Logical Autobiography 50

Jean-Yves Beziau

Abstract. After describing my family background and interest for mathematics and philosophy at school, I explain how I became interested in logic when studying at the university in Paris. I describe how I discovered the work of Newton da Costa on paraconsistent logic, how I met him in Paris and then go to do research in Brazil, Poland and USA before defending a PhD on universal logic at the department of mathematics of the University of Paris 7 and a PhD on logical truth at the department of philosophy of the University of São Paulo. I relate my postdoctoral years in Rio de Janeiro and Stanford and how I settled down for a couple of years in Neuchâtel, Switzerland, organizing the first world congress on universal logic in Montreux and launching a journal and book series on this topic. I tell how I came back to the land of the future, starting more editorial projects, organizing logic events around the world (Paris, Beirut, Vatican, Lisbon, etc.) and going on developing research related to all aspects of logic (mathematical, philosophical, semiotical, historical). I finish by a short overview of my future projects, supported by a list of potential papers and books following a complete list of my writings up to now.

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A designer knows he has achieved perfection
not when there is nothing left to add,
but when there is nothing left to take away.
Antoine de Saint-Exupéry

Contents

1. Why an Autobiography?

I[1] see two good reasons to write an autobiography: on the one hand, to reflect on and become more conscious of what we have done; and on the other hand, to inspire and provide guidance and advice to others. I have read a few autobiographies which were very useful to me. Let me give two important examples: *Confessions* [41] by Jean-Jacques Rousseau, and *I Want to be a Mathematician: An Automathography* [22] by Paul Halmos.

I read *Confessions - Part I* when I was a teenager and it continues to have a strong influence on me to this day. I don't know much about Rousseau's philosophy and this is the only book by him that I have read in its entirety. I feel close to Rousseau because I have been connected to several places where he lived: Geneva, Annecy, Neuchâtel. But this is only one aspect. This geographical connection is not necessarily an emotional one—it is more as if he were there, part of the landscape. In fact I don't feel a special affinity with Rousseau's personality; my own personality is perhaps closer to that of his rival, Voltaire. But I was much impressed by the way Rousseau conducted his life, always innovating, thinking about all kinds of topics while traveling by foot through Europe.

Paul Halmos's autobiography is quite different, since it is pretty much restricted to his intellectual life. As with Rousseau, I don't feel a real affinity with Halmos's personality. But what I like is that he was not just a follower, and that he had many interesting ideas regarding both his main area of specialization, mathematical logic, and the way he conducted his academic life. He not only gives a lot of useful tips, but also reflects on the activity of the mathematician, worthy of a thousand papers in the philosophy of mathematics. A typical controversial remark by Halmos is: "The best notation is no notation; whenever it is possible to avoid the use of a complicated alphabetic apparatus, avoid it. A good attitude to the preparation of written mathematical exposition is to pretend that it is spoken. Pretend that you are explaining the subject to a friend on a long walk in the woods, with no paper available; fall back on symbolism only when it is really necessary." ([23], §15. Resist symbols.) I like that, although I don't necessarily agree with it, since I believe in the power of (non-trivial) symbolism—cf. my recent book *La Pointure du Symbole* (2014).

Of similar interest to me is Gian-Carlo Rota's *Indiscrete thoughts* [39] with its remarks about teaching, publishing, lecturing, accurate testimonies and provocative ideas about the relation between logic, mathematics and philosophy—including his essay "The pernicious influence of mathematics upon philosophy". I enjoyed also very much Suppes's "Intellectual autobiography, Part I, 1922-1978" [49] and *The Part and The Whole* by Werner Heisenberg [24]. Other autobiographical works I have read only in part are also very interesting, like André Weil's *The Apprenticeship of a Mathematician* [50], Alexander Grothendieck's *Récoltes et Semailles*

[1]Many tanks to Robert Purdy, Patricia McCaslin and Damien Bureau for proofreading this paper.

[19], Lévi-Strauss's *Tristes tropiques* [30], and Carl Jung's *Memories, Dreams, Reflections* [26].

Regarding consciousness, it is very important to write an autobiography especially when this is not a final autobiography at the end of life, because this is a reflection not only about the past, but also about the present and the future. In this sense I think it is worth to write different autobiographies at different stages of our life. I wrote one in 2000, when I was 35 years hold. It is called "From paraconsistent logic to universal logic" (2000). It was a couple of years after my two PhDs, one in mathematical logic at the university Paris 7 in 1995 and one in philosophical logic at the University of São Paulo in 1996. At this stage I was starting to develop a full research program but didn't have a permanent position—I was a visiting scholar at Stanford University. I had no precise idea about how I could or would be able to do that. But shortly after that I got a position in Switzerland for a couple of years and was able to implement my research activities. The above autobiographical paper is a 30 page paper about the period 1990-2000 in which I explain in details how I started to develop the idea of universal logic. It is complemented by a paper I wrote this year: "The relativity and universality of logic" (2014). I will not repeat here the details of the development of my research project on universal logic, nor those of my project on the square of opposition that I have described in "The new rising of the square of opposition" (2012).

In the present paper I will give a general vision of my life up to now, with more personal elements, although it is mainly an intellectual autobiography. I have tried to write something of interest not only for people working in a particular area of research. This paper can be of interest for people working in areas related to the work I have conducted concerned with logic, mathematics, philosophy, computer science, semiotics. But I hope it can also be of interest for people working in any area of research.

2. Youth and Adolescence (1965-1983)

2.1. Birth and Family

I was born Januray 15, 1965 in the city of Orléans, France, the last of a family of five children. My parents had previously given birth to four girls: Hélène (1954), Elizabeth (1956), Pascale (1958), Françoise (1963). Orléans is a quite famous town, about 130 km South-West of Paris, associated in particular with Joan of Arc nicknamed *The Maid of Orléans*. I was born in a hospital just near her famous statue. Orléans is connected to the French royal family d'Orléans, itself linked to the American city *New Orleans*, orginally *La Nouvelle Orléans*. I lived only two years in the region of Orléans. I am not of a definite origin. My father is from the West of France, my mother was born in Casablanca, Morocco and we have never really settled down somewhere, a place to which I can say I belong to.

My father, Jacques Béziau, was born in 1929 in La Guichère, a small village in the west of France, close to the Atlantic Ocean, near the boundary between

Brittany and Vendée. The family name Béziau is from this region. There is a place called *La Bézilière* close to my father's birthplace. It is not a common name in France.[2] This is one of the most Catholic regions of France. During the French revolution, the people there were supporting the King of France. The counter-revolutionary Catholic army of Vendée was directed by François Athanase Charette de la Contrie who had at some point restructured his army in *La Bézilière*. Charette was shot and is considered a hero in this region. He was admired by Napoleon, who, when taking power over the revolution, stopped the anti-Catholic frenzy and for this reason is cherished in the Vendée area. My father's aunt, Adèle, entered the Catholic Church as a nun. And my father's brother became a priest: he was one of the worker-priests—a missionary initiative by the French Catholic Church. However my father himself, and my grandfather, were rather critical of this Church.

My grandfather, Vincent, had a strong personality. Being a tough guy he was sent for three years of military service during the 1920s in the Middle East, in the region which is now divided in the countries of Lebanon, Israel and Syria. Back home he married a girl who was living in Paris but coming to this region where she was from during the holidays. Her name was Alice. She was raised Avenue Foch, near Champs-Elysées, her father being a policeman. He died at an early age and Alice had to earn money when she was still a teenager—she was working with fashion at Guerlain. Meeting Vincent, who was of one of the wealthiest families of her region of origin, she married him and never lived again in Paris, although she liked very much this city and used to go there from time to time. Alice's brother was living in Paris with his wife Madeleine, he was a barber and had a hairdressing salon in rue Saint-Denis. Later in the 1980s Madeleine helped me to find a flat to rent nearby, in rue Tiquetonne. At the time I lived here, at the end of the eighties, this area was quite decadent, a mix of prostitution, clandestine workers in the Sentier (brands like Naf Naf and Kookaï were appearing), suburban gangs emerging from the *Forum des Halles*. Nearby was Beaubourg with a lot of tourists and street animators, the très chic Café Coste, the gay and Jewish quarters in the Marais, the Gothic church Saint-Eustache, the Bibliothèque Nationale (National Library), Passage Choiseul where Louis-Ferdinand Céline grew up, Port Royal, Paris Bourse, the Louvre... The heart of Paris (the 1st, 2nd, and 3rd Arrondissments) is part of my life.

My grandfather lost most of his money during the second world war doing bad transactions. My father wanted to be an airplane pilot, but due to the lack of money he was placed in a marine mechanics school in the nearby city of Nantes. Nantes has been a very important town in the history of France for marine and this was a very good school. After the end of the school my father was able to work on boats at an early age. First he was sailing on oil boats going up to Kuwait then on merchandise boats going to North-Africa. The boats were stopping in

[2]Presently there is officially no accent in my proper family name—my name is Jean-Yves Beziau—the accent having been lost through some Kafkaesque administrative process that I will not explain here. But I am happy with that, I think accents are a useless complication. One of the advantages of the English language is to have no accents or other parasites surrounding its letters.

various harbors and my father had the opportunity to visit many different places like Beirut and so on. He sometimes met his brother who as a priest was going to the harbors to help mariners no to spend in a few hours all their money with drinks and prostitutes. My father started to be fascinating by the desert and made the project to cross the Sahara by motorbike. A project that he realized. He was the first man to cross this huge desert by motorbike, a BMW. Form Morocco He went down to *Afrique noire* (Black Africa) and came to Morocco crossing one more time the desert. The German firm BMW rewarded him with a brand new engine and invited him to visit their factory in Munich. With his brother they like very much motorbikes, a passion they had inherited from their father. Unfortunately his brother died in a motorbike accident when he was 23 years old. This was an emotional shock for my father, because they were very close. The name of his brother was Yves. That is why, later, my parents gave me the name Jean-Yves.

My father met my mother in Morocco, the place he chose as a basis for his Sahara expedition. My mother was born there and they lived in this country a couple of years, my elder sister was born in Morocco, before going back to France. These were the last years before the independence of Morocco. As my father later described it to me, this was an amazing place, a mixture of Arabs, French, Jews, Berbers, Italians, Spanish and also Americans. Americans came there during the second world war; my father at some point worked in an American military base. The famous movie *Casablanca* is about this epoch. My mother was born Louise Desmeules in 1929 in Casablanca, Morocco. Her father William Desmeules was from a small town called Ropraz near Lausanne, Switzerland. William's mother had got pregnant at an early age, and William never met his father. Later his mother married another man with whom she had several children. Due to the English name she gave her first child it is suspected that William's father was of English origin. When still young, William left Switzerland for a life of adventure. He settled in Marocco where he worked at the post office and then he had a grocery. He married Marcelle Heitz, born in Oran, Algeria. Her parents were from Alsace. They were typical *Pieds-noirs* settlers having a huge farm and a big family—my grandmother had about 10 sisters and brothers. At some point her family moved from Algeria to Morocco, where she and William met. Antoine de Saint-Exupéry made an emergency landing on Marcelle's parents' farm, near Casablanca. William ran to meet the aviator; that is how he met Marcelle. Saint-Exupéry gave the family his parachute as a souvenir, and later this parachute was used to make a white dress for my mother for her communion.

One of the important connections between William and Marcelle was the protestant religion and culture. They had three daughters: Louise, Marguerite and Germaine, my mother Louise being the eldest one. My mother as a child was sent to Switzerland by boat and train through some Swiss protestant organization, crossing Europe during second world war. At the end of colonization, my grandparents went back to Switzerland, living in Lausanne, where I spent some time during the holidays when I was a child and of which I have strong memories. Their home was full of souvenirs from North-Africa and also books everywhere, of all kinds. At the

time my mother met my father she was working in a Montessori school and the plan was for her to go to Paris to study pedagogy with Jean Piaget, but she didn't go because they had their first child. Her sister Marguerite went instead and was a student of Piaget. Later Marguerite dedicated her life in France to helping people from Africa learn French so they might integrate better into society. She married Jean Dybowski, a descendant of the famous Jean Dybowski, the French colonizer in Africa of Polish origin. On this side of my family we also have a Polish connection through cousins of my mother who emigrated to Argentina and Australia and all married Polish descendants. The younger sister of my mother, Germaine, married a Swiss engineer, and they went to live, like her parents, in the region of Lausanne. Part of the family of her husband are Swiss immigrants in Brazil.

My mother was interested in education all her life; for some years she was very active in the parent-teacher association Cornec. Later in her life she worked in Geneva in a private retirement home, responsible for running its cultural activities, and for helping its residents to prepare to face death. She also helped a friend of hers who had an Atelier Arno Stern of therapeutic painting in Geneva. My mother always liked very much flowers and plants and had a strong interest in botany, she used to frequently go to the botanic garden in Geneva. She didn't like very much to travel, after leaving Morocco, she never went back there, and spent most of her life in the Genevois. At some point I did with her the trekking promenade around the four-forest cantons lake which was designated to commemorate the 700 years of the Swiss confederation in 1991. My mother liked to say that she had attended all the three Swiss national expositions that happened during her lifetime: in Zurich in 1939, in Lausanne in 1964 (when she was pregnant with me), and in Neuchâtel in 2002, when I had just returned to live there. My mother never told me what was wrong or right to do, she had the idea that children have to try and discover. My father would have liked me to become an airplane pilot but never forced me to go in that direction. He liked very much the sky and astronomy—observing the stars with telescopes—and also the sea; at one point he bought a sailboat and we used to go sailing on weekends. He didn't like TV and we never had a TV at home. But my parents liked listening to the radio and music and going to the cinema to see all kinds of movies and also attending sessions of *Connaissance du Monde* (Knowldege of the World)—a series of documentary movies about different parts of the world followed by a lecture and a discussion with the film director. They took me along with them and this opened me to the world.

2.2. Early Years—Forest and Mountain

I was born in the city of Orléans at the time my parents were living in Orléans Forest. My father had entered the ONF (Office National des Forêts)—the National Forests Office. In France most of the forests belong to the state. I don't remember quite nothing about this forest. I have seen some photos, my father liked to make photos, a passion inherited from his father. He was quite good at that, having a good knowledge of how to capture light. We were living in wild conditions at the middle of the forest, the largest in France with very old sequoias. We were in

isolation at the middle of the forest in a house of the ONF which at the beginning was without electricity and tap water. Nowadays the house is an abandoned ruin. My sisters were not going to school, my mother was educating them.

PICTURE 1
WITH MY SISTERS - IN THE MIDDLE OF ORLEANS FOREST

When I was two years old my parents moved to Cruseilles, a small town in France 25 km South of Geneva, 20 km North of Annecy. From this place I have my first memories. Working in the administration of the forest my father had the possibility to change of location every three years.[3] He asked to come to this region because he likes the mountains and it was close to the family of my mother living in Lausanne, Switzerland. Cruseilles is located in the Genevois, close to a mountain, Salève, dominating Geneva, which was administrated by my father and where we use to go. Cruseilles is also in the Savoie area (the name is related to pines, numerous in this region), formerly part of the Kingdom of Sardinia. This area became part of France only in the second part of the XIXth.

In this region there is the Mont Blanc, the highest mountain in Europe (4.800m) which is nowadays between France, Switzerland and Italy. The Mont Blanc was explored in particular by Horace-Bénédict de Saussure (1740-1799), the founder of alpinism, ancestor of the linguist Ferdinand de Saussure. When I organized the First World Congress and School on Universal Logic in Montreux in 2005, by lake Geneva, Kripke told me that he was happy to see the Mont Blanc from his hotel room at the time he was writing a paper for a book commemorating 100 years of Bertrand Russell's paper "On denoting". This mountain is part

[3]At the end of his carrier he was working in the French Caraibe, responsible for the natural park surrounding the volcano *La Grande Soufrière* in the Guadeloupe island. I visited him there and had the opportunity to dive in Jacques Cousteau's underwater reserve–one of the most spectacular dive site in the world.

of a correspondence between Russell and Frege. Russell wrote to Frege on December 12, 1904: "I believe that in spite of all its snowfields Mont Blanc itself is a component part of what is actually asserted in 'Mont Blanc is more than 4,000 metres high'." But this was not the idea of Frege, replying to Russell on December 13, 1904: "Mont Blanc with its snowfields is not itself a component part of the thought that Mont Blanc is more than 4,000 metres high" [16]. When I was in my twenties I did the tour of Mont Blanc with my sister Françoise. It is a spectacular trekking promenade of about 200 km circling the mountain going up (to 3,000 m) and down to villages in three countries, attracting many people from all over the world. When we were living in Cruseilles, I started to do mountain trekking and skiing at a young age.

Cruseilles was in a booming region. Winter sports were flourishing and the nearby city of Annecy is charming, on the banks of a very nice lake. Local people are good in business, this is the place of origin of Carrefour today one of the largest retail group in the world. I have known since my youth the Carrefour hypermarket in Annecy and also the original shop of Fournier, the founder of the group. In Cruseilles we had a big ONF chalet, the furnitures where in woods produced by my father. Cruseilles is the place I started to go to school. My first contact with school was to pass an exam to skip the first year. I remember a personal interview during which I had to answer some questions. When I arrived at school I already knew how to read and write; I had learned at home with my mother. My sisters liked to read me some tales and I also soon started to read some, we had plenty of tales book at home. It made me strong impression and much developed my imagination. I was also listening to some music. My father and sisters went to attend a show of Los Calchakis in Geneva playing music from the Andes and came back with their disc that I like it very much. I also liked another panpipe music, completely different—Romanian music promoted by Gheorghe Zamfir, turned famous in the world by the Swiss musical explorer Marcel Cellier. In my twenties I attended a show by Zamfir at the Saint-Germain church in Paris mixing panpipe with organ, an idea of Cellier. At school we were listening some classical music and we had to recognized who was the composer, I was quite good at that and like in particular Russian composers: Rimsky-Korsakov, Moussorgski, Tchaikovsky, Prokoviev. Another souvenir I have is that we were still learning to write with a fountain pen and an inkpot.

PICTURE 2 — IN CRUSEILLES

My family decided to leave Cruseilles not because they didn't like the region but because my father had some problems with his supervisor. He did not agree to largely spread DDT, a very strong insecticide.[4] Since living in the forest my parents started to be concerned by the protection of nature. They also were in favour of organic food and were attracted by alternative medecine. This was at the end of the sixties, long before it became a fashion. They made strong friendship with the pharmacist of Cruseilles, completely different from Homais, the famous character of Flaubert. He was Vietnamese and initiated them to Asiatic culture and my father liked it very much, at home we incorporated a series of Asiatic behaviors. My parents were also against nuclear energy and we use to take part to meetings. This was the beginning of the hippie period, there was a very good atmosphere, relax an friendly. Although my parents were not of the traditional and conservative style, they never were hippies: having long hair, wearing strange clothes, using drugs. My father at some point smoked cigarettes, which in fact at this time were freely provided by the ONF to their officers, but he stopped with a acupuncture treatment. One of my sisters later became an acupuncturist.

France is a very rationalist country where all these things were dismissed at this time and the governement promoted lots of wrong things based on some "scientific" dogmas. This has been strongly criticized by Alexandre Grothendieck in particular in his talk about scientism, "The new universal church" [20], presented in 1972 for Russell's centenary. I was raised at this period, in a culture quite close to these ideas, but my parents never were radical in the way Grothendieck

[4]My father in his wish list for a "mutation" (transfer) put as number one Alsace and at the end of the list Corsica–He was transferred to Corsica as a kind of retaliation, a place people were afraid to go because of the harsh behaviors of Corsican against outsiders, leading sometimes to murder.

turned out to be. I discovered Grothendieck's essay much later and I think it is very interesting, a good reflexion about rationality and science, pointing out the paradoxical irrationality of some scientists. It took more tha 20 years, and quite a number of toxic deaths, before the French government took action about asbestos at the main scientific campus (Jussieu) within Paris. At the time this campus was constructed there was already warning about the danger of asbestos. During many years the authorities were negating the possible negative effects on the students and professors but at the end the campus was completely evacuated during some years to remove asbestos. The campaign against asbestos was a long fight and by some coincidence was led by mathematical logicians working on the campus, in particular my former teacher Michel Parigot—I had already gone out at this time. I spent only two years in this abestos environment.

2.3. The Age of Reason in the Island of Beauty

I lived three years in Corsica Island, from 7 to 10, important years for the development of a child. This is where I entered the age of reason and started to have real interest for mathematics. Paradoxically this happened in a mythical location where I was surrounded by a natural not say supernatural atmosphere. This had a very strong influence in my life which is lasting up to now. Corsica is incredible from a geographical point of view. In French it is known as *Ile de Beauté* which means *Island of Beauty*. It is a mixture of mountains (the highest, Monte Cinto with permanent snow) and sea, a lot of contrasts in a very small area. Nowadays 3 millions of tourists visit Corsica per year, mainly in the summer, an island inhabited by 300 000 habitants. Despite tourism, the island is preserved due to the fact that Corsicans resist invasion, in particular don't let foreigners to settle and/or buy houses, to construct buildings.

During the first half of our stay in Corsica we were living in an isolated house at the middle of the island in the mountains, near the river Golo, it was called Onia. It was a wild place and the nature was very impressive, in particular there were many different kinds of mushrooms. I walked a lot around our house in the nature alone or with a tiger cat we had called Popolasca, after the name of the mountains of this area. The school was about 3 km in Ponte Castirla and I was going there by bicycle with my sister Françoise. This was an elementary school with very few children. For this reason we were all in the same class and room. What I remember from this time is that for the recitation exercise we were able to choose the poetries we wanted to declaim. I liked La Fontaine and to choose the longest fables to push to the limit my memory capacities. Corsica was at the same time wild and protected from globalization, but connected to the whole world, since there are Corsicans in many parts of the world and they always come back to their island. Our teacher at school was a Corsican lady who had lived several years in China. My sisters were listening to music of this time, early seventies. Two pieces of music impressed me. One was *Slag solution* by Joe Buffalo's band and the other one was *Ouverture to the sun* by Sunforest, incorporated in the soundtrack of Kurbick's movie *A Clockword Orange*. My sister Hélène was painting and I did

my first painting under her supervision. I liked to paint Corsican villages in the mountains, and boats on the sea.

The island was attracting hippies and adventurous people. My father used to take hitchickers on board of his car and sometimes invited them in our house. My parents had many friends and we were going to their houses. I remember especially two Canadian families from Québec. One living in the convent of Omessa–we were sleeping in the cells, and another one living in a small village in Cap Corse, which was completely abandoned, with houses with door open and still full of furnitures and things. I have a rare exemplary of the *Pensées* by Blaise Pascal we found in this village. My father was in charge of a big part of the Corsican forest and we were traveling all around the island. The atmosphere of the ONF was quite good and there was the tradition of méchoui convivial parties (barbecued whole lamb) imported from North-Africa—at some point the Sultan of Morocco Mohammed V had been exiled to Corsica with his family.

PICTURE 3
IN CORSICA - WITH MY SISTERS FRANCOISE AND HELENE

At school we were learning the history and geography of Corsica. The teachings was in French but all the local children had Corsican as their mother tongue. Corsica is known because this is the place where Napoleon Bonaparte was born, the first French Emperor, and one of the most famous politician in the history of humanity. His nephew Napoleon III was the second and last emperor of France. The writer Prosper Mérimée was part of Bonaparte's circle, a good friend in particular of the Empress Eugenia, wife of Napoleon III. He made Corsica famous through his novel, *Colomba*. Mérimée is also the author of the novel *Carmen*, a story which became famous through Bizet's opera based on it. Napoleon although supposedly a real Corsican is not very popular in Corsica because the Corsicans

were fighting from independence. The island had been invaded and dominated along the years by foreigners. Pasquale Paoli (1725-1807) succeeded to create a Corsican republic from 1755-1769, based on a constitution which is considered as the first constitution of the modern world, probably the first constitution in the history allowing women's suffrage. Jean-Jacques Rousseau was supporting Corsicans and was asked by the Corsicans to work on a constitution— see [42]. Corsican constitution has inspired the United States constitution. In the USA five towns are called Paoli remembering the Corsican politician. Paoli also created an University in Corte in 1765, the historical capital of Corsica, town where we were living in the second part of our stay. May 8-9, 1769 Corsicans lost the battle against French troups at *Ponte novu* and up to now Corsica is part of France. Napoleon was born August 15, 1769 in Ajaccio, but he was conceived in Corte where his father was attending the university. Napoleon strongly contributed to the incorporation of Corsica within the French empire he himself developed.

The University of Corte was closed in 1768 and only reopened in 1981 under the name *Università di Corsica Pasquale Paoli*. I remember that at the time we were living in Corte the reopening of this university was a main issue for Corsicans. Many years later in 2010 I had the possibility to organize the 2nd Word Congress on the Square of Opposition at this university with the help of my friend Pierre Simonnet who was working at the computer science department. We had the participation of Damian Niwiński from Warsaw University, Editor-in-Chief of *Fundamenta Informaticae*, and of the famous mathematician Pierre Cartier, one of the most active members of the second generation of Bourbaki and a close friend of Grothendieck. Cartier likes very much Corsica in particular because he spent there his honeymoon. During the event we filmed Cartier telling in details his meeting with Gödel in his house in Princeton in the fifties. It was in Corte that I encountered modern mathematics, not at school but through some booklets by Georges Papy that my mother gave me. Pappy (1920–2011) was a Belgian mathematician, a great promoter of modern mathematics for young children but also to a wider audience. His booklets were full of pictures and it was indicated that the age of the readers may vary between 7 to 77. These booklets present many important results about set-theory and infinity, like the one-to-one correspondence between the natural numbers and a proper subset, Cantor–Schroeder–Bernstein's theorem, etc.

