

De Casteljau's autobiography: My time at Citroën

Paul de Faget de Casteljau

My first contact with Citroën had nothing in common with an entry accompanied by a brass band, so there is absolutely no reason to brag about it. My vague scientific recollection had turned into a faint blur in Algeria, and the advertisement of a job vacancy, for which I was foolhardy enough to apply for, described individuals who resembled everything else which I was not myself. When Monsieur Baron introduced me to Monsieur de la Boixière, I recognised the extent of my incompetence and came to the realisation that I was just the opposite of the man he was looking for—feeling exactly as though I was suffering from a hangover of too much alcohol. What kind of a double Dutch sounding language was this about small vectors, rhythms, stepper motors, about moulded and smelted pieces? And it was only with a totally bad conscience that I let him believe that I could be of any use to him, seeing only the beginning of possibly having overbid myself after I had accepted the position.

Monsieur de la Boixière united in his personality the temper of a bold corsair with an unyielding royalist. When I was finally, as an employee, allowed to visit the Holy of Holies, I was overcome by an attack of dizziness. Everything, absolutely everything at Citroën was put together, for instance a pneumatic punched tape reader device, a pneumatically operated stepper motor, switching cabinets crowned by their 6 mercury vapour thyratrons, a huge model, 1 kilowatt, 1 litre, and other decoding devices, without forgetting that much venerated device which was a speed limiter operated by ignition interruption, while connected to a tape recorder with continuously acoustic adaptable speed regulation. (...) Where had I ended up?

Specialists admitted that all electrical, electronic and mechanical problems had more or less been solved. All—except for one single formality which made up for 5%, but certainly not for 20% of the problem; in other words, how to express component parts by equations. I was assigned with the task to find a solution within three months—before obtaining admission to participate in the much more serious work of the study and research department. These three months lasted for more than thirty years!

Here I came across ÑAQUA (phonetic writing of *il n'y a qu'à* [you only have to ...] corresponds to the English “it is easy”, the translator) for the first time, that magic word which I never knew how to spell it correctly, undoubtedly of Spanish or American–Indian origin viewing the tilde on top of the letter “n”. This had resisted all preceding attempts, and our slightly disappointed royalist sought his last refuge in a prayer to our Lord in order

to beseech to send him a “mathematician”. The answer of the Lord must have been more or less the following: “I might have what you need, but I am not quite sure whether I will make you happy with it!”

It was just hard luck that I had introduced myself as a physicist in order not to become a victim of that premature mental deterioration in which every mathematician goes down. For this reason Citroën was presented to me as heaven on earth. I set out to work, if you can call it work—for honestly speaking: what was I going to do here?

The irrefutable principle of every piece was the design drawing—no question about it to change it only slightly. And there was a rumour going round that a university degree was not, compared to good practical workshop experience, a fruitful investment for a man of my age. What is the use of the command of differential equations if according to Monsieur de la Boixière 99% of the work does not exceed the level of the rule of three. My situation became even worse by the fact that I as the only person who did not have the right to fall back upon the magic force of the *ÑACA*, this fundamental element of all research being worthy of this name.

As it is, a lot of people who are “*researching*” can be found in France. And people are still *looking for* someone who can find—that is how a research scientist of the Institute Pasteur once formulated it. (Play on words with the French verb *chercher*, meaning both *to research* and *to look for*, the translator.)

And shamelessly, many epic stories were spread consecrated to my short-lived notoriety, and at the same time they would crown the inevitable failure of my attempts and confirm my total incapability. Even a friend of mine, whom I still appreciate very much, once said to me: “Smash in your own face alright, so that you will never do such a thing again”.

The construction plans presented to me were often the ones nobody else was able to put into practice. They were peppered with characteristics which contradicted any kind of mathematics: three non-coplanar tangents for determining the tangent plane in one point, only virtually visible contours, and many a thing more. As a result I was soon greeted with a sonorous “The plans are wrong” instead of a “Good morning” in all the places where I dared to enter.

What could be done with these bloody moulded and smelted pieces which resisted every serious manufacturing? All the more that 0.1% of one piece, for instance a small triple link, could make up for 99.9% of all calculations.

Therefore the idea began to stir in my mind to go through the car body forms mathematically. I was inspired by the courtesy visits of Monsieur Fumey from Franche-Comté, he being a coachbuilder himself, who lost a leg in the trenches of World War I. It was either absolute thoughtlessness, in order not to call it madness, or else a phenomenal trick. Nobody could tell for sure, and I myself was even less sure than all the others.

It is only too true that there is *rosserie* in the French word *carrosserie*, standing for car body (*rosserie* meaning nastiness)! “If we cannot manufacture the pieces according to the construction plans, the whole effort is of no use”, exaggerated Monsieur de la Boixière and added: “We can discuss about ‘*thingoids*’ of the *n*th degree and are still unable to cope with rectangles and circles!”

It had to be done quickly. The entire department acted in secret complicity, extremely happy to hold out against Monsieur de la Boixière. Shortly after, on a particularly stormy afternoon, *Olivetti Tetractys* transformed an entire role of paper into approximately forty

cubic curves, while making a deafening noise. This was bordering on the limits of patience of the neighbouring engineers—they looked for jobs elsewhere.

