

PROFESSOR ZENON JAGODZIŃSKI

in memoriam



Professor Zenon Jagodziński was born in Samcieszynek, district Bydgoszcz, on April 5, 1913. He began his study at the Faculty of Architecture of the Technical University of Lvov in 1934. Four years later, he moved to Warsaw, when he specialised in radio engineering at the Technical University of Warsaw. The outbreak of World War Two interrupted his study. During the September Campaign he served as officer of artillery in the Polish army. After the battle by the river Bzura, he was taken captive. Until the very end of the war, he was in captivity. After liberation by the Allies, he stayed in Grate Britain, where he continued his study at the Polish University College that was established at the Imperial Institute of Science and Technology in London. In 1947 he completed his study in the field of telecommunication and took his M.Sc. degree at the Faculty of Electrical Engineering. At the end of this year, he came back to Poland and

started to work at the Naval Radio Service that was founded in that time at the Faculty of Engineering of the Technical University of Gdańsk. There he constructed in 1950 the first Polish echo sounder. In 1952 he was appointed lecturer at the newly established Faculty of Telecommunication of the Technical University of Gdańsk. Prof. Jagodziński organised the Department of Radio Navigation at this faculty in 1953. Beside his didactic and scientific activities, he was engaged simultaneously in research concerning hydroacoustic constructions. In his department there were constructed echo sounders and sonars for the search of wrecks on the Polish shelf, as well as an ultrasound telephone for communication between frogmen and submarines.

In 1960 Prof. Jagodziński took his doctor's degree in technical science at the Faculty of Telecommunication of the Technical University of Warsaw. His dissertation dealt with echo ranging systems. In 1964 he was appointed associate professor.

In 1969 he organised a specialisation in hydroacoustics that was unique in Poland; the staffs of the Department of Hydroacoustics and the Department of Electro-Acoustics at then Faculty of Electronics of the Technical University of Gdańsk were involved in it. The specialisation, founded and managed by Prof. Jagodziński, was attended and graduated by about 200 students. He was supervisor of 10 completed postgraduate studies. Five of his postgraduate students were qualified as assistant professors. He is the author of two monographs and about 70 scientific publications and of many patents and studies concerning radio navigation and hydroacoustic constructions.

Prof. Jagodziński performed many important faculty and university duties. He was subdean of the faculty for two terms. He is member of the Committee of Acoustics and the Committee of Sea Research of the Polish Academy of Sciences. He has organised the Polish Acoustical Society and was member of the management of this society for many years and its president from 1981 to 1987. He was member of the scientific council of the Research Centre of the Navy and the Naval Fishing Institute.

Prof. Zenon Jagodziński was awarded the Chivalry Cross of the Order of the Rebirth of Poland, the Medal of the National Education, the Bronze and Silver Medals of Merits to the Country's Defensive System, the Honourable Distinction of Merits to the District of Gdańsk and the Golden Distinction Worker of Merit of the Telecommunication. He also received awards of the President of the Committee of Science and Technology, of the Minister of National Defence, of the General Staff of the Polish Army, of the Commander of the Navy and many others.

Prof. Jagodziński retired in 1983. He left behind a group of mature scientists in the Department of Hydroacoustics (that has been called the Department of Acoustics since 1993). This is where theoretical and applied research in the field of hydroacoustics has been continued.

On December 9, 1994 the honorary doctorate was given to Prof. Jagodziński by the University of Surrey, Guilford, that is the heir of the tradition of the Imperial Institute. This honourable title was awarded Prof. Jagodziński as an outstanding scientist who, according to the idea of the founders of the Polish University College, returned after graduation to his ruined and vandalised country in order to organise a reputable scientific centre that has effectively co-operated with the British acousticians in the field of hydroacoustics and ultrasonics.

Prof. Jagodziński has two desirable but seldom features: the ability of a creative application of theoretical achievements in practice and, first of all, the ability to stimulate a creative climate of friendly co-operation.

The first one bore fruit in the forms of two monographs: the *Radio Navigation Systems*, that appeared in 1969 (and disappeared a long time ago, not only from the bookstores but also from libraries from which it has been appropriated by fan-readers) and another one entitled *Ultrasonic Transducers* that appeared in 1998 year and is hush vanishing from the bookstores. The respect of Prof. Jagodziński for practice manifested itself in the obligation, and pleasure, of each of his students to participate under the Professor's supervision in the field laboratories installed on lakes (hydroacoustics) and airports (radio navigation). In this way the students was given a chance to get a knowledge of problems appearing in real systems and centres and to gain in engineering intuition indispensable in the designing of hydroacoustics and navigation devices.

The second one has born fruit in the creation of a stable and strong team of a recognised scientific and didactic position; this team has tried to continue and develop the style of activities of Prof. Jagodziński.

Professor Zenon Jagodziński died in January 22, 1999.

Professor Jagodziński will always remain in the memory of all those who had the privilege to meet Him on the way of their lives.

1. Introduction

Important series, like the quantitative assessment of pressure in playing air musical instrument or the evaluation of transducers' working properties, are yielded by estimating the amplitude in front of the transducer face.

As known, such evaluation can be made with direct measurement, by scanning with microphone the volume of interest, or indirectly by measuring the signal backscattered toward the transducer from a plane-like target located at different places.

The former method is usually considered the "gold standard" for any quantitative estimation of pressure levels, while focusing properties, providing a target small enough to be considered like a point, can be detected with the latter too.

In any case the quantity to be measured is always the field amplitude, while little emphasis is given to the phase field distribution.

As a matter of fact, the phase can be neglected in imaging systems characterisation, where the lateral resolution – or the capability to distinguish two near details along a line perpendicular to the beam axis at a certain range – is determined by the beam full