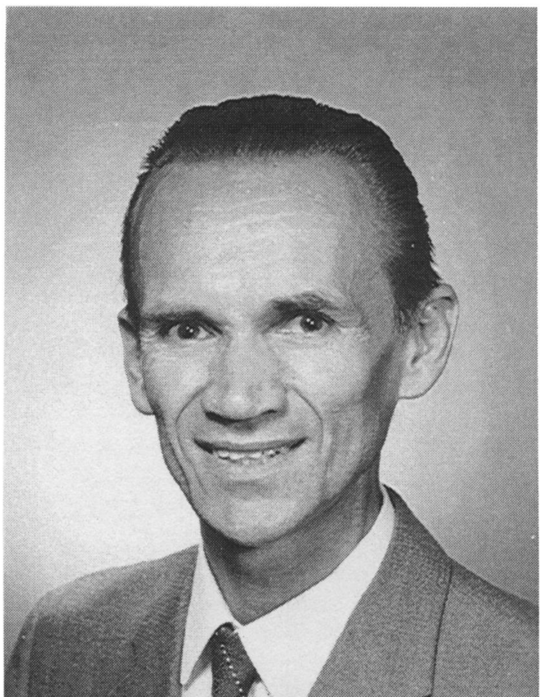

Jan Mařík 1920 – 1994

JAN MAŘÍK — OBITUARY

Washek F. Pfeffer
University of California, Davis

With deep sorrow we learned that on January 6, 1994, our friend and colleague, Professor Jan Mařík, died at the age of 73 after a protracted illness.

Jan Mařík was born on November 12, 1920 of Czech parents in Užhorod in Subcarpathian, Ukraine, then a part of Czechoslovakia, where his father was a civil servant. In 1923 Mařík's parents moved to Prague. Except for some interruption during the war, he lived in Prague until 1969.

In the fall of 1939 Mařík started to study electrical engineering at the Czech Technical University. Unfortunately, the Czech universities were closed by the Nazis on November 17 of that year, and he was eventually sent to do forced labor at a factory in the Austrian town of Steyer. In April 1945 Mařík left the factory illegally and returned to his home. Immediately after the end of World War II he began to study mathematics at Charles University. After graduating from the University in 1948 he taught for two years at the Czech Technical University as an Assistant Professor. In December of 1949 he received the RNDr degree (*Doctor of Natural Sciences*). Then he studied and did research at the Mathematical Institute of the Czechoslovak Academy of Sciences and received the CSc degree (*Candidate of Science*) in 1955. He joined the Mathematics Department of Charles University in 1953, was promoted to Associate Professor in 1955, and to Full Professor in 1960. 1959 he earned the prestigious DrSc degree (*Doctor of Science*), the highest scientific degree offered in Czechoslovakia. (It was patterned after the Soviet model and indirectly after a French title.) From 1957 till 1970 he was the Editor in Chief of the *Czechoslovak Mathematical Journal.*

Jan Mařík was a highly conscientious teacher who successfully translated his prolific research into lucid and stimulating lectures. During his tenure at Charles University he built the whole school of Czechoslovak mathematical analysis. At the time of ruthless oppression and terror in Communist Czechoslovakia, he demonstrated a great deal of personal courage in supporting the talented Czech and Slovak mathematicians regardless of their political beliefs.

Mařík spent the fall of 1966 in Denmark as a Visiting Professor at Aarhus University. In September, 1969 he came to Michigan State University in East Lansing as a Visiting Professor for one year. The Czechoslovak Embassy then rescinded his exit visa and ordered the family to return before January, 1970. Instead he remained and was made a Full Professor of Mathematics at Michigan State University. He obtained United States citizenship in 1977 and made East Lansing his permanent home. Since 1982 Mařík was one of the two managing editors of the *Real Analysis Exchange*, working under the pseudonym of John Marshall. He used the pseudonym to protect the Czech and Slovak contributors against possible political reprisals: the Communist Government of Czechoslovakia considered Mařík's emigration illegal and could punish anyone for having contacts with him.

Mařík had broad research interests and contributed to many areas of mathematics. His most significant contributions were to the following branches of analysis:

1. Representation of linear functionals and topological measure theory.
2. Integration in Euclidean spaces and geometric measure theory.
3. Representation of functions by derivatives.

In each of these fields he obtained results of lasting importance. Some of his best work was written in Czech, and consequently remains largely unknown to the international mathematical community. A typical example is his monumental paper [2], which inspired many Czech and Slovak mathematicians, but is generally inaccessible in the West.

