

OUTLINE OF THE POLISH ACOUSTICIANS HISTORY. PART I (UNTIL 1969)***LESZEK FILIPCZYŃSKI**

This elaboration is devoted to the chronology of the most important events in the scientific life of Polish acousticians. The beginning of Polish acoustics is located in the thirties. Unfortunately, tragical situation of Polish during the Second World War stopped scientific progress on that field. Those scientific and engineering staff suffered the importance personal losses they have been deprived their employments. The staff has been submitted to the dispersion. The laboratories equipment have been destroyed or carried out by the occupant. Libraries and collections of books have been lossed in such way, that now we posses almost any original documentation related to that period. The remembrance to be keep in the form of scanty of notes prepared by Prof. Marek KWIEK (tragical deceased in 1962) and by Prof. Zbigniew ŻYSZKOWSKI (deceased in 1988) and also reminescences of Prof. Ignacy MALECKI allowed to reconstruct in fragmentary form history of the birth of Polish acoustics. After-year 1953, the activity of Polish acousticians is well-documented in the form of native and foreign scientific publications, books, handbooks, proceedings, list of papers of Polish acousticians [1-3] and also in the form of easy to attainment reports about scientific activity of Polish institutions, for example [5, 6, 20]. For that reason this period has been treated shortly.

The chronology of significant events has been divided into two periods. The first one of twenty-five years after liberation closed year 1969. This period contains creation of the Polish Society of Acoustics (1963) and Committee of Acoustics of Polish Academy of Sciences (1964) an initiation of the first quarterly periodic "Archives of Acoustics" (1966). At the end of period in the year 1967, it has been published the list of papers of Polish acousticians, to be appeared during the time 1945-1966.

The second part of outline of Polish acoustics history which is now preparing, contains chronological events of major importance to be arised after 1969.

* This paper was published in Polish in Proc. of the XXXVI Open Seminar on Acoustics "OSA-89" held in Szczyrk-Biła in September 1989, pp. 27-41

Events of major importance in Polish acoustics

1930

"System of transversaly recording of film sound by using a mirror oscillograph". This system, constructed and patented by Leonid PIMONOW, M. Sc.; graduated from the University of Vilno, was applied in almost all the sound films to be produced during the period 1930-1934 in Poland and next, the system was ransomed by the German firm "Klangfilm".

1933

a) M. KWIEK, M. Sc., graduated from University of Poznań in both different domains: physics and musicology, undertook the research on acoustics at University of Poznań [10-13]. He continued his postgraduate study in Germany under the supervision of Prof. F. TRENDELENGURG and Dr M. GRÜTZMACHER.

b) The first measurement of city noise was carried out in Warsaw, Cracow and Vilno in 1934 by applied the Barckhausen apparatus. The measurement was carried out under the supervision of W. GAŹKIEWICZ [24].

c) The Committee of Noise Overcoming was established by Union of Traffic Enterprises and Ministry of Communication. In 1936 the Committee submitted to the ministries and institutions some conclusions concerning the noise overcoming. The Second World War stopped the committee activity [24].

1934

The State Institute of Telecommunication located in Warsaw, Ratuszowa 11, to be supervised by Prof. Janusz GROSZKOWSKI, initiated the work on the telephonometrics and telephonic speaking machines. The work, conducted by T. KORN, M. Sc. was successful and allowed to introduce just before war the speaking clock into the public telephones net, W. FIJAŁKOWSKI, M. Sc., undertook the work on electro-acoustics specially the problem of telephony.