In Corte I was reading a lot of books—we were living next door to a library. At this moment was released the comic book *Astérix in Corsica* by Goscinny and Uderzo. I read many other comic books by Goscinny, my favorite being the series *Iznogood* (a joint work with Tabary producing the pictures) and I liked also *Le Petit Nicolas* he produced with Sempé. René Goscinny is of Polish-Jewish origin and spent his youth in Buenos Aires. He is a very talented and imaginative writer who had a strong influence in France, rivaled only by the Belgian cartoonist Hergé with his famous *Tintin*, also excellent. By contrast to Goscinny, Hergé was pro-Nazi and it has been claimed that Tintin's dog, Milou, was inspired by Hitler's

dog. This is certainly not the case with Astérix's dog Idéfix (Dogmatix in English–Goscinny was very good at wordplays, most of them simply untranslatable), who is known to cry when a tree is cut. I was also walking around the city by the rivers Restonica and Tavignano. The atmosphere at elementary school was very good, the students were smart and friendly, the girls beautiful. I enjoyed the exercises we had to do—inventing stories inspired by music we listened to while writing. At this time I was always number one at school without any special effort.

2.4. Thorens Glières and Annecy

We left Corsica in 1975 and came back to Haute-Savoie, to a small village called Thorens Glières. This is the place where Saint François de Sales (1567–1622) was born. He was the bishop of Geneva and is the author of *Introduction to the Devout Life*. We were living in an ONF house a few meters from the chapel and the castle related to his family. In this castle Napoleon III met the count of Cavour, minister of the Kingdom of Sardinia, to discuss the affiliation of the Savoie area within France, which was formalized in the Treaty of Turin in 1860 according to which the County of Nice also became part of France. The region was full of forests and mountains. I did a lot of hiking, skiing and bicycling. In the mountains there was a national park my father was taking care of which was accessible only by climbing and there were some refuges where people from the ONF and their family and friends were allowed to stay for a couple of days. My father participated in the re-introduction of several disappeared species of animals and this park was also known for Western capercaillies—specialists were going there to study their behaviors. I took part in observations of these birds.

For several years, as I was arriving from Corsica, my nickname was Napoleon, or Napo for short, or Bonaparte. For four years I attended a middle school in the nearby village of Groisy. I didn't much like the atmosphere at that school, and I didn't get very good marks, except in mathematics, and in "la composition française"—exercises in imagining things and then writing essays about them. The mathematics classes were strongly in the spirit of modern mathematics. We were taught abstract algebra, and the exams were much more directed toward proof than calculation. I was able to solve the most difficult questions. At this time mathematics saved me, because in France it was considered the number one discipline, absolute proof of intelligence. Also I got good results on IQ tests. At that time it was a popular practice to administer IQ tests in schools, and your IQ was taken into account when determining what track your further education would follow.

I started to read a lot of science fiction books, classics by Isaac Asimov, van Vogt (who I later learned was a follower of Korzybski, a promoter of non-Aristotelian logic), Philip José Farmer, Philip K. Dick. This gave me a lot of inspiration. The writings of Asimov about robots have a quite interesting logical

aspect, and Asimov is thought to have anticipated the idea of Wikipedia.[5] My favorite author turned out to be Fredric Brown; I liked his style, sense of humour, ability for ingenious plot, incredible imagination and psychological subtlety. Before he started writing science fiction, Brown wrote crime stories—*The Far Cry* is my favorite. He was also much influenced by Lewis Carroll who I also read at this time.

Our neighbor was a colleague of my father, about 30 years old, and he liked to play chess. I started to play chess, and after a couple of weeks I was able to win against him. I liked very much this game. For me it was connected to reasoning. Before I had a math exam, I thought it was good to play a game to fortify my mind. At this time I was also listening to all kinds of music. I liked singers like Eddie Cochran, Leonard Cohen, Peter Gabriel and bands like the Beatles, Pink Floyd, Deep Purple, King Crimson, Genesis. Then appeared disco music with Cerrone, Boney M and punk music with Sex Pistols, Clash, Ramones, etc. I started to play music, composing different pieces. I began also through my father, who has always been interested in cars, a passion inherited from his father, to take an interest in car racing, in particular Formula 1—my father had worked for Ferrari in Morocco and had met Ascari. My favorite driver was Niki Lauda.

After middle school I went to the nearest high school, which was in Annecy, about 20 km from Thorens Glières: the Lycée Gabriel Fauré, bearing the name of a famous French musician. I had to go by bus, and it was quite slow because the bus stopped in many villages along the way, and during the winter there was lots of snow, so we went very slowly. I would wake up at 6 in the morning and come back home at 7 in the evening. All this had a negative effect on my schooling; I had to repeat my first year of high school. But this was also related to a general teenage feeling of dissatisfaction. I went to Paris for the first time and stayed with my sister Hélène who was living there. Paris made a very strong impression on me. I wanted to be independent and even thought of quitting school.

At some point there was in Annecy a competitive exam to enter the Post Office to be a postman and I decided to be a candidate. I had a positive idea of the Post Office since this was related with my grandfather William and Saint-Exupéry who had worked for the famous postal line from Europe to Chile—I had a collection of stamps. Also I knew that Gaston Bachelard had been a postmaster, so it seemed to me that this kind of work was not incompatible with the intellectual life. I had sympathy for Bachelard, also influenced by Korzybski's non-Aristotelian logic. Later, when I was a student at the Sorbonne, Bachelard's daughter Suzanne was one of my professors. She was giving a class on the *Dioptric* of Descartes. She was criticizing Descartes, although she liked him, laughing in a funny way at him. I didn't become a postman because I failed the Post Office exam—strangely enough because of mathematics. The general exam was not very difficult. We had to know

[5]Although Asimov may have anticipated Wikipedia, no science fiction writers did anticipate personal computers and the web, two fundamental components of our present world. Reality is always more surprising than fiction.

lots about geography and I was good at that, and we had to write a composition française, which was also easy for me. Then there was a mathematics test, which was a rule-of-three problem. But due to my modern mathematical training, I had very little exposure to such questions, and I did not succeed in solving it. Modern math again saved my life.

I therefore had to continue on with high school, and prepare for my "Baccalauréat". The situation improved because I moved to Annecy and I found a nice girlfriend. At first I shared a flat with my sister Françoise and her boyfriend, but soon I was living on my own. This was in 1981. I was 16 years old, living alone, and I never went back to living at home. And for many years, up to 2002, I was without any kind of longer-term "home base", changing addresses nearly every year and sometimes living in hotels. Later Pat Suppes would tell me I was like Kreisel, a good friend of his but opposite in personality to him, since Kreisel moved around a lot while Suppes had been living at the same address on the Stanford campus since the 1950s. Kreisel has been pivotal for the development of logic in France. In the 1960s under his influence a school of mathematical logic started up in France. Jean-Louis Krivine and Jean-Yves Girard were taught by him. Krivine and Girard have both been teachers of mine, so in some way I have benefited from Kreisel spreading of logic in the world. But I must say I have never been much attracted by Kreisel's style, personality, directions of work in logic–a "Tarskian dissident", as depicted by Sol Feferman (see [14]). I have always felt close to Alfred Tarski. But Kreisel is surely an interesting character. He was a good friend of Raymond Queneau, one of my favorite writers, and had many interests in life. Even if there is an apparent similarity between me and Kreisel from the point of view of nomadic versus sedentary person, there is a strong difference in the sense that Kreisel was a rich man. In my case, nomadism has been related most of the time to living in a precarious situation. This was not easy at all, but it was a conscious choice. I had a preference for a life of adventure. I wanted to avoid a boring everyday repetitive life. Reasoning and thinking for me are connected to this nomadism in two opposite ways: on the one hand, traveling is good for developing ideas; and on the other hand, reason makes a good defence against fear and despair, not so much in the sense that analyzing emotions by reasoning dissolves the problems, but rather that reasoning is good for the health.

Being short on cash I would take "summer jobs" during the holidays for pocket money during the school year. I had three very different kinds of jobs: one to do with apple trees, one with a security agency, and one in a cheese factory. These jobs gave me a clear idea of what I wanted NOT to do, and motivated me to go on studying. In the cheese factory I worked on a production line seven hours a day from 5:00 a.m. til noon, repetitively placing little pieces of cheese on a rail that carried them into a machine that automatically wrapped them in plastic.[6] Until doing that, I had no real idea that there were people who do this their whole life. I

[6]And I have seen the same little piece of cheese wrapped in ornamental plastic bags with different colorful brands, so that the consumer has the illusion of choosing among diversity.

had seen Chaplin's movie *Modern Times*. Watching a movie is quite different from living through the experience. I watched lots of movies because my parents had registered me in Annecy's cine club, one of the oldest in France—and in Annecy there is yearly the international festival of animation films I was also attending. I saw lots of great movies by Pasolini, Godard, Eisenstein, etc.

At Gabriel Fauré high school I had two friends, Alain and Jacques, with whom I talked about most everything and even started a music band. They were the two best students in the school. Alain was the very best. For him everything was easy, he always got top marks in all fields, i.e. 20/20, in the French system. In the last year of high school he had a philosophy teacher who was a Lacanian and who had a reputation for being very harsh, nobody understood what he was talking about and it was difficult to get a mark higher than 5/20. Alain regularly got about 15/20. For him this was the most interesting and challenging subject, exactly because it was difficult to understand. And after high school he decided to go on in this direction, he did his PhD with Jacques-Alain Miller in Paris, the main Lacanian after Lacan's death. Lacan has been strongly criticized by Sokal and Bricmont in their book *Impostures intellectuelles* translated into English as *Fashionable nonsenses* (see [48]). Most of their book is rather *argumentum ad personam*, with no serious argumentation and/or philosophical basis. In 1998 I was invited with other colleagues to take part in a debate with Sokal and Bricmont at the University of São Paulo. In my talk I criticized their "argument" about Kristeva. At some point in their book they say that she speaks about the continuum and $\aleph_1$ in the context of poetry and that this makes no sense because in literature there are only a finite number of characters or strings of characters. I said two things about that. First that it is possible to write a poem involving all the transfinite cardinals: $\aleph_0$ is a beautiful cardinal, etc. This is a poem close to the Oulipo spirit, mixing mathematics and poetry. On the other hand I told them that in Hilbertian proof theory a proof is considered as a finite string of characters but that nevertheless Gentzen proved the consistency of arithmetic using transfinite recursion up to ϵ_0. Bricmont answered me something like: "Maybe, but nevetherless Kristeva wrote a lot of nonsense". Sokal and Bricmont defend a return to the *Siècles des Lumières*—I am not sure this is very interesting. Their book gives a distorted vision of French intellectual life in the decade after the second world war, which is one of the most intellectually interesting periods. There was in particular a mixing of mathematics with other fields in a highly creative way. This was the time of structuralism. André Weil was collaborating with Claude Lévi-Strauss. Le Lionnais, co-founder of Oulipo, edited a beautiful book, *Les grand courants de la pensée mathématique* [29], including in particular Bourbaki's masterpiece *The architecture of mathematics* but also a piece by le Corbusier and much more. My other friend, Jacques, was principally interested in mathematics, and after he passed his "baccalauréat" he entered "Mathématiques supérieures" at the Lycée Berthollet, also in Annecy. I entered this school too, but in "Lettres supérieures". In France these are called "classes préparatoires", nickamed "prépa", and they are taught in high schools even though you cannot enter them until after you have

passed your "baccalauréat", which is the end exam of high school. In "prépa", students prepare for the entrance exam to the *Ecole Normale Supérieure*, considered to be the best post-secondary school in France—one dares not call it a mere "university"—and one of the best in the world.

At the time I started high school it was standard practice for students to be assigned different "tracks" according to aptitude. Since I was good at mathematics I was placed on a scientific track. I didn't like the atmosphere, particularly that 80% of my class were boys and only 20% girls, but also because we had to take physics and chemistry, which I found boring. Then I transferred to a section combining literature with mathematics, and that was fun. We had a very good literature teacher, and I started to write all kinds of things. In my "Baccalauréat" there was an oral exam on literature where we had to comment on a text chosen by the examiner from a list we had prepared. The list of texts was supposed to follow some rules, but it was allowed to include personal writings. Most students didn't, but I put quite a few of my own compositions on the list, hoping to be asked to comment on something I had written. But the examiner, a woman, asked me to comment on a poem by Arthur Rimbaud. I refused to do so, explaining that for me the whole business was absurd. The woman told me that I was wrong not to be interested in Rimbaud, that I would probably like his poetry, that I was a bit like him. In the end, I got quite a low mark for literature, and only passed my "baccalauréat" thanks to a high mark in mathematics. I always enjoyed mathematics at high school, real mathematics, based on reasoning. At some point when I was about 14 years old I had the feeling that reasoning was independent of the contents that were being reasoned about, and after that I didn't have much interest in the specific contents. I was more interested in difficult types of reasoning. Rubik's Cube was very popular at that time among students, but it never interested me; it was not the kind of difficulty that I was interested in.

In the last year of high school I had about nine hours of philosophy a week. The program included a wide range of topics. We had a very dedicated teacher, a young woman. I was very enthusiastic and got the highest marks. She recommends me to go to "Lettres supérieures" in Annecy and then to go on in Paris, where, she told me, I would have the best teachers. This is what I did. After one year of "Lettres supérieures" I applied to go to "Première supérieure" to the top ten best Lycées in Paris. For this second year we had to choose a specialty. For nine I applied with history as a speciality and only for the best, Henri IV, I applied with philosophy as a speciality. I was selected to all of them and therefore went to Henri IV for philosophy. Before my class of "Lettres supérieures" I had no particular interest for history, but during this year we studied Greek antiquity, Roman antiquity and XIXth century French history. I liked it a lot and this was the discipline where I had the best marks. I was also good in philosophy, but traditionally in France, it is more difficult to get a good mark in philosophy than in any other area. In History I had average marks of 17/20, in philosophy 14/20. I preferred philosophy than history but since I wanted to be sure to be selected in a good Lycée in Paris, that is the reason why I applied to all the Lycées with

history, excepted one, the best. That was a kind of wager. A strange wager, quite different from Pascal's one. During this year in philosophy we studied Blaise Pascal and I liked it. Our professor was an old Christian lady and we studied in details the *Book of Job*. She also liked Plato, we studied in particular the *Symposium*. During this year I learned a lots about Greek culture, writing in particular a 40 pages essay analyzing in details religion in Iliad and Odyssey. During the Easter holidays a trip was organized with all the students to the region of Tuscany in Italy, we visited all the museums in Florence and Siena and many historical stuff spread in small villages. It was a fantastic travel in a region which is a wonderful mix of beautiful nature and culture. This was two weeks of relaxation, much welcome because in "prépa" we had to work hard all the time, writing lots of dissertations in the section I was.

3. Student in Paris (1984-1991)

3.1. Lycée Henri IV—Focusing on Philosophy at the top of Paris

In 1984 I moved to Paris in "Première Supérieure" at Lycée Henri IV. This lycée originally called Lycée Napoleon is the highest rated lycée in France together with the nearby Lycée Louis Le Grand. There is a legendary rivalry between the two. Louis le Grand is better for science and Henri IV for letters. Many famous people are alumni of these two Lycées. One of the objective superiority of Henri IV is geographical and physical. Henri IV is at the top of the Montagne Saint-Geneviève and has a tower, the Clovis tower, after the name of Clovis the first king of the Franks. This tower was during many centuries the highest building in Paris. I was "interne" (boarder) in the Lycée and we used use to climb at night at the top of the tower (not open to the public) from which there is a nice view of Paris and also exploring underground passages and the many buildings of the Lycée (several movies as been shot there, such as *La Boume*, in English: *The Party or Ready for Love*). We were allowed to go outside at night and come back at any time, so for me Henri IV was not at all a prison like was the nearby Lycée Saint-Louis (a third famous Lycée) for Jean Van Heinjenoort, as reported by Anita Feferman: "We were walking on Boulevard Saint-Michel, towards the Seine, when he pointed to a large building and said directly to me, "That's the prison where I was locked up for two years." "Prison?" I said, "What do you mean, prison?" "Well, it is a school, I was an interne, which means I wasn't allowed to go out except on Sundays." [13][7] Contrary to a prison Henri IV was a nice and quiet refuge including a beautiful flowered cloister. I was happy to go back there after wandering around discovering Paris. The Lycée attracted students of many different backgrounds and origins; in particular Henri IV has a tradition of welcoming the children of French expatriates

[7]As is known, Heijenoort left the Lycée Saint-Louis to join Trotsky in Turkey and then spent ten years as his secretary and bodyguard in Mexico, and then went to the USA where he became a good friend of Quine and the first historian of modern logic, promoting the myth of Frege as the founding father—the detailed story is related in Anita Feferman's book [12].

living in the ex-colonies of France. I had good friends, the atmosphere was quite extraordinary.

Concerning the teachings I was not very motivated because it was a lot of cramming for entering *Ecole Normale Supérieure*, especially since I was preparing for the entrance exam for ENS Saint-Cloud, where there is a specific program changing every two years. In history the program was colonization and in geography the Maghreb (Tunisia, Algeria and Morocco) for which, despite of, or maybe because of, the history of my family, I had little interest. During this year of "Première Supérieure" I had interest only for philosophy. Since philosophy was my area of specialization, I had two classes of philosophy: one which was common to everybody, and one which was only for those who were specializing in philosophy. The one for everybody was given by Pierre Raymond and the topic of the program was "La morale"; the other was given by Pierre Jacerme and there were two topics, "L'existence" and "Le symbole". I especially liked the topic on symbol—years later I am still working on that topic, organizing a congress and publishing a book on it—cf. *La Pointure du Symbole*. Independently of the topics these classes of philosophy were interesting because of the strong personalities of the two teachers. They were two opposite characters and figures. Raymond was a former student of Althusser and Jacerme a former student of Beaufret, the two main leading figures of philosophy in France in the sixties and seventies.

Raymond was a nice guy but his classes were rather boring, not easy to understand because it was not clear what he was aiming at. One thing I remember is that he told us about Wittgenstein, the first time I heard about this philosopher. And my first contact with Wittgenstein was not with his *Tractatus* or logic but with Ethics. I read his writings about Ethics and Esthetics and quite liked them, in particular his criticism of the way we use language, how our mind can be directed by language without understanding what we are thinking of. Later I found similar criticisms in Schopenhauer, one of the major influences on Wittgenstein.

Through Jacerme I learned about Heidegger. The first book I read was *What is a Thing?* and I liked it very much, especially the first part where he talks about mathematics explaining the original meaning of the word. Up to now I think this is one of the best introductions to philosophy. Later I also read *The Principle of Reason*, one of his best books, and various of his essays of the 1940s and 1950s, in particular those collected in the book *Off the Beaten Track*. On the other hand I never had any interest in *Being and Time*. Later on I read his essay "Plato's doctrine of truth", which led me to write a Master's thesis on Plato's cave.

I presented myself to the ENS exam but without much motivation. On the one hand I had no interest in disciplines other than philosophy; on the other hand, even for philosophy, I was not much interested in entering ENS, because at that time it meant following a not very exciting track: preparing "agrégation" (another cramming thing), teaching in high school, etc. A track connected with quite a secluded life. I wanted to have more contact with real life. With research in philosophy in mind, I decided therefore to go to the university.

3.2. Studies at Universities Paris 1 and 7—The Logical Way

After doing two years of "prépa" it is possible to get an equivalence to enter the third year of university. The Sorbonne was just nearby. When I am speaking here of Sorbonne, I am speaking of the building. Historically the Sorbonne was a university located in one building, "rue de la Sorbonne", but nowadays the Sorbonne is spread over many buildings and it is not only one university but three universities have the name Sorbonne: *Université Panthéon-Sorbonne* (Paris 1), the *Université Paris Sorbonne* (Paris 4), and *Université Sorbonne Nouvelle* (Paris 3). After May 1968 the University of Paris was split into many universities. Today there are 14 universities, each having a number and a name: from Paris 1 to Paris 14. I have studied in Paris 1, Paris 3 and Paris 7. From my entry to the university in 1985 up to definitively leaving Paris in 1991 I earned 7 diplomas: [8]

- Licence de philosophie, 1986
- Licence de logique, 1987
- Maîtrise de philosophie, 1987
- Maîtrise de logique, 1988
- Diplôme d'études approfondies de Philosophie, 1988
- Diplôme d'études approfondies de Logique et fondements de l'informatique, 1990
- Licence d'études cinématographiques et audiovisuelles, 1991

I came back to Paris in 1995 for a few days just to defend my eighth French diploma, a PhD in mathematical logic.

I will try here to explain how logic became my main topic of study. Logic most of the time does not appear as the name of a field of study or a discipline. It is very difficult to find a university with a department of logic and/or a diploma of logic. In Paris there were (and still are) no departments of logic, but some diplomas of logic: "Licence" and "Maîtrise" in the department of philosophy at Paris 1, and a Master's degree and PhD in the department of mathematics at Paris 7. I obtained all four of these degrees. When I applied for an equivalence to enter the "Licence" of philosophy at Paris 1, I was required to pass some exams in logic because this field was a strong part of the philosophy curriculum in that department and did not exist in "prépa". I had no precise idea of what was beyond the substantive word "logic". In French there is an adjective and a noun, which are the same word: "logique". As with the English adjective "logical", the French adjective is part of natural language. The French noun, however, is not widely used—the layman does not exactly know what it means, and among intellectuals there is a lot of ambiguity surrounding it. I didn't know exactly what logic was about but I was attracted by the very word. After asking colleagues about the

[8] I have indicated the names of the diplomas in French because there are no straightforward translations. These university diplomas do not exist anymore in the new Bolognese system that has been implemented in Europe. A "Licence" was a 3-year degree, a "Maîtrise" a 4-year degree, and a "Diplôme d'études approfondies" (="DEA") a 5-year degree, equivalent to a Master's degree.

program, I studied by myself and passed these exams. They were about basic propositional and first-order logic, with some exercises of translation from natural language sentences into formal language.

I then entered the "Licence" of philosophy. There was a bit of everything: I remember that I studied Sartre with Hélène Védrine and Plato with Sarah Kofman. It was also possible to do a "Licence" of logic based on an advanced class of logic centered on the completeness theorem for first-order logic, together with some epistemology and philosophy of science. I completed this second "Licence" while I was doing my "Maîtrise" of philosophy. Such a "Maîtrise" was a compound of two classes of philosophy and a dissertation of 100–150 pages. I wrote a dissertation about the philosophy of modern physics under the direction of Bernard d'Espagnat, a very famous physicist who was also teaching philosophy of physics at Paris 1.[9] My dissertation is focused on David Bohm's holomovement (cf. [5]) but with a strong part about the Copenhaguen interpretation and on the background Heidegger's analysis of the relation between thing and think. I was quite impressed by the writings of Werner Heisenberg. In 1987 Bohm was supposed to come to Paris but he was not allowed because of visa obligation and I went in London to have a discussion with him. Besides the dissertation and a class with d'Espagnat, I followed an interesting class by Sarah Kofman on the comparative study of the Presocratics viewed by Hegel, Nietzsche and Heidegger.

After my "Maîtrise" I was first thinking of doing a Master of philosophy on logic and foundations of mathematics with Jacques Bouveresse. But then I read "Plato's doctrine of truth" by Heidegger and decided to work on Plato's cave. Since I liked the classes of Sarah Kofman I asked her if she would agree to directed my work on this topic and she gave me a positive reply. Kofman did her PhD on Nietzsche with Deleuze and then met Derrida with whom she became a good friend and was much influenced. I never really read texts by Derrida but I read several books of Kofman. My favorite one is *Comment s'en Sortir?* (How to find a way out?) [28] which is about the notion of "aporia" in Plato. Plato's cave is one of the most famous texts of philosophy and I wanted to understand its profound meaning if any. My initial idea was to examine and classify all the various interpretations and also, since I liked images, the different pictorial representations of the cave. A book by the Canadian Yvon Lafrance was very helpful for this work–in this book he has indexed all texts about Books 6 and 7 of Plato's *Republic* with short abstracts of their contents. On the one hand I was much surprised to discover that there were very few different interpretations of the cave—and also very few pictures—but on the other hand I discovered some interesting things in particular about a cave in Crete that inspired Plato. I decided to write a dissertation in three parts, each being a caricature of three different interpretations. The first is a class given by a teacher of high school commenting Plato's cave explaining the theory of ideas, epistemology with a touch of morality. The second is a dialogue of Jean

[9]Later on d'Espagnat won the Templeton prize.

Beaufret with "one who is questioning", a parody of the books of Beaufret *Dialogues avec Heidegger*. The third is a mix of new age, neo-Platonism and Hellenic history emphasizing the rituals happening in the cave discovered in Crete, to which Pythagoras and Plato supposedly took part. I defended this Master's dissertation at Sarah Kofman's own house—she had some difficulties of locomotion. She liked it and gave me a good mark. Later on, when I had already left Paris, she committed suicide and I dedicated a paper I wrote about Schopenhauer's analysis of suicide to her.

