Report on Algebraic Cycles and the Geometry of Group Orbits

The meeting in honor of Peter O'Sullivan's 60th birthday

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On 2–4 September 2011 we held a conference to honor Peter O'Sullivan on the occasion of his 60th birthday. Because most Australian mathematicians have never heard of Peter O'Sullivan, it might be best if we begin with a brief summary of the speeches given in his honor at the party which concluded the conference, on the evening of Sunday 4 September.

I began with a very brief introduction, telling the assembled party that the very first time I ever heard of Peter O'Sullivan was in May 2002. As it happens, I was visiting Paris at the time, and I had just sat down to lunch at the cafeteria in Chevaleret (Université de Paris VII), when Bruno Kahn sat down across the table from me. Without even saying 'Hello' he asked: 'Who is Peter O'Sullivan?'

I had no idea, but at the time I was still a recent arrival in Australia, and hence suggested asking Gus Lehrer. Gus was amazed to hear that there was someone in Australia, who knew what a reductive group was, that he had never heard of.

At that point I handed over the proceedings to Bruno Kahn who described how, out of the blue, he and Yves André received a letter from this Peter O'Sullivan at Coogee Beach, who said he had independently obtained some of their results by different methods, and that his methods were superior and could be used to improve on their results. Needless to say they were skeptical, especially as they could find no trace of a Peter O'Sullivan anywhere in the mathematical literature. After some correspondence with O'Sullivan, André and Kahn realized that he really could improve on their work. They arranged for him to be invited to visit IHES for three months.

Yves André took over from Bruno Kahn to tell the people assembled at the party about the talks O'Sullivan gave during this visit, of the respect his results received from the likes of Ofer Gabber, and of the Bourbaki Seminar that he (Yves André) devoted to results by O'Sullivan and Kimura. He told us, for example, about comments Serre made.

Kimura then went on to talk about the finite dimensionality result that he and O'Sullivan obtained independently, one of the more remarkable advances in the theory of motives in the last two decades. And finally Imi Bokor spoke. In the

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mathematics community in Australia Imi is probably the person who has known Peter O'Sullivan the longest — they happened to go to the same high school and were only a year apart. To the extent that I know anything about Peter's early days, it mostly comes from Imi.

The brief summary is that Peter did his Honours degree at UNSW from 1971 to 1974. He started a PhD at Sydney University in 1975 under Sam Conlon, but dropped out in the middle of 1976. From then until 2002, no-one in the maths community heard anything of him. The reader should note that O'Sullivan is entirely self-taught: the mathematics he does today is totally unlike anything he could possibly have learned from Sam Conlon. In fact, there is no-one in Australia who could have taught him — he is the only person in Australia to work on motives, and probably the only person in the world to do so from the Tannakian perspective he has.

At the party, Srinivas observed that there are parallels with Ramanujam.

The conference itself featured talks about the areas Peter O'Sullivan has contributed to. This means, of course, that most Australian mathematicians would be unfamiliar with the subject matter — Peter works on mathematics that isn't common on our shores. We didn't really expect many senior mathematicians to come to the meeting — after all, most of us lead busy lives and have a hard enough time keeping up with progress in our own fields. But we had hoped to attract a large number of students: students are young and free and could benefit from talks on subjects they're unlikely to be taught at their home institutions. We had therefore budgeted for a large contingent of students, which unfortunately didn't materialize. The result was that we ended up spending far less than expected.

Attendance at the conference was much smaller than expected, but the people who came all thought it was a great meeting and congratulated us.

Let me end with a piece of propaganda. My view is that what happened at the conference illustrates yet again the sad state of Australian mathematics, an issue that the AustMS has been campaigning about for decades. Over the last decades there has been a brain drain from Australia leaving our coverage of mathematics very thin, with huge holes in areas of major international activity. It seems a crime that a conference that brings together such a stellar group of international speakers cannot attract Australian participants. The country doesn't train students in areas sufficiently close to what the conference discussed.

Let me therefore encourage the AustMS to continue campaigning for a rebuilding of Australian mathematics.