1935

a) The State Industrial Works of Tele- and Radiotechnics, located in Warsaw, Grochowska street, Section of Progress in Research - conducted by Z. ŻYCZKOWSKI, M. Sc., graduated from Electrical Department of Warsaw Technical University, joined the work on the new types of microphone inset with steel diaphragms and powder chambers, as the application to the laryngophones and telephone's receivers, based on the new types of magnets alloy. Previously, it has

been also constructed the dynamic loudspeaker which was applied to the Amplifon and next to the superheterodyne radio receivers.

b) Origin of the laboratory of architecture acoustics located at the Institute of Building Engineering of Civil Engineering Department of Warsaw Technical University. The laboratory was conducted by Prof. Waław ŻENCZYKOWSKI. The measurement of noise and architecture acoustics research has been carried out by Bronisław BUKOWSKI, M. Sc., Irena WASIUTYŃSKA, M. Sc., and J. WOJCIECHOWSKI.

1936

a) The problem of architecture acoustics was carried out at the Research Institute of Building Engineering of Architecture Department of Warsaw Technical University (Head Prof. Stefan BRYLA) by I. MALECKI [7], M. Sc. graduated from Electrical Department of Warsaw Polytechnics.

b) "Dependence of the sound property on its audibility" – Doctoral Thesis of M. KWIEK, M. Sc., has been promoted by Prof. L. KAMIŃSKI and Dr M. GRÜTZEMACHER at University of Poznań and published in *Akustische Zeitschrift* [14, 15]. Dr M. KWIEK cooperated as the assistant with Prof. Stanisław KALANDYK – head of the Institute of Physics at Medical Department of University of Poznań. Dr M. KWIEK published a few works on problems of noise and tone quality.

c) Creation of Technical Department at Research Office in Polish Radio Broadcasting in Warsaw under the supervision of I. MALECKI, M. Sc. [19]. I. MALECKI was just coming from Berlin, where he worked at Institut für Schwingungsforschung on the problem of high frequency ultrasonic wave-generation, under the supervision of Prof. E. MAYER.

The main area of interest of Technical Department concerned following problems: acoustics of broadcasting studios and design of the Central Broadcasting of Polish Radio. The department worked on the measurement of acoustic insulation and conditions of broadcasting studios also on testing of microphones and on carrying out the theoretical and experimental research on acoustics of interiors. The work was also carried out by Stanisław KOWNACKI, M. Sc., Włodzimierz WORONCOW, M. Sc., and by a few technicians.

1938

Dr Wiktor JANKOWSKI graduated from the Medical Department of the University in Lwów publishes a paper on the internal ear (*Pol. Gaz. Lek.* 17, 25, 519–524 (1938)) initiating his scientific activity directed toward acoustics.

Wincenty PAJEWSKI, M. Sc., carried out the research at the State Institute of Telecommunication on the professional radio receivers, in particular the problem of frequency stability by using the piezoelectric oscillators.

1939

In March, the beginning of building of Central Broadcasting of Polish Radio in Warsaw. The acoustics design was just prepared by the team conducted by I. MALECKI, M. Sc. The architectonics design was worked out by Prof. B. PNIEWSKI.

Dr Tadeusz CEYPEK, graduated from the Medical Department of the University in Lwów, passed the habilitation in the otholaryngology.

1940

- a) Closure by the occupant of all High Schools and laboratories.
- b) Dr. M. KWIEK after expulsion by occupants from Poznań to Ostrowiec Świętokrzyski began to preserve the church organ. In the same time he worked on the problem of organ's acoustics. He made a few unique research on field of music's acoustics and detaily prepared instructions for the organ builders and musicians.
- c) Conspiratorial teaching and researching on acoustics conducted by Prof. S. BRYŁA at Institute of Architecture of Warsaw Technical University which was acted under the sign-board of vocational school. There, I. MALECKI, M. Sc. received his Ph. D. degree on subject "Physics of porous materials" [16] promoted by Prof. S. BRYŁA. The Doctoral Thesis included recapitulation of the research work during the period 1936-1939.

d) After the returning from German captivity, W. PAJEWSKI, M. Sc. worked in private firm on the production of piezo-electric oscillators from where a part of production he supplied to the conspiratorial broadcasting net system in Warsaw District with the aid of engineer; later Prof. S. RYŻKO.

