Revitalising industry thanks to innovation

by

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Overview

In 1993, in order to save jobs which were threatened by an owner's decision to relocate his paint company's site, Antonio Molina bought the company. He decided on an ambitious development strategy. This included external growth so that the company could become national and then international; choosing the railway industry market to avoid costly marketing expenses; investing in R&D so that it accounted for 10% of the turnover; creating a subsidiary dedicated to research; diversifying into the automobile and aeronautical sectors; and on each occasion using the most up-to-date technology. Because of the priority given to innovation over the past fifteen years Mäder has become the European leader in its field. It has increased its number of employees from eighty to eight hundred and multiplied its turnover twenty-fold. Antonio Molina is currently applying the same strategy to the Matikem competitiveness cluster and its Verem programme which is focused on systems of complex materials. He aims to make the newly formed Nord-Pas-de-Calais-Picardie region the centre of European bio-economy.

Report by Élisabeth Bourguinat • Translation by Rachel Marlin

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In 1993, Corsain, the company where my mother-in-law was financial director, was about to be bought by the Lafarge Group. The factory, located in Marœuil near Arras, made paint both for internal decoration, and for train carriages and industry in general. It employed eighty people, and Lafarge's intention was to relocate the factory sixty kilometres away. Corsain was the only factory in Marœuil, and the prospect of there no longer being a factory in the village was devastating for its inhabitants. At that time, I was a financial analyst, and having studied the company's accounts I decided to buy it from under Lafarge's nose in an LBO (Leveraged Buy-Out) with the company's executives. Today the factory still exists and employs about one hundred people who continue to make decorative paint.

The strategy

Once we had bought the company, we discussed the best way to make it grow.

Essentially, the company sold its paint to clients within a radius of fifty kilometres around Arras. We decided to make it into a national and subsequently an international company. The market for paint is necessarily multi-domestic (each country produces for its home market) because it is not just a case of selling a product, but also selling a service, and this means that we have to be close to our clients.

We also felt that we had to choose between the decorative paint market and the industrial market. To sell decorative paint one has to be rich because marketing costs are high. In our case, the LBO had used up all our money. Therefore, we chose the industrial paint market and decided to become the leader in the railway sector. We achieved our goal because today, in French trains, there is not an ounce of paint that is not made by Mäder and, on a European level, our closest rival accounts for less than 50% of our turnover. With time, we have grown in other industrial sectors, each time aiming to be number one.

To achieve this result, we took another strategic decision from the very beginning. We decided to improve the technical quality of our products by devoting 10% of our turnover to research (compared to our rivals who did not spend more than 5 or 6%). Today, about one hundred and twenty-five people at Mäder work in our research department. After a few years, we decided to segment and structure this activity because there are different ways of reasoning according to whether research is fundamental or applied. We created a long-term subsidiary, purely for research purposes, called Mäder Recherche which immediately started working closely with the University of Haute-Alsace. Our central R&D laboratory is in charge of making innovations into industrial products. Finally, the 'markets' laboratory is in charge of determining whether the products will sell.

Balancing external growth with endogenous growth

In view of my age when I bought the company, I chose external growth rather than organic growth because it is faster. I suggested adopting a cohesive networking system between the companies so that each company that we had bought had to 'plug in' to the group and communicate with it in order to share and increase knowledge, rather than remain a separate entity in the group. We preferred companies which possessed technologies we did not know in order to build up gradually an encyclopaedia of skills.

We nevertheless imposed on ourselves a constraint with this approach by not growing externally by more than 50% in order not to expose ourselves too much to social problems which often accompany mergers and acquisitions. When an entrepreneur is faced with a social problem, he tends to devote all his time to it rather than looking after the rest of the business which is essential. Due to this principle of constraint, the number

of people whom we have had to lay off in the course of our twenty-one acquisitions can be counted on the fingers of one hand. Because 50% of growth was endogenous, there was always enough space for everyone.

From Marœuil to China and India

Our first acquisition was Bolloré Jival in 1996. This company made industrial paint for the aviation sector and general industry. It also gave us a degree of prestige as it is the oldest paint company in the world. It was founded during the French Revolution by a painter who had perfected a varnish to protect his paintings. A century later, at the Paris World Fair in 1867, it received a gold medal for its 'cold enamels for bicycle tubes'. As it happens, this prize heralded the Group's current strategy which is oriented towards the transport sector and the principles of energy savings and durability.

