REMEMBERING JEAN-LOUIS LODAY

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In all fairness, I am not too sure if my few years of mathematical interactions with Jean-Louis justify writing this note. However, when I think about the feeling of great loss many of us had once the tragic news of passing away of Jean-Louis started spreading around, I feel like trying to make a small tribute of my own to this wonderful person and amazing mathematician. Making a somewhat lame excuse, I can say that it would be a great pity if something will accidentally be lost forever, however small the lost bit of information might be. More to the point, I should admit that I generally appreciate other people's strolls down the memory lane as a part of my recreational reading; I only hope that someone would benefit from mine in one way or the other, too. Of course, as most people writing down their recollections about virtually anything, I probably end up talking about myself much more than about Jean-Louis, for which I cannot apologise enough.

I remember vividly the first encounter I had with Jean-Louis' maths. I was in my third year of undergraduate studies in 2001, and was helping Sasha Shen with marking of the legendary "extramural maths competition for secondary school students in grades 6 to 8", which still serves its wonderful goal of showing to kids how exciting and different from the usual "cruel and unusual punishment" of a secondary school lesson a maths problem can be. Sasha, who was back then the editor of the "Mathematical Entertainments" section of *The Mathematical Intelligencer*, regularly received a catalogue of maths books published by Springer; he had one on his desk that day, and suggested to everyone present to have a glance in case they found something of interest to them. I spotted the *Dialgebras* book [4] there, and asked Sasha to order it. I received it in a few months, a common thing for anything involving Russian post, and found it very exciting, — it was developing for some algebraic structures that were completely new for me (but looked very interesting), that is dendriform algebras, dialgebras, and Leibniz algebras, analogues of results concerning associative algebras and Lie algebras that I already knew from courses on Lie algebra cohomology and Hochschild cohomology given my supervisor Boris Feigin at the Independent University of Moscow. It was actually explained in the book how stuff like that would fit into the general framework developed in the seminal paper of Victor Ginzburg and Mikhail Kapranov [2], but I did not follow through the references until a few years later. However, I studied the book with great excitement, and decided to myself that I would really like to use its methods and ideas sometime. It was the second time something like that happened to me. The first time around I had a similar feeling of joy when I read, as a high school student, a popular article of Dmitry Fuks on elementary questions around Kac–Macdonald identities in *Kvant* magazine [1], and got really excited about the interplay of applying generating functions for combinatorial questions with proving identities for generating functions by methods somewhat "foreign" to combinatorics, that is representation theory and homological algebra (in modern language, one probably would speak about categorification, which of course was not present in either paper of Fuks or the mind of the high school student reading it many years after it was published). Wonderfully enough, the key topics of my PhD thesis were related to both of the stories: I computed combinatorially meaningful graded characters of some representations of symmetric groups using homological algebra for operads, and "deformed" some of the additional structures on those representations in the spirit of an unpublished observation of Muriel Livernet and Jean-Louis about how the operad controlling Poisson

algebras can be deformed into the operad controlling associative algebras. During my PhD studies I of course fully realised the impact of Jean-Louis' work on the circle of questions I was working on, but we never talked properly at that stage (in 2006, during my last year as a PhD student, I visited Strasbourg briefly, but Jean-Louis was away on one of his numerous travels, so our paths did not cross back then).

It was in 2008 that I first had some "real" maths conversations with Jean-Louis. It was during a "Workshop on Algebraic Structures in Geometry and Physics" organised by Andrey Lazarev in Leicester. At that stage, I had already been thinking about the circle of questions that later resulted in the notion of "Gröbner bases for operads", and I mentioned bits of my work in progress to Jean-Louis, who got somewhat curious about what I had to say. Since then, we kept discussing various operads-inspired questions over e-mail, thus starting the kind of interaction for which I struggle to find the right noun describing it. Probably, the closest notion existing in the academic world would be "mentoring". What it really was is that we talked a lot about mathematics, with both Jean-Louis mentioning questions he found promising, and me trying to test-drive my recent ideas and thoughts with him (mostly, I admit somewhat apologetically, ideas related to questions I wanted to approach, not the ones that Jean-Louis advertised to me as questions worth looking at). In addition, Jean-Louis generously shared his advice on career development and job hunting, most kindly followed all my requests for reference letters for the latter, and related many stories from the past when he thought it was appropriate. Also, our interaction brought me closer to the wonderful circle of mathematicians who used to be students of Jean-Louis at some point. (I would rather avoid the words "former students" which sound almost like "former children" to anyone who actually has an experience of supervised research!) With some of them, we now have regular conversations about maths, and even ongoing projects.

