C H R O N I C L E

ANALYSIS AND EVALUATION OF STANDARDIZATION IN ACOUSTICS IN POLAND

Industrial development and the consequent intensification of the process of urbanization presents an irreversible menace to man's environment, his work-place, his home and his rest. Amongst the numerous hazards for man, the Polish law and national industrial health service include excessive noise and mechanical vibrations which occur in the environment.

Noise and vibration are factors which adversely affect the comfort, the physical and psychological health of man, and the quality and efficiency of his work. The sensitivity to noise and vibration is dependent on the one hand on physical features such as its level, spectral composition, and duration and on the other hand on the degree of man's sensitivity to noise and vibration. This depends not only on his nervous and psychological resistance, and the temporary state of his mind, but also, and primarily, on the nature of his activities, and the places and condition in and under which they are carried out. A number of legal acts have been issued in Poland aimed at reducing the potential of noise and vibration. They include, among others:

(a) the Ordinance of the Cabinet Council of Ministers of August 21, 1959 on general hygienic and sanitary conditions in newly built or reconstructed industrial plants (Official Law Gazette No. 53 item 316) which reads that the permissible noise intensity in working rooms should not exceed the level detailed in obligatory standards viz:

- in design offices – 40 dB,
- in precision workshops – 50 dB,
- in noisy factory halls – 90 dB,

(b) the ordinance of Minister of Labour, Wages and Social Welfare of March 17, 1976 concerning the highest permissible concentrations and intensities of agents harmful for health, in work establishments (Off. Law Gaz. No. 13 item 77); which reads that at work-places in factory halls, pits and in the open air the maximum permissible noise intensity should be 90 dB (A).

In addition the Council of Ministers issued a resolution in 1971 which formulated guidelines for increased noise and vibration control in work establishments. A number of other executive instruments have also been published.

The Council of Ministers is in the process of issuing a new resolution to supersede the previous resolution. While retaining its most important decisions, it will introduce a number of new aspects to cover those areas so far not dealt with by the existing resolution, particularly concerning noise in cities, towns and settlements, and in housing etc.

Standardization and metrological work in acoustics is carried out in accordance with the schedule laid down by the Polish Committee of Standardization and Measures.

The problems covered by the program between 1972-1975 were implemented by the inclusion of particulartopics in the yearly plans of the ministries.

The program covered, among other topics, the following:

(a) in standardization:

– the establishment of laboratory and practical measurement methods for testing the acoustic and vibrating properties of machines and equipment,

– the delineation of permissible levels of noise and vibration for particular types of machines and equipment, transport and construction equipment together with measurement procedures,

– the establishment of a basic classification of the types, quality requirements, and methods of investigation of the properties of sound-absorbing, sound-proofing and antivibration materials elements and systems;

– the determination of methods for the calibration of devices for the measurement of noise and vibration;

– the establishment of quality requirements and methods of investigating the efficiency of devices for protecting the individual against noise and vibration;

(b) in metrology:

– the organization in selected centres of measurement laboratories authorized to calibrate measuring and testing devices,

– the selection and organization together with the respective ministries of units entitled to test machines, equipment and tools, including transport and construction equipment, for noise and vibration.

The quantitive state of standards in acoustics on December 31, 1976 was as follows:

– 21 Polish standards (PN),

– 19 branch standards (BN),

– 6 drafts of Polish standards for experimental use,

– 6 analytical and research papers.

In addition to basic standards dealing specifically with acoustics many standard specifications PN and BN defining the requirements for and testing of particular machines and equipment give consideration to the problem of noise measurement, and also to its permissible level. Thus, for example all acoustical problems related to earth-working machines produced by the Construction Machinery Union are dealt with in internal standards.

A detailed list of issued Polish standards and branch standards concerning acoustics and vibration is given in the table below. In addition, the following drafts of standards have been submitted for issuance:

– methods of measurement and the evaluation of noise at workplaces (PN),

– permissible noise level for electrically driven hand tools (PN),

– permissible level of noise and vibrations in telecommunication rooms. Requirements and methods of investigation (BN),

– permissible noise level in post-office rooms. Requirements and methods of investigation (BN).

Although the state of standardization, in principle, meets the actual requirements, it needs supplementing with standards concerning: further basic problems, the method of measurement of a noise source in operating conditions, and the problems of the measurement of and the criteria for the hazards presented by noise and vibration.

These problems are included in the «basic plan of standardization and metrological work for the years 1976-1980». The following investigations will be carried out in the part related to the control of noise and vibration:

– the establishment of general measurement methods for noise infrasound, ultrasound and vibration in places of work;

– the construction and testing of meters for measuring sound levels, including octave filters, and also of devices for measuring vibration infra- and ultrasound;

– the determination of permissible noise levels for power boiler equipment, for automobile engines, for agricultural tractors, for machines for the timber industry and the textile industry, for aircraft (at airports and in their neighbourhood and on flight paths at different flight altitudes) and in post office rooms.

– the establishment of methods for measuring the sound power level of boiler equipment, combustion engines (inside and outside the automobile cabin), industrial pumps, refrigerating compressors, machines for the timber industry, mine fans and power-operated tools.

The plan will be realized by the inclusion of particular topics in the yearly plans of the respective ministerial departments.