I was then thinking of doing a PhD of philosophy about Schopenhauer, I started to have a strong interest for this philosopher after reading various books of Clément Rosset [10] about him. But Rosset was in Nice and I didn't succeed to get in touch with him. Finally I decided to matriculate for a PhD with Philippe de Rouilhan to do something about philosophy of logic. I had known de Rouilhan from the "Maîtrise" of logic I was doing in parallel with my "Maîtrise" of Philosophy. He was a kind of provocative dandy, from an aristocratic family—one of his ancestors had been secretary to the King of France. His style was contrasting to the one of traditional philosophers, whether continental philosophers or analytic philosophers like Bouveresse, his former PhD advisor. Initially a mathematical logician, he shifted to the philosophy of logic, or rather the history of logic, and became a specialist of Frege and Russell. We studied with him Frege's "Über Sinn und Bedeuting" and various paradoxes of this time. De Rouilhan was a strong admirer of Heijenoort whom he had the opportunity to meet. In this "Maîtrise" of logic Bouveresse was also giving a class about philosophy of logic but the core of this degree was modern logic. We had 4 classes for each of the main topics: model theory by Joël Sakarovich, set theory by Michel Eytan, recursion theory by Jean Mosconi and Susana Berestovoy, and proof theory by Joël Combase. There was also a class of computation by Susana Berestovoy—we were learning LISP. This was a fine and serious background for logic studies given by an ecletic group of eclectic people (Sakarovich was also interested in architecture—see his book [43]). Eytan liked category theory and he was using the book *Axiomatic theory of sets and classes* by Murray Eisenberg [11]. For his class I wrote my first philosophical essay about logic, the topic he gave us what about the truth of assertions in set theory. Susana Berestovoy was form Argentina, she was very dedicated and it was possible to discuss with her for hours after the class. Combase had studied with Kreisel and then Feferman at Stanford, he was intelligent and friendly but had some psychic troubles.

After the "Maîtrise" of Logic at the department of Philosophy of Paris it was possible, but not easy, to be admitted at the department of mathematics of Paris 7, to go on study logic, doing a Master and PhD in logic. The University of Paris 7 is the most interdisciplinary university in Paris (the others are generally focused on some specific topics), this is why it has been named "Denis Diderot", after the name of the famous encyclopedist. But it is known in particular for its department

[10] For me Rosset is the best French philosopher of the second part of the XXth century.

of mathematics, one of the best in France. At that time it was directed by a former student of Grothendieck, Jean-Louis Verdier, but unfortunately he died in a crash accident shortly after I arrived, in 1989. The department was strong for algebra, category theory and logic. At this time the group of logic of this department was gathering the main French logicians, Jean-Louis Krivine, Jean-Yves Girard, Daniel Lascar, etc. Few years later it was split in various groups, Girard developing his own group in Marseilles.

In this department there were Master and PhD of mathematical logic which had just been renamed PhD of logic and "fondements de l'informatique" , corresponding to some fashion and the shift of interest of some members of the group from model and set theories to lambda calculus and foundation of programming. These people were focusing on the relation between proofs and programs, the Curry-Howard correspondence being a kind of motto that they were putting forward at each talk they were giving (a litany is still going on). These logicians had strong personalities, they were different from each other and had not necessary good relations between ecah other. We had a very dedicated teacher, René Cori. Together with Lascar they published later on a two volume book corresponding to what they were teaching to us in the first semester (see [6]). As the reader can check it is a lot of stuff, a very intensive class about the basic elements of modern logic. The academic year was divided in two semesters and in the second semester we could choose some optional classes. I did one with Girard on proof theory and also one with Daniel Andler on non-classical logics.

Then during the summer we had to write a monograph corresponding to a research work showing or not our capacity to do research and go on with a PhD. Very few people were intending to go on to do a PhD and we were not especially encouraged to do so. I wanted to do a PhD but it was not clear on which subject I would work. This was the case of other students who generally were incorporated to one of the group, in particular working on linear logic with Girard. I didn't follow this linear road. An interesting subject naturally appeared to me. In Paris I had a nice girlfriend whose father was a psychoanalyst who had been analyzed by Lacan. At some point we were relaxing in his house in the countryside on the banks of the Loire River. In these circumstances I read an interview of Newton da Costa in the Lacanian magazine *L'âne*(The Donkey). I had never heard before about this Brazilian logician and his work. The title of the magazine article was something like, "Paraconsistent logic: a logic for the unconscious?". I liked the personality of da Costa, the way he replied to the interviewer's questions, the way he maintained that he did not consider himself only as a technician of logic. At the end of the interview he quoted Pierre Curie saying: "Faire de la vie un rêve, et d'un rêve une réalité" (To turn life into a dream, and a dream into reality). And I was very much interested by the topic: a paraconsistent logic, a logic in which the principle of non-contradiction does not hold. I wanted to understand how this could work, mathematically speaking. Moreover it seemed to me very interesting from a philosophical point of view, since the principle of non-contradiction is often presented as the most basic law of thought.

Back to Paris I went to the library looking for da Costa's papers. I had no difficulty to find them because his initial papers have been published in French in the *Comptes Rendus de l'Académie des Sciences de Paris*. How this happened is explained by Marcel Guillaume in [21], a Bourbachic mathematician friend of da Costa. Thought these papers had been published in France, nobody knew them in Paris. I started to work on that and asked Daniel Andler if he would be interested to supervise my Master on this subject. He had given us a class on non-classical logics including modal logic and non-monotonic logic but did not know paraconsistent logic although he knew Guillaume. I explained to him what was paraconsistent logic and he gave a positive reply. Andler had done his PhD in Berkeley in Tarski's group at the beginning of the seventies—see [1]. Later on his interest turned to articificial intelligence, cognitive science and philosophy of science. At the time I met him he was researcher at the CREA (Research Center on Applied Espistemology) attached to the polytechnical school and working on the launching of the cognition department at ENS-Ulm, that he succeeded to create. He is now professor of philosophy of science at Paris 4, *Université Paris-Sorbonne*. I have enjoyed very much to work on that Master's thesis. I read in details the papers by da Costa trying to understand everything. I reformulated the main concepts, developed some new techniques, in particular using sequent calculus that I had just learnt and presented some new proofs. I liked very much the work of Gentzen and the cut-elimination theorem that I had studied in details reading the orginal paper of Gentzen and following the class of Girard who told us that this was one of the most fundamental theorems in modern logic. I succeeded to develop a proof of the cut-elimination theorem for a sequent calculus I constructed for the paraconsistent logic C1 of Newton da Costa and variations of it. A former student of Paul Bernays, Raggio, had presented an incomplete work in that direction 20 years before. By doing this work on paraconsistent logic I had a better understanding of how was working classical logic. I was trying to see what what similar to both of these logics and what was different–both from the semantical viewpoint and the proof-theoretical viewpoint. This was the first step in the direction on my work on universal logic that I developed later on in my PhD as I explained in details in my 2001 paper "From paraconsistent logic to universal logic".

While doing my Master of Logic at Paris 7 I was going to the seminar of de Rouilhan at the IHPST [11] where interesting logicians were giving talks. I remember in particular a very attractive talk by George Boolos (1940-1996). Sol Feferman also presented a talk, about Gödel. The atmosphere was relaxed; at this time, after the talks, there were cocktail parties with plenty of Champagne. I think nowadays they serve Coca-Cola.

In Paris 7 I had a friend studying logic with me who liked very much category theory and the philosophy of Alain Badiou. At this time Badiou's book *L'être et*

[11] IHPST means Institut d'Histoire et Philosophie des Sciences et Techniques—an institute affiliated with Paris 1 and CNRS, located in the Odeon area of Paris, close to Saint-Germain des Prés. It was originally created in 1932 and directed by Gaston Bachelard from 1940 to 1955.

l'événement had just been released—a book in which Badiou deems the invention of the notion of forcing, by Paul Cohen, to have been the main event for philosophy in the XXth century. My friend started to organize some meetings with a small group of people to discuss the book gathering Badiou and some mathematicians, mainly people working in category theory, in particular René Guitart. This was useful to reinforce the link between mathematics and philosophy. After that Guitart was invited to give a seminar at the *Collège International de Philosophie* that I attend and which was very interesting. Guitart had good relations with Jacques Riguet (1921-2013), a mathematician, friend of Lacan, who taught Lacan graph theory and who did a nice PhD on relational structures.

When studying logic I was also studying cinema. I had always been interested in cinema in my early age and was thinking of becoming a film director. France is a very important country for cinema, one can argue that this is where it started with the projection of movies of Lumières brothers at *Salon indien du Grand Café*, place de l'Opéra in 1895. This is also the first country in the world where cinema was introduced at the university. I matriculated for "Licence" of Cinema which was a joint degree of Universities Paris 1 and Paris 3. I attended very interesting classes on history of cinema, critical analysis of movies, script writing, soundtrack, etc. I saw many many movies, during a period an average of 3 movies a day. The university film library in Paris is the biggest in the world with lots for rare and original movies which were projected at those universities and there was also the general film library of Paris and many movie theaters in the Latin Quarter. I also attend a retrospective of Swiss movies at the Swiss Cultural Centre in the Marais which was close to my house. I was thinking of entering the newly created school of cinema, FEMIS, directed by Jean-Claude Carrière who had written many scripts of Luis Buñuel's movies, in particular *That Obscure Object of Desire*, his last and best movie. But for some reasons I followed the logical road having the idea that I could work later on in cinema. And this is what I have done to such an extent, producing movies related to logic and philosophy. On the other hand, at some stage, I completely stopped to watch movies, because of a lack of time and also because I think it is more interesting to live in reality than in fiction—these two reasons being connected.

During these years in Paris I have progressively focused on logic. Logic did not appear suddenly to me as a kind of new creature I became fascinated or obsessed of, running after it. Before really studying logic I liked abstract mathematics and philosophy. The substantive word "logique" appeared to me, I liked it and discover that was not just an illusory reality, that there is a real substance in it. I was lucky to be in a place and a time where modern logic was taught and where there were even degrees of logic. I went on doing research in logic and I am now professor of logic. I don't see logic as a field among others. The meaning of the Greek word "logos" is related to science, reasoning, language, relation. Logic is a very rich notion. As Rougier put it: "Le *logos*, voilà la création du génie grec, dans les sciences, les arts, en morale et en politique; et le logos veut dire tout à la fois *discours*, *raison* et *raisonnement*, *rapport* et *proportio*" (The *logos*, here

is the creation of the Greek genius, in sciences, arts, moral and politics; and the *logos* means at the same time, *discourse*, *reason*, *reasoning*, *relation* and *proportion*) [40]. I gave recently a talk about that in 2013 during a congress organized by friend Olga Pombo at the occasion of the unification between the two main Universities of Lisbon and the corresponding paper has been published under the title "Philosophy, mathematics, logic: three sisters".

3.3. Meeting Newton da Costa and leaving Paris

Since a couple of years I had the idea to study abroad. I was thinking mainly of the United States, because I was attracted by the country itself, in particular California, and because I know that there were very good unversities there. But no concrete opportunity appeared to me to go there at this time and instead of going to North America, I went to South America—different continents but this is America. For someone from Europe they certainly have something more in common than just the name. Before knowing the work of da Costa, I had not thought of going to Brazil. But while working on da Costa's paraconsistent logic I started to think it was a good idea. Brazil is famous for carnival and soccer—I was not really interested in such things—but also for the Amazon forest and the contrasting futuristic project of Brasilia, capital of the Land of the Future, created out of nothing.

While working on my Master I wrote a letter to da Costa, but didn't succeed to enter in touch with him. This was before e-mails, standard mail was not working good and I didn't have the exact address. By chance da Costa showed up in Paris in January 1991, just few days before the application deadline for a one-year Lavoisier grant from the French Ministry of Foreign Affairs to go to Brazil. Da Costa was giving a series of talks; I attended one at the IHPST. It was quite spectacular. I was introduced to him and I met him nearly every day during one week. The contact was very good. Da Costa asked me why I was interested in paraconsistent logic. He was curious, but also apprehensive and worried, because many people are attracted to paraconsistent logic because they venerate contradictions—a particular case being the Marxists. When I told him that my interest was about the foundations of logic he was relieved. We share the same interest, he had written a book entitled *Ensaio Sobre os Fundamentos da Lógica* (Essay on the foundations of logic) that later on I would translate into French [7]. He wrote me a letter of invitation I was able to join with my application. Some weeks later I was facing a jury of about not less than ten very serious guys at the Ministry of Foreign Affair in Paris. To go to study logic in Brazil was quite weird, moreover I didn't speak Portuguese. But I was supposed to go to the best University of Brazil, USP (Universidade de São Paulo) and I additionally received a letter of support of Michel Paty of the REHSEIS [12], a philosopher of physics, good friend of da Costa, who was cooperating with USP since a couple of years. Shortly after the interview I received a positive reply

[12] REHSEIS was a CNRS research institute about history and philosophy of science founded by Paty, attached to Paris 7, now it has been incoporated in an institute called SPHERE, CNRS-Paris 7)

for this grant. Before traveling to Brazil I wrote two papers based on my Master thesis and went to Portugal to learn the language. I gave a talk at the University of Braga and visited Porto and Lisbon. I liked Lisbon very much, and it continues to be one of my favorite cities in the world. In August I flew from Paris to São Paulo.

My departure of Paris in 1991 is a turning point in my life. On the one hand I got a grant which by itself was enough for housing and daily expenses and after that I always succeeded, not always easily, by earning my life doing research and/or teaching in logic. On the other hand I left France and never came back there to permanently live. During my studies in Paris I financially survived by a few money my parents were giving to me, some grants and some paid work I was doing. At this time in France, for undergraduate students, there were some grants based on family income, provided the student was normally advancing his studies. Since my father had a quite low salary I got this kind of grants and also was housed in in a low cost "cité universitaire" where priority was given to people with low income (for a limited duration of time). At the master level the grants were based only on the quality of the students, I got such kind of grants for two years. These grants were helpful but far to be enough for daily living. To get more money I started to give privates lessons. In Paris there is a good market for that. I was first mainly given lessons to secondary school students helping them to do their homework in all fields but I progressively I concentrate giving philosophy lessons to high school students preparing the "Baccalauréat". I was quite good at that in the sense that my students succeeded to have good marks at the exams. This was a bit tiring and time consuming because I had to go to the people home in all the districts of Paris. Nevertheless that was very interesting in the sense I was in touch with a great variety people seeing their home. I stopped to do that when at some stage I started to work at the "Lycée autogéré" of Marly le Roy. We were teaching in students home or in our home. I did that during about 3 years. I was giving a class of philosophy two times a week. This was quite an interesting experience. The salary was low but this was a regular income. The students were interesting people, we had many discussions. In general I think teaching is a nice activity and that we learn a lot by teaching. The last year I also worked in a marketing company. We were working mainly using phone. We had to phone to a huge quantity of varied people, asking them all kinds of questions. At some point we were working for Arthur Andersen. Consulting agencies were at this time becoming important in France. We had to phone to the most important companies and to succeed to make an interview of one of the main directors, a detailed interview of about 1 hour asking him all he was expecting from a consulting agency. It was quite challenging. I learned a lot about the services of consulting agencies and about how to succeed to talk to the boss. At some point I also applied to work in the new MacDonald in the latin-quarter, they wanted to have students to work part-time. I thought it could be a funny experience and would give me a regular income, but I was not selected.

I left France when I was 26 years old. So roughly speaking I have spent by now half my life in France and the other half outside of France. While I regularly return to France on visits, and although I like the country very much for a few days or a few weeks at a time, I am rather critical of the French intellectual world. Moreover I am becoming doubtful about the evolution of the culture, society and politics in France. Concerning the French academic world, the people are often both arrogant and ignorant at one and the same time. They think they know and yet they don't know, which is the worst kind of ignorance (Blaise Pascal wrote a nice text about two kinds of ignorance in *Pensées*). And I think that the division between universities and CNRS is not a good idea. In Switzerland and in Brazil, in contrast to France where CNRS researchers get a full salary and have no real obligation to teach, those countries' science foundations (respectively SNF and CNPq) restrict themselves to giving grants in support of projects directed by university professors.

4. Research Around the World (1991-2002)

I did two PhDs in about 5 years living variously in Brazil, Poland, France and the USA and traveling in many other countries—making in particular two round-the-world trips. I defended a PhD dissertation on universal logic in the department of mathematics at the University of Paris 7 in July 1995 and a PhD on logical truth in the department of philosophy at the University of São Paulo in March 1996. At the same time I was working on my PhDs I was writing papers, assisting conferences, presenting talks, meeting and discussing with a lot of people around the world. I don't think it is a good idea to work on a PhD in complete isolation, writing hundred pages, not connected with what is going on, that nobody will never read. I believe that research is a collective endeavor flourishing by interaction between human beings. On the other hand I think it is good to have moments of isolation to concentrate on writing. I wrote each of my PhD in about one month after months of thinking and discussion. When I am writing a paper this is also the methodology I am using: after thinking about a topic and presenting it to conferences, I sit down and write the paper in one, two or three weeks. I am not working only on one topic. I am working on many topics which are in gestation and depending on the circumstances one or another will materialize in a paper. During this 10-year PhD and post-PhD period, I gave about 200 lectures and wrote about 50 papers.

4.1. Interaction with Newton da Costa in São Paulo

I arrived in Brazil in August 1991. I didn't really like the country at first sight, but only after a couple of years. It certainly changed my life because the Brazilian spirit is very different from many different countries. It is quite difficult to know exactly up to which point I changed because I don't remember exactly how I was before, but when I go to France I see how much people are different. In Brazil in general people are smiling and kind. This is good for physical and psychic health. No depression here. It will maybe arrive when people will be "rich": locked in their

house watching TV and taking their car to go to the supermarket, project of society promoted by politicians in Brazil as in many other countries. But it not clear that they will succeed in Brazil. Other countries are like Brazil in Central and South-America: Mexico, Costa Rica, Peru, Bolivia, Chile. But in Brazil it is stronger. Maybe this is a kind of indigenous spirit inherited from the natives to which outsiders have been mixed. Moreover in Brazil it is reinforced by the Portuguese culture, quite different from the Spanish culture predominating in other countries of Central and South-America.[13]

In his famous book, *Brazil, land of the future*, Stefan Zweig wrote the following about Brazil: "Arriving in Rio, I received one of the most powerful impressions of my whole life. I was fascinated, and at the same time deeply moved. For what lay before me here was not merely one of the most magnificent landscapes in the world, a unique combination of sea and mountain, city and tropical scenery but quite a new kind of civilization. There were colour and movement which fascinated and never tired the eye; and wherever one looked there was a pleasant surprise. I was overwhelmed by a rush of joy and beauty... Brazil's importance for the coming generations cannot be assessed even by the most daring calculations. I knew I had looked into the future of our world." [51]

My first contact with Brazil was not easy because I arrived in São Paulo, at this time very dirty and polluted. The country was not yet open to mondialization. There was very few imported products. The people were dressed with ugly clothes. The price of a home phone line was the same as a car. At first I was living inside the campus of the University of São Paulo, far from the center with quite nothing inside. One main attraction was a collection of snakes at Butantã Institute.

I was attending the seminar of da Costa. I soon realized that very few people, not to say nobody, were working any longer in paraconsistent logic in Brazil. That was not a problem for me because my interest was to develop a general theory of logics and I was mainly interested to work on the theory of valuation, a general semantic theory developed by da Costa. I wrote two papers with da Costa on the theory of valuation and develop ideas on abstract logic that I later wrote down on my paper "Recherches sur la logique abstraite", which are a central part of my PhD in mathematical logic. I was concentrating on "logical structures" in a Bourbachic spirit. Bourbaki had a strong influence in Brazil and in particular in São Paulo where André Weil, Jean Dieudonné and Alexander Grothendieck (about the visit of the latter see [2]) came for extended stays in the 1940s and 1950s. Da Costa was a former student of Edison Farah, a set-theoretist who had been a good friend of André Weil. He was retired and we used to visit him in his house, he told us many stories about the adventures of the Bourbachic tribe in Brazil.[14] Da Costa brought

[13] Some people use the expression "Latin-America" to talk about Central and South-America. I think this is misleading. Cannot we say that French speaking people in Canada are Latin? In Brazil "latinos" has a pejorative flavor, designating in a negative way "other" people of South-America, those speaking Spanish.

[14] Farah proved a statement that Weil thought was false: the equivalence between the axiom of choice and infinite distributivity of intersection and union

me also to the house of Miguel Real, a person he has known for many years. Real was an important jurist—the man responsible for Brazil's new civil code—who took a strong interest in philosophy and logic. He founded the *Instituto Brasiliero de Filosofia* (IBF), launched the *Revista Brasileira de Filosofia* (RBF), and the first series of conferences of philosophy in Brazil.

During my first year in São Paulo, I developed contacts with various students and colleagues of da Costa. Edelcio de Souza, who, with his wife, Simone helped me to discover São Paulo, in particular taking me to all the most famous restaurants in town. Andrea Loparic, who was working with da Costa on the theory of valuations and lived nearby the USP, inviting me for lunches at her house—she speaks fluent French, having done her PhD in Belgium, and also takes an interest in psychoanalysis. Décio Krause, who was living in Curitiba, but regularly came to USP. Nelson Papavero working in biology and who put me in touch with a friend of his in Rio who later on invited me to work with him. Otávio Bueno who at this time was a young undergraduate student with long blond hair staying late at night at the library—we used to come back to town together by bus discussing about many topics. I had also some contacts with a group of young French guys, I share a flat with one of them and started to write a novel in French that was never published called *L'Oubli de Vivre* (Forgetting to Live).

In April 1992 I did a one month trip outside of Brazil, I went to Chile and Argentina. This was quite interesting. Argentina is completely different from Brazil, I went to Buenos Aires and liked it very much. I had a colleague there that I had met in Paris, Francisco Naishtat, who had lived in Paris during the military dictature and also had spent one year at Berkeley. He introduced me to colleagues and friends, in particular Mario Lipsitz, a former PhD student and friend of Michel Henri, who became a good friend of mine. I gave a talk at the computer department of the University of Buenos Aires, where I met Marcelo Conglio (who later on moved to Brazil where he is presently the president of the Brazilian Society of Logic) and Carlos Alchourrón (known in particular for the AGM theory, logic of theory change he developed with David Makinson and Peter Gärdenfors). In Chile I gave a talk in the logic group of Rolando Chuaqui at the department of mathematics of PUC (Pontifical Catholic University) in Santiago. I went north up to the desert of Atacama, and south up to Ponte Arena and Tierra del Fuego via Chiloé Island. I climbed one of the most active volcano near Puerto Monte and also visited Valparaiso.

In June 1992 I went to Rio de Janeiro for the second time (I was shortly there in January). I visited Vera Vidal, a specialist of Quine I had met in Paris together with da Costa, who was at this time the director of the philosophy department of the Federal University of Rio de Janeiro (UFRJ), where I am presently working. I also met Luiz Carlos Pereira, a proof-theoretist, who did his PhD with Dag Prawitz in Sweden and who is working at the PUC of Rio de Janeiro. This was the time of ECO 92, the very big United Nations Conference on Environment and Development gathering more that 100 heads of governement from the whole world. There were many events. I missed the concert of Philip Glass accompanying the

projection of Godfrey Reggio's movie *Powaqqatsi* but I attended an Amazonian version of *A midsummer's night dream* by Shakespeare directed by Werner Herzog with the telenovela actress Lucelia Santos best known as Escrava Isaura.

In August 1992 I went again in Argentina, this time to take part to the 9th Latin American Symposium on Mathematical Logic, which was happening in Bahía Blanca. It is a town about 700 km south of Buenos Aires where there is an important group of logicians founded by Antonio Monteiro, a Portuguese who first move to Brazil and the settled down in Bahía Blanca. The people there are working mainly in algebraic logic, with connections with the work of the Romanian logician Grigori Moisil, who developed De Morgan algebras. The congress was happening August 10-14, 1992. I was supposed to go back after one year in France, i.e. July 31 and my airticket had one year validity. It was not possible to extend this validity and I had to buy a new airticket. I had few money and I went from São Paulo to Bahía Blanca by bus (2 days of trip between São Paulo to Buenos Aires) and train (one night of train from Buenos Aires to Bahía Blanca).

At the congress I presented my joint work with da Costa on the theory of valuation. There were celebrities like Jerome Keisler and the Polish logician Stan Surma, one of the major figures of logic of Poland after World War Two (WWII), directing a group of logic in Kraków. On the night train back to Buenos Aires I was sat next to him and I told him I was going to spend one year in Poland. He draw me a map of logic in Poland. He had left Poland during the communist time and was leaving now in New Zeland, but knew all the Polish logicians, most of them having been his students. He was traveling with his son, Charles. Later on in China in 2007 during the 2nd World Congress on Universal Logic where he came together with his father who was invited speaker, Charles told me about his adventures in Africa with his father teaching mathematics in the jungle when escaping communism in Poland. In China I also made an interview/movie of Stan Surma relating his carrier, in particular how he was sent to Moscow, studying with Kolmogorov. He was not converted to communism but to constructivism.

4.2. In Wrocław, Poland hosted by Jan Zygmunt

After one year I could have stayed in Brazil, incorporating myself in one way or another into the Brazilian academic sytsem—da Costa was supporting me to stay longer. But when I told him I wanted to go to Poland he also strongly supported me. He had been several times in Poland himself, and had invited Polish logicians to Brazil during the 1970s. For reasons that are even now not completely clear, logic flourished in Poland between the two world wars, becoming the strongest center of activities of logic in the world, depicted as the Lvov-Warsaw school—see Woleński's books and papers. When WII started, Alfred Tarski was visiting the USA and was forced to stay there, settling in UC Berkeley after some years uncertainty and developing what would be the main group of logic in the world during three decades. He visited Poland during the communist time very few times. At the University of Wrocław I had an office where it was written: "Tarski was here in 195?" —I don't remember the exact date. Why did I want to go to Poland?

Had not the center of logic moved from Poland to California? Not for what I was interested in. My main interest was the theory of the Consequence Operator, initially developed by Tarski at the end of the 1920s. He did not go on working on this theory when in California, developing there Model Theory. But people in Poland after WWII kept working on that and related subjects. In particular Jerzy Łoś and Roman Suszko, and their student Ryszard Wójcicki. I tried to get in touch with Wójcicki. He was a friend of da Costa, and had spent some months in Brazil. But it was not clear where he was located, and if he was still working in this subject—indeed at some point he focused on the philosophy of science. I ended up in Wrocław working with Jan Zygmunt, a former student of Stan Surma and at that time the Editor-in-Chief of *Studia Logica*.

