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**TO THE MEMORY OF PROFESSOR STANISŁAW SŁUPEK
1938–2006**



Prof. Stanisław Słupek was born in 1938, June 14, in Szklary, the Sub Carpathian region, in a peasant family. Having finished the elementary school in his village, he went to Chorzów, Silesia. There he attended a Secondary Metallurgical School specializing in blast furnace practice. In 1956 he passed his final examinations and obtained the diploma of metallurgical technician. After a successful entrance examination he was admitted to the University of Mining and Metallurgy in Kraków and became a student at the Metallurgical Faculty (Department of Heat Engineering). His Master's thesis on "The Examinations of Low-Pressure Burners" was written under the supervision of prof. Roman Andrzejewski who gave it a very good mark. In this thesis he tested variations in the combustion speed for various degrees of the mixture of town gas with the combustion air.

After graduation (June 25, 1962) he was offered a job at the Department of Heat Engineering from October 1, 1962, headed by prof. R. Andrzejewski. This was the beginning of prof. S. Słupek's scientific and teaching career.

This career lasted 44 years. Forty four years of strenuous work, demanding sometimes a physical effort, e.g. when carrying out measurements on considerable heights, at much increased ambient temperature (furnaces), when gases or dustiness of air, etc., threatened

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him. However, he accepted these difficulties because he was together with young people he liked very much. He liked their enthusiasm to create, to change, and to build. That sounds quite emotional, but that was true.

The scientific achievements of prof. S. Słupek will be discussed in the following respects:

- his main activity, i.e. the scientific research closely connected with teaching;
- his organizational work;
- his political-social interests forming his personality;
- his sports, tourist and recreational activities which were quite important in his life.

During this more than 40-years long period of his scientific and teaching career, he got acquainted exceptionally with the problems of the metallurgical industry in Poland.

Half a century ago, a position as a junior and senior research worker was quite an advantageous occasion because it allowed one to get well acquainted both with various process engineering, relevant devices and their complex analyses. Reliable measurements of the furnace operation parameters and those of heat appliances were needed. The industry offered gladly and lavishly money for scientific research co-operation. For their financial support they awaited, of course, results which helped to improve technological economical indices. Young S. Słupek had, then, the many-sided possibilities to get acquainted with the industrial problems.

From the very beginning of his career, prof. S. Słupek was interested in the problems of solid, liquid and gaseous fuel combustion in different heat and power engineering installations. His doctoral Ph.D. thesis (January 12, 1970) was preceded by complex examining of coke combustion in cupola furnaces. His doctor's thesis was titled *The heat radiation of dusted combustion gases in radiation recuperators of cupola furnaces formed coke-fired*. His scientific supervisor was the late prof. Roman Woźniacki, an outstanding mathematician and HEATER. Prof. R. Woźniacki adapted the cracovian calculus by Banachiewicz to the problems of heat technology. There were no computers then. Still as a Master of Science S. Słupek published 4 papers and participated in 3 scientific conferences.

On October 1, 1970 S. Słupek was promoted to the position of assistant professor in the Department of Heat Technology and Industrial Furnaces headed by prof. Tadeusz Pawlik. The years 1971 and 1972 were characterized by large scale experiments testing industrial pollution emitted to the environment. Complex environmental protection was at that time only a dream shared also by the authorities.

The "Nowotko" Metallurgical Works in Ostrowiec Świętokrzyski (now Spanish Celsa) charged our University with a task to make a complex analysis of dusts and gases emission of their Works. It was, then, an industrial plant with a full production cycle. Being an expert of the combustion processes in metallurgical furnaces and of the resulting dust and gas emissions, S. Słupek was offered the supervision of this research and this determined and deepened his scientific interest. The proposed solutions of this problem resulted in a series of publications. Only two are mentioned here: *The Emission of Dust and Sulphur Oxides and Their Spreading in the Atmosphere of the Plant with a Full Production Cycle*, written together with Mr. Rycombel; or *Complex Analysis of the State of the Atmosphere Pollution*

by the Plant with a Full Production Cycle, written together with Messrs. Bijak and Filar. The papers were published in the Scientific Bulletins-Environmental Science and Environmental Technology, No. 32 of 1972 and No. 2 of 1974 respectively.