“This will be a wonderful passing fancy of cubic curves”, lashed Monsieur de la Boixière out at me. Before he slammed the door, I still had the time to retort brazenly: “This time it won’t be you presenting this piece, but me!” As I was leaving the site in the evening and reached the *Quai de Javel*, I saw black and red figures everywhere performing their dances before my eyes. The piece in question of the size of a postal stamp was by no means a success, however resistance became increasingly weaker. When I was harping on the words polynomial, polar forms, interpolation, he clung himself to the idea which he baptised with the name “the pole”, and added: “If *polytechnicians* are needed to determine the pole, then the whole business is useless”. In order to prove to him that we could do without them, we produced the piece once more. We went in search for work “slaves” to produce the bonnet of the car 2CV with their help; under the supervision of Monsieur Vercelli, head of the department *Détermination Mathématique des Carrosseries*, it turned into a flying saucer. As culmination the dashboard—the nightmare of every coachbuilder—and finally the entire car covering (silhouette) of GS were produced by builders whose names were not conserved by history. (This indeed took place to counter the demands of the wood modellers.) (The wood modellers were on strike at the time when de Casteljau had the chance to transform his theory of *formes à pôles*. This explains the rush mentioned afore as well as the sneering remarks coming up soon in the text, the translator.)

The sneering remarks changed sides. While the workshop employees were contemplating the meaning of politeness anew, the supervisors followed in their footsteps: “These poles are so simple that anyone could have invented them!” This was confirmed by my speciality to demonstrate something in ten lines for which others filled sixty pages. At that time it became clear to me that the faults for which my professors reproached me, turned into much feared qualities. My refusing to adopt certain disciplines was interpreted as laziness. However it was nothing but some kind of a rejection of sterile knowledge. On assessing my homework Pham Tinh Quat even went as far as to say the following: “O well, it is actually nothing but a summarised crib”. The truth was that by doing so he described theories which immediately reached the core of a fact and cut out all which was superfluous. If you load a donkey, he will then stubbornly refuse to go on, if it is of the opinion that the luggage is not fastened right. But in the mountains where the horse with its luggage falls into the ravine, the donkey is able to pass and arrives safely. What do you think, which animal is more intelligent? The horse that submits itself to the mentally superior human being, or the donkey superbly ignored by the arrogant humans, but whose stubbornness prevents a catastrophe?

In addition to this, there was the sentence: “Whoever thinks of himself as belonging to the first ones, shall be among the last ones in the end”. These words reminded me of something a student incessantly repeated to us during the first year of a special course in mathematics at school: “Je suis celui qui je suis celui qui essuie la sue!” (I am the one following the one who wipes the sweat off himself, the translator.)

“Flattery makes you drowsy, hostility makes you strong, but there is nothing worse than indifference”, Monsieur de la Boixière used to say. Fortunately there were only very few flatterers at Citroën!

We even had a fool to divert the mathematicians after a day's hard work. And what a face Monsieur de la Boixière made, when the fool got a pile of cardboard cases on our request which was transformed into wonderful polyhedra by our expert's hands. From this day on our fool was called Monsieur "Chemise" (case made of cardboard), an anchor of which Monsieur de la Boixière immediately made use. He only used to mumble "Monsieur Q", the first letter of the last occupant's name of our office, who, tapping with his fingers on the table, confirmed receipt of the message.

From that time on everything went fast. The American TABCYL (boneshakers) arrived. All people knew that the "y" was pronounced like a French "u", quite unpronounceable for a Latin tongue. For them it sounded like the letter "i", just like for our teacher of the second preparation year for the Grande Ecole, Ghouti Benmerah, who used to mix up letters within some words, when he would lash out against us: "You look all as though you were totally *focused!*" The end part CYL originated from the Greek *kulindros*, spelt with a "k" like our new boss Monsieur Krautter, to put it more clearly with a *kappa*, which then also allowed beside $\tilde{N}ACA$ the $\tilde{N}ACAPPA$ (*(il) n'y a qu'à pas* meaning "it is not that easy", the translator).

Moreover, what *baraka* (meaning "luck" in North-African French), complex conjugates \overline{K} could now be channeled underneath the surface of the water of the complex plane. That \overline{K} might possibly be derived from the Provençal distorted form *gabare* (from the Greek word *garàbos*). It was just a piece of cake to proceed to the quaternions from there on. The only problem which remained to be solved by my supervisors was the following: "How can a donkey be taught to obey?" The ageing donkey was soon passed on to its last master, identified in an English dictionary as a grain of sand, loose chipping The master decided to have me transferred as an old piece of furniture, which I had become in the mean time, into the museum. I was able to escape from it in the end—with the threat of being stored away in the attic or in the scrap yard!

My stay at Citroën was not only an adventure for me, but also an adventure for Citroën. And I once more want to thank all those who have played along—sometimes involuntarily.

Once again, thanks!

Paul de Faget de Casteljau