Personal Reminiscences

I am delighted to have been asked to give this opening talk at this conference to honour Tony O'
Farrell. This is going to be broad in nature ; it will not cover Tony's manifold contributions to
research; there are better qualified people to do this than I am.

Instead I will look at the many and varied contributions Tony made to the Department, the institution ,
the discipline. As such this consists in large measure of personal impressions, personal recollections.

I was already working here a few years when Tony was appointed head of department in Sept. 1975.
It was then a small place with a relaxed atmosphere. Tony came to us from the US; he had done his
Ph.D in Brown and then spent a further two years at UCLA. Coming from such high level institutions
he was keen to implement the standards, the practices, the attitudes which prevailed there in what was
then a small rural backwater. So the syllabus was revamped, more journals acquired, a weekly
seminar organised.

Anybody who knows Tony knows he is passionate about the things that matter to him. In particular he
is passionate about Mathematics and this passion was communicated to the staff members, quite small
in number then, but especially to students whom he wished to interest in the subject, and to attract
new students equally. He wanted people to talk about Mathematics, to make it alive, to enthuse about
it. Mathematics should be talked about just like great poetry or literature or history was talked about.

Great discoveries and great mathematicians were introduced into lectures to stimulate and enliven
discussion. One anecdote from that time comes to mind. Tony arrived in one morning with a few
typed sheets headed Memorable Mathematics. On these he had listed about 100 great ideas and great
results from early times down to the present. As he passed them out he opined that every student
should be acquainted with these ideas at some stage in his/her career. I was somewhat sceptical not
least because there were many items on this list which I had never heard of. A little later I went back
rather gleefully to ask did he not think the Fourier Inversion Formula merited inclusion in his list. We
then chatted about other results which might merit inclusion.

He revitalised a student Maths society; the process of student support via regular consultation hours
was initiated; regular homework was assigned and marked.

In those days people had preconceived notions about what a professor should look like. He should
have a serious demeanour, wear an air of gravitas, perhaps smoke a pipe, certainly be middle-aged.
Tony did not fit the bill in any of these ways: he was in his twenties, looked younger and could pass
for a graduate student. At that time it was customary to close the main gate at 6pm; if you arrived after
this you had to call the security man. Tony arrived up one evening to find the gate closed. The
security man asked him "Who are you?" Tony answered " I am the professor of Mathematics". The
security man looked disbelievingly and scoffed "And I am the King of Siam!."

One of his early innovations was to start a Maynooth Preprint Series. Certain work presented at
seminars and drafts of papers in preparation were typed. These were then sent to other Mathematics
departments, mathematical societies; the idea was to get printed material in return, perhaps even some
journals, and generally to convey the impression of an active department. Some of these notes in the
preprint series were substantial pieces of work. I can recall a few:

A set of notes on BMO in late seventies which pulled together material which was known but not readily available into a coherent whole. It was written in a characteristic style: compact, concise, containing the essentials but leaving the reader to fill in certain gaps which were not immediately visible. I learnt a lot from this which was useful to me later.

A set of lectures on Celestial Mechanics, the 3 body problem and Poincare's work on this, quite ambitious in scope;

The Gelfand-Schneider theorem in Number Theory

The Prime Number theorem.

In return we received preprints from many universities: Lund, Upsala, Oslo, Stockhom, Amsterdam,Paris , Berlin and others.

Tony was not keen on following textbooks when giving courses. He preferred to write his own notes. This allowed him to choose from a wide range of sources and so include a range of material which was unusual but exciting. In the circumstances of the time where a broad range of courses was not available such as Differential Geometry, PDE, Fourier Transforms, he would include elements from these topics in for instance his Real Analysis course. He wrote a wide variety of notes for use in topics as diverse as series, ODE, topology, real analysis, number theory. Examples might be taken from the Amer. Math. Monthly, or the College Math. Journal. These notes were then sold to the students for a modest sum thereby providing a fund for departmental use. In his Real Analysis course Tony included material from Differential Geometry , perhaps unusual at the time: mean and Gaussian curvature of surfaces, developable surfaces, first and second fundamental forms; esoteric items such as the Weingarten equations and the Theorema Egregium of Gauss were included in the exercises. The seminar was a weekly affair; speakers were invited from Ireland and further afield. The money was found from different sources including the sale of notes mentioned above. He showed a distinct entrepreneurial flair in this regard. Tony wasn't shy and would invite some very distinguished people; I recall Fred Almgren from Princeton, Simon Donaldson from Oxford, Bob Kaufman from Illinois and John Wermer from Brown giving seminars among others.

Tony was interested in engaging teachers from second level in Maths. courses and in improving the standard of teaching. He gave invited lectures at gatherings of Maths. teachers. He paid particular attention to geometry, a subject which had suffered from inappropriate revision of the syllabus which threw out Euclid but introduced some incomprehensible abstractions in its place. In this he was not alone; indeed all the professors of Mathematics at the Irish universities were in agreement that action needed to be taken on this matter. It is illuminating to dwell on this for a moment since it illustrates what can happen when a group of academics bent on reform come up against entrenched attitudes in the Department of Education, in particular some intransigent individuals in key positions. The convenor of this group was Professor Paddy Barry from UCC and I would like to quote from a memo he addressed to the Department in 1985 on the subject of a new draft syllabus.