My reasons for going to Poland were not exclusively logical. After an experience of one year immersed in a completely different culture, I wanted to repeat the experience with a different environment. I had always had good feelings about Poland and I was curious to live in a country of the second world.[15] When I was young how was life in the Soviet empire what a mystery for us. It was difficult to go there, those who were going were communists and what they were saying was not taken seriously contrasting with the anti-communist propaganda based in particular on stories of people who had escaped and were refugees. When I was 14 years old I did an exchange trip with my school staying two weeks with a German family in Bayreuth. One tourist attraction there was to go to the border. The separation between East and West was much more than the symbolic wall separating Berlin in two parts. It was a metallic wall of grids and explosives of thousands of kilometers separating the communist world from the rest of the world. Going to the border we were gazing at the communist world, a hundred meters away from where we were, looking at people we could not meet. The whole atmosphere looked different, old-fashioned, with old cars. West Germany on the contrary was hypermodern, much connected to the USA, especially in this Bavarian region controlled by the Americans.

The Berlin Wall was destroyed in 1989 and the Soviet Union came to an end in August 1991 when I was in Brazil. When I arrived in Poland it was a transition period where most of the people were still living in the old communist style and at the same time there was a very strong capitalist development, a kind of conquest by different kinds of people coming from all over the world. The Polish people were quite optimistic because many of them have strong sympathy for USA and antipathy for Russians who have dominated the country for many centuries before and during communism. I arrived in Poland in Warsaw in September 1992 aboard the legendary Paris-Moscow train of communist times, not working anymore nowadays. The situation was strange and confusing. Paris-Warsaw was a 24h trip. The train arrived at the end of the afternoon on a Friday. I was expecting some French

[15] The tripartition of the world into First World, Second World and Third World, was effective after Alfred Sauvy coined the expression "Tiers Mone" in a paper published August 14, 195 in the French magazine *L'Observateur*

officials at Warsaw train station but nobody was there. I didn't speak Polish, had very little money in my pocket, and did not know where to go. For my stay in Poland I had applied for another grant of the French Ministry of Foreign Affairs. It was quite easy to get this grant, there was no impressive interview like for the grant to Brazil. Very few people were attracted to come to Poland. This exchange program was still working as during the communist time, in particular our grant was in local currency. My grant was less than 100 US dollars per month which was supposedly enough to survive in Poland (on the other hand Poles coming to France would get their grants in French currency corresponding to an amount of more than 1,000 US dollars). In Warsaw train station I asked the help of a friendly Polish guy who had traveled with me on the train and I met a French girl who was in the same situation as me. The guy helped us to call the French Embassy. They said that they could do nothing right now because it was Friday afternoon but offered us to stay in an apartment for visitors in the French Embassy for the weekend. I stayed with that girl and we visited Warsaw. On Monday morning we had a meeting with some authorities who put us on a train to Wrocław. Coincidently this was also the destination of this girl (the only other French grantee for all Poland) who was going to Wrocław's art school which is quite important.

In Wrocław Jan Zygmunt took care of me, first lodging me for a few days in a student dormitory, and then getting me a small flat in the house of scientists—designed during the communist period for professors–on Maria Curie-Skłodowska street. At the University of Wrocław there is a department of logic and methodology of science, like in several other universities in Poland, of which Zygmunt was the director. It is traditionally one of the most important centers of logic in Poland. After WWII, the Soviets annexed large parts of eastern Poland, including the city of Lvov, now this area is in Ukraine, and gave back to Poland a part of Germany, the Silesia, where was the city of Breslau renamed with its original name, Wrocław. The University of Breslau was important during the German time, this is in particular where Schrödinger was working and where was published in 1884 Frege's book *Die Grundlagen der Arithmetik: eine logisch-mathematische Untersuchung über den Begriff der Zahl* (in English: *The Foundations of Arithmetic: the logical-mathematical Investigation of the Concept of Number*). After WWII the university went on to be an important university in Poland, one of the main indeed, with a lot of students coming from all Poland and at my time also form other countries. After WWII Wrocław was a kind of transposition of Lvov, many Polish people from Lvov moved to Wrocław, including the academic people and the Ossolineum foundation (which is famous for its library and is also an academic publishing house, the orignal publisher of *Studia Logica*). Jerzy Łoś, one of the leading figures of logic in the 1940s and 1950s, worked there and published in 1949, with Wrocław University Press, his famous monograph about logical matrices [31]. The department of logic had several unpublished manuscripts by him, some in French, that Zygmunt showed me. Jan Zygmunt was much interested in the history of logic. He is the official editor of Tarski's works in Poland—Tarski's son Jan Tarski visited him when I was there. After seeing Zygmunt's paper "Life and Work of Mojżesz

Presburger" [52] I had the idea to ask him to write a similar paper about Adolf Lindenbaum, considered to be one of the most prominent Polish logicians of the inter-war period. After many years the paper is now finished and has just been published in *Logica Universalis* [53].

I was interested in the work of Lindenbaum because I was working on a generalization of the maximalization theorem, which is attributed to him. Zygmunt showed me a quote of a Polish logician making a nice metaphor comparing a maximal theory to a glass which is so full that adding only one more drop causes it to overflow. During that period I made good progress in my work. I fully developed the idea and project of universal logic—this was where I decided to choose the expression "universal logic"—and I wrote my PhD thesis about logical truth that I sent to my advisor Philippe de Rouilhan in Paris. I gave various talks in Polish universities, in particular Łódź (invited by Grzegorz Malinowski, a many-valued logician directing a strong group there), Kraków (where I met Wroński), Kielce (meeting Prucnal), and went to the Czech Republic near Prague to take part in LOGICA'93—one of the first meetings of the LOGICA series of events still going on.

I enjoyed very much the center of Wrocław, with Gothic architecture and a lot of canals. It was like time had stopped in the 1930s—and then you had suburbs with communist buildings from the 1960s. I usually had lunch at the Ossolineum restaurant which was next door to the department of logic. I liked very much the Polish food and also the fact that people drank tea all the time. I prefer tea to coffee. Coffee in Poland was very expensive but tea very cheap and there was a huge variety, some very good, imported from China; this was a positive consequence of the Soviet regime.[16]. The atmosphere was interesting, a mixture of the old communist world with the rising of a new world with a lot of adventurers. The Russian army was on the leave. There were some Russian markets where they were selling everything, watches to planes. I bought some oils paintings and started to paint. This was a quite inspiring atmosphere, I finished my novel *Forgetting to Live* and wrote a couple of short stories.

[16]I have never been Marxist. I think the materialist philosophy of Marx is rather crude. On the other hand the communist world as it emerged from Marxism-Leninism was interesting because it was preserved from Consumerism, all people were highly educated and there were no beggars in the streets

PICTURE 4
CONSCIOUSNESS 3 - A PAINTING I DID DURING 1993 POLISH WINTER

It was quite cold during the Polish winter, but there was a beautiful sunny snow weather and a nice landscape with rivers and trees. I remember ducks landing on the ice, and crowds of ravens. At first I was quite isolated in particular because I was not speaking Polish, I tried at the begiining but just gave up. At the end I knew a lot of people and there were parties nealy everyday. The city was booming, economy was strong, new bars and shops were opening any time. Was elected as mayor a logician, former student of Zygmunt. Since my grant was low Zygmunt suggested to me to give classes at *Alliance Française* where his daughter was learning French. I was engaged there and giving a two hour class per week I got a salary similar to my monthly grant. It was an advanced class, I just had to talk French about any subject I like. That was fun. I also organized a cine-club at *Alliance Française*. I started by the projection of a French movie not difficult from the linguisitic point of view, *La Guerre du feu* (Quest for fire) by Jean-Jacques Annaud. In Poland French language and culture are very popular, this is due to various reasons, one of them being that Napoleon created the Duchy of Warsaw in 1807 liberating Poland from Prussia. Even if it had a very short life of 7 years, this was very important for Polish people. After that Poland was occupied by Russians and Austrians until 1918.

At the end of my one year stay my idea was to go to France, to defend my philosophy PhD and go ahead to California. Nothing of that directly worked out. I applied to a Fulbright grant in Paris when I was in Poland and was selected to an interview but was not able to go because I had not enough money to pay the trip. When I was in Poland I was matriculated to the Swiss consulate, this is in fact mandatory for any Swiss citizen abroad and I was receiving the magazine for Swiss abroad. In this magazine there was an article about the Swiss National

Science Foundation (SNF) encouraging Swiss from abroad to apply for SNF grants. I decided to apply to a SNF grant for young researchers to come back one more year in Brazil while waiting for the next deadline to apply for a Fulbright grant. The guy responsible for SNF grants for Swiss abroad was the President of the Swiss Academy of Science, at that time Jean-Daniel Nicoud, professor at the EPFL (Polytechnical Federal School of Lausanne), the father of the optical mouse. He told me there would be no problem for me to get the grant but that he wanted to meet me before taking a decision. I plan to go there just after the end of my stay in Poland, which was extended for a couple of months, Zygmunt requesting that to the Polish academic authorities.

Back to Paris at the end of 1993, after spending the end of the year with my family, I went early in 1994 to Lausanne, met Nicoud and gave a talk at his institute (EPFL institute of microinformatics). I got a positive reply for the grant but had to wait about six months before effectively getting it—including the air ticket. During this time I went to Paris, trying without success to defend my PhD but having a positive interview at the American center for a Fulbright grant that I would use the next year. The future was good but I had no money for the present. I succeeded to survive by signing a contract with the publisher Masson to translate the book of da Costa in French and giving some private lessons of logic to the president of the *Cause Freudienne*, the Lacanian association of psychoanalysis. Her name was Liliane Majhoub-Trobas and she wanted to know more about logic because Jacques-Alain Miler was giving a seminar making many references to logic (the main interest of Lacan was topology, but Miller is more interested in logic). I enjoyed to do that. In June 1994 I came back to Poland to send to Brazil many boxes of books and papers I had to leave there and I took the opportunity to go for a second time at the LOGICA meeting in the not so far Czech Republic. I presented my first talk about universal logic there. The corresponding paper, titled simply "Universal Logic", was subsequently published in the proceedings.

Let me now explain the situation with my philosophical PhD. In France, for a PhD it is just necessary to write a monograph, there are no classes to attend, no necessity therefore to be on location. Before leaving Paris in 1991 I matriculated for a PhD at the philosophy department of Paris 1 with de Rouilhan and for a PhD at the mathematic department of Paris 7. I sent my philosophy PhD to de Rouilhan from Poland waiting for his feedback. He didn't like the work. When I met him in Paris he told me that this was a completely different kind/style of work he was acquainted and that we would never reach an agreement. He told me he will help me to work with another colleague. That was quite fair, but I was not able to find anybody interested. The next in line was Dubucs and he also didn't like the work. So I left Paris for Brazil without solving the problem and decided to concentrate on my mathematical PhD. I met also in Paris my advisor for this PhD, Daniel Andler, who encouraged me to go ahead.

My philosophical PhD is called *Sur la vérité logique* (On logical truth). This is a new framework for logical truth for structures with one binary relation. I discuss the crucial notions of constants, variables, quantifiers, infinity, equality

and function. I developed a theory based on an idea of Wittgenstein to have a (non ambiguous) name for each object and applied this theory for classical logic but also to paraconsistent logics–the standard model theoretical approach does not properly work for such logics). Later on I presented this work for a PhD at USP in São Paulo. This is still one of my less known work.

4.3. São Paulo again and Los Angeles

In July 1994 I arrived in São Paulo for the second time in my life. Having a grant from the Swiss National Science Foundation, I thought I would have a comfortable financial situation, but this was not the case—I would have to wait another 8 years for that. The Brazilian government had just launched a new currency, the "Real". This completely stopped the inflation and that was good. But quite unexpectedly the currency was raising everyday, during a couple of months. The Real was launched on the basis of a 1 to 1 correspondence with the US dollar, but after a few months, the value of one Real was about 1.20 dollars. This was a general situation vis-à-vis all the currencies including the Swiss Franc, therefore I lost an important part of my grant. I found a room to rent close to Paulista Avenue in front of Maksoud Plaza. São Paulo turned out to be one of the most expensive cities in the world. Richard Sylvan and Graham Priest were visiting Brazil at this time, I remember they were quite surprised about the situation. This was the first time I met these two pseudo-Australian logicians and the last time in the case of Sylvan who unfortunately died two years later on a trip to Bali. I gave to Sylvan my paper "Universal logic" I had just written after my talk at LOGICA'94 in Czech Republic that I was finishing to prepare to send for publication. The next day he gave me back the paper he had read in details with some annotations (I still have this copy).

In August 1994 I wrote my PhD of mathematical logic in about one month. I was working hard day and night putting all my results together. The title of this work is *Recherches sur la logique universelle (Excessivité, Négation, Séquents)*. The first part contains some general results about completeness based on the concept of relatively maximal theory. Then there is a general theory of negation, followed by the study of some paraconsistent systems. In the third part I establish the connection between valuations and sequents and develop some general results about cut-elimination. My PhD has led to about 5 published papers. The main result is a theorem establishing a close relation between sequents and bivaluations. I had been looking for that for two years and in August 2014, while writing my PhD, the solution naturally appeared. I had the basic idea by reading the first paper of Gentzen which is about Hertz's *Satzsysteme*, his main inspiration for sequent calculus and the cut rule. This theorem is a nice, new, and non-trivial result—a minimum condition I think to get a PhD in mathematics. Having finished to write my PhD in September 1994 I was eager to send it to Andler, since I wanted to defend it by the end of the current French academic year, i.e. July 1995. The process for the defense was quite long. At the department of mathematics of Paris 7, it was as follows: if your PhD advisor thought your thesis was good enough he

submitted it to a commission of the department of which he was not part of. This commission was sending your work to referees they were choosing who will give their advices, on this basis the commission was allowing or not the defense. Andler was very careful and read my PhD in details, it took him about 3 to 4 months to do so. Then he presented it to the commission of the department. I was a bit nervous. I had to wait and relax. I gave copies of my PhD to different colleagues in particular to Luiz Carlos in Rio who carefully read the part on sequent calculus and corrected some light mistakes. The chosen referees gave approval for defense in Avril 1995 and the defense was projected in July 1995.

Early 1995 I went to California to enjoy my Fulbright grant. I was invited at the department of mathematics of UCLA, University of California at Los Angeles, by Herbert Enderton (1936-2010). I knew his books of introduction to logic and set theory which are very nice. UCLA together with UC Berkeley was at this time one of the most important centers for logic. I arrived in Los Angeles and found a flat to rent in Venice. I was going by bus from Venice to the Westwood area where UCLA is located, via Santa Monica. I liked to see the sunset in Venice beach and sometimes I was walking on the beach from Venice to Santa Monica.

At UCLA I attended seminars at the department of mathematics and at the department of philosophy. People from the math department were attending seminars at the philo department (but not vice versa), in particular Tony Martin who had a double position in both departments, but also Yiannis Moschovakis, the greatest Greek logician since Aristotle as he liked to say. At the philo department I was attending the seminar of Joseph Almog and also of David Kaplan. This was a small group of people who knew each other and used to go every week to have dinner together. Kaplan also invited people to parties at his house, I went there once. It was friendly and quite provincial. It was not clear at all that they know what was going in the rest of the world, even outside California, or LA. Once Almog during his seminar told us that he had discovered a very nice paper by a totally unknown guy named John Corcoran. At the math department the situation was a bit strange with some weird people showing up. There were seminars of mathematic logic, in particular the Cabal seminar. No philosophers were coming but there were computer scientists at the main seminar. There was a wine and cheese party after this seminar where I gave a talk.

Mathematical logicians at UCLA liked to play badmington. I was sharing an office with a nice guy called Gary, coming back from Israel having worked with Shelah. He taught me how to play badminton in a way I didn't know, the idea being to hit the bird so that your partner cannot take it like the ball in tennis. When I was a child I used to play badminton in a way similar to what is called frescobol in Brazil and matktot in Israel, the objective being to keep the bird in the air. This is a good example of how by changing the teleological rule, we completely change the game. I wrote a paper on this topic later on entitled "Rules of the game" (joint paper with Tarcisio Pequeno).

I had no car and went only two times outside of LA. One visit in Ojai, one in the some natural parks near Palm Spring organized by the Fulbright program

gathering all the Fulbright fellows. The director of the program was a nice lady called Ann Kerr, widow of the former president of the American University of Beirut (AUB) shot on location–later on, in 2012, I organized the 3rd World Congress on the Square of Opposition at AUB. During this tourist tour I remember that we stopped at a shop in an Indian reserve and the Indian woman told us a bit about the story of her tribe. At the end of her talk one of the Fulbright fellow wanted to thank her and asked her how to say "thank you" in her native language. She replied that there was no word for that in her language. I think it is a very interesting situation that can be interpreted in two opposite ways: these natives were too rude to express their thanks or they were advanced enough not to need to transform their feeling in a formality through a word. It is indeed very easy to say "thank you" all the time without feeling anything.

I came back at the beginning of July 1995 in Paris to defend my PhD at the math department of Paris 7. LA airport was under treat by a guy nicknamed the Unabomber (later on identified as Theodore Kaczynski, a former mathematician of UC Berkeley) and in Paris I escaped of a bombing in the underground train RER who killed many people. My PhD defense was not a big event. I had prepared some slides but the projector was not working. And there was no party after the defense. There is a tradition in France to organize after a defense a "Pot de thèse": drinks and food paid for by the student and/or his family. I was not living in Paris, none of my family came to my defense, I had little money of my own, and what little I did have I was trying to save for the future. The members of the jury were Jean-Louis Krivine, Jan Zygmunt, René Guitart, Michel de Glas and Daniel Andler.

4.4. Copacabana

After my PhD I was not eager to have a permanent position of professor at a university. I wanted to go on doing research. I wanted to go to Rio de Janeiro, this is the place I wanted to live for a couple of years. I had made contact for that with Mauricio Kritz that I knew through his friend Nelson Papavero, himself a good friend of Newton da Costa. Kritz was working at the LNCC = Laboratório Nacional de Computação Científica (National Laboratory for Scientific Computing), a research lab located near the Sugar Loaf. One of the bosses there was his former PhD advisor Marco Antonio Raupp, later Minister of Science in Brazil. Kritz had some interest to apply logic and category theory to biology. I arrived in Rio in July 1995 and had some difficulties to receive a grant, in particular because my profile of post-doc from abroad was not part of the system, and Brazilian bureaucracy is quite tricky. I had to wait nearly one year without a salary. Also my laptop computer broke because of voltage variations and I had no money to buy another one. Nevertheless I did not give up.

At some point there was a permanent job for a logician at the department of philosophy of the University of Brasilia. I went there to meet the people and to discuss the conditions. I had already been in Brasilia in 1992 during my first stay in São Paulo with my friend Hilan. They were ready to contract me but I decided

not to go. I preferred to stay in Rio without a job than to go to Brasilia. The reason is that I think the place for daily life is not a secondary thing, it is really important. Brasilia is an interesting town to visit for a couple of days, but I would never like to live there. One friend of mine who did his PhD in Oxford told me that this has been the worst place he has been living. I have always been very cautious about the place I was living. In Rio I was renting a room in a flat in Copacabana on Atlantic Avenue, facing the ocean. Every morning I was going to swim and run on the beach. I started to run more and more, and after a couple of months I was easily running the full lengths of the beaches of Copacabana, Ipanema and Leblon without difficulties. My friend Otávio is also a good runner, he likes to participate in ultra-marathons (100 miles).

In January 1996 I was invited by my friend Carlos Knudsen to give a summer course in logic at the math department of the Federal University of Pará in Belém, in the north of Brazil, some 2,500 km from Rio. Belém is a nice town on the estuary of the Amazon river. I visited the interesting Émil Goeldi museum and research center about Amazonia. Since arriving in Rio I was going to USP every two weeks, staying at Marcelo Coniglio place who was living in the center of São Paulo in a trendy area. I was going there to attend da Costa's seminar at USP. In March 27, 1996 I defended my PhD of philosophy on logical truth at this University.[17] When I arrived in 1991 at USP I did not matriculate as a PhD student, just as a visitor. But at some point the people of the philosophy department thought it would be nice if I had a PhD from their department. I therefore matriculated and presented the work I originally intend to present at Paris 1 with de Rouilhan. Many years laters it was quite useful for me to have this diploma to get a job in Rio. USP is considered the best University in Brazil and also the best in the whole Central and South America. Many famous scientists have been working at USP, like the physicist David Bohm, who emigrated to Brazil after he was fired from Princeton University during the McCarthy era.

After about one year Kritz succeeded to get a grant for me at the LNCC. It lasted 1 year and a half. In 1998 my grant was cut. This was the first economical crisis of the "plano real" and the Brazilian government decided to cut the grants of foreigners. I spent again more than half a year without income. Petrucio, a friend of mine who was working at the math department of the UFF, a university which is on the other side of the Guanabara Bay, succeeded then to get a position of invited professor for me and I also got a research grant from FAPERJ—Rio de Janeiro Research Foundation to go on working at the LNCC which had been relocated in Petrópolis ("City of Peter") the former Imperial city, 60 km from Rio in the mountains. I was circulating between these different locations always based on Copacabana.

Despite my financial instability during this period, I went to many conferences in Brazil and in the world. This may appear quite paradoxical, but is explained by

[17] Among the members of the Jury was David Miller, who was secretary and friend of Karl Popper. He fully approved my dissertation with 10/10 mark—I guess because it is 100% refutable.

the fact that on the one hand I was member of some research projects with money for traveling to events and on the other hand I started to be invited speaker. Here is the list of events I took part of during my stay in Rio from 1995 to 1999. I have indicated the name of the event, dates, location and the title of the lecture.

- 9th Brazilian Meeting of Philosophy, September 3-7, 1995, São Paulo, Brazil, *Applications of Paraconsistent Logic to Justice and Law*
- Pratica'96 (Proof, Type and Category) April 24-25, 1996, Rio de Janeiro, Brazil, *Rules, Derived Rules, Permissible Rules and the Various Types of Systems of Deduction*
- 11th Brazilian Meeting of Logic May 6-10, 1996, Salvador, Brazil, *The Mathematical Structure of Logical Syntax*
- 3rd Wollic (Workshop on Logic, Language, Information and Computation) May 8-10, 1996, Salvador, Brazil, *Paraconsistent Model Theory*
- 3rd Bariloche Meeting of Philosophy August 29-31, 1996, San Carlos de Bariloche, Argentina, *Present Philosophical Tendencies*
- 2nd Annual Conference on Applications of Logic in Philosophy and Foundations of Mathematics April 24-27, 1997, Karpacz, Poland, *Universal Logic in Perspective*
- 27th International Symposium on Multiple-Valued Logic May 28-30, 1997, Antigonish, Canada, *What is Many-Valued logic ?*
- 1st World Congress on Paraconsistency July 30–August 2, 1997, Ghent, Belgium, *What is Paraconsistent Logic ?*
- 4th Wollic (Workshop on Logic, Language, Information and Computation) August 20-22, 1997, Fortaleza, Brazil, *Classical Negation can be Expressed by One of its Halves*
- 20th Brazilian Congress of Applied and Computational Mathematics September 8-12, 1997, Gramado, Brazil, *Neojunction: between Conjunction and Disjunction*
- 4th Brazilian Meeting of Analytic Philosophy October 6-9, 1997, Florianópolis, Brazil, *Philosophical Aspects of Non Classical Logic*
- Logic, Proofs and Algorithms April 15-18, 1998, Campinas, Brazil, *Sequents and Bivaluations*
- Visions of Science—Meeting with Sokal and Bricmont April 27-28, 1998, So Paulo, Brazil, *Round table on Logic and Language*
- Pratica'98 (Proof, Type and Categories) June 18-19, 1998, Rio de Janeiro, Brazil, *Logical Rules and Logical Laws*
- 4th Bariloche Meeting of Philosophy June 24-27, 1998, San Carlos de Bariloche, Argentina, *Philosophy and Logic: Asset and Perspectives*
- Stanislaw Jaśkowski Memorial Symposium July 15-18, 1998, Torun, Poland, *The Paraconsistent Logic Z*
- 20th World Congress of Philosophy August 10-16, 1998, Boston USA, *Do Sentences Have Identity ?*

- 8th National Brazilian Meeting of Philosophy—ANPOF September 26-29, 1998, Caxambu, Brazil, *Round table on Translations between Logics*
- 11th Brazilian Meeting of Logic May, 24-28, 1999, Itatiaia, Brazil, *Singular Terms in Mathematical Logic*
- 5th Wollic (Workshop on Logic, Language, Information and Computation) May, 24-28, 1999, Itatiaia, Brazil, *A Sequent Calculus for Lukasiewicz's Three-Valued Logic*
- 1st Principia International Symposium August 9-12, 1999 Florianópolis, Brazil, *Are there any Logical Principles?*
- 11th International Congress of Logic, Methodology and Philosophy of Science August 20-26,1999, Kraków, Poland, *The Philosophical Import of Polish Logic*
- 1st Southern African Summer School and Workshop on Logic, Universal Algebra and Theoretical Computer Science December 1-10, 1999, Johannesburg, South Africa, *From Paraconsistent Logic to Universal Logic*

To these talks correspond a series of papers that the reader can find in my complete bibliography, up to the present, at the end of this paper. During this period I made good progress in my logical research and had several new ideas. In particular I discovered an important connection between modal logic and paraconsistent logic, showing that S5 is a paraconsistent logic, this being connected with the square of opposition. Details of the development of these works are described in my 2007 paper "Adventures in the Paraconsistent Jungle" and my 2012 paper "The New Rising of the Square of Opposition".