One of this stories that always comes to my mind when I think of Jean-Louis is about his trip to Russia long ago. To prepare for that trip, he decided to learn how to say in Russian "I don't understand anything you're saying!", which would be a logical thing to learn if you only have time and energy to learn one thing beyond the obvious "Hello", "Thank you", and "Good bye". It turned out that he learned the necessary phrase ("Ничего не понимаю!") so well that when he tried to use it with some random Russian people in the street, everyone was completely fooled by the absence of any foreign accent and accused him of being a Russian who was just pretending to be a foreigner! Indeed, when Jean-Louis told me the way he would pronounce it, he sounded 100% Russian. This cute little story is however hard to believe completely, knowing Jean-Louis' curiousity and taste for foreign languages and cultures, something I was lucky to observe on many occasions while spending time with Jean-Louis in several countries around the world: in the UK, in Ireland, in China, and of course in France. The vast knowledge of many topics in and outside maths that Jean-Louis always exhibited, and his enthusiasm about new things never ceased to impress me. One thing of which I will always remain proud is that on a couple of occasions during a dinner in a restaurant I managed to suggest a choice of wine that would leave Jean-Louis pleasantly surprised. His knowledge of wine, both as a Frenchman and a person of impeccable taste, was of course in a league way above my humble amateur attempts, which made his approval much more rewarding. It was most wonderful to observe how excited and positive he could get demonstrating his approval for such a minor "achievement".

It became so natural over years to share my mathematical observations with Jean-Louis and get some inspiring feedback. I think that nearly everyone who ever received an e-mail ending with the usual signature *JLL* can relate to that. I can recall two instances when I managed to suprise Jean-Louis by discovering something around the circle of topics he has been working with rather closely, once explaining the meaning of combinatorics of planar trees for free algebras with compatible associative products (related both to some constructions for dendriform algebras and to a joint project

on combinatorial Hopf algebras Jean-Louis conducted together with Maria Ronco), and the other time proving, by means of shuffle operads and operadic Gröbner bases, a conjecture of Jean-Louis and Nantel Bergeron on the module structure of the pre-Lie operad over its commutative magmatic suboperad. Jean-Louis was most kind when expressing his views on my work; on a few occasions some colleagues of mine to whom he "advertised" my work would mention his opinions to me, often make me blushing away upon the realisation of how generous Jean-Louis' description of my results was! I can hardly express the joy of learning that Jean-Louis and Bruno Vallette present some of my work in their textbook [3], the last big completed project of Jean-Louis, though definitely not the last mathematical project started under his influence and inspiration.

One future event that Jean-Louis supported as one of the scientific advisors is the programme "Grothendieck-Teichmüller Groups, Deformation and Operads" which is to be held in Cambridge in the spring of 2013. In a few of our last conversations, Jean-Louis was very excited about this programme, intended to be very much in line of his general approach to maths as a discipline based on interconnections between seemingly disconnected topics. Our two or three most recent e-mail exchanges have been further from maths itself, being rather about the most mundane and at the same time inevitable topic for a young mathematician like myself, that is job-hunting and reference letters. As I said, Jean-Louis' help with these matters was invaluable. It was a week after the sad news that I went through the interview process which in the end landed me an appointment to something I have always considered a dream job. It is really sad that Jean-Louis was no longer with us when I was overwhelmed by this news, — he would be the first person with whom I would have liked to share it. I can only hope that this short note gives at least some idea about the role Jean-Louis played in careers of young mathematicians; to get a true feeling of it, one has to increase the impression I tried to create by several orders of magnitude.

References

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