

*Czesław Domański\**

## **JULIAN PERKAL – PIONEER OF NEW STATISTICAL METHODS IN SCIENCE**

Julian Perkal was born on April 24, 1913 in Lodz in the family of Benjamin, engineer in mechanics and Edwarda, nee Wierzbicka.

He started his education in the Skorupka Secondary School in Lodz.



Professor Julian Perkal

In 1924, after his family moved to the farmhouse in Brzezina, he attended the Secondary School of Polish Educational Society in Sieradz. In this school he passed his final exams – *matura* in 1932.

In years 1932–1937 he studied mathematics at the University of Warsaw. His master's thesis *On the convex sets in Euclidian  $n$ -dimensional space (O zbiorach wypukłych w przestrzeni euklidesowej  $n$ -wymiarowej)* was written in 1937 under the supervision of professor Karol Borsuk (1905–1982).

Having graduated from the university, he took a job in the private land-measuring bureau of E. Helfenbaum in Warsaw, where he worked to 1939.

After the capitulation of Warsaw on September 28, 1939 he was kept in the war prison camp, from which he managed to escape and got to the Soviet side. There he worked firstly as a teacher in Kolno region, subsequently in Woszki (1940) and in Lachów. After that he was brought to the Budzanow region in Tarnopol district, where he initially worked as a surveyor and then as a teacher and methodological inspector of mathematics.

In years 1939–1941, he moved farther to the east of the Soviet Union. He stayed in the kolkhoz in Andiżyńsk district, where he first took a job as a worker on the farm and then as a surveyor. Since May, 1942 he worked as a surveyor in Woroszyłowsk district. His parents were displaced to the ghetto in Sieradz and in 1943 murdered by Germans.

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In 1944, he initiated the Union of Polish Patriots in the Woroszyńsk district and engaged deeply in its activities.

Julian Perkal returned to Poland in 1946 and lived in Wrocław. He took a job at the Faculty of Mathematics, Physics and Chemistry, University of Wrocław as a senior assistant in the Department of Mathematics, which was then headed by professor Hugo Steinhaus (1887–1972).

In 1950 he received the Ph.D. degree with the doctoral thesis *Remarks on marking the volume of tree trunks (Uwagi o oznaczaniu objętości pni drzewnych)*, which was issued in “Works of Scientific Association of Wrocław” („Prace Wrocławskiego Towarzystwa Naukowego”), B, 31/1950.

He worked in the Higher School of Agriculture as the head of the Department of Mathematical Statistics in the years 1951–1953.

In 1953 he returned to the University of Wrocław to take up the position of the assistant professor in the Department of Applications of Mathematics. In 1955 he was promoted to the position of *docent*.

Perkal received the Ph.D. degree in mathematics (which was equal to the habilitation qualifications at that time) with the thesis *On the sets of material and abstract points in environmental studies (O zbiorach punktów materialnych i abstrakcyjnych w badaniach przyrodniczych)*, which was published in „Report of Scientific Association of Wrocław” „Sprawozdanie Wrocławskiego Towarzystwa Naukowego” 12/1957, Appendix, pp. 1–14. In the same year he was promoted to the position of the professor.

Since 1960 till the end of his life he ran the Department of Applications of Mathematics at the Faculty of Mathematics, Physics and Chemistry, holding also the position of the Dean of the Faculty in years 1956–1958. Simultaneously, since 1949 he was working in the newly founded Institute of Mathematics of the Polish Academy of Sciences (called at the beginning the State Institute of Mathematics), holding the position of the head of the Department of the Environmental, Economic and Technical Applications in years 1960–1965. He was also the initiator and the curator of the Department of Statistics and Mathematical Methods at the Academy of Sciences of the Faculty of Physics in Warsaw.

Julian Perkal was the initiator of the Polish Biometrical Association and its first president in years 1961–1964. He also edited the journal “Biometrical Letters” („Listy biometryczne”), which he initiated in 1964.

He wrote 91 works, majority of which investigated problems of application of mathematics in various studies: anthropology, botany, zoology, methodology, forestry, agriculture and economy. The largest number of his works concentrated on taxonomic methods, dendrometry and anthropology. He belonged to the group of founders of the so called Wrocław taxonomy, which focused on methods of ordering units characterized by many numerical variables. These

methods were connected with the anthropological studies on ordering the excavated human skulls and were aimed at graphic presentation of similarities among units with the use of spanning trees. The studies were preceded by the Czekanowski (1882–1965) method.

Perkal's work *Geometric field indicators (Geometryczne wskaźniki łąk)* presents the indicators which characterize the shape, the size and the grass pattern on the farm fields. This launched the discussion on the shape and length of the empirical units. Perkal introduced the wheel length-measuring tool (longimetr kółkowy) to obtain the proposed generalized length of empirical curves.

In the area of factor analysis Perkal proposed the computationally simple method of defining factors. As an instigator and a co-author he created the norm tables for the height and weight of the child depending on its age (which was a novelty in the world paediatrics). He examined human development curves and studied problems of stochastic discrimination introduced by R.A. Fischer. He proposed a generalization of the Fischer method.

The monograph *Mathematics for naturalists and farmers (Matematyka dla przyrodników i rolników)*, Warsaw, 1958–63, parts 1–3, gives an overview of his studies. Perkal was a member of many scientific associations, domestic and foreign.

He died on September, 1965 in Wrocław.