I wrote the two papers "What is Paraconsistent Logic?" and "What is Many-Valued Logic?".[18] These papers are connected to clarification and understanding of basic notions of the fields of paraconsisent logic and many-valued logic. This was can be called "logical philosophy" if we use this expression in a way similar to the way Bertrand Russell was using the expression "mathematical philosophy". Logical philosophy in this sense is neither mathematical logic, nor philosophy of logic.[19] The idea is to have a deeper understanding of the mathematical notions involved connecting them to philosophical questions. This is not "philosophy of", because by so-doing we are actively interacting with the object of study. And this is not just mathematics, because we are trying to understand the meaning of the constructions not just to prove theorems. Modern logic is often rejected both by philosophers and mathematicians. Philosophers say that it is mathematics and they don't see the philosophical value of all this. Mathematicians say that this stuff may have philosophical interest but that this is not real mathematics, it is a lot of formal trash with no real mathematical value. And both are right to some extent. Modern logic many times is lost in twilight zone between mathematics and

[18] Later on I wrote a paper entitled "What is classical propositional logic?" I intend to go on writing other "what-is" papers—see the section "Future papers" in my bibliography.

[19] The expression "Philosophical logic" is also used, cf. in particular *The Journal of Philosophical Logic*. Its meaning is not necessarily clear.

philosophy, being neither one, nor the other. But it can be both and then it is beyond mathematics and philosophy, the mixture of the two leading to some real enlightenment.

During this period I worked in general philosophy. I attend for the first time an edition of the WCP: World Congress of Philosophy, the one in Boston 1998. At this occasion I met Quine. I was in touch with him when editing a special issue of the journal *Logique et Analyse* about logic in Brazil. He sent me a paper "Mission to Brazil" [37] recalling his one year stay in Brazil in the 1940s. Quine quite liked Brazil and learned to speak and write Brazilian Portuguese. He published an excellent book in Portugese, which has not yet been translated into English *O Sentido da Nova Lógica* [36]. At this event in Boston I presented my paper "Do sentences have identity?" criticizing Quine's idea that sentences exist but not propositions because there are "no entities without identity" (one of the most famous Quine's mottos).

I presented a talk about the present state of philosophy in Bariloche, Argentina, where there is every two years a big international congress of philosophy. In this talk I critically presented three tendencies of philosophy: traditional philosophy, analytic philosophy, new age philosophy. I emphasized in particular the weakeness of academic philosophy not able to attract ordinary people. This was later on published in my 2003 bilingual booklet *Tendances Actuelles de la Philosophie / Tendências Atuais da Filosofia*. In Bariloche I attended a talk by John Searle on money. I think he is a good example of what can done. Searle is one of the most famous alive philosophers but nevertheless in the USA it is very difficult to find a book of Searle in a bookshop. I faced this difficulty when at Stanford in 2000. I was looking for his book *The Mystery of Consciousness* [44] and was not able to find it in the bookshops of Palo Alto and around. It was in fact easier to find it in bookshops in Brazil, translated in Portuguese. This book in Brazil even helped me to solve a question with the police. I had this book in my bag when I was flying from Rio de Janeiro to Joahnnesburg, South-Africa, to attend a big school and conference organized by Val Goranko. When doing the check-in at the airport the police was convinced that I was a drug trafficker because, as they explained me later on, I was well-dressed and arrived in the last minute at the check-in. This was a typical behavior of traffickers which were numerous for this destination, Rio de Janeiro being a huge cocaine export hub in South-America and South-Africa one of the most important consumers market. When they asked me what I was going to do in South-Africa and saw the book of Searle, they just let me go away without advanced search.

During this period in Rio I reinforced my contact with Brazilian colleagues, on the one hand the group of Campinas, on the other hand the group of Fortaleza. Campinas is traditionally the most important center for logic in Brazil. There is there indeed a Center of Logic, it is called Center of Logic, Epistemology and History of Science, *CLE = Centro de Lógica, Epistemologia e História da Ciência*, but it is mainly logic. Up to now they have escaped the danger to be transformed into a Center of History and Philosophy of Science as did happen with the LMPS

congresses launched by Tarski, where logic has became marginal. CLE has in fact been visited by Tarski in the 1970s, a visit organized by Itala D'Ottaviano, one of the two pillars of the CLE since nearly 30 years together with Walter Carnielli, both being ex PhD students of da Costa. This is a very active group with many visitors, publications and connected to the Brazilian Society of Logic (SBL).

After the 1st World Congress of Paraconsistency (WCP1) organized in Ghent, Belgium in 1997, the CLE logicians were planing to organize WCP2 in 1999 for the 70 years of Newton da Costa. With João Marcos, a master student of Walter at the time, we travel by car during three days on the coast of the state of São Paulo to find a good location. We found a nice hotel on a nice beach, named Juquehy (meaning "Rain Dance" in Puppy Guarana). The participants enjoyed it very much and WCP2 was a great success, organized in 2000 (there was a delay)—the best WCP so far. I became a good friend of João Marcos who has interest for many things and, like Walter, fluently speaks about 10 languages. I only fluently speak three. I think it is nice to know lots of languages, it helps to open our minds. This was the idea of Schopenhauer, his favorite language was Spanish—I think Portuguese, especially from Brazil, is better. But I am not sure that to know a lot of languages is a sufficient or necessary condition for good communication. Most of the time it is beyond words and Joã Marcos and Walter despite each speaking 10 languages have sometime difficulties to understand each other.

PICTURE 5
WITH ARTHUR BUCHSBAUM AND NEWTON DA COSTA
AT THE 2ND WORLD CONGRESS ON PARACONSISTENCY IN
JUQUEHY, BRAZIL, 2000

My contact with Fortaleza was established through Arthur Buchsbaum. He did his PhD on paraconsistent and paracomplete logics. We were in touch via e-mail when I was in Poland. When I arrived in Rio he was working in Fortaleza, Ceara, and came to Rio for the defense of his PhD at PUC. This is the first time I met him and we became good friends. His advisor was Tarcisio Pequeno from Fortaleza. After spending many years in Rio working at IBM and then the department of informatics of PUC-Rio, the best in Brazil, Tarcisio came back to Ceara and started to develop a group of Logic and Artificial Intelligence (LIA). He was interested in a mixture of paraconsistent logic and non-monotonic logic. At this time Tarcisio invited me to take part to his research group and I started to regularly go to Fortaleza, about 2.000 north of Rio. I enjoyed very much the climate and culture quite different from Rio, becoming a good friend of Tarcisio and his colleagues and students (Ana Tersa, Marcelino, Ricardo). Besides logic he had a strong interest for philosophy, with Vanderveken they organized a congress with Searle in Fortaleza. We had many deep discussions. What I learned with Tarcisio, and also other colleagues in Brazil, is to work all the time with uncertainty and flexibility and I think it is good.

4.5. Stanford, USA and two trips Around the World

I arrived in Stanford, California in January 2000 where I would stay 2 years. My situation in Rio was instable. Half of the time I was without income. I decided to apply for an advanced grant of the Swiss National Science Foundation to go somewhere. The idea of going to Stanford appeared naturally. I was interested to go to California for a longer period. There was a good connection between the group of Patrick Suppes at Stanford and the group of da Costa, in particular through the Chilean logician Rolando Chuaqui and more recently with Francisco Doria from Rio who had been visiting Pat, and his former student Acacio de Barros who was on location working with Pat. One idea I had about Suppes was his relation with Tarski. In 1957 he organized with Tarski and Henkin a big meeting on axiomatic methods at Berkeley (cf. [25]) which was the first step for the launching of the LMPS (Logic, Methodology and Philosophy of Science) series of congresses, the first being organized in 1960 at Stanford by Suppes himself. When I arrived at Stanford Suppes was mainly working on the brain and I would work with him on this topic but he let me develop my research as I liked. When I was at Stanford John Etchemendy, philosophical logician, became the provost of the university, a function he is occupying up to now. Sol Feferman and Grigori Mints were the leading logicians. Johan van Benthem was coming every year and he was becoming a strong guy for the development of logic there. Richard Zach was finishing his PhD at Berkeley and was lecturer at Stanford.

Again the financial situation was quite a disaster for me because this was a time of a booming economy in Silicon Valley and the Swiss franc, as other currencies, was losing ground against the American dollar—though nowadays the Swiss franc is higher than the US dollar. I had to rent very expensive rooms

(nearly 1,000 USD a month) in some houses of "poor" people[20], and I was getting around the "farm", as Stanford is known, by mountain bike, and from time to time going to San Francisco, taking my bike with me on the train. This was the time of the rising of Google, founded by two Stanford students, Larry Page and Sergey Brin, recalling the exploits of the legendary Stanford duo Bill Hewlett and Dave Packard, who during my stay gave to Stanford the highest donation in the history of donation. Maybe in the future Page and Brin will surpass this record. A few years earlier, Bill Gates had also donated a large amount of money to the computer science department of Stanford. Besides money the farm also boasted nice raccoons, several statues by Rodin (a version of *the Thinker* and others), and a memorial installation about Eadweard Muybridge, author of the "motion-picture" that proved Leland Stanford's contention, that all four hooves of a horse are off the ground at the same time while trotting).

When I was at Stanford I also traveled quiet a lot taking part in congresses. During the summer of 2000 I took part in two big events of the Association for Symbolic Logic—the ASL wanted to do something special for the year 2000. They organized one event in Champaign, USA and one in Paris, France. In June in Champaign I saw Saunders MacLane for the first and only time. The ASL congress in Paris in July was much bigger, taking place at the Sorbonne, the biggest congress in the history of logic up to now. I presented talks about universal logic at both events. In August I went to the ESSLLI in Birmingham (12th European Summer School in Logic, Language, and Information). I had been selected to give a course on paraconsistent logic. That was nice; among the students of that course I counted Alessio Moretti and Catarina Dutilh-Novaes.

The following year, 2001, I went for the first time to a meeting of the SEP (*Society of Exact Philosophy*) an annual meeting held alternately in Canada and the USA—this time it was in Montréal. I gave a talk titled "Sentence, Proposition and Identity", a work I was doing in connection with Suppes's idea about congruence. Identity is a notion I have always been interested in. It is a notion where typically logical philosophy is important. One has to know what a congruence relation is. On the other hand one need to have a good philosophical interpretation of this notion. Suppes has articulated the notion of congruence to study the relation between sentences and propositions, an articulation that can be used to defend the notion of proposition against Quine's rejection of it. During my stay at Stanford Quine died and there was a one day workshop with talks by Suppes, Mints, Feferman, etc. The talk of Pat was quite provocative, sinking Quine in his grave: by an analysis of the bibliography of *Word and Object*, he was showing that Quine knew quite nothing about the recent advances and experiments about language and psychology when he wrote that book, relying mainly on what his Harvard colleague and friend B.F.Skinner was telling him.

[20] At some point I was renting a room in a house in Menlo Park, and the woman asked if I would take a shower in the morning or in the evening, my reply was both and her reply what that this was not possible.

PICTURE 6
WITH MIKE DUNN, ALEXANDER KARPENKO AND VLADIMIR VASYUKOV AT THE ACADEMY OF SCIENCE IN MOSCOW IN 2001

In May 2001 I went for the first time in my life to Russia for the Smirnov meeting to which I was invited—a biennial logic meeting in Moscow. Mike Dunn, Paul Weingartner and Diderik Batens were also there. The event was organized in particular by Vladimir Vasyukov whom I knew from Poland. His father had been a Russian army officer and he grew up in Poland. Another organizer was Alexander Karpenko, the director of the chair of logic of the Russian Academy of Sciences in Moscow, also a poet, with whom I became a good friend. After that I went several times again to Russia, for some conferences in Moscow and St-Petersburg, and I always enjoyed it.

In June 2001 together with Darko Sarenac who was doing his PhD at Stanford I organized a workshop on paraconsistent logic in Las Vegas. In July 2001 I did my first trip around the world. It was a round trip following the direction of rotation of the earth in the South-Hemisphere: from San Francisco to Australia, then South Africa, then Brazil, then back to San Francisco at the end of August. In Australia I went to Hobart, Tasmania for the Australasian philosophical meeting. I took part there in a workshop on logical pluralism organized by JC Beall and Greg Restall. Then I gave a lecture in a one-day workshop in Melbourne where I met Lloyd Humberstone. Next I went at the extreme West of Australia in Perth were is working Slater and I gave my first tlak about the square of opposition, in relation with his paper "Paraconsistent logics?" claiming that there are no paraconsistent logics. From Perth I flew to Johannesburg where Goranko was still working at Rand Afrikaans University and gave a talk on universal logic. Then in Brazil I took part in events in Fortaleza and Florianópolis, giving in particular a mini-course on paraconsistent logic at the Annual Brazilian meeting of Computer Science.

The Swiss National Science Foundation (SNF) grant that I was receiving at Stanford was ending in July 2001, before my first trip around the world Pat Suppes asked me what my future plans were, and offered to engage me for a couple of months more at Stanford working with him. That seemed good to me and I gave him a positive reply to work with him up to the end of November 2001. In the fall of 2001 I met nearly every day with Pat for discussion, this will lead to our joint paper "Semantic Computation of Truth based on Associations already Learned" (published in 2004). In this paper we have developed philosophical and theoretical basis to explain our the brain is working. At his "Brain Lab" Suppes was conducting lots of experiments but Suppes was not a naive empiricist, he knew that data make sense only through a theory. What I remember about all these experiments is that, surprisingly, a triangle as a picture, as a written word, and as a spoken word was provoking the same effect on the brain.

My plan after Stanford was to go to Switzerland. There was a new program of the SNF, a grant of several years, mix of research and teaching, for people having a PhD since a couple of years but not having yet a permanent position. The SNF program was designed to prepare a wave of retirements of professors, avoiding the loss of good researchers, brain draining due to unemployment, providing a smooth transition between research and a permanent position of professor. The idea was to locate the winners of these grants in some Swiss universities, where there was possibility for them to get a job later on. My plan was to go to the University of Neuchâtel where there was an Institute of Logic. The director of this institute, Denis Miéville, had written to me, suggesting me to apply. I therefore applied for this grant at the beginning of 2001 and was selected for an interview at the beginning of January 2002 in Bern. My idea was to stop in Bern while doing a second quase-complete around the world trip, earth rotation: leaving San Francisco to Brazil stopping in New Zealand, Asia, India and Europe. My intention was to go to Brazil waiting for the result, staying in Brazil if the result was negative, applying again the following year. The competition was very tough, about 30 people were selected every year for all Switzerland and all fields. I knew it would not be that easy, applying with a project in logic.

A the end of November I left California. I stopped first in the Australasian logical meeting in Wellington. From Wellington I went by train to Auckland, a trip of whole day duration I did with Stpehen Read. In Auckland I took part to a philoshical meeting and then flew to Singapore. From there I went to Thailand crossing Malaysia by bus, and then flying from Bangkok to Kathmandu, Nepal. It was shortly after the Nepalese royal massacre when the King and seven members of the royal family were killed by his son and in the countryside some Maoists were trying to get the power attacking and murdering people. I nevertheless made a drive on the direction of Himalaya and visited Bakthapur that I liked very much. From Kathmandu I flew to Varanasi, India. It was my first visit to this country. I did a trip by boat on the Ganges and I went to visit the nearby city of Sarnath, where the Buddha did his first speech. I then went by train to Chennai and Mumbai.

From Mumbai I had a flight at night to Zurich with a stop in Dubai on Emirates airline. My flight was arriving in the morning, shortly before the interview in Bern. I tried several times to change this flight with the travel agency which booked my around the world trip in San Francisco, but there was no way to change it. I went to Emirates office in Mumbai, also without success. My flight was at 3:00 in the morning. Before going to the airport I was training in my hotel room in Mumbai for the interview. I was quite exhausted when boarding the plane after queueing and confusion at this big airport. Fortunately the atmosphere on board was pretty relaxing, Emirates at this time had been elected number one airlines in the world. We stopped in Dubai airport early in the morning where I had to change planes. At this airport I bought a music tape that during the coming months I listened to a lot, especially when flying. It was by a woman singer that I did not know yet, the Lebanese Nawal Al Zoghbi, this was her 7th and most successful album, *El Layali* (The Nights), with a song of the same name, my favorite one. Arriving in Zurich I had to run to catch my train to Bern. In the train I fell asleep and nearly missed disembarking at Bern. After leaving my luggage in a locker in the station, I ran to the SNF building. I arrived only two or three minutes before the interview. I asked if it would be possible to grab a quick coffee. They told me that there was no time to do so, that the jury was waiting for me. I succeeded to rightly conduct the presentation of my project.

After that I took the train again to go to Neuchâtel where I would sleep and meet my potential collaborators the next day. And this is what I did. I remember that there was a lot of snow and that it was cold, this was my first time in Neuchâtel and I quite liked it. After that I went back to Brazil waiting for the reply. It came sooner than expected, at the beginning of February. My contract would start August 1st in Switzerland, I had time to relax a bit. I took this opportunity to visit the Machu Pichu and did the Inca Trail. I also crossed the region of the Titicaca lake up to La Paz in Bolivia—a wonderful trip. In April 2002 I organized a workshop with Décio Krause in Florianópolis[21] for the 80th birthday of Pat Suppes, who was visiting Brazil on his way to Chile.

5. Launching projects from Switzerland (2002-2008)

5.1. By the Transparency and Depth of a Swiss Lake

I left Brazil at the end of July 2002. I spent a fews days in Rio de Janeiro with Arthur Buchsbaum at his brother's house at the foot of the "Cristo redentor"—Christ the redeemer—and participated to the 8th WoLLIC (Workshop on Logic, Language, Information and Computation) happening at the PUC-Rio. From Rio

[21] Florianópolis is located in a very nice island in the state of Santa Catarina, south of Brazil. This is where my friend Arthur Buchsbaum moved after living a couple of years in Fortaleza beause to hot for him. This is also the place where Newton da Costa moved with his family after his retirement from USP. In this island Saint Exupéry used to stop on his way to Chile. The hut where he was staying is still existing near a small village whose central street is called "Avenida Pequeno Príncipe".

I flew to Italy to take part of the 14th ESSLLI (European Summer School in Logic, Language and Information) happening in Trento where João Marcos was organizing together with Diderik Batens (the big smurf of logic in Belgium) a workshop on paraconsistent logic. This event was giving continuity to the 1st and 2nd World Congresses on Paraconsisent logic (WCP1, Ghent, Belgium 1997; WCP2, Juquehy, Brazil, 2000).

At this time I started to discuss with Walter Carnielli the organization of the WCP3 in Toulouse at the IRIT for 2003 (the idea being to have a WCP every 3 years). The IRIT (*Institut de Recherche en Informatique de Toulouse*) is one of the major research centers in France with 700 researchers and a good diversity of lines of research including strong logic trends, in particular with the two fuzzy guys, Henri Prade and Didier Dubois (one of the main editors of the *Journal Fuzzy Sets and Systems*) of the ADRIA team (*Argumentation, Décision, Raisonnement, Incertitude et Apprentissage*), and with the LILaC team (*Logique, Interaction, Langue, et Calcul*) with people like Andreas Herzig, Philippe Besnard, Philippe Balbiani, Jonathan Ben-Naim, Luis Fariñas del Cerro. Luis was at that time the general director of the IRIT and gave us full support for organizing this event. Walter had been in touch with Luis and IRIT since a couple of years. The IRIT had took over the *Journal of Non-Classical Logics*, founded by Walter and others in Campinas, which had been renamed on this occasion *Journal of Applied Non-Classical Logics*.

From Trento I went to Neuchâtel to start a new life. This would be the first time after I left Paris in 1991 that I will really have my own house and first time I will have a non-precarious position. This was a four year contract with the Swiss National Science Foundation (SNF), with a possible two year extension, and at the end perhaps a permanent position. In Neuchâtel I was attached to the *Institute of Logic and Centre of Semiological Research* founded by Jean-Blaise Grize. Grize was retired when I arrived and the institute was directed by his former PhD student, Denis Miéville, who was mainly interested in the work of the Polish Logician Stanislaw Lesńiewski, the PhD advisor of Alfred Tarksi. This is through this Polish connection that I arrived in Neuchâtel. Miéville wanted to develop his institute, having heard about the SNF program, reading some of my papers and knewwing I have ben working in Poland, he invited me to come there. When I arrived in Neuchâtel, Miéville was the Rector of the University of Neuchâtel, as had been also Jean-Blaise Grize between 1975-1979. Grize (1922-2013) was a former student of Piaget. The father of Jean Piaget, Arthur Piaget, (1865-1952) was the first Rector of the University of Neuchâtel (1909-1911). Jean Piaget (1896-1980) was born in Neuchâtel where is first research study was on the mollusks of the lake. He was then professor in Paris and founder of a research center in Geneva, *Geneva International Center of Genetic Epistemology*. Grize worked with him in Geneva and then settled down at the University of Neuchâtel.

Neuchâtel is one of the beautiful cities in Switzerland by a lake with transparent water from the mountains, good inspiration for philosophy. Schopenhauer

wrote: "The real philosopher always looks for limpidity and precision, he will invariably try to resemble not a turbid, impetuous torrent, but instead a Swiss lake which by its calmness preserves transparency despite its great depth, a great depth revealing itself precisely through its great transparency." (*On the fourfold root of the principle of sufficient reason*) [46]. Precision is famous in Switzerland through the watches industry. Neuchâtel is a few kilometers from the Watch Valley, where the most famous watches in the world are built, at the border between Switzerland and France in two small towns in the mountains: Le Locle and La Chaux-de-Fonds. The latter is also famous because this is the town of Le Corbusier and, less known, of Louis Chevrolet (Chevrolet's logo is a cross remembering the Swiss flag). In La Chaux-de-Fonds was found recently the correspondence between Bertrand Russell and Louis Couturat [22] who was edited and published by Anne-Françoise Schmid [45].[23] A very interesting book where the who logicians are talking about many different subjects.

The region of Neuchâtel is also where the legendary absinthe beverage was conceived at the end of the 18th century. The nicknamed of this beverage is the "Green Fairy" and it was very popular among artists in the XIXth century. Van Vogh was a great consumer and it is suspected that the colors of his paintings are connected with the psychic effects of this beverage, considered as hallucinogenic. At some point absinthe was outlawed in all the countries—in Switzerland from October 7, 1910 until March 1, 2005. So when I arrived in Neuchâtel it was still illegal, but everybody had a clandestine bottle at home. After its re-legalization (following some strict rules lowering the effects), it became a popular drink in the bars and restaurants of the city. Neuchâtel, like many places in Switzerland, is an interesting mixture of provincial and cosmopolitan atmospheres. Switzerland is one of the countries in the world with the highest percentage of foreigners, in particular due to the strong traditional asylum policy of the country. The basis of Switzerland's banking system was laid by French protestants seeking asylum in Switzerland from persecution—16th to 18th centuries. When I was living in Neuchâtel the recent political refugees were mostly Albanians. There are also people settling in Switzerland for business due to the very stable political and economical situation. In Neuchâtel there is one of the biggest Philip Morris's factory in the world, which was the first factory of Philip Morris outside the USA. When I arrived in Neuchâtel there was the Swiss national exposition—nearly 40 years after the preceding one in 1964 in Lausanne—and it was really animated. I found

[22] Louis Couturat (1868-1914) is the guy who promoted the work of Leibniz on logic who was during several centuries completely unknown. Couturat is the author of *La Logique de Leibniz* [8] and also *L'Algèbre de la logique*[10], *Histoire de la langue universelle* [9] and many other interesting books.

[23] Anne-Françoise is a good friend of mine who invited me to take part to a joint project jointy organized with Nicole Mathieu, "Modélisation et interdisciplinarité". During five years (2007-2012) we have invited, listened and questioned 12 great French intellectuals in Paris. I have a strong memory of two of them: Maurice Godelier and Radyadour Kh. Zeytounian. This resulted in a book—I was responsible for the section of logic and linguistics featuring Jean-Pierre Desclés and Patrick Blackburn, see the my paper [98].

a big flat to rent, with a nice view of the lake and the mountains and used to invite colleagues and friends for fondue parties.

When I arrived in Neuchâtel, Miéville was quite busy with its activity of rector, but we had meeting with his assistants and students nearly every Monday morning. This was a friendly group. There was a diploma of logic "licence de logique" which disappeared through the Bologna process of "uniformisation" [24] of studies in Europe. At the beginning of October was organized in Neuchâtel the annual meeting of the Swiss Society for Logic and Philosophy of Science whose topic for 2002 was quantification. This was the opportunity to present the work of my PhD on logical truth. I presented again in more details this work at a small workshop we had in the winter of 2003 at a monastery near Lausanne. It led to my CQFD 2005 paper "Le Château de la Quantification et ses Fantômes Démasqués". This was directly connected with the work of my colleagues in Neuchâtel working on Leśniewski's systems. Leśniewski had the idea that a variable can range over one, many or zero objects , contrary to the main trend, up to now dominating, where a variable range only over single objects. I told them that I was not interested into empty domains, because *if there is nothing, there is nothing to say*. For me that perfectly justifies the standard model theory developed by Tarski according to which the domain of a structure is always considered to be non empty. As a consequence, "for all" implies "there exists", which is better formulated as "at least one", avoiding existential and scholastic problems. I know the work of Fraïsse, French logician friend of Tarski, his tentative to develop a framework for model theory with empty domains, but I think philosophically it is ambiguous for the above reason. Although I like Fraïsse's idea of *zerology* (cf [15]), considering that we can understand things through limit cases, I think also that there is a danger to focus on exceptions. Obsession for exceptions and monstrous cases in philosophy can led to sophistry. At some point Pat Suppes in our discussions put the emphasize on that, saying that what is important first of all is the general situation. And I agree with him: If you focus on awkward cases you will create an awkward theory. Of course in mathematics one counter-example is enough to kill a theorem, but there is a difference between a theorem and a conceptual framework.