1941

Until 1943, Dr. I. MALECKI led the conspiratorial lecture on acoustics of interiors for students of the third year at the Architecture Department of Warsaw Technical University [16].

1943

a) The habilitation of Dr. I. MALECKI on "Propagation of sounds waves in closed areas" [17] at Architecture Department of Warsaw Technical University promoted by professors S. BRYŁA, R. TRECHCIŃSKI and M. WOLFKE.

b) In November, the occupant partialy revealed the conspiratorial activity of Warsaw Technical University. The lectures became suspended. Prof. S. BRYŁA has been shot.

1944

The total destruction of laboratories of Warsaw Technical University during the Warsaw Insurrection.

1945

a) The habilitation of Dr M. KWIEK on "The monumentary organ of the Kielecko-Sandomierski land" at the Humanistic Department of University of Poznań promoted by professors Józef WITKOWSKI and Adolf CHYBIŃSKI.

b) Creation of the Independent Section of Electro-Acoustics at the State Institute of Telecommunication supervised by Janusz KACPROWSKI, the specialist on the field of telephonometry.

1946

a) Creation of the Chair of Electro-technics and Acoustics at Gdańsk Technical University supervised by Prof. I. MALECKI.

b) Associated Prof. W. JANKOWSKI moves from Lwów to Wrocław organizing there the Clinics of Otolaryngology at the Medical Academy.

c) W. PAJEWSKI, M. Sc. after the returning from the labour camp in Germany organized the Section of Piezo-electric Materials at the State Institute of Telecommunication in Warsaw. At the same time he lectured on "Materials and Piezo-electric elements at Warsaw Technical University.

After emigration from Lwów to Zabrze prof. T. Ceypek organizes in 1950 at the Silesian Medical University the Otholaryngological Chair and Clinics. As the head of that centre he initiates in 1953 the scientific activity in industrial audiology. Cooperating with university acoustical centers he concentrates his activity in acoustic damage problems occurring in the metalurgical and mining industries.

1947

Creation of the Acoustics Section — supervised by doc. M. KWIEK, at the Chair of Experimental Physics of University Poznań, conducted by Prof. Szczepan SZCZENIOWSKI.

1948

Beginning of students education on the field of electro-acoustics at Wrocław Technical University — Z. ŻYSZKOWSKI lectured on the subjects: electro-acoustics and electro-acoustics devices at Telecommunication Section of Electrical Department.

1950

a) Vocation of Prof. I. MALECKI as the Head of Institute of Electro-acoustics at Warsaw Technical University, coloborators Witold STRASZEWICZ, M. Sc., and Stefan BASIŃSKI, M. Sc; students education on film technique and electro-acoustics in broadcasting.

b) Initiation of the Main Institute of Technical Physics in Warsaw. Appointment of Acoustics Section and Laboratory supervised by Prof. I. MALECKI (collaborators Leszek FILIPCZYŃSKI, M. Sc., Jerzy WEHR, M. Sc., [25] and Waclaw KOŁTOŃSKI, M. Sc.).

c) The work on the echo sounder's construction for the Radio Ship Service supervised by Zenon JAGODZIŃSKI, M. Sc.

1951

Initiation of the research activity in the Sonochemistry by Prof. Bronisław ZAPIÓR at the Jagiellonian University in Cracow in the Chair of General Chemistry. In 1961 Adam JUSZKIEWICZ, M. Sc. began the collaboration in this field. After prof. B. ZAPIÓR was pensioned off in 1961, dr A. JUSZKIEWICZ took over the Section of Sonochemistry.

