Contribution of Ken Johnson (Penn State Abington, Pennsylvania)

Hans-Juergen Hoehnke

I first met Hans-Juergen in Jadwisin near Warsaw in 1989, at a conference on universal algebra and non-associative algebra. In my talk I had mentioned the question of whether the group determinant of a finite group has sufficient information to determine the group. The group determinant factorisation was the motivating problem for Frobenius' work in which he began representation theory for finite groups. Hans-Juergen was not at my talk, but when he heard about my question from someone in attendance he came to me with great enthusiasm stated that work of Frobenius which appeared subsequently to the original papers on the group determinant could be used to show that the answer to my question was positive. I mentioned that some experts to whom I had posed the question had indicated that they thought that it was very unlikely that the group determinant could determine a group, and Hans-Juergen replied emphatically: "I am the expert". And he was correct.

Our oral communication was somewhat difficult since neither of us spoke the other's language with sufficient expertise, but we began a collaboration which was not without misunderstandings but which led to one of the major themes of my research, on "k-characters" of finite groups and related factors of the group determinant. One important result was that for any representation which contains at least one copy of each irreducible representation of a group (an example being the regular representation), the1-, 2- and 3-characters of this representation determine the group. This joint result with Hans-Juergen demonstrates that the work of Hoehnke and the school of A. Bergman on multiplicative norm forms can be used to obtain very intrinsic information about group representations. In addition we were able to show that other invariants which had been postulated for finite groups could be explained in terms of Hoehnke's work. While within group theory the results have not found striking applications so far, the relevance to areas where representation theory is applied continues to grow. Hans-Juergen compared the work to that of Felix Klein who used invariant theory as an alternative to representation theory.

I visited Hans-Juergen several times, at first in Berlin and Potsdam, then in Bad Harzbug and finally in Hanover. He and Mrs Hoehnke were gracious hosts and although clearly his personality was imprinted with the difficult situations which he faced in his life his talent as a deep mathematician shone out. I regard him as a very original mathematician who did not hesitate to "follow his own destiny", and as a person I will miss him very much.