This question of empty domain and quantification is also related with the square of opposition, a topic which became one of my main topics during the beginning of my stay in Neuchâtel.[25] I already discussed the square of opposition on relation with paraconsistent logic visiting Slater in Perth in July 2001, topic I discussed again at the 14th ESSLLI in Trento, leading to my 2005 paper "Paraconsistent logic from a modal viewpoint". But in my first months in Neuchâtel I made important progresses leading to the development of my research project on the square of opposition, where paraconsistent logic is only one aspects. Part of this work can be found in my 2003 paper "New light on the square of oppositions

[24] Giving the same form, unifying the multiplicity into one single form. There is no exact English translation of this word

[25] I will not here present the details of this study that I have described in my overview 2012 paper "The new rising of the square of opposition"

and its nameless corner". The two centrals idea I had at this time are concerned with the extension of the theory of the square of opposition in two ways: to the third and other higher dimensions (polyhedra), to go to polytomy (this leads or not to polyhedra).

Going to the third dimension by itself was not a new idea, because people had already the idea to generalize the square of opposition to a cube of oppositions. But I presented a different polyhedra than a cube, to which I was led wanting to relate three hexagons of opposition dealing with interactions between modalities and negations. On the one hand doing that I was using hexagons which are two-dimensional generalizations of the square of opposition. On the other hand my construction of a polyhedra of oppositions was motivated by an intrinsic necessity not the product of an abstract generalization in the air. Generalization and abstraction are two very interesting features of mathematics and thought in general. To generalize is interesting but most of the time it is trivial. There are some people who want to generalize everything all the time, this is quite superficial. Most of the time these people are not capable to study the details of a particular thing, this requiring care and attention. The same can be said about abstraction, the two phenomena going hand to hand. To be able to jump into abstraction, to fly in the sky of generalities allowing us to have a general vision of the phenomena, is a very difficult task to perform. If we fail we are sunk into an ocean of trivialities or just splashing in a swimming pool with artificial plastic tools. This difficulty manifests regarding the question of polytomy of oppositions.

The theory of oppositions started with dichotomy promoted by Pythagoras and Plato. It was generalized into a trichotomy by Aristotle introducing the notions of contrariety and indetermination. Blanché's generalization of the square of opposition strongly emphasized trichotomy. His hegaxon is obtained by putting together two triangles [26]. Kant in his logic book [27] argues that only dichotomy is *a priori* that all other polytomies are empirical. But Blanché's hexagon indeed shows that he is wrong. One may decide to generalize dichotomies of opposition to any kind of polytomies, this can be easily done mathematically. One can generalize for example the hexagon of Blanché based on trichotomy to an octagon of oppositions based on the mix of two quatritomic figures (one of contrariety, one of subcontrariety) looking like the octagons found in Islamic culture. The question is whether this is philosophically interesting or not. Similar discussions can be developed about many-valued logic. I don't necessarily agree with Quine saying than many-valued logic is not logic but algebra, but I think that it is important when working with many-valued logic to keep in mind the philosophical aspect. Truth and falsity are represented in modern logic by 1 and 0. This does not necessarily mean that all natural numbers of real numbers can be considered as truth-values.

Being back to the old world I was eager to develop contacts with people of different countries in Europe. It started first with France and Italy. At the 14th

[26] About this hexagon see Blanché's master piece [4] and my 2012 paper "The Power of the Hexagon"

ESSLLI in Trento was present Alessio Moretti a French-Italian guy living in Nice. It was the second time I met him after the 12th ESSLLI in Birmingham in 2000. We had good contact because, like me, he had interest for many things, including Smurfs. He was a philosopher with an open mind having a good knowledge of both analytic and continental philosophy. And he had also a strong interest for logic and mathematics. He was living in Nice doing a PhD under the direction of Jean-François Mattéi (1941-2014), a specialist in Pythagoras and Plato—on Plato he wrote the excellent book *L'Etranger et le Simulacre* [33] that I read when working on Plato's cave. At the end of August 2002 there was the congress of the ASPLF organized by Mattéi in Nice and Alessio invited my to stay at his house. I went to Nice by plane from Geneva, a short (less than one hour) and very beautiful flight, one of my favorites. There is a nice view of the lake and the Mont Blanc taking in off in Geneva, and then we go south seeing the Alps up to the Mediterranean sea, the plane flying above the sea before landing at Nice's airport. I like very much the region of Nice, geographically very similar to Corsica and culturally it is an atmosphere which is a mix of France, Italy, England and Russia. The ASPLF congress was nice. I met a lot of new people. ASPLF means *Association des Sociétés de Philosophie de Langue Française*. It is an organization gathering philosophers from all around the world speaking French and they have been organizing international congresses regularly since 1938—in Nice this was the 29th edition. This was the start of a long collaboration with Alessio. Later on I presented to him my idea about the square of opposition which became its favorite topic up to now and he did a PhD with me (2005-2009) on the *Geometry of Logical Opposition* [34] in the University of Neuchâtel .

In October I came again in Nice on my way to Sardignia. I had organized a series of talks on my new ideas on the square of opposition. From Nice I took a boat to Corsica—my first time in Corsica since I had left in 1975. I arrived in Ajaccio, went south to Bonifacio, going through Colomba's village near Sartẽne. I slept one night in Bonifacio and next day took a boat to Sardignia and then cross the whole island to arrive in Cagliari where I gave my first talk of this tour—I had contact with Francesco Paoli that I had met in Tasmania in 2001 and who was working there. From Cagliari I took a boat to Naples. The arrival to Naples by boat is very impressive with view on the Vesuvius. In Naples I had contact with Nicola Grana, a long time friend of Newton da Costa, who had worked on paraconsistent logic and the theory of valuations (see [18]). I gave two talks and Nicola in two days showed me everything in Naples, a city I enjoyed very much, a bit like Brazil (there are many Italian descendents in Brazil, especially in São Paulo, and most of them are from Naples). I also visited Pompei. From Naples I went to Roma, my first visit to this impressive city, and then go on up to Siena where there was my friend Claudio Pizzi, an Italian modal logician who has been adopted by the Brazilian community, and gave again a talk on the square. From Siena I went back to Nice and then Geneva.

I also made strong connections with a group of people in Nancy where I met Fabien Schang and Katarzyna Gan. From some time we developed a N3-linkage

(N3 = Nice-Neuchâtel-Nancy). In Nancy a group of logic and philosophy of science has been developed by Gerhard Heizmann in partcular through the Archives Poincaré—the famous mathematician Henri Poincaré was from Nancy. This culminated with the organization of the 14th LMPS in 2011. Fabien was at this time a PhD student of Heizmann who later on invited me to take part of Fabien's defense. Heizmann was very talented to organize events, in particular emphasizing very friendly gathering around food and drinks. He certainly inspired me for my later organizional activities. I took part in the fall 2002 to the event he was organizing named PILM = Philosophical Insights into Logic and Mathematics: The History and Outcome of Alternative Semantics and Syntax. Many important logicians were there in particular van Benthem and Hintikka. I presented a work I have been doing since Stanford, showing that in most of the cases possible worlds are superfluous for relational semantics.[27] The corresponding paper was subsequently published in the nice book resulting from PILM: *The Age of Alternative Logics* (see [3]). Later on there was also in Nancy a congress on Polish logic organized by Roger Pouivet, a French philosopher married to a Polish woman, who translated the famous book on the principle of contradiction in Aristotle by Łukasiewicz into French. On this occasion I met Katarzyna, a Polish student, who was going back and forth between Nancy and Poznań. This was the beginning of a long-lasting friendship and collaboration. I went to Poland in 2003 to take part in an event that Jan Zygmunt organizes every year in Karpacz, a nice village in the mountains in the south of Silesia, bringing there two colleagues from Neuchâtel.

In November 2002 was announced a position for a logician at the University of Lausanne. I decided to be candidate although I was not very motivated because I had just started my 4 year SNF fellowship which in many senses was more interesting for me for the coming years. This position was in particular organized in the perspective of the development of the *Centre Romand de Logique et Philosophie de la Science*, a research center to develop activities in logic and philosophy of sciences between Geneva, Lausanne and Neuchâtel.[28] I was selected with two other guys (one of them was Marcus Kracht) for a lecture and an interview. I remember that during the interview, since I had nothing to loose, I clearly told the committee that I was not interested to teach logic just by presenting truth-tables, translation exercises and so on. The committee retained none of us. They decided to summon other candidates among those not selected for the first round, among them Achille Varzi from Columbia who after the interviews of this second round was chosen. But Achille gave up. People suspected that he applied a very common strategy in the USA: since the salaries in Switzerland are very high, and his salary at Columbia

[27] This is related to my paper "Possible worlds: a fashionable non-sense?" that I wrote when at Stanford stressing the fact that most of the time people don't know what they are talking about when they talk about possible worlds—this paper has not yet been published, it was rejected several times in the actual world. I have published later on in 2010 a paper entitled "What is a possible world?"

[28] The creation of this center, an idea due to Jean-Claude Pont, has aborted due to discord between people.

was low, at the end he got an increase of his salary to stay in New York that he likes very much, after a free trip to visit Switzerland for the interview.

The committee had listed in the sceond position Jacques Duparc who therefore got the job. Jacques was my former friend from the Lycée Gabriel Fauré in Annecy. After having entered the math sup "prépa" he quit because he liked very much mathematics and this was too much oriented towards engineering. For some reasons he then entered a Medicine faculty and then quit again to do philosophy. After a couple of years I met him by chance in Paris and I told him I was studying logic and explaining him all about what it was and the logic cursus at Paris 1 and Paris 7. He has been working on Heidegger and Wittgenstein but then he started to study logic and liked it very much, especially set theory, getting very good results and ending up defending a logic PhD at Paris 7, after a stay at UCLA. At the time of the open position in Lausanne he was teaching logic in Germany.

Miéville was sad not to have Varzi because Varzi had interested for the mereology of Leśniewski. At this stage I think Miéville didn't support me because in any case I would be around at least 4 years and the idea was to enlarge the logic community with one more person. On the other hand the president of the committee was a mathematician, Dominique Arlettaz, from the University of Lausanne (now the rector of this university), with whom I add previously a peculiar case. In 1999 before going to Stanford, there was a position of logic in Lausanne, a kind of tenure track position. I applied and was chosen by Dominique Arlettaz. Since I also got the grant to go to Stanford, I decided not to go to Lausanne. I explained this to Arlettaz but he insisted very much for me taking this position saying that I was exactly the kind of people they were looking for. If I had taken this position in 1999, probably I would have been nominated full professor of logic in 2003 at the University of Lausanne, the time this position was attributed to Duparc. I don't regret anything. It was not easy to choose but I think this was the right choice, both going to Stanford in 2000 and not making specific efforts to get the position in 2003. Before the interview in Lausanne I clearly told Arlettaz in a personal meeting when he was visiting the University of Neuchâtel to give a talk thatI was not interested right now by the position, but he told me they could not wait.[29]

With my SNF project I had a 4 year grant for a student doing a PhD with me. In Switzerland there was no one in position to do a PhD in logic. I decided to invite a Brazilian student, Alexandre Costa-Leite, that I had met a couple of years ago in a congress of Florianópolis. At this time he was an undegraduate stdudent at the Federal University of Goias, nearby Brasilia, the region he is from. We were keeping in touch. He was asking me advices. I advise him in particular to to do his Master at UNICAMP. This what he did: a Master's thesis on Fitch

[29] I have always thought strange that at universities everywhere in the world whole life positions are attributed in a few weeks. The procedure also most of the time is highly dubious due to the way the jury is constituted. The ones who choose are not rightly chosen and/or self-chosen, so how on this basis the final choice can be good? André Weil has stated an interesting law of university hiring: First rate people hire other first rate people. Second rate people hire third rate people. Third rate people hire fifth rate people, ...

paradox directed by Walter Carnielli. He had just finished, so that was a good timing. He was glad to be invited to Switzerland, he adapted quickly and easily and enjoyed very much Neuchâtel but also the nearby cities of Bienne and Fribourg. He also traveled around benefiting from the Erasmus program to do research stays of a couple of months each in Amsterdam, Paris and Lisbon during his PhD. He did his PhD on *Interactions of metaphysical and epistemic concepts*—that is the title. This is a work in logical philosophy related with combination of logic. The defense was in 2007 with Paul Gochet, Pascal Engel and Arnold Koslow as members of the jury. Alexandre had a strong interest in combination of logic, we both went to CombLog'2004 in Lisbon, organized by Amilcar Sernadas and Walter Carnielli at the IST (*Instituto Superior Técnico*), and the day after his defense we organized the workshop CombLog'07 in Neuchâtel. At CombLog'2004 I presented the "copulation paradox": the fact than when combining conjunction and disjunction, we get more: distributivity. Gabbay liked the expression. Later on I have further develop this work with Marcelo Coniglio who was also present at this event among many others: Razvan Diaconescu, Jospeh Goguen, Carlos Caleiro, Don Pigozzi, etc. There was a really nice atmosphere in Lisbon surrounded by Fado and Bifadas.

I attended CombLog'2004 on my way back to Switzerland after a third around the world trip, this time in reverse rotation—the shortest, less than 30 days, and craziest around the world trip I did. From Geneva I went to St. Petersburg, then Hong-Kong, Bali, Australia, Tahiti, Easter Island, Santiago in Chile, Buenos Aires, São Paulo, Lisbon and back to Geneva. In Australia I took part to the Australian Congress of Philosophy in South Molle Island on Great Barrier Reef Marine Park. I presented the talk "Three Definitions of Human Beings", comparing Plato, Aristotle and Desmond Morris's definitions, respectively bipeds without feather, rational animals, naked apes. Blaise Pascal in his famous essay on the axiomatic method [35], which has strongly inspired Alfred Tarski, emphasizes the trilogy Axioms/ Definitions/ Demonstrations. Nevertheless Pascal claims that there are some notions that are useless to define and gives as an example "human beings". On the contrary I think that this notion is one of the most interesting to define. I am working on this subject having presented several time talks on that but have not yet written a paper. Besides this around the world trip I also went to series of events I already took part of: LMPS, WCP, SEP. The 12th LMPS did happen in Oviedo, Spain, the 21st WCP in Istanbul, Turkey and the 31st SEP in Montréal (all in 2003). I also kept in touch with Brazil and South and Central America taking part to several meetings there in particular going to the 12th SLALM (Latin-American Symposium on Mathematical Logic) in San Jose, Costa Rica in January 2004. I enjoyed very much Costa-Rica visiting both the Pacific and the Caribbean sides.

I took part in October 2004 in Geneva to the first congress on Louis Rougier (1889-1982) organized by Jean-Claude Pont. Before this event, like many people, I knew nothing about Rougier, a very important French philosopher from the XXth century, friend of Schlick and promoter of the Vienna Circle. He married Lucy

Friedman, the secretary of Schlick and adopted her daughter she had from a previous marriage—this woman came to the meeting in Geneva. Rougier has written many interesting books and was very active, the reason why he became unknown is due to his constant support of the Marshal Pétain during and after second world war. For this reason and other reasons nobody wanted to talk to him or of him. Rougier was neither pro-nazi, nor antisemitic but he was anti-communist and also anti-democrat. He defended neo-liberalism, a position not welcome among the intellectuals in France after WWII. He was also anti-rationalist and anti-Christian. Although I disagree with most of his ideas, I think he is certainly one of the most brillant thinkers of the period. His criticism of rationalism is quite interesting, his way to question basic principles considered as obvious by the rationalists, indeed not obvious at all and sometimes wrong. Rougier was the first to strongly defended relativism in logic. He had a good knowledge of what was happening in logic, the appearances of different non-classical logics. He was a conventionalist and had the idea that there are different logics for different situations. He wrote the following: "Avec la logique, l'homme a brûlé sa dernière idole" (with logic, human being has burnt his last idol). I wrote later on the paper "Rougier: logique et métaphysique" (2011) a critical presentation of his main ideas and asked Mathieu Marion, a good specialist of Rougier, to write an introduction of Rougier essay "On the relativity of logic" for the *Anthology of Universal Logic* I have edited in 2012.

In 2004 I also took part to an interesting meeting: the *Third Philosophy Day*, at UNESCO in Paris, November 18. I was invited there to take part of a panel on globalization organized by my friend Francisco Naishtat. At this occasion I presented the idea of a world university. At the end of the day there was a very nice music show by Herbie Hancock, after which the happy few were invited for a cocktail party on the roof of the UNESCO building (UNESCO has good location in Paris, near Napoleon gravestone at *Invalides*). Herbie had some nice pendant with colored feathers and I asked him what was this. He told me that was a gift of Carlos Castaneda.

5.2. Universal Logic Take Off

PICTURE 7 - POSTER OF THE 1ST UNILOG

In the fall 2004 I started to organize the 1st UNILOG, 1st World School and Congress on Universal Logic projected to happen in April 2005. I had organized in October 2003 a small workshop in universal logic with Alexandre Costa-Leite with the participation of Arthur Buchsbaum who was visiting me in Switzerland at this time, also Petrucio, Paulo and Sheila Velso, Darko Sarenac, Jacques Duparc, Ramon Jansana and few others. But organizing a big event was a completely different story. This was my first experience of doing that and I worked very hard to be sure it would be a success. It was important to find a good location and a good timing. I chose the city of Montreux beautifully situated by the bank of Lake Geneva, and for the timing I thought that Easter would be nice because many important events are organized in the summer and in Spring around Montreux there is still a lot of snow which is quite nice. During the event we organized a trip to the Marmot paradise which is at 2.000 meters above Montreux, we went there by the typical cog railway and this was a very pleasant promenade at the middle of the snow. I decided to organize a combination of a school and a congress. For the congress I had the idea to have a contest and a secret speaker (a speaker whose identity is revealed only at the time of his talk). This format was successful and was repeated to the next editions of the event. Alexandre continuously helped me to organize this event and suggested to have Kripke, one of his favorite philosophers, as the secret speaker. We had no idea if he would accept, but he did. He liked the universal logic projected and has never been to Switzerland, he wanted to know this country. We succeeded to organize his coming without much trouble and it was a success. The whole event indeed was a great success for various reasons. The hotel

was a charming family hotel. Montreux is really relaxing. We had lots of famous logicians and also a very good book exhibition. Some Chinese logicians came and suggested to organize the second UNILOG in China, we started to discuss this possibility in Montreux.

PICTURE 8
WITH SAUL KRIPKE ON THE ROOF OF HOTEL HELVETIE

At the 1st UNILOG was launched the book *Logica Universalis—Towards a General Theory of logic* published by Birkhäuser, a collection of papers related to universal logic. In November 2004 I entered in contact with Birkhäuser to propose them to launch a new journal: *Logica Universalis*. Birkhäuser is the publisher of the journal *Algebra Universalis* and many other important mathematical journals and books in particular the collected papers of Alfred Tarski. For me that was the natural editor for a journal on universal logic. They very quickly replied to me. Birkhäuser is based in Basel, about 90 minutes by car or train from Neuchâtel. Two representatives visited me the next days and I also went to Basel. They told me that launching a journal is a very serious enterprise, that it has to be done carefully so that the journal will not disappear in a few years. They thought a book series would be safer. Anyway we agreed to produce as a kind of experiment a book with the title *Logica Universalis*. Thomas Hempfling, now the present director of Birkhäuser, came to the 1st UNILOG in Montreux to talk with the people, to feel if the atmosphere was propitious for a new journal of logic. Birkhäuser agreed to sponsor the contest by offering a 500 Swiss francs book coupon to the winner. At the end all was positive and Birkhäuser decided to launch the journal *Logica Universalis* and the book series *Studies in Universal Logic*. This was carefully prepared and both started in 2007. Up to know I have managed the editing of

this journal and book series—a very interesting work. *Logica Universalis* rapidly became one of the most important journals of logic and in the book series we have published many interesting titles, the latest being a book on Leon Henkin: *The Life and Work of Leon Henkin* [25].

After the great success of the 1st UNILOG—many people told me it has been the best conference of their life—I was quite optimistic about my future. But success rhymes with difficulties. It is like mountain climbing: the higher we go, the more beautiful view we have, the more risks we face, and the more likely it becomes that a lethal fall may happen. In September 2005 I was traveling in the West part of USA. I gave a talk at the Santa Fe Institute in New Mexico, an interesting interdisciplinary institute where a friend of mine,David Krakauer, was working and visited the nearby artistic town Taos where Julia Roberts lives. I did not go there to meet her, but I was interested to visit Taos because this is where the novel of Fredric Brown, *The Far Cry*, takes place. At the Sante Fe instute I met the writer Eric McCormack who dedicated me one of his books. He is living in Santa Fe and had some interest for logic. In California I visited Pat Suppes at Stanford and drove through Los Angeles by the highway number 1 through legendary places like Carmel and Big Sur, a trip I had no opportunity to do when at UCLA and Stanford since I had no car at this time. I visited Herb Enderton at UCLA and gave a talk there at the cheese and wine seminar.

After my talk at UCLA I was relaxing in Ojai, a nice town in the mountains near LA, on my way back to San Francisco. I then received a surprising piece of news: the Rector of the University of Neuchâtel told me it would not be possible for me to have a prolongation of my SNF grant at the University of Neuchâtel. It was three years I had been working at this university, I had one year left but already had to ask for the two year prolongation at the SNF. Such prolongation would in principle be nearly automatic, since the idea of the SNF was to avoid brain draining, keeping the good researchers in Switzerland until they find a permanent job, I had not yet found. I had to ask for prolongation by writing a report of what I had done during three years and I had done a lots of things, that was not the problem. The problem was that I needed the formal agreement of the university which was hosting me

Since I arrived in Neuchâtel the rector had changed. It was not anymore Denis Miéville. Miéville had became quite unpopular and he had to leave his position. Since the direction of the university has been confused, the state of Neuchâtel, who is financing the university, decided to change the way to choose the rector. They decided that the rector will be be chosen by the state (the same situation indeed than in France and Brazil), not by internal decision of the university. They decided to choose Alfred Strohmeier, a computer scientist, former director of the big department of informatics of the Federal Polytechnical School of Lausanne (EPFL). The e-mail I was receiving when in Ojai was from Strohmeier, but he told me that it was not possible for him as a rector to give me his approval for the prolongation of my grant since Miéville was against it and the approval of the rector has to be in conformity with the decision of the host institute. What was

happening is that Miéville did not want me to stay for two intertwined reasons. Due to his failure as a rector he was quite bitter, he wanted to come back to his activities of logician and from this point of view the success of my activities was making shade to him. But it was difficult for him to tell me that he didn't want me to stay, so he tried to make me believe that he had given a positive support for my prolongation of the SNF grant but that Strohmeier was against that, because he was against him as a former rector. But the real state of affairs was revealed.[30]

Facing this intricate situation I tried to find a solution. Strohmeier told me he will support my prolongation if another institute of the University of Neuchâtel would host me. I talked with Jean-Jacques Aubert new dean of the Faculty of Letters and Human Sciences. He wanted me to stay and did his best to support me. I ended up at the Institute of Psychology directed by Anne-Nelly Perret-Clermont, who was in connection with Piaget school. Having the invitation of this institute, Strohmeier gave me his approval and got a positive reply from the SNF for a two year prolongation of my project. I move to her institute at the end of my 4 year period, i.e. in August 2006. I worked two years there and it was very nice. Students of psychology were quite interesting and I took the opportunity to give courses on various topics, in particular imagination.

During this period I organized an interdisciplinary congress on imagination at the University of Neuchâtel. I like very much interdisciplinarity and Piaget, a symbolic figure of Neuchâtel, was also a promoter of interdisciplinarity, he coined the word "transdisciplinarity" that he thought was better. So I thought that the circumstances were good to organize interdisciplinary events. In 2005, still at the institute of logic, I organized a first interdisciplinary congress on the symbol—whose main topic was a critical appraisal of Ferdinand de Saussure's claim that arbitrary signs (by opposition to symbols considered as non-arbitrary signs) are very important. My idea of such interdisciplinary event was to try to gather colleagues of one university from as different fields as possible. The University of Neuchâtel was good for that because there are all the main fields one can find in a university and the university is small so that it is not so difficult to get in touch with everybody. The University of Neuchâtel has different buildings in different places in the town, but the town also in small, everything is at a walking distance. I had an office at the department of mathematics at the faculty of science. I succeeded from this faculty to convince not only a mathematical colleague (Alain Robert, author of a very good book on non-standard anaylsis [38]) but also a chemist, a geologist and a physicist to join for the event. Colleagues from the faculty of theology (Lytta Basset), department of linguistic (Louis de Saussure), department of philosophy (Daniel Schulthess), etc. joined. The event was quite a success. I also invited a couple of colleagues from outside, in particular Claudine Tiercelin who gave a talk on Peirce. This gave birth to the book *La Pointure du Symbole*. By doing this congress and book I discovered many things in particular

[30] When Miéville retired in 2012. The Institute of Logic of the University of Neuchâtel has been closed.

the excellent works on signs by the typeface designer Adrian Frutiger (see [17]). For the book I got additional papers by Robert Dewar on traffic signs, Elisabeth Nemeth on Neurath, Jeremy Narby on life signs.