1952

a) Creation of the Institute of Acoustics and Vibration Theory supervised by doc. M. KWIEK, at the Chair of Theoretical Physics conducted by Prof. S. SZCZENIOWSKI (collaborators Halina RYFFERT, M. Sc., Antoni ŚLIWIŃSKI, M. Sc., and shortly Helena HARAJDA, M. Sc. just before transition to the Institute of Vibration Research at Academy of Agriculture in Poznań).

b) Creation of the Institute of Vibration Research at Polish Academy of Sciences in Warsaw supervised by Prof. I. MALECKI, the structure of Institute has been based on the team came from the Main Institute of Technical Physics. In the next year Institute has been integrated with the new created Institute of Fundamental Technological Research [5] (the new collaborators J. KACPROWSKI, M. Sc. and W. PAJEWSKI, M. Sc., since 1953 — Jerzy RANACHOWSKI, M. Sc. and Stefan CZARNECKI, M. Sc [4], since 1956 — Ryszard PŁOWIEC, M. Sc., since 1957 — Z. PAWŁOWSKI, M. Sc.).

c) Prof. Z. ŻYSZKOWSKI lectured on electro-acoustics and electro-acoustics transducers at Telecommunication Department of the Technical University in Wrocław.

d) Prof. I. MALECKI won the Third Degree State Prize for the research on acoustics of interiors.

e) W. PAJEWSKI, M. Sc., won the Third Degree State Prize for the research on

materials and piezo-electric elements and for the production implementation of quartz oscillators and piezo-electric crystals.

f) Creation of the Central Laboratory of Polish Radio Broadcasting in Warsaw Head Dr Bolesław URBAŃSKI, which was integrated with the Section of Acoustics (Head S. CZARNECKI, M. Sc.).

1953

a) The First Conference on Ultrasonic Technics to be organized by Institute of Fundamental Technological Research PAN in Warsaw, inaugurated a series of meetings with the wide number of foreign participants. During the years 1953–1966 six conferences took places to be organised by IFTR PAN in Warsaw [18], Międzyzdroje [23], Krynica and Jabłonna [8]. The proceedings were published in Polish and English. During these conferences the all over the world connections have been formed between the participants from Poland, France, Germany, Soviet Union and Czechoslovakia.

b) Creation of the Building Systems and Acoustics Department at Research Office in Polish Radio Broadcasting (since 1959 – Department of Radio and Television Broadcasting conducted by J. SADOWSKI, M. Sc. – graduated at Department of Telecommunication of Warsaw Technical University.

c) The chair of Radio Navigation has been organised by Z. JAGODZIŃSKI, M. Sc., at Gdańsk Technical University. The field of research was extended on ultrasonics and hydroacoustics by constructing the echo sounder and sonar which have been used wreck searching on polish shelf. In the second part of fifties the hydrotelephone has been constructed for diver's wireless communication.

d) Zbigniew KACZKOWSKI, M. Sc., undertook the research on magnetistrictive materials in Department of Electronics (Head Prof. J. GROSZKOWSKI) in the Institute of Fundamental Technological Research in Warsaw.

e) Prof. W. JANKOWSKI takes over the Chair and Clinics of Otolaryngology in Medical Academy of Wrocław developing an intensive cooperation with Polish Acoustical Centers.

1954

a) The First Open Acoustics Seminar has been organized by Prof. M. KWIEK at Department of Acoustics and Vibration Theory of University Poznań. From the Second one up [21, 22] to the Fifth seminars took places yearly at the High School of Agriculture in Olsztyn, organized by the Chair of Physics, conducted by doc. Franciszek KUCZERA (collaborant Aleksander OPILSKI, M. Sc.). At the seminars the Polish and foreign participants took part on the field of physical and technical acoustics. The next seminars took places in Zabrze-Rokitnica, Gliwice, Szczecin, Poznań, Warszawa and Wisła (see the elaboration devoted to the twenty-five years of the Polish Society of Acoustics [26]).

b) The Wire Transmission Chair, supervised by Prof. Z. ŻYSZKOWSKI has been transformed into the chair of Wire Teletransmission together with the Electro-acoustics Institute at the Technical University in Wrocław.