In 1999, the French market started becoming too small for us. We had the opportunity to buy Mäder, a Swiss group which was a sort of 'Rolls Royce' of industrial paint. This group was faced with a huge problem. Following an accident in a chemical factory which had led to the widespread pollution of the Rhône River, Switzerland's safety standards became much more stringent. Mäder was in the process of completing a project, and the newly imposed constraints came at an additional cost of 30 million Euros. We knew this group well, and we had license agreements with it. The financial *montage* was quite complex because its turnover was the same as ours, but in the end we were able to buy it and to complete the operation in just one-and-a-half years.

This acquisition gave us a much broader geographical coverage because we now had a factory in Switzerland as well as sales locations in Germany. We decided to change these sales sites into production sites, and started buying companies in Germany, and then China, where Alstom approached us to supply them with paint for their first sixty-four TGV trains, and subsequently also in India.

Today, we have a presence in 14 countries. Our turnover increased from 10 million Euros in 1993 to 200 million Euros. We increased our employees from 80 to 870, 360 of which are in France, 200 in Switzerland, 200 in Germany and 70 in China.

To finance this growth, we had to ask banks and investment funds for financial help, but they had to follow two important rules: they had to be minority shareholders in the capital, and there was to be no dividend payments because this practice was incompatible with devoting 10% of the turnover to R&D. All our financial backers agreed to these principles without any difficulty: they stand to make a capital gain when they leave the capital.

Polymerisation using ultraviolet radiation

In 2000, when we bought Mäder, I sensed that one of the technologies developed by this group, polymerisation using ultraviolet radiation, had a great future. It had numerous advantages such as its lack of solvents, zero evaporation, and much lower energy consumption.

At the time, this technology was still in its infancy and no-one thought that it would lead anywhere. Today, we have managed to perfect a process which allows transition from a liquid state to a solid state in one-tenth of a second using very little, but well directed, energy. We realised that not all the forms of UV wavelengths were of interest: for example, those from 200 to 280 nanometres only produce a little polymerisation with our process, consume a great deal of energy, and are extremely carcinogenic. We took two to three years to scan all the UV frequencies and to identify a very narrow wavelength band which is of interest for our technology.

After years of work and a number of doctoral theses, we undertook tests on a continuous production line of pre-painted bands of aluminium. The energy savings compared to a conventional process were 5,000 times less! We continue to move forward with this technology, but we do have a limit: the person in charge of the workshop explained to me recently that in the near future the light from a cigarette lighter would be enough to initiate a process of polymerisation! So we must maintain sufficient levels of security.

'Becoming Cinderella's fairy'

Another major research area was to attempt to use agro-based materials rather than fossil-fuel based materials for the organic part of paint.

In 2012, we founded the IFMAS (*Institut français des matériaux agrosourcés*: French Institute for Agro-based Materials) with the INRA (*Institut national de la recherche agronomique*: National Institute for Agricultural Research); the CNRS (*Centre National de la Recherche Scientifique*: National Centre for Scientific Research); the University of Lille 1; the Douai École des Mines; the Lille École nationale supérieure de chimie; the University of Artois; the groups Florimond Desprez and Roquette; and finally the MAUD (*Matériaux et applications pour une utilisation durable*: Materials and Applications for sustainable use) competitiveness cluster which has since become Matikem (*Matériaux innovants pour la chimie*: Innovative Materials for the Chemical Industry).

This body is one of the nine ITEs (*Instituts pour la transition énergétique*: Institutes for Energy Transition) created in the context of the 'Investments for the Future' programme. When Louis Gallois (President of the PSA Peugeot Citroën supervisory board) asked me 'What is your dream?' I replied 'To become Cinderella's fairy. I would like to touch a large potato and change it into a car part!' We are not very far from this scenario, because before the end of the year we will be producing our first polyester paints made 100% from agro-based products with technical characteristics which are similar in quality to paints manufactured from fossil-based materials.

Other industrial sectors

After the railway sector, we moved into the automobile sector. Mäder is currently the number two in internal automobile paint in Europe. We work primarily for Renault and Peugeot, but also for Audi, BMW and Porsche, and we have worked on new innovations such as self-healing paint, a process which should be complete in two or three years. In the interiors of luxury cars, female drivers may scrape the paintwork with their diamond rings, but with our self-healing paint, a scratch from the night before will have closed up the following morning all by itself. This concept of course has other applications, for example for corrosion protection on oil platforms where the slightest scratch may give rise to complicated problems.