The second event was easier to organize because I already organized one and the theme imagination was naturally attRactive. For this second event I invited Catherine Chantilly, now my present wife, to film the event. We had known each other through an artistic event she was organizing every year since 2005 with Alessio in castles in the Bourbonnais, center of France, her region of origin which is full of castles. I took part to this event in 2005, 2006 and 2007 and enjoyed it very much. In 2005 I presented there a photo exhibition about the *Do not Enter* traffic sign (in French: *Sens Interdit*. I started to seriously work on photography in 2003 and decided to start a parallel carrier on photo, which I found as much as interesting as filming. My idea to work on the *Do not Enter* traffic sign suddenly appeared to me when in Moscow in 2003 when I took the first photo of such a sign. My interest for this sign was connected with symbolism. I presented this exhibition in several locations. In French the name of the exhibition was *Le Monde en Sens Interdit* in English *Do not Enter in the World*, a funny name for this exhibition I presented in Chengdu, China, in a trip I was doing in 2006 in preparation of the organization of the 2nd UNILOG.

PICTURE 9
DO NOT ENTER IN THE WORLD, CHENGDU, CHINA, FEBRUARY 2006

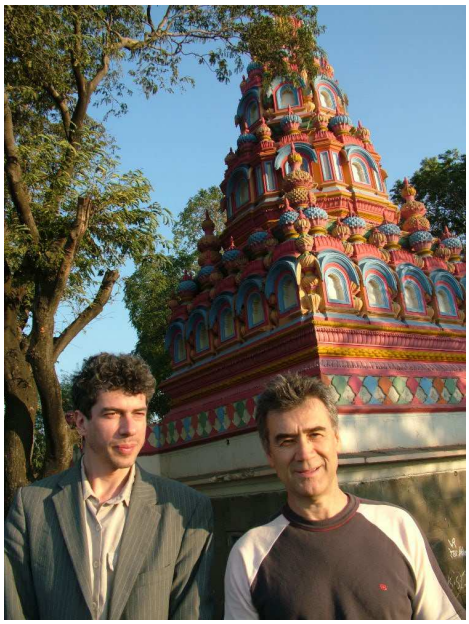
After my visiting in Winter 2006 in China, we decided to organize the 2nd UNILOG in Xi'an, the ancient capital China, rather than Beijing where the 23th LMPS was pojected. We scheduled UNILOG on August 16-22, 2007, just after the LMPS so that participants of LMPS could join us and know more about China. Xi'an is a city indeed much more interesting than Beijing. It is more authentic with a strong cultural variety and the famous *Terracota Warriors*. Huacan He the main

Chinese organizer was at this time working at The Northwestern Polytechnical University in Xi'an. The 2nd UNILOG was a nice edition, allowing people to know more about China.

Before the 2nd UNILOG I organized the First World Congress on the Square of Opposition in Montreux, June 1-3, 2007. I was not favorable to organize again UNILOG in Montreux because I thought better to have this event circulating around the world. But since the condition in Montreux were very good, I think it would be nice to take the opportunity to organize a second event there. The SQUARE was easier to organize because it was smaller (no school). But nonetheless quite challenging: I wanted in particular to develop interdisciplinarity. I thought the square was a good basis for that because it is a very simple theory that everybody can understand. I wanted also to have an artistic part. Since we were in Montreux, music naturally came to my mind. I asked Michael Frauchiger to help me for that. Michael is a Swiss guy, married with a Brazilian girl, manager of the Lauener Foundation. Henri Lauener (1933-2002) was a Swiss philosopher who before his death gave some money to organize a prize, which is awarded on a regular basis. I was at the first award ceremony in Bern in 2004—the prize was awarded to Pat Suppes—and I noticed there was an important music part, jazz music. Michael told me that it was so, because Lauener liked very much music. Michael asked then jazz musicians to prepare pieces of music based on the square of opposition and a show for our event in Montreux and we got a nice result. For this event we also produced a movie, a remake of the biblical story of Salomé, where we used the square to articulate the relations between the 4 main characters of the story. Our version of this story is quite different from the original and the versions of Flaubert and Oscar Wilde. The movie was shot in Morocco in April 2007 with Catherine acting as Herodias, Alessio as Herod, Joana Medeiros, a Brazilian actress, as Salomé and myself as St John the Baptist. The four of us were filming and directing the movie at the same time, it was quite an interesting experience. Another event I organized when in Switzerland was a workshop on possible worlds with Saul Kripke in Neuchâtel in June 2008. I had invited Kripke for the SQUARE in Montreux but at the last moment for health problem he had to cancel his trip, but I was able to reschedule his airticket for a coming in Switzerland in the next future.

During this period 2005-2008 , besides organizing 7 events (2 UNILOGs, 2 interdisciplinary congresses in Neuchâtel, the first SQUARE, CombLog'07, Workshop with Kripke), I also took part to several events and did some lecture tours in USA and India. In Europe I took part in *The Impact of Categories—60 Years of Category Theory in Historical and Philosohical Retrospect*, October 10-14, 2005 (organized by Andrei Rodin at ENS in Paris, France); *Paradox: Logical, Cognitive and Communicative Aspects* November 4-6, 2005, (Organized by Jurgis Skilters in Riga, Latvia); *Applications of Algebra to Logic and Informatics X*, March 6-12, 2006 (Organized by Joanna Grygiel in Zakopane, Poland); *15th Annual Meeting of the European Society for Philosophy and Psychology* July 9-12, 2007 (organized by Kevin Mulligan in Geneva, Switzerland); *Identity and Structure*, December 7-8,

2007, (Organized by Karin Verelest in Brussels, Belgium); *International Workshop on Truth Values*, March 29 - June 2, 2008 (Organized by Heinrich Wansing in Dresden, Germany); *ECAP08 - 6th European Conference on Computing and Philosophy*, June 16-18, 2008 (Organized by Jean Sallantin in Montpellier, France).



PICTURE 10
WITH WALTER CARNIELLI IN POONA, INDIA, DECEMBER 2005

In Central and South America I took part to the 13th SLALM (Latin American Symposium on Mathematical Logic) August 7-12, 2006, Oaxaca, Mexico and to the 14th SLALM in May 11-17, 2008, Paraty, Brazil. This was my first time in Mexico and I enjoyed very much Oaxaca and Puerto Escondido on the nearby coast. In Oaxaca I presented a talk on absolute maximality, a concept I have introduced. The idea is the following: Emil Post has proved the maximality of classical propisitional logic (CPL) in the sense that the connectives of this logic cannot be strengthened, but it is known that we can extend CPL by adding non-definable connectives like modal operators. CPL is Post-maximal, but it is not "absolutely maximal". A logic that would be absolutely maximal is a logic to which no additional connectives can be added without trivialization, i.e., tranforming this logic into a trivial logic in which anything and everything are derivable from anything. Up to now I have not written a paper on that topic After the SLALM in Mexico I flew to Madrid In 2006 to atttend the World Congress of Mathematics. At this occasion the Field medals was attributed to Terence Tao, Grigori Perelman, Andrei Okounkov and Wendelin Werner. I presented a poster on universal logic in the logic section and won the prize for posters of this section. I attended an interesting lecture by Leo Corry about Hilbert and Einstein. After Madrid I went

to Budapest for the 31st Meeting of the ASPLF whose topic was *Le Même et l'Autre* where I took part to a panel on identity and logic. In July 2008 there was the 4th World Congress on Paraconsistency (5 years after WCP3 in Toulouse) in Melbourne, Australia.

PICTURE 11
WITH ALEXANDRE COSTA-LEITE AND ARNOLD KOSLOW
NEW YORK, APRIL 2008

In 2008 I also did a tour of lectures in the East of USA, going from New York to Buffalo and back. Alexandre was doing a post-doc at CUNY with Arnold Koslow. I also went for one month on a mission of the Swiss Secretary of Education and Research in Indian. I gave talks in Kanpur, Mumbai (where my friend Raja Natarajan is working at the Tata Institute of Fundamental Research), Chennai and stopped on the way to Varanasi, one of my favorite towns in India. This was my third visit to India after the first on the way to my SNF interview in Bern in 2001, and a second at a congress of artificial intelligence in Pune in December 2005. After the congress in Pune I drove about 3.000 km up to Goa then Hyderabad and back to Mumbai, spending about two weeks with Peter Arndt walking and discussing on Goa's beaches.

6. Back to the Land of the Future (2008-2014)

6.1. Honeylips Beach

My contract with SNF was ending July 31st 2008 and I didn't know exactly what I would do in the next future. In Switzerland there was no job. At some point, in 2006, I started to make some formal bureaucracy to be able to be a candidate in

France. In this country, if you want to apply for a job at a university you must first be "qualified" by a national committee. This is a pre-selection that will tell you if you can apply to positions as assistant professor or full professor, or to no positions at all. It is not easy and and you have to apply in some specific sections. I applied to the philosophy section and mathematical section for full professorship and was qualified for both. But there was no interesting positions open so I did not apply. It is in fact not easy to find a position corresponding to what we are doing and I never wanted to apply to a permanent on something outside of my main research interest, i.e. logic.

I received then an invitation from my friend Tarcisio Pequeno for a 3 year research position to work in Fortaleza, Brazil. I think this was a nice proposal that would allow me to go on with my research and applying to some jobs. And I like the state of Ceara of which Fortaleza is the capital. Due to some delay typical of Brazilian bureaucracy—In particular there was a problem to get the visa to work there—I started to officially work in Fortaleza only October 1st, 2008. I had stopped the renting of my flat in Neuchâtel. With Catherine we spent some days in a camping near Neuchâtel, discovering an other aspect of Switzerland I was not imaginating: ordinary people living in a camping. I was not succeeding to get my visa at the Brazilian consulate in Geneva. At the beginning of September we decided to go Portugal, this was a first step of 2.000 km in direction to Brazil and I had some contacts at the Brazilian consulate in Lisbon. I succeeded to get my visa there but I had to wait a couple of days. We decided to go to the Algarve, South of Portugal.

At this time I started to develop my project of an anthology of universal logic. The idea was to prepare a collection of logical papers of the XXth century in the spirit of universal logic, each paper commented by a specialist. I chose 15 papers and ask colleagues to work on them. The book was finally released in 2012. The full title is *Universal Logic: an Anthology - From Paul Herz to Dov Gabbay*. There was some delay due to copyright issues. The preface of about 10 pages is a general presentation of what is universal logic explaining the choice of these 15 papers. Among them, there are 5 papers translated for the first time in English: two originally in German by Paul Hertz and Paul Bernays and three originally in French by Alfred Tarski, Haskell Curry and Jean Porte.

We finally moved to Fortaleza. There I started to work again in paraconsistent logic and also took part to the international congress commemorating the 80th birthday of Newton da Costa in Campinas in September 2009. The work on paraconsistent logic I developed in Ceara is philosophical. I had always been unsatisfied with the existing philosophical discussion surrounding paraconsistent logic, ambiguous praise or/and apology of contradictions, remembering Mao Tse Toung's 1937 essay, *On contradiction*. I have now a clear idea of a serious philosophical approach that can justify paraconsistent logic. I developed these ideas when in Fortaleza but up to now had no time to write this down, it will be developed in a projected paper entitled: "Cats, Tigers and Stones". The idea is that tigers are cats that are not cats. Big Cats, as we say in English, are different from

small domestic cats which are the real cats. This is a typical example interestingly expressed here by a scriptural variation of a capital letter, a "differance" à la Derrida. For most concepts we can make a difference between the "real things" and the border cases. A general perspective of such border cases corresponding of "to be and not to be" can be found through representation. A typical symbolic example is Magritte 1919's painting, *The Treachery of Images*, known also through what is written on it "Ceci n'est pas une pipe" (This is not a pipe): we have a pipe which is not a pipe.

This approach combines well with the dual notion, that of paracomplete negation, which is better known and more accepted. The idea is that, given a concept C, it is possible for something to be neither C, nor non-C, because it is out of the scope of the concept. For example, we can say that animals such as wolves, snakes, birds, etc., are not cats—but does it make sense to say that a stone is not a cat? The same with lots of notions such as the number 4, a cell phone, the Soviet Union, etc., which are all in an incomplete zone dual of the inconsistent zone. The idea is to construct a logic with a negation which is both paraconsistent and paracomplete. Up to now it is not clear what is a good mathematical construction for that.[31]

While in Fortaleza I went on to work on universal logic. I "crystalized"[32] the similarity between Garrettt Birkhoff's approach to universal algebra and universal logic by the expression "axiomatic emptiness", and also developed the notion of anti-classical logic as a typical example and motivation for axiomatic emptiness. I presented a talk about that at the 6th Smirnov's Readings in June 2009 in Moscow. I also worked hard to prepare the 3rd UNILOG in Portugal. The event happened April, 18-25, 2010 on Estoril, near Lisbon. Carlos Caleiro and his colleagues from IST in Lisbon did a great job, which was nearly annihilated by the eruption of Eyjafjallajökull in Iceland. The eruption started on April 14 and led to the strongest ever paralyzation of air traffic in Europe. We were afraid that we would have to cancel the event for which we were expecting about 300 participants. We succeeded nevertheless to organize the event with about 200 participants. On the one hand the eruption stopped, on the other hand many people succeeded to come in one way or another. Some people came by train, bus or car. Among them, the famous proof-theorist Gerhard Jaeger who was one of our keynote speakers. Facing this situation he decided to come by car from Bern, a driving distance of about 2,200 km—to compare: the distance between New York and Miami is about 2,100 km. I did not see his car, but as a German I guess he has a BMW, Mercedes or Porsche, a comfortable and speedy car, nevertheless in France and Spain the speed on the highway is limited, a situation different from Germany. The eruption also did not

[31] The expressions "paracomplete negation" and "paracomplete logic" have been introduced by Newton da Costa, by analogy to the expression "paraconsistant negation" and "paraconsistant logic" suggested to him by Miró Quesada. Quesada suggested to him "non-alethic" for something which is both "paraconsistant" and "paracomplete". I have suggested "paranormal" for a good para–llelism.

[32] This is a Frenchism: it means that various ideas or thoughts nicely take a specific form.

affect direct flights from Brazil or USA to Portugal. Hintikka was able to join as a secret speaker. It was nice to have him at UNILOG despite the fact that his project is clearly opposed to universal logic, since he believes, like Ross Brady and Huacan He, in the idea of a universal system of logic, which according to him is his own system IF.

During this period I also went on working on the square of opposition, in particular developing further applications. In October 2009 I presented in Buenos Aires applications of the square and the hexagon to economy. I emphasized, like for many other situations, that the theory of opposition behind the square permits to refine our thinking and theories going beyond dichotomies. I discussed the trichotomies Buy-Sell-Rent and Save-Spend-Invest. In November 2009 I went to Corsica to prepare the Second World Congress on the Square of Opposition which happened June 17-20 in 2010 at University of Corsica Pascal Paoli in Corte. Probably this was the first time that a real international congress was organized there with people from all over the world who had never come to Corsica before, in particular Brazilians, like my friends Arthur Buchsbaum and Luiz Carlos Pereira. They were very impressed by Corica and I was happy to introduce them to this place where I grew up. There are many tourists in Corsica during the summer, but they mostly come from Europe. Corte is a small town in the middle of the mountains and the atmosphere of the was very relaxing. Michel Barat, the Rector of the Academy of Corsica, came and delivered an introductory speech. It was not just a few formal words but a whole lecture. He is a philosopher and also a freemason who has been the great master of the Grande Loge de France (GLDF). We tried to organize an artistic counterpart like at the first congress in Montreux but we ended up just with some Corsican students singing some traditional Corsican polyphonic music not inspired by the square. During this stay I discover by chance a Corsican band with a Portuguese/Spanish name—“A Primavera” (the Spring)—mixing Corsican music and music from the Andes that I liked very much. This revealed to me a strong connection between Corsica and Peru.

PICTURE 12
WITH TARCISIO PEQUENO IN GUARAMINGUA, CEARA, BRAZIL

During this time in Fortaleza I also worked with Catherine on a project of a movie on living philosophers. My original idea was to make interviews of the most important alive philsophers (between 10 to 15 people). Catherine likes to work on fims and joined me for this project. In Fortaleza she was contracted by the FUNCAP (Cearense Science Foundation) to do such a work. We had already started before arriving in Ceara, filming in particular Jaakko Hintikka in Paraty. By developing the project we changed the general setting and decided to rather produce a series of movie by countries, a project that can be called *World Philosophy* or/and *Philosophy in the World*. There are different reasons to proceed in this way. One is that it is not at all clear who are the 10 most important alive philosophers, if any. The other reason is to present less known philosophers of different countries and cultures. The project is developing slowly but I think at the end it will be nice. During this period in Fortaleza we produced a first movie about France filming Alain Badiou, François Laruelle and Jean-Luc Marion in their private houses during our visits in Paris. And in 2010 we did a one month trip to Canada from west to east, filming John Woods in Vancouver and Thomas De Koninck in Quebec City. De Koninck is known to have inspired Saint Exupéry for *The Little Prince*. The aviator was hosted De Koninck family when Thomas was a child and he was asking a lots of questions. Later on Thomas De Koninck became professor of philosophy at the University of Laval in Quebec City. Saint Exupéry is certainly very philosophical. I think the case of De Koninck perfectly justifies the new direction of our project. De Koninck is not one of the 10 most important philsophers in the world, but he is an important philosopher in Canada, certainly not well enough known abroad as he should be.

When I was in Fortaleza, a position appeared at the Federal University of Rio de Janeiro in 2009. After reflection I decided to seriously apply. I was 44 years old and up to this age had had no permanent position. I knew that waiting more will be each time more difficult, but was in some sense ready to face the challenge. In my life I always have refused to choose a job for comfort. The reason I decided to apply to this position in Rio is related to three criteria:

- Nice place to live
- Good position in a good university
- Interesting intellectual environment

Rio is one of best towns to live: it is geographically spectacular, a big international town, one of the most famous town in the world, at the middle of the sea, the forest, the mountains. [33]. I had been working in different departments, but my preference was to be a professor of logic in a philosophy department. This was exactly the position that was offered, in the University of Brazil, a.k.a. the Federal University of Rio de Janeiro, or UFRJ, the oldest and largest university in Brazil, and considered one of the top three universities in Brazil, and in all of Central- and South-America, along with USP in São Paulo and UNICAMP in Campinas. The intellectual environment in Brazil is good for me because this is one of the countries in the world where logic is the most developed, with a variety of people from mathematical, philosophical and computer science backgrounds. There is a center of logic in Campinas (CLE), a Brazilian Society of Logic (SBL) and a regular Brazilian Congress of Logic (EBL). I therefore applied to this position and was selected in May 2009, but it took more than one year to be contracted and to start my work in Rio due to some bureaucratic difficulties. Coming back to Fortaleza from Rio de Janeiro after the interview I had a serious problem swimming in the sea. In Fortaleza, we were living in a flat by the sea, in "Praia de Iracema" (Honeylips Beach—Iracema is a legendary Indian girl from the Tabajara tribe), with a 180-degree panoramic view. It was like we were at the middle of the sea where dolphins were bathing. I went on swimming and was driven by strong waves to some sharp rocks to which I tried to grip on, but which were cutting my skin. I succeeded to come back to the beach bleeding. Up to know I have some (not so dramatic) scars.

6.2. Flowing in the River of January

I started to work at the University of Brazil—UFRJ—in Rio de Janeiro in August 2010, the second semester of the academic year. In Brazil the academic year is divided into two semesters. The first one starts at the end of summer, i.e. after Carnival, sometime in February, and goes up to early July, then there is a break of about one month, and then the second semester goes until December. Having a permanent position I started to give some regular courses. In the department of

[33] For me the ten top cities in the world are: Rio de Janeiro, Geneva, Paris, St Petersburg, Rome, Lisbon, San Francisco, London, Montréal, Athens

philosophy of UFRJ there is a class of introduction to logic which is mandatory for undergraduate students and several optional classes of logic.

We are supposed to give 2 classes per semester. Generally the first semester I gave "Introduction to Logic" and in the second semester an optional class which is a follow up. And additionally, each of these semesters, an optional class of logic and/or a graduate seminar. I like very much to give the class of introduction to logic. For me it is important to give a very general vision of logic not limiting this class to some truth-tables, basic first-order logic and translation of sentences of natural language into these logical systems. In this perspective I wrote a paper "Logic is not logic" giving a general idea of what is logic and emphasizing the difference between reasoning and the theory of reasoning that I have expressed by the a capital variation, one more "differance". I am also orienting Master and PhD theses. Brazilian students are friendly, they have a variety of interests, are open to new ideas and are eager to learn. The Brazilian government has launched since a couple of years, a very nice project called "Scientific Initiation" to encourage research already among undergraduate students. The students can get a grant to develop a research project and there is annually in all universities in Brazil a week of 'Scientific Initiation", where these students present their works and are evaluated by a jury. At Brazilian universities research is also strongly encouraged among professors, who are not considered just as teachers. The Brazilian research council (CNPq) gives grants for that.

Since 2010 I have taken part to many conferences and organized many events. I was invited to different events, in particular: the Journées Alain Badiou in Paris, the 70th birthday congress of Istvan Németi in Budapest, the 60th birthday congress of Arnon Avron in Tel Aviv, the Vasiliev memorial congress in Moscow. In the winter of 2012 I made a tour of Germany supported by the Humboldt Foundation giving more than ten lectures throughout the whole country and also neighboring countries like Liechtenstein and Poland. I gave talks to philosophy departments, to mathematics departments, and to computer science departments. I met some old friends (like André Fuhrmann in Frankfurt and Peter Arndt in Regensburg) and made new ones—I was happy in particular to give a talk in Darmstadt, a place related to Ernst Schröder.

PICTURE 13
WITH PETER ARNDT IN REGENSBURG, GERMANY, JANUARY 2012

Before going back to Brazil I went to Lebanon to prepare the 3rd World Congress on the Square of Opposition at the American University of Beirut (AUB). I had contact there with Ray Brassier, at the time director of the department of philosophy of AUB (where David Makinson has been working previously) and Wafic Sabra, the director of the Center for Advanced Mathematical Sciences of AUB, who had worked with David Bohm in London. The event in Beirut was a great success. We received the support of the embassies of Switzerland, France, Italy and Brazil. The Swiss Ambassador in Lebanon, Ruth Flint, kindly offered a very nice Swiss cheese and wine cocktail for the opening of the event and the Brazilian Ambassador Paulo Roberto Campos Tarrisse da Fontoura offered us also to all the participants a cocktail at the Brazilian cultural center in Beirut[34]). He was happy to learn that logic was an important field of research in Brazil.

In the fall of 2012 I started to organize the 4th UNILOG, scheduled to take place March–April, 2013, in Rio de Janeiro. This was an important step for the development of UNILOG. It was the most successful of all UNILOGs with nearly 500 participants, 50 invited speakers, lots of tutorials, including one about logic for the blind given the by late Laurence Goldstein. And of course there was also a contest and a secret speaker (the late Grisha Mints—he was not able to travel, but he presented an on-line lecture). For organization we benefited from the full support and dedication of Katarzyna and her husband Przemysław Krzywoszyński from Adam Mickiewicz University. The school started with a general discussion

[34]In Brazil there are many people from Lebanon and Syria. One of my Brazilian colleague, Fabio Tfouni, came to this square event with his parents and meet relatives living in Syria.

about why studying logic and ended with a discussion about pubication, to encourage the young researchers to publish. There was also a good book exhibition. The event was organized in a marvelous location at the foot of the Sugar Loaf. We succeed to organize it in a strategic military school there—ECEME—thanks to the president of the *Brazilian Academy of Philosophy* (ABF), João Ricardo Moderno.

PICTURE 14
WITH CATHERINE CHANTILLY AND JOAO RICARDO MODERNO
RIO DE JANEIRO IN 2013

I was elected titular member of this Academy in 2012 and shortly after I was named Director of International Relations of ABF. In this position I presented the candidacy of Rio de Janeiro to host the World Congress of Philosophy. I did that during the summer 2013 at the 23th World Congress of Philosophy in Athens. I was supported in particular by Itala d'Ottaviano, representing the IBF (*Brazilian Institute of Philosophy*). We lost to Beijing. The Chinese had already bid once before and lost, so this was their turn. During the assembly the members admitted that Rio would be nice... but for next time. The WCP will happen in 2018 in Beijing (WCP frequency is once every 5 years) and then most probably in 2023 in Rio. During the 23th WCP in Athens, I also discussed with the honorary president of the ASPLF (*Association des Sociétés de Philosophie de Langue Française*), Jean Ferrari, who suggested me to organize a congress of the ASPLF in Rio. At this time the next ASPLF was already projected to happen in August 2014 in Rabat, Capital of the Kingdom of Morocco. I went there to present the candidacy of Rio and I also presented a plenary talk there, the topic being "Le possible et l'impossible". At the assembly of the ASPLF in Rabat we discuss the candidacy of Rio de Janeiro and the idea is to organize the congress of the ASPLF in Rio in 2018.

When in Rio I launched on the one hand a new series of events, an annual 2 days workshop at the Sorbonne called *Logic in Question / La Logique en Question*, and on the other and a seminar of logic in Rio de Janeiro, *Logica Carioca*, trying

to gather logicians spread in the various universities in Rio (there are about ten universities in this city). I also launched 4 new editorial projects: *Cadernos de Lógica e Filosofia*, *SAJL = South-American Journal of Logic*, *Logic PhDs* and the *Encyclopedia of Logic*. *Cadernos* is a book series published by College Publication, publishinh house of Dov Gabbay. The idea is to translate some important works related to logic for undergraduate students and/or a wide audience. We will soon launch the translation of *The Game of Logic* by Lewis Carroll, a collection of papers by Peirce and the translation of Tarski's classical book *Introduction to Logic and the Methodology of Deductive Sciences*. The idea of *SAJL* is to promote interaction between logicians of all kinds in South-America and to make their works known in the rest of the world. This is a joint project with Marcelo Coniglio. We are preparing a special issue dedicated to the Argentinian logician, Carlos Alchourrón. *Logic PhDs* is another series with College Publication, were PhDs of famous logicians will be published. Soon will be published the PhD of Haskell Curry presented by Jonathan Seldin (Curry wrote his PhD in German and was the last student of Hilbert) and the "classical" PhD o Krister Segerbeg on modal logic presented by Patrick Blackburn. We will also published the PhD of Saunders Mac Lane (presented by Peter Arndt), which was on logic, as few people know, also written in German and defended at Göttingen. In this series we will additonally published the best recent PhDs. The *Encylopaedia of Logic* is a joint project with IEP = *Internet Encyclopedia of Philosophy*. Since August 2013 I am the logic area editor of IEP and decided with the support of the general editors of this web Encyclopedia, James Fiser and Bradley Dowden, and the general editor of College Publication, Dov Gabbay, to also produce a printed Encyclopedic logic book.