1956

a) At the first time the Polish Acousticians took part in the 2-nd International Congress of Acoustics (ICA) held in Stuttgart.

b) Creation of the Independent Chair of Acoustics and Vibration Theory at University of Poznań (supervised by Prof. M. KWIEK, the new collaborant – Prof. Edmund KARAŚKIEWICZ).

c) Creation of the Department of Technical Acoustics at the Central Institute of Labour Protection in Warsaw the scientific activities of which was concerned with the method of industry noise measurement and acoustical expertises (Head of Czesław PUZYNA, M. Sc.).

d) Dr of English philology Wiktor JASSEM, head of the Phonography Section at the University in Poznań, organized in Poznań the Section of Acoustical Phonetics in the frame of IFTR PAN.

1957

Initiation of the following publications: "Progress in Acoustics" (published in the frame of works of Natural Philosophy Committee at Poznań Society of Science's Friends), single copies of "Acoustics" as the part of Scientific Copies of Poznań University and two volumes of "Bulletin de la Societe des Amis des Sciences et des Lettres" [20].

1958

Creation of the Section of Buildings Acoustics (supervised by Dr Jerzy Sadowski) transformed in 1962 into the Acoustics Department at the Institute of Building Techniques in Warsaw (the new collaborant Barbara SZUDREWICZ, M. Sc., 1962).

1959

a) The quarterly "Proceedings of Vibration Problems" published by Prof. Sylwester KALISKI at the Institute of Fundamental Technological Research PAN concerned the problems of acoustics in the wide range. In 1975 the quarterly changed the title on "Journal of Technical Physics".

b) Creation of the specialization – electro-acoustics at the Department of Telecommunication of Wrocław Technical University.

1961

During the Open Seminar on Acoustics in Szczecin the team of 38 founders decided to establish the Polish Society of Acoustics.

1962

The tragical deceased of Prof. M. KWIEK in airplane's crash. The Head of Chair became Prof. E. KARAŚKIEWICZ and at the next years doc. H. RYFFERT (the new collaborators Edward HOJAN, M. Sc., Edward OZIMEK, M. Sc., and Mikołaj ŁABOWSKI, M. Sc.).

1963

a) The Foundation's Gathering of the Polish Society of Acoustics in Poznań. The first Chairman was Prof. E. KARAŚKIEWICZ.

b) The affiliation of the Polish Society of Acoustics at the Fourth Department of Technical Sciences, Polish Academy of Sciences.

1964

a) Creation of the Committee of Acoustics at the Fourth Department of Technical Sciences, Polish Academy of Sciences. The first chairman became Prof. I. MALECKI (1964–1971), the second Prof. L. FILIPCZYŃSKI (1971).

b) The Chair of Physics "A" of Silesian Technical University since 1971 – Institute of Physics headed by Prof. F. KUCZERA, collaborant Dr. A. OPILSKI organized the research on molecular acoustics of fluids. In 1966 the Department of Electrophysics was formed in which the research on quantum of semiconductors and acousto-optics has been undertaken, the supervision of Prof. A. OPILSKI (collaborant Z. KLESZCZEWSKI, M. Sc.).

1965

a) Creation of the Section of Music Acoustics at the Department of State-Managing of the Warsaw High School of Music (head Prof. Andrzej RAKOWSKI, collaborators Tomasz ŁĘTOWSKI, M. Sc., and Antoni JAROSZEWSKI, M. Sc.). In 1968 the Section transformed into the Chair of Musical Acoustics, supervised by the same person (collaborants Prof. Marian RAJEWSKI and Prof. B. URBAŃSKI). In 1979 the High School was renamed on the F. Chopin Academy of Music.

b) The research programme on urban-acoustics was elaborated by the Acoustics Department of ITB (head of Prof. J. SADOWSKI) in collaboration with