We have also moved into the aeronautical sector by targeting the most technological aspects. For example, we have the monopoly of the corrosion treatment of the interior of reactors which are subject to temperatures of 800° C. We are also specialists in paint for landing gear, brakes, fuselage, and internal air exchangers, in other words all the most highly complicated problems in aeroplanes where we have very few competitors. For the corrosion treatment, we have perfected a chromium VI-free product which is the first of its kind in the world, and which has earned us the contract to be exclusive suppliers of paint for the entire Airbus A320neo. This took seventeen years of research which may explain why we have so few competitors.

We also expanded into glassware, and provide a very large part of the paint used for Saint-Gobain's flat glass and Panolac panels.

Each time we start growing in a new industrial sector, we tackle the technical side before the sales side. We systematically resort to joint development, not only for financial reasons, but also because it is essential to understand the real needs of the market.

Tomorrow, composites

We have become so good in our field that, paradoxically, we sell less and less paint. Whereas we used to apply 50-micron layers of paint, we now only need 15. We have recently carried out a test using our varnish of ultra-violet technology on a TGV train. We needed less than one kilogramme of varnish to cover an entire carriage! Of course, this product is very expensive, but having larger revenues is not the answer for everything. We still have to make sure we have enough work for our employees.

This is why we have now turned to composite materials where the volumes are larger than for paint. Due to our polymerisation technology using ultraviolet radiation, we have already developed a concept of composites which is similar to paint inasmuch as we only need to paint a layer 3 millimetres thick compared to 3 microns thick (for a car part, for example). Our technology should allow us to paint even larger parts: in the laboratory, we are already able to polymerise epoxy parts which are 6 centimetres thick!

The current boom in composite materials is the result of the attempt to make objects lighter, and this is true both for the railway sector and for the car and aeronautical sectors. The construction of the 2-tiered TGV trains, for example, is limited by the fact that the centre of gravity is higher. The second tier has to be made lighter if one wants to increase speed and maintain safety at the same time.

The composite, which is the most used especially in the aeronautical sector, is a combination of epoxy resin and carbon fibres. However, this material is very difficult to recycle and when it is burned, it gives off hydrogen cyanide which is deadly. We are sure that we will only manage to obtain satisfactory solutions to make paints lighter if we resort to much more varied materials.

This is why we have registered a series of patents on combinations of extremely varied materials including thermosetting materials, thermoplastics, fossil-fuel based and agro-based materials. For example, we are able to manufacture polyester composites with carbon fibres without using epoxy, and we also work with basalt fibres which have more interesting characteristics than carbon. We can also make several layers of polyester and epoxy on the same part. We are currently working with the Plastic Omnium company on all of these projects.

The impact on employment and recruitment

Since the beginning, Mäder's growth and the creation of jobs have relied exclusively on our research efforts and the innovative products which we have perfected. During the course of our development, recruitment has become much easier. When we were just the Corsain company in Arras and we needed researchers, we had a hard time finding candidates. Today, we have no problem because we are now one of the two European leaders in industrial paint. The link between innovation and employment is therefore very strong.

The Verem programme

We wanted to share and generalise our experience with Mäder to the Verem programme used in the Matikem competitiveness cluster.

Few innovations, few jobs

We started off with three observations. The first is that the Nord-Pas-de-Calais region is ranked fourth of all the French regions in industrial activity, but is in last place in terms of the proportion of turnover devoted to research, and the number of doctoral students. Of a total of 106,000 companies, only 200 carry out research. We have to instil in entrepreneurs the crucial importance of innovation.

The second observation is that the Lille-Roubaix-Tourcoing conurbation will become associated with the Belgian cities of Courtrai and Tournai, and this will then become the largest truly European conurbation. This area will also become the most densely populated in Europe.

The third observation is that every conurbation necessarily includes a university. There is no large conurbation without a university, and few important universities are located outside conurbations.

With these observations in mind, we met the people in charge of the conurbation to explain to them that the role of competitiveness clusters is not only to enable the emergence of group projects, but also, and above all, to encourage the creation of jobs. This was the case with EuraTechnologies, the economic competitiveness cluster in the Lille

conurbation which is devoted to IT (information technology) and communications technology, and is where IBM has recently located its offices. When one plants a flag which is very obvious, this rapidly attracts other people who also contribute to the creation of jobs.

