gros, at the beginning of 1979, of my decision not to continue in my position as Scientific Director beyond the three years for which I had committed. He didn't try to put any pressure on me to stay. Whatever the reasons, he didn't want to twist my arm. I am infinitely grateful to him.

These three years spent alongside François Gros have truly marked my professional life. I would like here to pay tribute to his memory and to express my gratitude for the trust he placed in me; for the chance he gave me to mark Pasteurian biophysics with my personal seal; for the scientific and human experience that it allowed me to live; for the impact this experience had on my subsequent research; for the visibility it gave to the youngster that I was.

3. The Pasteur-Weizmann Council

The third context in which I had the opportunity to work under the direction of François Gros was the Pasteur-Weizmann Council, a non-profit association the purpose of which is to encourage and support scientific collaborations between researchers in the Institut Pasteur in Paris and the Weizmann Institute in Israel. Robert Parienti was, with Simone Veil and André Lwoff, its designer and for nearly forty years its tireless animator. In 1987 Raymond Dedonder, successor to François Gros as director of the Institut Pasteur, entrusted me with the responsibility of clarifying and structuring the operating methods of this association. I carried out this task in close collaboration with a colleague from the Weizmann Institute, Benny Geiger, and we were appointed "scientific coordinators", Benny Geiger at Weizmann and myself at Pasteur, with the mission of ensuring proper respect of the rules that we had established. The Pasteur-Weizmann Board of Directors was then chaired by André Lwoff, and François Gros chaired the Scientific Council. In 1992, François Gros succeeded André Lwoff as chairman of the Board of Directors and gave way to the President of the Weizmann Institute, Michael Sela, as head of the Scientific Council. It was therefore from 1987 that I again found myself working under the direction of François Gros. First as Scientific Coordinator, then from 1996 as successor to Michael Sela as President of the Scientific Council.

During these years spent at Pasteur-Weizmann with François Gros, I particularly appreciated his unreserved commitment to this exemplary bilateral scientific collaboration. The time and energy he devoted to it despite his multiple occupations. His full availability. The countless ideas and suggestions, sometimes utopian but often constructive, that he formulated to strengthen and develop both the interactions between researchers from the two institutes and the fundraising activities. The facilities offered, thanks to him, by the Academy of Sciences to help promote Pasteur-Weizmann. The irreplaceable impact of his personality on patrons. And always the same blind trust displayed towards his collaborators, Robert Parienti for fundraising, finances and management of the association and myself for scientific affairs...

At the beginning of 2003, François having reached the end of his second term and therefore no longer being eligible, I in turn became Chairman of the Board of Directors of Pasteur-Weizmann. The succession was not easy. While I felt comfortable in the management of day-to-day business, I had neither the experience of chairing a board of directors, nor the exceptional aura of François with the friends and donors of our association. But his presence at board meetings as Chairman of the Steering Committee, his wise advice, his original ideas, his generosity in the support he has constantly given to the collaboration between the Institut

Pasteur and the Weizmann Institute, have greatly facilitated my task and will have greatly marked the life of the association.

François Gros's involvement in the development of international scientific collaborations is not unique to Pasteur-Weizmann, which is only one example of the various international collaborations he supported actively. Beyond the Weizmann Institute with Israel, foreseeing the important role that this country would play in the development of advanced technologies, he contributed to the creation of the Franco-Israeli Association for Scientific and Technical Research (AFIRST) which he managed for years together with Ephraim Katzir. From the very first hours of China's opening up to the West, thanks to the decisive support of Ming Nguy Thang, a researcher at IBPC (the Institut de Biologie Physico-Chimique in Paris), François Gros created the Franco-Chinese Association for Biological and Medical Research, which played a pioneering role in Franco-Chinese scientific relations. And during his mandate at the French Academy of Sciences, in 1997, François Gros was the initiator of an important revival of scientific and technical exchanges with developing countries, mainly in Africa, by proposing the creation of the COPED (Comité Pays en Développement) of which he assumed the presidency until June 2017.

4. At the end of the day...

The few personal recollections mentioned above reflect only part of the spectrum of François Gros' activities, in particular his impressive contribution as a scientist. As a young researcher first, with the isolation and characterization of the messenger RNA of the Escherichia coli lactose operon, thus bringing the final confirmation of the concept proposed by François Jacob and Jacques Monod. Then as the inspirator of a laboratory and a school of thought whose contribution to Developmental Biology is amply illustrated in the other articles of this Comptes Rendus Biologies issue.

To all this must be added his activities as an adviser to two Prime Ministers, which earned him so many difficult times and unfair criticisms, as Permanent Secretary of the French Academy of Sciences, as author of eight books.

A tireless worker, François managed to carry out all these activities simultaneously. A real tour de force. But what remains for me the most striking image is that, under all circumstances, he remained the same person, available, gentle, smiling, affable, generous with his time, understanding, deeply human. And it is above all for this aspect of his personality that I would like to pay tribute to him, as well as to his wife Danielle who did so much to make him who he was.

5. Disclosure of interests

The authors do not work, do not advise, do not own shares, do not receive funds from an organization that could benefit from this article, and have not declared any affiliation other than their research organizations.