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A NOTE ON PETER GIBLIN

Peter Giblin has been a key member of the international singularities community for well over three decades, as a major researcher, a gifted expositor, a co-worker to many and an organiser of conferences and events. He is best known for his infectious love of geometry, particularly of curves and surfaces in 3-space, and his work often illustrates the way in which apparently naïve geometric questions can lead to fascinating, demanding and subtle mathematics. His clarity, openness, patience and lack of pretension have made him a particular favourite of graduate students, but also those working in applied fields who want to learn about singularity theory but feel oppressed by its technicality.

Peter Giblin was born on the 10th July 1943 and educated at King's College London where be obtained a B.Sc. in 1964 and a Ph.D. 1967 under the supervision of J. E. Reeve. He was appointed as assistant lecturer at the University of Liverpool in 1967, subsequently rising through the ranks, as lecturer, senior lecturer and reader before being awarded a chair. Peter held, at one time or another, a majority of the most challenging administrative roles within the department, eventually serving as its head. He was recognised through his time there as an inspiring lecturer by every cohort of students he taught, winning the University's Sir Alastair Pilkington Award for Teaching Excellence twice. While this brief sketch of Peter's career naturally focuses on his research, his outstanding lecturing ability, and his capacity for lucid and clear exposition is something those of us in the community have all benefited from at conferences and in reading his papers, particularly those beginning their research careers. There is also a major contribution to mathematical education, on Merseyside and the UK, and more generally a significant professional presence in the UK mathematical community which, for space reasons, we will have to pass over.

Of course this brief account focuses on a description of his research work; naturally just to date since Peter is still very active. He has always been a gregarious mathematician, preferring to share his enthusiasms with others; rather than punctuate this account with the names of his collaborators, we refer you to his list of publications on his web page http://www.liv.ac.uk/~pjgiblin/pubs/index.html.

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Peter's thesis concerned isolated singularities of complex surfaces, including the so-called Herszberg singularities, or as they later became known the simple singularities. This was a precursor to the enormous outpouring of research that followed the foundational work of Brieskorn and Milnor. For a number of years singular points of complex surfaces remained the focus of his interest, until he was drawn into a long-term Liverpool based project of Terry Wall's, understanding the canonical stratification which appears in Mather's proof of the topological stability theorem. Some work on Whitney regularity of strata over unimodular families followed, as well as a detailed consideration of the versal unfolding of the $\hat{E}_7$ singularity, equivalently the space of quartic curves. However it was around 1980 that Peter found his true calling, the generic geometry of curves and surfaces in 3-space. This started with a major project on caustics by (first) reflexion from a mirror from a point source of light. The key problem was to decide for what mirrors was it true that a generic point source yielded a generic caustic. Even in the curve case its solution involved some beautiful plane geometry, which, it transpired, was linked to earlier work of such luminaries as Hamilton and Cayley.

Further investigations on generic geometry followed: in considering 2 parameter families of plane caustics, parameterized by the location of the light source, there was a need to study stable mappings on smooth discriminants. This in turn yielded results on the profiles of a generic smooth surface as orthogonally projected from all viewing directions, and the duals of those profiles. The symmetry set of curves and surfaces were also considered; these are the locus of centres of bi-tangent spheres and in some sense measure the infinitesimal reflectional symmetry of the original geometric object. Their analysis proved of considerable interest in pattern recognition.

Indeed, around this time connections were made between those working in generic geometry and those working in computer vision. In its simplest and most idealised form the latter's challenge is to understand the geometry of a surface in 3-space from its orthogonal projections; attempting to mathematize our brain's capacity for understanding objects from their 2-dimensional views. This link between two previously separated communities proved invaluable to both, and Peter was the most adept at moving between these two worlds. Papers on specularities, epipolar curves, reconstructions of surfaces and two books, one on patterns of the face, followed. However Peter continued to work in singularity theory; there was a major project on the differential geometry of one-parameter families of surfaces, which indeed underpinned much of the work on the geometry of the face. Further investigations of the affine differential geometry of surfaces, and affine equivalents of the symmetry set followed, and Peter is in the process of completing yet another major project

(with Jim Damon) blending singularity theory with the tools of the computer vision community.

As you would expect in a subject as vibrant and international as ours, and a career as distinguished as Peter Giblin's, this work has been supported by a range of funding and been carried out in a range of different places. At Chapel Hill, University of California, Amherst, Brown University, Minnesota, Warsaw and many other locations with support from the EPSRC, the EU, Leverhulme, Fulbright, London Mathematical Society. Peter has supervised 12 PhD students on a broad range of topics and has had over 30 co-authors for his (to date) 117 publications. He has written or co-authored 8 books, including the widely used introduction to singularity theory "Curves and Singularities" written with Bill Bruce. He has also been a pioneer of the use of computers to illustrate, often literally, mathematical ideas and results. Perhaps the most characteristic aspect of Peter's career has been his ever present, and still undimmed, enthusiasm for mathematics, combined with a steely determination to understand, and a natural gift to explain in clear terms what he has discovered. We wish you a (with this publication naturally belated) happy birthday Peter, from all your colleagues and friends, and look forward to working with you for many years to come.