A very visible flag

Our first approach was to contribute to the merger of three universities in Lille all of which are interested in materials. They are the École Centrale, the École nationale supérieure de chimie and the École nationale supérieure des arts et industries textiles. We will now create a Master's programme in Lille in which students from all three establishments can register as well as students from non-scientific universities such as the École supérieure de journalisme, the EDHEC (*École des hautes études commerciales*), and even Sciences Po, in order to encourage contact between the scientific and literary communities.

We also included the University of Lille in our approach (which was the result of the fusion of three higher education establishments the year before). With a little bit of luck, it should feature on the list of the IDEX (*Initiatives d'excellence*: Initiatives of excellence) because it is now part of the short list which only has three candidates. The involvement of the CNRS, via its various branches and doctoral schools, should also allow us to increase the number of doctoral students by also mobilising industrialists for CIFRE (*Conventions industrielles de formation par la recherche*: industrial agreements for training through research) theses.

Industrial university chairs, such as the chair we created in Mulhouse, represent a useful channel for encouraging doctoral theses which may contribute to the development of the region. We are in the process of creating one for agro-based materials. Our ambition would be to create a third one for the photopolymerisation of agro-based materials.

Specific tools

The University of Lille has very specific tools which may attract industrialists.

The first is its research equipment on nuclear magnetic resonance (1 200 MHz) which will be the first of its type in Europe, and even in the world. It is currently being manufactured in Germany.

The University also agreed to create a laboratory to research heterogeneous catalysis which will make it possible to combine different types of agro-based materials. When one uses agro-based polyesters to manufacture composites, it is essential to have several production pathways at one's disposal if one wants to make complete products. The Picardie Innovations Végétales, Enseignements et Recherches Technologiques (Picardy Plant, Teaching and Technological Research Innovations) ITE is working on products which are made exclusively from oil, and the IFMAS, on products made exclusively from starch. The Verem programme will make it possible to link these different products. To complete the range of composite materials, we will also be working with the Valenciennes-Maubeuge metallurgy and ceramics research centre.

Finding industrial applications

Carrying out research and recruiting doctoral students is not necessarily enough to make innovations materialise. One also has to find industrial applications.

A few years ago, we carried out research with the University of Louvain on composite materials which were 100% mineral, a characteristic which made them extremely fire-resistant. If you put a flame to a 2-millimetre wide sheet made from this type of material and put your hand on the other side of the sheet, you would feel nothing. One day, by complete chance, I was talking about this product to a friend who imports three hundred thousand barbecues every year. He found the idea of a plastic barbecue revolutionary because it avoids burns and makes a wide variety of shapes of barbecue possible. He contacted a designer and he will soon be opening a small workshop in Roubaix manufacturing high-end barbecues.

University campuses devoted to innovation

If one wants innovations to result in jobs in the local area, one must have the space to construct campuses, student housing, company incubators, and to welcome new businesses. Matikem took charge of the activities at the Villeneuve d'Ascq Haute Borne scientific park, a centre of excellence which occupies an area of 40 hectares.

A scientific committee

To identify industrial applications and direct theses towards the most promising sectors, we will be using a scientific committee. I am in the process of recruiting the members. I have already had some favourable replies, for example from Zodiac Aerospace and Solvay.

A regional prototyping financing fund

We must also find a means of financing the TRL 6 and 7 (Technology Readiness Level) projects. In France, there are rarely problems in the earlier stages of projects (stages 1 to 5), but after that, there are 'constipation' problems where money is put into research, one gets bigheaded, and not a single job results! It is practically impossible to receive money for prototyping in France, whereas in Belgium and Germany in certain sectors 100% of prototypes are financed.

This is why we are currently working on the creation of a regional fund for financing prototyping. I think those working in regional authorities are suitable people with whom to discuss this as they understand the interest of inexpensive investment which can then be translated into local jobs. This idea is gaining ground.

Conclusion

In a way, we have reproduced the Mäder system to benefit a wider group, and hope that this will give similar results!

Discussion

Trains without paint

Question: *There are trains today which are not painted. Does this represent a potential threat to your company?*

Antonio Molina: There are indeed trains using stainless steel in Japan and Spain, but Mäder supplies the varnish which protects them.