"We are writing as Professors of Mathematics to draw attention to the fact that there are serious defects in the draft syllabus. We are well aware that no syllabus is likely to meet with universal approval ... but like the present syllabus, the draft syllabus is gravely defective logically. The listed axioms do not produce plane geometry and the listed theorems cannot be proved from them; thus they constitute a bogus axiomatic system. As a consequence the draft course in geometry is substandard, incompetent mathematics and the quality is so badly defective that it constitutes a national scandal. It is all the more deplorable since the Syllabus Committee has produced this after receiving the

enclosed submission detailing similar defects in the present syllabus. The members have evidently encountered strands of three quite separate treatments of plane geometry due to Euclid (c.300 B.C.), G. D. Birkhoff (1932), and G. Papy (1967) but what they have produced is as little a course in geometry as combining the second act of Hamlet, the first of Julius Caesar, and the second of the Merchant of Venice, would result in a play."

Later, Tony drew up his own course in Maynooth designed for teachers called Maths. Studies. Particular attention was paid to geometry and great care given to concepts which had caused problems in Euclid; there was a major discussion of the Parallel Postulate followed by an incursion into non-Euclidean geometry. Concrete examples were given and geometry thereby brought into the modern era.

People may wonder what Tony's views on Mathematics really were deep down. If he were ever to write a manifesto it might include something like this. In fact the following quote is taken from the introduction to his lectures on Celestial Mechanics:

The first rule of hurling is: keep your eye on the ball. The average mathematician has a tendency to let his eye wander. This is occasionally a Good Thing as when an old problem is solved by an assault from an unexpected angle. More often the mathematician's eye starts wandering when the scoreboard looks bad. Finding that he can only solve a little bit of his problem he proceeds to solve the same little bit of a much more general problem or he solves all of a simpler problem. This process explains the present bulk of Mathematical Reviews. The trouble with mathematical problems is that their solutions depend much more on clever tricks than on structural techniques. This fact has been obscured by the undoubted importance of structure the dominant element of this century's mathematics. Nevertheless it is a fact as will be verified by careful examination of the main theorems of the day. Unfortunately, whereas any competent mathematician can expose and exploit structure , clever tricks are harder to come by. The history of celestial mechanics provides many illustrations of the above process. Progress up the mainstream has been agonisingly slow. In 300 years there have been just a handful of basic results.

If I may expand a little on his philosophy: while theory is important in particular theories which open up new areas, Tony always included fascinating applications, special tricks and virtuoso displays of mathematical ingenuity. For instance his Real Analysis course included

The asymptotic expansion of the Gamma function

Wallis's and Stirling's formulas and their derivation

The construction of everywhere continuous, nowhere differentiable functions

Continued fractions and applications.

Magic in the classhall and on the blackboard was an essential part of the syllabus.

Any discussion of Tony's contribution to the institution which omitted the work he did for the Computer Science Department would be seriously incomplete. This department was set up in 1988 and a professor appointed. Things did not work out as hoped and difficulties soon arose and became acute over the next few years. The Head either resigned or was fired in mid-year leaving the department in a state of crisis. A controlling hand was needed to arrest a downward slide but who was this to be? The subject was a relatively new one, a technically demanding specialism. At this moment Tony responded to a request to manage the department until a new head could be appointed.

He was perhaps the only person in the institution capable of doing so. He was able to contain the crisis, to arrest the slide and to restore stability. There was nothing in it for him except the proverbial blood, toil, tears and sweat. He was now managing two departments and adopted a cruel work regime to do it, arriving in the morning at 7 and working until late in the evening. This went on for three years.

In the midst of all his other activities Tony found time to supervise research students. He lists these in his CV; five were Ph.D students. They were: Aengus O'Cairbre, Michael Conway, Denise Lord; Richard Watson, Declan O'Keefe, Tom Dowling of the Computer Science Dept. and Alejandro Sanabria Garcia who are all here today; Grayson Kakiko, Christoph List and Michael Wall.

To sum up, the scope, breadth and depth of Tony's contributions have been outstanding: to Mathematics where he made immense and valuable contributions, to the department in NUIM which he led for more than thirty years, to the institution, where he served on the Academic Council for the same length of time, to Computer Science, to pedagogy and teaching improvement at both second and third level. At a time in which academic life is changing almost out of recognition, when there is a constant narrowing of interests, a struggle to keep from drowning in documents as well as research papers and increasing pressure from the bureaucracy, Tony has preserved a wide range of interests. He continues to be well acquainted with developments in the physical sciences and computer science, but he is also well aware of what is going on in other areas. He even found time in the noughties to serve as chairman of the local branch of IFUT, the Irish federation of university teachers. He saw there was a need to work to preserve academic interests. He gave leadership and was fearless about it. He picked up languages: Irish was always there and he strove to promote it in his department; he has a good knowledge of modern languages, Spanish, French, Italian. He is a great servant of the university, a true academic committed to long-standing academic values, with an abiding interest in preserving the integrity of the University and the principle of academic freedom. He is a true polymath. He serves as an inspiration to aspiring young academics. May he continue to do so and to prosper for many more years.