

55 Years of Scientific Work Professor Kazimierz SZTABA



Professor Kazimierz Stanisław Sztaba was born on the 17th day of July, 1931 in teachers family in Krakow. In 1949 he passed the maturity exam and then entered the Mining Faculty of the University of Science and Technology (AGH) in Krakow. At the beginning of 1953 he passed, with a distinction, his diploma exam of the 1st degree basing on a thesis entitled *Analysis of performance of "Zloty Stok" mechanical processing plant* gaining a title of mining engineer. In 1955 he passed his diploma exam of the 2nd degree based on the *Analysis of wet classification process* thesis, and gained the title of master of mining engineering science with specialization in mechanical processing.

In December 1952 he was employed at then the Department of Mechanical Mineral Processing as a tutor. On March 2, 1960 he became a philosophy doctor of technical sciences after defending his thesis on *Influence of feed grain characteristics on homogeneous material wet classification results*. On June 24, 1964 he became a mineral processing doctor of science on the basis of his scientific activity and work on *Some geometrical features of mineral grains sets*. Later Professor Sztaba was appointed associate professor in 1968 and professor in 1977.

From October 1, 1968, for one year, he had been a head of the Mineral Mechanical Processing Department of the Mining Faculty of AGH. Since October 1, 1969, until 1985, he had been a director of the Mineral Processing Institute of AGH (in 1974 named Mineral Processing and Utilization Institute).

In the period of 1969-1972 he was the Personnel Development Deputy Rector of AGH. Because of his position, he led at that time, *inter alia*, a newly-introduced system of postgraduate and doctoral studies, making their status one of the greatest in Poland. During his initial work at the University of Science and Technology - AGH he dealt mainly with fine grains technology issues (micromeritics), particularly with flow classification and basic geometrical features of mineral grains. However, always the

main and, in some way, personal mineral process in scientific work of Professor Sztaba was, widely understood, grained materials classification and also identification and evaluation of materials and dressing processes.

Among 291 published works, which author or co-author is Professor Sztaba, about 50 concern, widely understood, grain classification (flow and mechanical classification), as well identification methods and separated materials features evaluation (not only geometrical).

So a great number of papers concerning classification processes proves that the particular interest of Professor Sztaba is this topic. Already in his 2nd degree thesis he introduced, for the first time in science, separation numbers and curves to describe and evaluate flow classification processes. An effect of this was two important publications, initiating his publishing activity.

- *Statistical method of wet classification process investigation*. Archiwum Górnictwa t. I, z.1, 1956, pp. 33-54.
- *Separation curves in wet classification process*. Archiwum Górnictwa t. I, z.2, 1956, pp. 167-197.

A kind of summary of Professor Sztaba ideas regarding classification processes is the paper on *Directions and development trends of model descriptions of flow processes*, Archiwum Górnictwa, 38, 2 (1993) and a book entitled *Przesiewanie*, Śląskie Wyd. Techniczne, Katowice 1993.

In 1969, apart from classification processes, he started also to deal with control and dressing problems in technological processes as well with liquid-slurry economics in processing plants.

He defined the task of a complex control of dressing technological processes, control on the basis of mathematical models of the processes. In consequence, he formulated a thesis on useless character of actually possible to achieve mathematical deterministic models to evaluate and optimize real dressing processes. To justify this thesis he studied necessary stochastic models and determined the possibilities of their application in a widely understood technological processes control, with output to their automation.

These works created certain style of solving industrial dressing processes by mathematical modeling. The methods of description represented various versions of multiple regression and correlative theory of stochastic processes. The models form evolved with time, taking into consideration some elements of heuristic approach to the industrial dressing processes modeling. Concrete scientific effects of these works were presented, *inter alia*, during the International Mineral Processing Congresses in Cagliari, Sydney, Donieck, Cannes, and Stockholm.

A review of the most important achievements of Professor Sztaba in mathematical modeling of dressing processes shows that he played a very important role as a research moderator of the mentioned issues, creating directions and purposes for investigations and proposing some concrete solutions. The results of this research were works on widely understood dressing processes control and mineral raw

materials processing, and technological processes automation. Within the latter activity, there were works connected with both individual technological values of regulation and control of processes or whole mineral processing plants.

Personal works of Professor Sztaba on the micromeritics topic were concentrated mainly on mineral grain geometric features and their sets (thesis of the associate professor title and several papers), possibilities of grain characteristics generalisation methods, dependence between space compaction and grains geometric features, as well as efficiency of grained materials mixing. A general direction of these works concerned a possibly general presentation of the mentioned phenomena and dependencies with application of statistical methods. In particular, he pointed to great possibilities of application of the term *segregation* to identify processing objects, proposing, *inter alia*, original methods of such applications.

The range of scientific works of Professor Sztaba of flow classification and dewatering processes, being a part of the liquid-slurry economics issue, is recently concentrated on application of these processes to fine or very fine grains with concrete practical application, for example, to clayey raw materials.

In the area of complex raw materials utilization, Professor Sztaba presented many analyses and papers (beginning from announced in 1970 first article in Poland proposing the idea of complex raw materials utilization and its conditions and then during next years developed the bases of rational utilization of wastes being created in the subsequent stages of the raw materials processing) and also other scientific works making possible to realize organizational and productive purposes, being done by various, selected institutions. Thanks to development of this issue, an enlargement of the Mineral Processing Institute of AGH investigations range was possible.

Apart from mentioned issues, Professor Sztaba dealt with widely understood mineral processing, for example he led and cooperated in many scientific works, being done as research-scientific activity of the Institute, in diploma works and many publications, reviews, opinions and norm projects. In particular, during the last years he presented and justified a thesis of gradual vanishing of mineral processing technological limitations and transforming it into highly complex mineral engineering.

After retirement (2002), Professor Sztaba did not stop his scientific activity and still leads research projects and helps younger workmates. The effect of this is, *inter alia*, a monography on *Identification and evaluation of selected mineral raw materials and theirs dressing processes features*, Wyd. IGSMiE PAN, Krakow 2003; of which he is the editor and main author.

It is worthy to underline that he has supervised 27 Ph.D. students, among them two are presently professors of AGH and one gained the title of professor. He reviewed many Ph.D., associate professor, and professorship theses.