Department of Electroacoustics of Warsaw Technical University, Chair of Acoustics of Poznań University, the Warsaw Institute of Automotive Transport, the Warsaw Office of Study and Project in Urban Engineering, the Airport Administration of Air Forces and the others institutions. As the result of this activity the acoustics map of Warsaw, Gdańsk and Poznań and also the basis of urban-acoustics were created.

c) Creation of the Laboratory of Industry Audiology at the Main Institute of Mining in Silesia in which the problems of hearing prophylacticity during the mining process were considered under the supervision of Dr. T. MALINOWSKI. In 1969 Laboratory of Vibroacoustics Menacement was formed, headed by Dr. Adam LIPOWCZAN. In 1976 both laboratories were reorganized into Department of Health Protection and Department of Technical Acoustics under the same managements.

1966

a) Initiation of the quarterly "Archives of Acoustics" (Archiwum Akustyki) published by Committee of Acoustics PAN and Polish Society of Acoustics (editor Prof. Stefan CZARNECKI).

b) Prof. I. MALECKI has been elected as the Chairman of the International Committee of Acoustics (ICA) for two terms of office 1966–1972. He presided at the meetings of the International Committee of Acoustics held in Tokio – 1968 and Budapest – 1971.

c) The team of Prof. I. MALECKI, Prof. L. FILIPCZYŃSKI, doc. Z. PAWŁOWSKI and doc. J. WEHR won the Second Degree State Prize in Science for works devoted on propagation of ultrasonic waves.

d) Creation of the Department of Acoustics at the Rzeszów High School of Pedagogy, the main scientific programme of which concerned with the theory of acoustics fields (head of Prof. Roman WYRZYKOWSKI, since 1967 collaborant Witold RDZANEK, M. Sc.). In 1984 Prof. W. RDZANEK became the head of Department.

e) Creation of the Institute of Electronic Technology PAN. In 1966–1967 prof. W. PAJEWSKI and doc. Z. KACZKOWSKI organized the Department of Piezotronics with the Piezomagnetic Section.

1967

Bibliographic list of the Polish author's works in the field of acoustics published during the periods 1945–1966 [1], 1966–1971 [2], and 1972–1982 [3].

1968

a) The intensification of research activity on hydro-acoustics at Gdańsk Technical University – formation of the Hydro-acoustics Department at Institute of Telecommunication supervised by Prof. Z. JAGODZIŃSKI, doc. Gustaw BUDZYŃSKI

was the head of the electrophone's problems. In the year 1980, Department of Hydro-acoustics has been divided into Hydroacoustics Department and Sound's Engineering Department, the supervisions by the hitherto persons.

b) Initiation of the book "Speech Analysis and Synthesis" published by the Institute of Fundamental Technological Research PAN and PWN, devoted on problems of the acoustics of speech (editor Prof. Wiktor JASSEM). The next volumes have been edited in the years 1970, 1973, 1976 and 1981.

1969

Creation of the Co-ordination Center of Acoustics Problems Architecture at the Council for Mutual Economic Aid with which the following institutions collaborated: Acoustics Department of Institute of Building Technology in Warsaw, Institute of Acoustics of Poznań University, Institute of Telecommunication of Gdańsk Technical University, Institute of Mechanics and Vibroacoustics of Cracow Academy of Mining and Metallurgy, Institute of Radioelectronics of Warsaw Technical University and Warsaw Academy of Music.

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- [11] M. KWIEK, *The scientific methods of noise overcoming*. The lecture delivered in 1936 Meeting of International Committee for Noise Overcoming acted as the structural part of the League of Nations in Geneva, and at Meeting of the Society of Warsaw Technical University.
- [12] M. KWIEK, *Resonance factors in tone quality*, Musicology Annual II, Warsaw 1936 (in Polish).
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Prof. I. MALECKI has been elected as the Chairman of the International Committee of Acoustics (ICA) for two terms of office 1966–1972. He presided at the meetings of the International Commission of Acoustics held in Tokio in 1961 and 1969.

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