The Daniell approach to the Lebesgue integral presented in [1] influenced generations of mathematics and physics students at Charles University. The representation of linear functionals discussed in [3] and [4] is related to the well-known results of Edwin Hewitt. Paper [6] is a pioneering work on regularity of Baire and Borel measures; its condensed English translation [7] is widely cited in the literature.

Mařík's work on integration in Euclidean space and geometric measure theory is of special significance. In [2] he laid the foundation for the development of conditionally convergent integrals in higher dimensions, an area that started to flourish only in the past decade. Using present terminology, the change of variable theorem proved in [5] is a form of the "area theorem." In [8] Mařík defined the perimeter for bounded measurable sets and established a very general Gauss-Green theorem for the Lebesgue integral. These results, obtained independently, parallel to a large degree the famous work of the Italian school led by Caccioppoli and DeGiorgi. Papers [9], [10], [11] and [12] deal with further development of conditionally convergent integration in Euclidean spaces. Here Mařík defined Denjoy-type coordinate free integrals which provide a more general Gauss-Green theorem than the Lebesgue integral. The integrals differ significantly from the coordinate bound Perron-type integral of [2].

His interest in representing functions in terms of derivatives began with [13] where it was shown how to represent every approximate derivative in terms of derivatives. This representation has now been established for kth approximate Peano derivatives as well. In [14] it was proved that a Baire one function that is zero almost everywhere can be represented as the product of two derivatives. A study of the nature of functions that can be represented as the product of a finite number of derivatives was undertaken in [15]. The paper [16] focused on functions that can be written as a sum of powers of derivatives. Shortly before he became ill the bulk of the work on a long paper yet to be published was finished. In this paper the multipliers of the class of all derivatives that are continuous in the L^p norm for $0 \leq p \leq \infty$ is classified and the multipliers of the multipliers as well.

With the departure of Jan Mařík we have lost a distinguished mathematician and devoted teacher. But we have also lost a sensitive man of impeccable honesty whose uncompromising passion for the truth made a lasting impression on all of us. His memory will always remain in our hearts.

What follows is a list of those papers cited here and is by no means a complete bibliography of Mařík's scientific publications. That list will appear later.

References

[1] *The Lebesgue integral in abstract spaces*, Časopis pro Pěst. Mat., **76** (1951), 175–194.

[2] *Foundations of the theory of integration in Euclidean spaces*, Časopis pro Pěst. Mat., **77** (1952), 1–51, 125–145, 267–301.

[3] *Extreme points of the unit ball in the space of functionals on a given linear lattice*, Časopis pro Pěst. Mat., **79** (1954), 3–40.

[4] *An integral representation of a functional*, Czechoslovak Math. J., **5** (1955), 467–487.

[5] *Transformation of m-dimensional Lebesgue integrals*, Czechoslovak Math. J., **6** (1956), 212–216.

[6] *The Baire and Borel measure*, Časopis pro Pěst. Mat., **81** (1956), 431–450.

[7] *The Baire and Borel measure*, Czechoslovak Math. J., **7** (1957), 248–253.

[8] *The surface integral*, Czechoslovak Math. J., **6** (1956), 522–558.

[9] *Continuous additive mappings*, (with J. Holec), Czechoslovak Math. J., **15** (1965), 237–243.

[10] *Extensions of additive mappings*, Czechoslovak Math. J., **15** (1965), 244–252.

[11] *A non-absolutely convergent integral in E_m and the theorem of Gauss*, (with K. Karták), Czechoslovak Math. J., **15** (1965), 253–260.

[12] *On a generalization of the Lebesgue integral in E_m*, (with J. Matyska), Czechoslovak Math. J., **15** (1965), 261–269.

[13] *Representations of functions by derivatives*, (with S. J. Agronsky, R. Biskner and A. M. Bruckner), Trans. Amer. Math. Soc. **263** (1981), 493–500.

[14] *Baire one, null functions*, (with A. M. Bruckner and C. E. Weil), Contemporary Mathematics, **42** (1985), 29–41.

[15] *Products of powers of nonnegative derivatives*, (with C. E. Weil). Trans. Amer. Math. Soc. **276** (1983), 361–373.

[16] *Sums of powers of derivatives*, (with C. E. Weil), Proc. Amer. Math. Soc. **112** (1991), 807–817.