In the open-hearth furnaces of those times there was mainly used strongly sulfated mazout. Hence the interest in limiting the emission of toxic components of combustion gases to the environment. At that time Mr. Tadeusz Sendzimir (he was the first who in 1934 introduced in Poland yet unknown anywhere else cold sheet mill) received an honorary doctor's degree of this University. He granted a private scholarship for the most talented young research workers of our Faculty. The scholarship holders were to study in the U.S.A. The first scholarship holder was S. Słupek. He went to the U.S.A. in 1976 and stayed at the state University of Pennsylvania where he carried out investigations on the combustion of water-oil emulsions. During his stay there, he published together with Messrs. Essenhaig, Koval and Shaler three important papers on the above mentioned problem. Mr. T. Sendzimir wrote then a letter to prof. Jan Janowski in which he said that he was satisfied that such a reliable and bright research worker as S. Słupek was the first to open the series of scholarship holders, and that he hoped that the programme would develop and progress. Dr. S. Słupek was followed by the present professors Andrzej Nowakowski, Janusz Łuksza, Maciej Pietrzyk, Jan Kusiak and Zbigniew Kędziński.

In 1977 Dr S. Słupek presented his monograph on the *Process of Combustion Water Emulsions of Liquid Fuels*. In the monograph he discussed in a complex way the process of combustion of the fuel oil emulsion with an addition of 10; 12.5; 20 and 30% of water and the mixture of the emulsion of 12.5% of water, coal dust and magnesium oxide dust in various ranges. Experiments were carried out from the point of view of the analysis of thermal parameters of the emulsion combustion process, and considering the effect of water on the process of forming the oxides of NO_x , SO_x and soot in the combustion gases.

Basing on the method of apparent surfaces the distributions of flame temperatures and inner surface temperatures of the furnace walls were calculated for various flame emissivity.

On March 21, 1977 the Faculty Council (comprising 34 persons) accepted the monograph unanimously. The Central Qualification Committee also accepted it without any objections. Dr. S. Słupek received his Doctor of Science degree. In November 1977 S. Słupek obtained the post of associate professor.

According to the Central Programme of Basic Investigations (CPBP) he and the Department team made research into the determination of the conditions of toxic components formation in the flame, NO_x , WWA and soot in particular, and the influence of the combustion process parameters on lowering their contents. Further stages of these investigations concerned the ultrasonic production of the water emulsion of mazout and an addition of CaO to the water-mazout emulsion to eliminate SO_x from combustion gases. These investigations resulted in 5 doctorate dissertations supervised by prof. S. Słupek. Altogether he supervised 8 doctor's theses. Two of these persons are now professors at our Faculty.

Prof. S. Słupek published papers in Polish and foreign magazines and attended numerous international conferences on the problems of combustion and environmental protection. Some tens of this papers were presented by him during international scientific symposia on all continents. He published about 170 papers in the field of metallurgy, heat technology and environment protection.

It would be impossible to mention all of them. Therefore only two of them will be named:

- *Determination of the Influence of the Blast Parameters on the Combustion Temperature in a Blast Furnace* (1987) written with Mr. Z. Szydełko;
- *Prediction of Soot Concentration in Fuel Oil-Water Emulsion Flames* (1988) written with Mr. J. Koziński.

In 1987 S. Słupek was promoted to the degree of professor, and in April 1994 to that of full professor.

The teaching work of prof. S. Słupek is inseparably connected with his researches. Prof. S. Słupek lectured on thermodynamics, heat technology, theories of combustion process, low-emission combustion and environmental protection. Those lectures were given for the students of the Faculties of Metallurgy and Materials Engineering (lately Metal Engineering and Industrial Computer Science), Physics and Applied Computer Science and Interfaculty School of Energy. Prof. S. Słupek was the founder of that school. He was held by the students in high esteem and trust, and enjoyed high popularity.

It is impossible not to mention here that prof. S. Słupek was the reviewer of more than ten doctoral theses and eight D. Sc. monographs. He also wrote references for the 13 candidates for the professor's degree.

Prof. S. Słupek was the author of 15 textbooks, manuals, chapters in the books on combustion and environmental protection, among others:

- *Fuels Science and Heat Equipment* (1970 and 1971);
- *Heat Technology* (8 editions) – written in co-operation with Messrs. Buczek and Nocoń;
- *Reduction of Gaseous Emissions from Liquid Fuel Flames* (in *Energy and Environment Progress*, New York 1992) – written with Messrs Koziński and Guthrie;
- *Combustion and Fuels* (4 editions) – written with Mr. Kordylewski *et al.* (chapters).

He also wrote accounts of 3 books on combustion and environmental protection. The books were written by Messrs. Kozaczka, Nadziakiewicz, and Jarosiński.