In February 2014 I organized together with Mihir Chakraborty the 5th edition of the World Congress on paraconsistency at the Indian Statistical Institute in Kolkata , in India. People in India are starting to have strong interest for paraconsistent logic. We decided to organize three tutorials preceding the congress so give a better understanding of what paraconsistent logic is. In May 2014, there was the 4th SQUARE, happening at the Pontifical Laterian University (PUL) in the Vatican. Raffaela Giovagnoli, professor at PUL, had made the proposal to organize the event there during the 3rd SQUARE in Beirut and we received the full support of Gianfranco Basti, Dean of the Faculty of Philosophy pf PUL. Moreover the Bishop Enrico dal Covol, Rector of the Pontifical Lateran University, gave an introductory lecture (in French) at the beginning of the event. Katarzyna Gan succeeded to organize a cocktail party at the Polish Embassy in Vatican with the Ambassador Piotr Nowina-Konopka and Juliette Lemaire (with the support of Anne Hénault) a cocktail party at the Embassy of France in Vatican with the Ambassador Bruno Joubert—this Embassy being located in Villa Pauline Bonaparte, sister of Napoleon.

In June 2014 During the world soccer cup our university in Rio was closed, so I took the opportunity to make an extended trip to Europe through the Marie Curie exchange program GeTFun (Generalizing Truth-Functionality) set up by Carlos Caleiro and João Marcos. I did my first trip to Romania, visiting my friend and

colleague also a GeTFunian, who is living in the very nice village of Sinaia. This is where the second International Mathematical Olympiad was organized in 1960, the first having also been organized in Romania, in 1959 in Brasov. Razvan won the Romanian Mathematical Olympiad when he was young and is now researcher at Simion Stoilow Institute of Mathematics of the Romanian Academy (IMAR) in Bucarest where I gave a talk and had the opportunity to meet an old friend of Grigori Moisil. I went to the Vienna Summer of Logic where we had the workshop GeTFun 2.0 and then to Greece where I was keynote speaker at a workshop Logic and Utopia on Andros Island organized by Petros Stefaneas and Thalia Magioglou. I spent a few days in Athens in particular to develop a good synergy between UNILOG'2015 to happen in Istanbul, June 20-30, 2015 and the 10th Panhellenic Logic Symposium to happen in Samos Island, the Greek Island where Pythagoras was born, June 11-15, 2015.

7. Projects

7.1. Research and Publications

I will go on working on universal logic, the square of opposition and non-classical logics. And also on various philosophical topics. To get an idea of what I plan to do, the reader may look at my projected future papers and books that can be found in my list of writings at the end of this paper.

7.2. Organization of Events

I think workshops and congresses are very important. These are where people meet, discuss ideas, and plant the seeds of future collaborations. I have taken part in many events, and I constantly work to promote these kinds of exchanges.

Up to now I have launched three series of congresses:

- UNILOG *World Congress and School on Universal Logic*—a biennial or triennial peripatetic event—Montreux 2005, Xi'an 2007, Lisbon 2010, Rio de Janeiro 2013, Istanbul 2015
- SQUARE *World Congress on the Square of Opposition*—a biennial or triennial peripatetic event—Montreux 2007, Corisca 2010, Beirut 2012, Vatican 2014, Easter Island 2016
- LIQ *Logic in Question / La Logique en Question*—an annual 2-day workshop in the spring at the Sorbonne, Paris, France

The idea of UNILOG is to have a school followed by a congress. Moreover during the congress there is a contest and a secret speaker. UNILOG is an event promoting logic in all its aspects: philosophical, mathematical, computational, historical, and more. For the next gathering, in Istanbul in 2015, we will have three types of tutorials: tutorials about the history of logic (logic according to Aristotle, Leibniz, Kant, etc.), tutorials connecting logic with other topics/fields (logic and music, logic and information, logic and colors, etc.), and tutorials presenting an

important theorem (incompleteness, completeness, compactness, etc.) in a universal perspective, i.e. examining the logical basis of this theorem. The contest will be about the future of logic and the secret speaker is still secret.

PICTURE 15
PROJECTED SQUARE OF OPPOSITION EVENT IN RAPA NUI
AKA EASTER ISLAND IN 2016

The idea of SQUARE is to have a really interdisciplinary event centered on a simple but rich and fruitful logical theory, the theory of opposition, also known as "the square of opposition". The expression "square of opposition" may refer to a particular stage of this theory, in particular Boethius's formulation of it with an explicit square diagram. But the theory of opposition started with Pythagoras, Plato and Aristotle before any notion of a square entered into it, and it has been further developed on the basis of other diagrams: cubes, hexagons, polyhedras ... The SQUARE is open to semiotics, linguistics, psychology, psychoanalysis, art, architecture, sociology, etc. After starting the first SQUARE in Montreux like the first UNILOG, we have organized the following square events in some eccentric/unsual localities: Corsica, Beirut, Vatican. Our idea is to go on in that direction: the next edition is projected at Rapa Nui / Easter Island. The SQUARE may end in the moon.

LIQ is a bilingual workshop in Paris about logic in its diversity, to promote interaction between anyone interested in logic in a wide sense, trying to answer some basic questions about the nature and import of logic. I developed the idea of this workshop together with Jean-Pierre Desclés, who was for many years the director of the department of mathematics and informatics at the University of Paris Sorbonne (Paris 4), Anca Pascu, a former student of his, and Amirouche Moktefi, one of the best specialists in the logic of Lewis Carroll. We had one

workshop where we discussed the teaching of logic in high school. But LIQ can also be topical, in the sense that it acknowledges and addresses current events—such as, for example, the workshop in 2014, where we had a special panel about Peirce, as it was the centenary of his death.

I am presently working with my colleague Ricardo Silvestre on the organization of the *1st World Congress on Logic and Religion*, to be held April 1–5, 2015 in João Pessoa, Brazil. The connection between logic and religion is very strong, and in many different ways. The notion of *logos* figures in several fundamental ways in the Bible, where it is identified with God: "In the beginning was the *logos*, and the *logos* was with God, and the *logos* was God"(John 1:1). In the Christian culture, many "proofs" of God have been proposed from Anselm to Gödel. And in the other main religions, reasoning is also important. I had planned to organize such an event when I was in Switzerland. I wanted to organize it in *Monte Verità*, the "Hill of Truth", located near Ascona in Ticino, where a peculiar colony attracting many famous people was created at the beginning of the XIXth century. It is now a center for congresses of all kinds administrated by ETZ Zurich (the Swiss Federal Institute of Technology). This event in João Pessoa will probably be the first in another successful series of itinerant international events.

I am actively taking part in the organization of two other series of events. The Brazilian Congress of Logic (EBL) is organized by the Brazilian Society of Logic (SBL) of which I am presently the vice-president. The 17th EBL was held in Petrópolis in 2014. The next EBL is scheduled to happen in Pirenópolis, a nice bucolic village near Brasilia, in 2017. The World Congress of Paraconsistency (WCP) was staged in Ghent, Belgium in 1997 (WCP1); in Juquehy, Brazil in 2010 (WCP2); in Toulouse, France in 2003 (WCP3); in Melbourne, Australia in 2008 (WCP4); and in Kolkata, India in 2014 (WCP5). I was one of the principal organizers of WCP2, WCP3 and WCP5. The plan is to stage the next one, WCP6, in Vancouver, Canada in 2016.

In Athens in 2013, during the 23rd World Congress of Philosophy, as the Director of International Relations of the Brazilian Academy of Philosophy, I put forward the candidacy of Rio de Janeiro to host a future staging of this event. The 24th edition will be held in Beijing in 2018 and we are working on organizing the 25th edition in Rio in 2023. Before that we intend to organize the 27th congress of the ASPLF (Association des Sociétés de Philosophie de Langue Française) in Rio de Janeiro in 2018.

7.3. Edition

Up to now I have launched two logic journals: *Logica Universalis* (LU) and *South-American Journal of Logic* (SAJL); and three book series: *Studies in Universal Logic*, *Logic PhDs*, and *Cadernos de Lógica e Filosofia*. I will go on to develop these editorial projects and develop new ones. I have the idea to develop a book series dedicated to some specific logical systems: *All about the modal logic S5*, *All about First-Order logic*, *All about Łukasiewicz's three-valued logic L3*, etc. These books will include historical, philosophical and mathematical accounts of these

systems. I also intend in the future to launch the *World Journal of Pictorial Philosophy* (WJPP), a journal of philosophy mainly based on the use of images. The cover will be a picture of Plato's cave.

In the coming months I will devote a lot of energy to editing entries in the area of logic for the Internet Encyclopedia of Philosophy, of which I am the present editor. In addition to being on the web, these entries will also be gathered into a printed book to be titled *Encyclopaedia of Logic*, the first ever encyclopedia of logic. To develop this project I have divided the entries into three categories: History (main figures, schools and books), Tools (theorems, concepts, logical systems), and Notions/Topics (including the relation of logic to other fields). Hundreds of entries are on the way...

I will also go on to develop with Catherine Chantilly our project of "World Philosophy" producing a series of DVDs each dedicated to philosophers of a given country.

7.4. University of the World

Beyond my research in logic, I have the idea to promote the creation and development of a world research center, which I prefer to call a "World University", or better, a "University of the World". On the one hand, I firmly believe that research and teaching have to be linked ; so calling it a "research center" would not sufficiently emphasize the teaching aspect, which is an essential component in my view. On the other hand, the word "university" fits nicely because it is connected with universality and the universe.

Human beings, including academics, still behave in a very primitive way, close to tribalism. Groups fighting against groups, an "evolution" of cannibalism. I think the creation of a world university can get us out of that. How, where and when? Those are elementary but fundamental questions, that will be answered by actions promoted and undertaken by people conscious of the limitations of tribe-centered activities. We can be inspired by people who have already worked in that direction, like for example Julian Huxley, brother of Aldous Huxley, who was the first director of UNESCO and also the creator of the World Wide Fund for Nature (WWF). I have alreay given some preliminary hints in my paper "Les universités face la globalisation: vers une université mondiale?" presented at UNESCO in 2004.

8. Workshops and Events Organized

1. *Logic in Rio de Janeiro*, Rio de Janeiro, Brazil, February 17-18, 2000
2. *2nd World Congress on Paraconsistency*, Juquehy, Brazil, May 8-10, 2000
3. *Workshop on Paraconsistent Logic - Part of International Conference on Artificial Intelligence IC-AI'2001*, Las Vegas, USA, June 25-28, 2001
4. *Foundations of Science Workshop dedicated to the 80th Birthday of Patrick Suppes*, Florianópolis, Brazil, April 22-23, 2002
5. *3rd World Congress on Paraconsistency*, Toulouse, France, July 28-31, 2003

6. *International Workshop on Universal Logic*, Neuchâtel, Switzerland, October 6-8, 2003
7. *1st World Congress and School on Universal Logic UNILOG'05*, Montreux, Switzerland, March 26 - April 3, 2005
8. *Symbolic language - Interdisciplinary workshop on logic, semiotics, linguistics, chemistry, physics, psychology, mathematics, philosophy, theology and art*, Neuchâtel, Switzerland, December 7-8, 2005
9. *The Square of Opposition – A general framework for cognition*, Montreux, Switzerland, June, 1-3, 2007
10. *CombLog'07 –International Workshop on Combinations of Logics*, Neuchâtel, Switzerland, July 4th, 2007
11. *2nd World Congress and School on Universal Logic – UNILOG'07*, Xian, China, August, 16-22, 2007
12. *Imagination - Interdisciplinary workshop on logic, semiotics, linguistics, chemistry, physics, psychology, mathematics, philosophy, theology and art*, Neuchâtel, Switzerland, December 17-18, 2007
13. *Workshop wih Saul Kripke*, Neuchâtel, Switzerland, June 5, 2010
14. *3rd World Congress and School on Universal Logic – UNILOG'2010*, Lisbon, Portugal, April, 18-25, 2010
15. *2nd World Congress on the Square of Opposition*, Corte, Corsica, June, 17-20, 2010
16. *Workshop LIQ1 - Logic in Question 1*, Sorbonne, Paris, May 2-3, 2011
17. *Workshop LIQ2 - Logic in Question 2*, Sorbonne, Paris, May 2-3, 2012
18. *3rd World Congress on the Square of Opposition*, Beirut, Lebanon, July, 17-20, 2012
19. *4th World Congress and School on Universal Logic – UNILOG'2013*, Rio de Janeiro, Brazil, April, 18-25, 2013
20. *Workshop LIQ3 - Logic in Question 3*, Sorbonne, Paris, May 2-3, 2013
21. *5th World Congress on Paraconsistency*, Kolkata, India, February 13-17, 2014
22. *4th World Congress on the Square of Opposition*, Vatican, May 5-9, 2014
23. *Workshop LIQ4 - Logic in Question 4*, Sorbonne, Paris, France, May 12-13, 2014
24. *Workshop The Logic of Lewis Carroll*, Federal University of Rio de Janeiro, Brazil, November 28, 2014

9. Writings and Publications

9.1. University Writings

1. J.-Y.Beziau, *L'holomouvement selon David Bohm*, Maîtrise de Philosophie, Bernard d'Espagnat (Advisor), 150 p., Department of Philosophy, University Panthéon-Sorbonne, Paris, 1986, This work includes a discussion I had with David Bohm in London in July 1986.

2. J.-Y.Beziau, *Quels sont les moyens par lesquels on peut se convaincre soi-même (et les autres) de la vérité des assertions concernant les ensembles?*, 13p., Homework. Maîtrise de Logique, Michel Eytan (Advisor), Department of Philosophy, University Panthéon-Sorbonne (Paris 1), Paris, 1988.
3. J.-Y.Beziau, *D'une caverne à l'autre*, 60p., Diplôme d'Etudes Approfondies de Logique et Fondements de l'Informatique, Sarah Kofman (Advisor), Department of Philosophy, University Panthéon-Sorbonne (Paris 1), Paris, 1988.
4. J.-Y.Beziau, *La logique paraconsistante C1 de Newton da Costa*, 51p., Diplôme d'Etudes Approfondies de Logique et Fondements de l'Informatique, Daniel Andler (Advisor), Department of Mathematics, University Denis Diderot (Paris 7), Paris, 1990.
5. J.-Y.Beziau, *Recherches sur la logique universelle (Excessivité, Négation, Séquents)*, 176p., Doctorat de Logique et Fondements de l'Informatique, Daniel Andler (Advisor), Department of Mathematics, University Denis Diderot (Paris 7), Paris, 1995.
6. J.-Y.Beziau, *Sobre a verdade lógica*, 200p., Doutorado de Filosofia, Newton da Costa (Advisor), Department of Philosophy, University of São Paulo, 1996.

9.2. Papers

1. J.-Y.Beziau, "Calcul des séquents pour logique non-aléthique", *Logique et Analyse*, 125-126 (1989), pp.143-155.
2. J.-Y.Beziau, "Logiques construites suivant les méthodes de da Costa", *Logique et Analyse*, 131-132 (1990), pp.259-272.
3. J.-Y.Beziau, "Au sujet d'une preuve du principe de contradiction", 3p., Vincennes, France, unpublished, 1991.
4. J.-Y.Beziau, "O princpio de razão suficiente e a lógica segundo Arthur Schopenhauer' ', in *Século XIX : O Nascimento da Ciência Contemporânea*, F.R.R.Évora (ed), CLE-Unicamp, Campinas, 1992, pp.35-39.
5. N.C.A. da Costa and J.-Y.Beziau, "Carnot's logic", *Bulletin of the Section of Logic*, 22 (1993), pp.98-105.
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7. J.-Y.Beziau, "Nouveaux résultats et nouveau regard sur la logique paraconsistante C1", *Logique et Analyse*, 141-142 (1993), pp.45-58.
8. J.-Y.Beziau, "La logique abstraite au sein de la mathématique moderne", *Ruch Filozoficzny*, 50 (1993), pp.289-293.
9. J.-Y.Beziau, "Sémantique universelle", 18p., Champagne sur Seine, France, unpublished, 1994.
10. J.-Y.Beziau, "Théorie législative de la négation pure", *Logique et Analyse*, 147-148 (1994), pp.209-225.
11. J.-Y.Beziau, "Universal logic" , in *Logica'94 - Proceedings of the 8th International Symposium*, T.Childers and O.Majer (eds), Prague, 1994, pp.73-93.

12. N.C.A. da Costa and J.-Y.Beziau, "La théorie de la valuation en question", in *Proceedings of the Ninth Latin American Symposium on Mathematical Logic*, M.Abad (ed), Universidad del Sur, Baha Blanca, 1994, pp.95-104.
13. N.C.A. da Costa and J.-Y.Beziau, "Théorie de la valuation", *Logique et Analyse*, 146 (1994), pp.95-117.
14. J.-Y.Beziau, "De la logique formelle à la logique abstraite", *Boletim da Sociedade Paranaense de Matemtica*, 14 (1994), pp.41-50.
15. J.-Y.Beziau, "Du Pont's paradox and the problem of intensional logic", in *Logica'93 - Proceedings of the 7th International Symposium*, P.Kolar and V.Svodoba (eds), Prague, 1994, pp.62-65.
16. N.C.A. da Costa, J.-Y.Beziau and O.A.S.Bueno, "Paraconsistent logic in a historical perspective", *Logique et Analyse*, 150-152 (1995), pp.111-125.
17. N.C.A. da Costa, O.A.S.Bueno and J.-Y.Beziau, "What is semantics?", *Sorites*, 3 (1995), pp.43-47.
18. N.C.A. da Costa, J.-Y.Beziau and O.A.S.Bueno, "Aspects of paraconsistent logic", *Bulletin of the Interest Group in Pure and Applied Logics*, 4 (1995), pp.597-614.
19. J.-Y.Beziau, "Negation : what it is and what it is not", *Boletim da Sociedade Paranaense de Matemtica*, 15 (1995), pp.37-43.
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28. N.C.A. da Costa and J.-Y. Beziau, "Définitions, théories des objets et paraconsistance", *Theoria*, 32 (1998), pp.367-379.
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64. J.-Y.Beziau, "Les axiomes de Tarski", in R.Pouivet and M.Rebuschi (eds), *La philosophie en Pologne 1918-1939*, Vrin, Paris, 2006, pp.135-149.

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87. J.-Y.Beziau, "La logique universelle De la logique moderne la logique post-moderne' ', in A.-F.Schmid, *Epistémologie des frontières*, Ṕtra, Paris, 2012, pp.30-59.
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9.3. Edited Books

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9.4. Edited Special Issues of Journals

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2. J.-Y.Beziau and M.Tsuji (eds), Contemporary Brazilian Research in Logic Part II, *Logique et Analyse* 157 (1997).
3. J.-Y.Beziau, The Challenge of combining logics, *Logic Journal of the Interest Group in Pure and Applied Logics*, 19 (2011).
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5. J.-Y.Beziau and A.Costa Leite (eds), Uses of non-classical logics: foundational issues, *Journal of Appplied Non-Classical Logic*, 21 (2011).
6. J.-Y.Beziau and S.Read (eds), The square of opposition in historical perspective, *History and Philosophy of Logic*, 2014.

9.5. Books

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2. J.-Y.Beziau, *Tendances actuelles de la philosophie – Tendências Atuais da Filosofia*, Nefelibata, Florianópolis, 2003.

9.6. Translation

1. Translation of the book *Ensaio sobre os Fundamentos da Lógica* by Newton da Costa in French: *Logiques Classiques et non Classiques*, Masson, Paris, 1997, with a Preface and two Appendices by the translator.

9.7. Reviews

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3. I.Grattan-Guinness, *The search for mathematical roots*, Review published in *The Review of Modern Logic*, 10 (2005), pp.135-138.
4. G.Brady, *From Peirce to Skolem A neglected chapter in the history of logic*, Review published in *The Review of Modern Logic*, 11 (2007), pp.155-161.
5. S.Odintsov, *Constructive Negation and Paraconsistency*, Review published in *Studia Logica*, 100 (2012), pp.653-657
6. Y.Shramko and H.Wansing, *Truth and Falsehood An inquiry into generalized logical values*, Review published in *Studia Logica*, Volume 102 (2014), pp 1079-1085.

I have also written about 100 reviews for *Mathematical Reviews*.

9.8. Future Papers

All these papers are at a stage of gestation, the birth of each will depend on circumtsances. Some will perhaps never be born, and other, not in this list, may spring.

9.8.1. Square of Opposition.

1. J.-Y.Beziau, "The two dualities *a priori / a posteriori* and *synthetic / analytic* in a hexagonal perspective"
2. J.-Y.Beziau, "A semiotic hexagon"
3. J.-Y.Beziau, "Incompatibility"
4. J.-Y.Beziau, "Beyond dichotomy"
5. J.-Y.Beziau, "The logic of traffic sign"

9.8.2. Paraconsistency and negation.

1. J.-Y.Beziau, "Round square"
2. J.-Y.Beziau, "Abstract theory of negation"
3. J.-Y.Beziau, "Two formulations / formalizations of the principle of non-contraction"
4. J.-Y.Beziau, "What is paracomplete logic?"
5. J.-Y.Beziau, "Cats, Tigers and Stones"
6. J.-Y.Beziau, "Absurdity, triviality, Nonsense, Contradiction"
7. J.-Y.Beziau, "Identiy and Contradiction'
8. J.-Y.Beziau, "Disjunctive syllogism and paraconsistency"
9. J.-Y.Beziau, "Conditional negation'

9.8.3. Order logic.

1. J.-Y.Beziau, "What is zero-order logic?"
2. J.-Y.Beziau, "The philosophy of first-order logic"
3. J.-Y.Beziau and P.Viana, "Third-order logic"
4. J.-Y.Beziau,"Undeterminated, Constante, variable, parameters"

9.8.4. Philosophy of Logic / Logical Philosophy.

1. J.-Y.Beziau, "How to define logic"
2. J.-Y.Beziau, "Logic: past, present and future"
3. J.-Y.Beziau and W.A.Carnielli, "Names of logic"
4. J.-Y.Beziau, "The identity sign"
5. J.-Y.Beziau, "What is modal logic?"
6. J.-Y.Beziau, "What is constructivism?"
7. J.-Y.Beziau, "Non-transitive logics"
8. J.-Y.Beziau, "What is a propositional function?"
9. J.-Y.Beziau, "What is a propositional variable"
10. J.-Y.Beziau, "Philosophy of Logic, Philosophical Logic and Logical Philosophy"
11. J.-Y.Beziau, "Logic, reasoning and rationality"
12. J.-Y.Beziau, "Three notions of contingency"

9.8.5. History of Logic.

1. J.-Y.Beziau and A.Buchsbaum, "Adventures of the turnstyle"
2. J.-Y.Beziau and J.L.Hudry, "All men are white"
3. J.-Y.Beziau, "The origin of classical logic"

9.8.6. Universal Logic.

1. J.-Y.Beziau, "The Completeness theorem in a universal logic perspective"
2. J.-Y.Beziau, "The Incompleteness theorem in a universal logic perspective"
3. J.-Y.Beziau, "Logics and theories"
4. J.-Y.Beziau, "Absolute maximality"
5. J.-Y.Beziau and A.Sernadas, "Combining disjunction with negation"
6. J.-Y.Beziau and J.Marcos, "Non-truth functional logics"
7. J.-Y.Beziau, "Bivalence and modality"

9.8.7. Language, Thought and Reality.

1. J.-Y.Beziau,"Exemplifying an idea"
2. J.-Y.Beziau,"Word, idea and reality"
3. J.-Y.Beziau,"Descriptive and normative"
4. J.-Y.Beziau,"Islands and clouds"
5. J.-Y.Beziau,"What is a category?"
6. J.-Y.Beziau,"Imagination, conceptualization and possibility"
7. J.-Y.Beziau,"Rationality and representation"
8. J.-Y.Beziau, C.Chantilly and F.Lihoreau,"Sensation, feeling and emotion"
9. J.-Y.Beziau,"Dices, hazardous symbol of chance"
10. J.-Y.Beziau,"Symbolically typical"
11. J.-Y.Beziau,"Aspects of structuralism"

9.8.8. General Philosophy.

1. J.-Y.Beziau, "Three definitions of human beings"
2. J.-Y.Beziau, "Rodin's thinker: a symbol for philosophy?"

9.9. Future Books

9.9.1. Edited Books.

1. J.-Y.Beziau (eds), *Anthology of Paracaconstent Logic*
2. J.-Y.Beziau (eds), *Anthology of Modal Logic*
3. J.-Y.Beziau (eds), *Anthology of Many-valued Logic*
4. J.-Y.Beziau and A.Moketfi (eds), *Conceptions of Logic through History*

9.9.2. Monographs.

1. J.-Y.Beziau, *Logic Compendium*
2. J.-Y.Beziau, *An Introduction to Universal Logic*
3. J.-Y.Beziau, *Beyond Dichotomy*
4. J.-Y.Beziau and A.Costa-Leite, *A panoramic introduction to paraconsistent logic*
5. N.C.A. da Costa and J.-Y.Beziau, *The World of Possible Logics*

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Jean-Yves Beziau
University of Brazil
Rio de Janeiro