It is also tempting not to use paint in the car sector. Some manufacturers claim that we will soon be able to inject parts made from plastic with the desired colour. I find this hard to imagine for several reasons. Firstly, pigments account for a large part of the cost, and if they are used on a thickness of 3 millimetres instead of 10 microns, this would be very expensive. Secondly, the different parts of a car's dashboard are generally produced in several countries and getting the same tint for all the parts would be complicated. Finally, recycling plastic would also be very complex.

Having said this, it is quite likely that in the future the tints may be obtained in a very different way from the way they are today. Matikem took part in the creation of the European Centre for Excellence in Biomemetics

in Senlis (CEEBIOS: *Centre européen d'excellence en biomimétisme*) which, among other things, researches the fact that the extraordinary colours of butterfly wings are produced simply by the angle at which a crystal is held up to the light. This could inspire us to produce different tints from a single crystal as a result of magnetic fields, and also to develop these tints with time.

Decorative paint

Q.: *Does your company take part in painting the Eiffel Tower?*

A. M.: No, because this paint is supplied for free! The Seigneurie company is in charge of this activity and this is representative of its market. If we were to launch into this sort of operation, it would not attract any additional new clients, and some of our current clients might even think that we were a bit eccentric.

Q.: *You said you chose industry very early on. Why, in this case, does the Corsain factory continue to produce decorative paint?*

A. M.: The other shareholders think that we should close the factory because it is not profitable, but personally I am opposed to this and I think it is imperative that we keep it going. Our story began with this factory and I think we have to keep it alive: life is not just about money and profitability!

Furthermore, this activity allows us to test certain new products by taking fewer risks than in industry, and also to benefit from lower prices for our purchases because of the large volumes we handle. We are slowly working towards making the activity a profitable one by marketing new products for the construction sector which have a strong added value.

Reasons for success

Q.: *A large part of your success can be explained by your choice of external growth and the financial engineering which you have managed to implement to good effect. What advice would you give in this field?*

A. M.: I would not suggest that the choice of external growth is necessarily the best. It is the quickest and, in view of my age when all this began, it was the only way for me to achieve the result that I wanted. It is more of a constraint.

As far as our success is concerned, 5% can be explained by work and 95% by chance. Before I took over Corsain, I had been teaching classes in financial engineering for a number of years. When I launched the LBO for Corsain and I went to see the BNP bank, the person I spoke to told me that he had taken my classes, and he asked me 'In your opinion, how do you think we should proceed with this operation?' If I had not come across this person, I would have probably discussed in vain with someone else for several weeks and in the end, Lafarge would have bought the company.

The 5% of success due to work also counts, and it is true that we are particularly good with regard to financial questions. When we bought Mäder in Zürich, our bankers never quite understood how we managed it, but it worked out very well and in strict accordance with the law. Having said that, it is also possible to find people with good financial knowledge outside the company.

What is most important for external growth is to give one's co-workers the pride of being members of a group which is growing, and which is the 'pilot fish' of its ecosystem. To achieve this, one must have a clear strategy and keep it up to date regularly. One must also be able to reorganise oneself constantly. We went from an organisation in the shape of a pyramid to a matrix organisation, then back to a pyramid system, and now we have changed the system again.

When we bought Mäder in Zurich, we imposed our organisational system (which was then in the form of a matrix) on all our new subsidiaries. Two years later, we realised that this was not working in Zurich. One of my executives explained 'The only principle which works here is the *Führerprinzip*.' We re-established a pyramid system and our problems were solved.

Constantly making new acquisitions facilitates the integration of subsidiaries. When you buy a new company, the one you have bought just before sees itself as 'old' and identifies more easily with the group.

Articulating research and marketing

Q.: *Can your success also be explained by the close link you have forged between marketing and research?*

A. M.: Yes it can. I would even say that when one has a good research department and good marketing then one needs salespeople less! Prospective marketing which predicts what sort of products we need in the long term plays a fundamental role. In 2000, when I decided to pin my hopes on ultraviolet technology, everyone thought I was crazy. Today, this technology represents 40 million Euros in turnover.

