EXPLANATION, APPRECIATION AND REMEMBRANCE

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Explanation. The papers in this issue of the Rocky Mountain Journal of Mathematics were written by participants in the Boulder Conference entitled "Ordered Fields and Real Algebraic Geometry", held on the campus of the University of Colorado, July 4–8, 1983; it was sponsored jointly by the National Science Foundation as the American Mathematical Society's Summer Research Conference No. 5 (1983) and the North Atlantic Treaty Organization's Advanced Research Workshop 55/83.

Although most of us would have liked to have a Proceedings published in Contemporary Mathematics, or in the Reidel NATO series, neither sponsor was willing to waive its Right of First Refusal regarding publication.

Accordingly I have collected most of the papers of the speakers at the Conference-Workshop, and mailed them to the Rocky Mountain Journal; fortunately for us the Journal's publication plans made it agreeable to them to publish the lot in this issue of the Journal. In order to lower the load on the Journal's Editorial and Refereeing staff, the bulk of their duties were performed by our Organizing Committee. I take full Editorial responsibility for any errors.

Appreciation. I am deeply indebted to the members of our Committee on Planning and Organization for their advice, encouragement and editorial work. These are

Eberhard Becker, Dortmund

T.Y. Lam, Berkeley

Jacek Bochnak, Amsterdam

Albrecht Pfister, Mainz

Gregory Brumfiel, Stanford

Tomàs Recio, Santander

Margherita Galbiati, Pisa

J.J. Risler, Paris

Danielle Gondard, Paris

For his crucial assistance on several occasions I want to express my gratitude to Alex Rosenberg. Special thanks are in order for Tomas Recio who did so much of my work.

The National Science Foundation and the American Mathematical Society cooperated wonderfully with my desire to support participants from outside the United States; this was essential to our effort to approximate to a balanced international representation. NATO also cooperated in this effort and in fact all NATO travel and subsistence funds, plus some money left over from the supplies and organization budget, went to the support of participants from NATO countries other than the United States. (But there was a very fair amount of support for American participants.) On behalf of the Committee and all participants I wish to express thanks for our sponsors' support. Warm thanks are due to the most patient, the most efficient, and the most helpful person at the Conference— I refer of course to Ms. Carole Kohanski.

It is doubtful whether my original idea of organizing this Conference would ever have reached fruition without extensive help from the University of New Mexico. Special thanks to my former chairman Tom Kyner and current chairman David Sanchez, Dean Garcia of the College of Arts and Sciences, to Research Provost Scaletti, to Chairman Allen of the University Research Allocations Committee, and to the secretaries in my department, Shirley Harty, Kathy Hall and Betsy Poor.

During a long spell when there seemed to be little hope of finding any money, and virtually no hope of finding more than the maximum $15,000 which might be obtained from NATO, I made an extensive search for assistance from the State of New Mexico. Although the search was unproductive I am very grateful for encouragement from the New Mexico Joint Congressional Delegation: Senator Domenici, former Senator Schmitt, Representatives Manuel Lujan and Joe Skeen. They did everything in their power to help us.

Finally, for a crucial part in postponing my collapse under administrative duties to be done (a director's lot is not a happy one) until approximately 4 P.M. of the first day of the Conference, I offer my warmest thanks to my wife Barbara.

Remembrance of Gus Efroymson. My first meeting with Gus took place when he came to Albuquerque to interview for a job in April 1969. He was interested in my recent successes in real algebraic geometry, and upon being hired he arrived for work in early June 1969. I was delighted that he wanted to collaborate with me.

At this time, the algebraic side of the subject, aside from Lang's Theory of real places, Robinson's two papers of 1954–55 generalizing Artin's solution to Hilbert's Problem 17, and the (still unknown to me) results of Pfister in quadratic form theory, consisted mainly of material found in a few of my papers, namely [1], [2], [3], [4] and the first 3 sections of [5]. In [4] and [5] are found my first nine reelnullstellensatz, all proved

between December 1968 and May 1969. These include the version proved by Risler in 1970 and published in Compte Rendu (Paris) in December 1970. For what it's worth, I conjectured the reelnullstellensatz in August 1968.

In six weeks I taught Gus the material of [4] and the first 3 sections of [5], that is, the then current account of real commutative algebra. By the end of the summer Gus had proved what I had set as the test problem, namely the weak dimension theorem, which occupies §4 of [5]. In response to Ky Fan's invitation we published our results in the book which honored Yu-Why Chen on the occasion of his 60th birthday, because of our friendship with Chen. He was Gus's colleague in Amherst and my teacher in Norman.

Early in 1971 Gus completed his proof of the strong dimension theorem [6]. By this time he was working almost entirely on his own; to my disappointment Gus was not willing to work with me on real algebraic curve theory [7] nor with Bukowski [8]. But in 1972 he did generalize many of these results to higher dimensional real algebraic varieties [11]. In the meantime he had done two other papers, [9] and [10].

As a result of my detour (1972–1978) into mathematical pedagogy I lost track of Gus' research, which in this period shifted to Nash theory, the subject in which he specialized for the rest of his career.

I hope that Jacek Bochnak will, sometime soon, publish his remembrance of Gus, who was his friend and collaborator for the last seven years of Gus' life. It would also be very nice if Bochnak would give an evaluation of Gus' entire contribution to real algebraic geometry.

On the non-professional side I might add a bit. When Gus arrived in Albuquerque he was amazed that some of us were regular joggers. One very cold day in January 1970, he excitedly reported that at 7:30 A.M. That morning, a jogger, who was just about my age, was trotting by Gus' home when he suddenly dropped dead of a heart attack. In spite of this Gus became an avid runner, specializing in the marathon. On the weekend preceding the 1981 Rennes Conference on Real Algebraic Geometry and Quadratic Forms, Claude Gondard, my wife Barbara, and I were detained for an hour in Claude's car on the Pont Neuf while the Paris Marathon passed by in a cold rain. We glimpsed Gus in the throng. His time was a bit over three hours. He was 44 years old.

In November 1982 Gus began to suffer an impairment to his balance. After weeks of puzzlement the doctors diagnosed cancer in both lung and brain. He insisted on teaching all of his classes in the Spring semester, prepared and delivered a talk in Boulder and shortly after Mahé finished his talk Gus produced a counter-example to one of Mahés conjectures. He remained mathematically lucid virtually to the end, which came on August 13, 1983, just a month after the end of the Conference.

It was his strength that Gus treasured most, both mental and physical strength; some say the latter took precedence for him.

Many of Gus' collegues from around the world have mailed condolences to his family (and to me). On behalf of Gus and his family I thank all of them for their kindness.

With the help of some of my colleagues I am organizing a Gus Efroymson Memorial Fund, to be used to support research by faculty here in the areas in which Gus' interest lay. When the planning is complete I will inform all of Gus' colleagues in order that they may have an opportunity to contribute.

To the memory of Gus Efroymson all the papers in this issue are dedicated.

December 1, 1983

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