Prof. Słupek's scientific research was always based on co-operation with industry, among others with Bankowa Metallurgical Works, Częstochowa Works, Katowice Works, and T. Sendzimir Works (now Mittal Steel). Prof. S. Słupek co-operated closely with the Committee of Scientific Research in the form of grants towards the elaboration of various kinds of designs. Scientific discussion he had with his colleagues, candidates for doctor's degree and M. Sc. degree were well known and cannot be neglected.

During his scientific career he was, among others,

- a member of the Scientific – Technological Board in the Lenin Metallurgical Works (now Mittal Steel);
- a member of the Scientific – Consultative Team for Environment Protection of Katowice Works;
- a member of the Combustion Section of the Thermodynamics and Combustion Committee of the Polish Academy of Sciences (since 1985);
- a member of the Flame Research Committee – International Flame Research Foundation Holland (since 1992);

- a member of the Thermodynamics and Combustion Committee of the Polish Academy of Sciences (since 1993);
- a member of the “Pure Combustion” Foundation;
- and since 1994 a charter member and an executive of the Polish Institute of Combustion.

Prof. S. Ślupek was a member of Scientific Councils of the Environment Engineering and Non-ferrous Metals Institutes. He was a member of the T08 Team and the Team of Informative Infrastructure of the Committee for Scientific Research. He was also a member of the Science Council at the Ministry of Higher Education.

In the field of forming opinions he was an expert in evaluating the environment safety on behalf of the Ministry of Environment Protection, Water Economics and Forestry, and in the name of Małopolska Province Voivode.

In the early seventies he was chosen an expert for the Chief Technical Organization and also for the Krakow Law Court in the field of heat engineering, heat measurements and environment protection.

On the turn of the seventies prof. S. Ślupek was a vice-director of the Institute of Metallurgy of University of Science and Technology AGH and a Vice-Dean of Faculty of Metallurgy and Material Science. He held this post for two terms from 1978 to 1984. At that time the education programme both for the full-time and extramural courses was modernized. In 1991 prof. T. Pawlik retired, and in his place prof. S. Ślupek became the head of the Department of Heat Engineering and Industrial Furnaces. In 1993 this Department was reformed and became the Department of Heat Engineering and Environment Protection. New modern laboratories for testing heating processes, air conditioning and environment safety were built. It should be emphasized that our School has the Certificate of the first class conferred by the State Certificate Committee, and for a long time it has been ranked as the first or second among technical universities in Poland.

Already in the sixties prof. S. Ślupek showed his talent as a very good organizer. For a few successive years (1970–1974) he was president of the Metallurgist Day Committee in our School. At that time it was an excellent way of teaching the organization and management of social money.

In the years 1972–1978 he was engaged in social-political work. He was a secretary of the School Party Committee, and a vice-president of the School Council for the Student’s Affairs (Rector’s representative). Prof. S. Ślupek paid much attention to the “thorough improvement of the recruitment of future student’s, demanding a high level of knowledge at the entrance examination. The improvement of this level determines the success of teaching and the abilities of a graduate” – quoted from the conversation with prof. S. Ślupek in the Bulletin of our School of 1973.

Prof. S. Ślupek was a well known sportsman in AGH University of Science and Technology. In the sixties he belonged to the swordsmen team trained by the famous Hungarian Coach Mr. “Papa” Kevey. Such celebrities as Zabłocki, Pawłowski, Zub and others were his charges. Prof. S. Ślupek fought as a swordsman for Cracovia. Next he was actively engaged in the Swordsman Section.

At the end of these recollections it should be said that prof. S. Ślupek was founder, head and Dean of the Interfaculty School of Energy in AGH. Alas, he did not live long enough to see the first graduates.

In recognition of his hard and honest versatile activities prof. S. Słupek was several times decorated by the Rectors of our School and by Ministers. Among others he obtained a Gold Cross of Merit and an Officer's Cross of Polonia Restituta. He was also given a Medal of National Education.

Prof. Stanisław Słupek was married to Miss Ewa Bzowska, M.Sc., and had two children (a daughter Natalia, graduated law from the Jagiellonian University, and a son Bartosz, graduate from the Jagiellonian University and from University of Science and Technology). He built a house (a true family shelter), and planted a few trees. Thus, he fulfilled his duty as a father and man. Mountaineering, biking and Alpine skiing were his hobbies.

He died on February 7, 2006, two day after his return from the skiing holidays in Alps. He was buried at the Salwator Cemetery.