Q.: *In fact it was you who made the link between marketing and research. It is almost the same configuration as that implemented by Paul Rivier at Tefal. Every month, he brought his marketing and research teams together and managed to make them discuss matters together because he was directly involved in both these areas.*

A. M.: The new organisation which was put in place in Mäder last September includes a new job in 'prospective marketing, innovation and R&D' with, importantly, the aim to give the responsibility for these two functions to one person. My wife, who is president of the board of directors, is making sure that this remains the case. She had a fundamental role in setting up the group. Without her, things would not have happened the way they have.

Q.: *You have a PhD in physics and you are a financial analyst. You combine curiosity with technical virtuosity. These characteristics are not very common.*

A. M.: In the long term, I think that my youngest son might be able to replace me in this role because he thinks and works in the same way as I do. He is currently working at Mäder Recherche and I am told he is a 'carbon copy' of me.

The proportion of R&D

Q.: *How did you fix the proportion of turnover you wanted to devote to R&D at 10%?*

A. M.: When I bought Corsain, I saw that the researchers and salespeople were constantly fighting. Some said 'We make great products, but you do not know how to sell them', and others said 'Your new products are not perfect, they are unsellable'. I discovered that in order to calm things down there should be 2.5 more researchers than salespeople. This was how we got to the figure of 10%. Today this rate has been slightly reduced. R&D probably accounts for 8 or 9% of our turnover.

Q.: *Your story has been fascinating to hear, but it cannot be that easy to be in charge of an R&D portfolio which was 'on hold' for seventeen years! How did you manage?*

A. M.: In my talk, I did not mention the numerous failures or the anxiety they caused. Of course, we failed much more often than we succeeded! But each time, we tried to learn from our mistakes, and from time to time we had some nice surprises.

On one occasion we invented a molecule which produces an ultra-wide dispersion on silica or calcium carbonate. We did not achieve what we had wanted to, but six months later, as a result of a test tube which had been forgotten in the laboratory, we noticed that one of the suspensions had remained stable throughout the whole time. This discovery was extremely useful to us.

Relations with subsidiaries

Q.: *What degree of autonomy do local directors have?*

A. M.: A federation of companies is always more flexible than a very centralised and procedural system. However, this model is more easily accepted by the family shareholders than by the financial investors.

We try to find the best situation thanks to organisational seminars and other ways which already exist in the group, and this creates some ties and a degree of homogeneity. They include ERP (Enterprise Resource Planning), software which updates information every day about toxicological regulations relative to each country, and software which helps in chemical formulations. Furthermore, we have to keep daily, detailed laboratory notebooks which enable us to demonstrate, if necessary, the nature of our formulas created in the past, and to provide proof if we need to claim authorship. These notebooks have been scanned so they can be consulted throughout all the group's laboratories. This also creates ties.

Q.: *Are the subsidiaries 'taxed' in order to finance the group's research?*

A. M.: Yes, they pay a percentage of their turnover, and they have to buy licenses when patents are registered. Of course, this measure creates tensions, but at least it encourages the subsidiaries to use the group's new technologies.

I remember that one time we installed some software on just one computer because everyone said that it was useless. However, after some time, a queue started forming in front of the computer of people wanting to use it…

Mobilising existing companies

Q.: *In the United States, a small company which devises a truly innovative project can easily find money to grow very quickly. In France, the financiers of a start-up are often unable to do as much. Is this a problem for the success of the Verem programme?*

A. M.: This is what encourages us to mobilise existing industrialists who have more resources than start-ups. Alstom, for example, is very interested in Mäder's method of producing composites with ultraviolet. The prototype will be built by a local company which makes special machines, and Alstom will then be able to create jobs.

Similarly Roquette is thinking about producing agro-based unsaturated polyesters. Nowadays all unsaturated polyesters are fossil fuel-based and have not been made in France for a very long time. Yet they represent a market of one million tonnes per year in France alone. With the joint efforts of the IFMAS and the P.I.V.E.R.T. ITE, we should be able to design unsaturated polyesters which are entirely agro-based and which will be made in the region.

Why France?

Q.: *Can you tell us what made you want to come to live in France despite the fact that you grew up in Spain?*

A. M.: My mother is French, and when I was born she did not speak Spanish yet. So I learned to speak French before Spanish. Having graduated from the École Centrale in Spain, I continued my studies in France at the *Institut supérieur des matériaux et de la construction mécanique* (Higher Institute of Materials and Mechanical Construction). Then I went to live in Lille which once belonged to my Spanish ancestors five centuries ago at the time of Charles V.

Presentation of the speaker

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