List of issued Polish Standards and branch standards concerning noise and vibration as of December 31, 1976

Ser. No	Standard No	Title
1	2	3
		A. Polish Standards
1	PN-70 / B-02151	Building acoustics. Soundproof protection for rooms in buildings.
2	PN-61 / B-02153	Building acoustics. Terminology and definitions.
3	PN-68 / B-02154	Building acoustics. Tests on acoustics properties in building partitions.
4	PN-73 / E-04255	Electrical rotating machines. Measurement of vibrations.
5	PN-76 / E-04072	Transformers. Determination of parameters of the noise.
6	PN-72 / E-04257	Electrical rotating machinery. Determination of acoustic parameters of noise.
7	PN-72 / E-06019	Electrical rotating machinery. Admissible sound level.
8	PN-73 / E-06020	Rotating electric machines. Vibration limits.
9	PN-75 / E-06260	Appliances for domestic and similar purposes. Noise level. Examinations and principles of fixing of admissible level.
10	PN-75 / M-35200	Admissible sound levels in rooms with energetic objects.
11	PN-72 / M-43120	Fans. Methods of noise determination.
12	PN-75 / M-47015	Earth moving machinery. Operator's stand. Admissible noise level and methods of tests.
13	PN-75 / M-53527	Instruments for mechanical vibration measurements. Terms and definitions.
14	PN/M-55725	Machine tools for metal. Test methods and admissible noise levels (Polish Draft Standard for experimental application).
15	PN-75 / M-78030	Driven carriageway cars. Admissible noise level and methods of tests.
16	PN-71 / N-01300	Noise of machines and equipment. Methods for determination of acoustic parameters.

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1	2	3
17	PN/N-01301	Acoustics. Measuring frequencies (Polish Draft Standard for experimental application).
18	PN/N-01302	Acoustics. Method of determination of the risk of weakened hearing (Polish Draft Standard for experimental application).
19	PN/N-01303	Acoustics. Method of determination of audibility and audibility levels (Polish Draft Standard for experimental application).
20	PN/N-01305	Acoustics. Plotting curves of equal sound levels and threshold of audibility of normal tones (Polish Draft Standard for experimental application).
21	PN-76 / N-01309	Ear protectors. Method of determination of attenuation and dB(A) reduction.
22	PN-75 / 0-79166	Transport packages. Methods of vibration tests.
23	PN-76 / R-36125	Agricultural tractors and machinery. Noise level at the operator's workplace. Measurement method.
24	PN-71 / S-04051	Automobile vehicles. Test methods and admissible outside noise level.
25	PN-71 / S-04052	Automobiles. Test methods and admissible inside noise level.
26	PN-74 / S-47013	Lorries, buses and trolleybuses. Drivers cabins. Requirements.
27	PN-75 / S-76006	Audible warming devices for privileged motor vehicles. Requirements and tests.
28	PN/T-01009	Electroacoustics. Terms and definitions (Polish Draft Standard for experimental application).
29	PN-64 / T-06460	Sound level meter. General requirements and technical tests.
30	PN-73 / Z-70050	Medical equipment. Clear tone classification audiometres. General requirements and tests.
31	PN-76 / Z-70051	Medical equipment. Audiometres for general purposes. General requirements and methods of testing.
		B. Branch standards
32	BN-73 / 1340-14	General purpose gears. Noise measurement methods.

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1	2	3
33	BN-75 / 1340-14	Noise of piston combustion engines. Methods of determining acoustic parameters.
34	BN-76 / 1807-01/00	Textile machinery and equipment. Noise measurement methods.
35	BN-76 / 1807-01/01	Textile machinery and equipment. Noise measurement methods at a distance of 1 m from the machine outline.
36	BN-76 / 1807/01/02	Textile machines. Technical permissible sound power levels of looms.
37	BN-76 / 1807-01/03	Textile machines. Technical permissible sound power level of spinning machines.
38	BN-76 / 1807-01/04	Textile machines. Technical permissible sound power levels of plaiting machines.
39	BN-71 / 3209-01	Permissible noise level in rooms of automatic telephone and telegraph exchanges. Requirements and investigation.
40	BN-73 / 3209-02	Permissible noise levels in rooms with telephonic connection and auxiliary hand-operated stands. Requirements and investigation.
41	BN-73 / 3209-03	Permissible noise level in rooms with telegraphic apparatus stands. Requirements and investigation.
42	BN-74 / 3209-04	Permissible level of noise and vibrations in buildings of telecommunication power plants. Requirements and investigation.
43	BN-75 / 3209-05	Permissible level of noise and vibration in operational post-office rooms. Packet distribution rooms. Requirements and investigation.
44	BN-69 / 3510-08	Rolling stock. Acoustic properties. Requirements.
45	BN-74 / 3612-02	Automobiles. Exhaust silencer. Requirements and investigation.
46	BN-75 / 3801-02	Aircraft with maximum take-off weight of 5700 kg. Inner noise. Methods of determining acoustic parameters.
47	BN-76 / 3801-03	Propeller aircraft. Noise in pilot's compartment. Methods of determinating acoustic parameters.
48	BN-75 / 5615-01	Piezoelectric transducers of accelarations with ceramic element. General requirements and investigation.
49	BN-75 / 8824-01	Building acoustics. Measurement of sound absorption coefficient in reverberation chamber.
50	BN-75 / 9360-17	Aircraft. Permissible noise levels. Methods of determining aircraft noise characteristics.

Copies of these standards (in Polish only) are available from: Centralna Księgarnia Normalizacyjna, Sienna 63, 00-820 Warszawa.

Marek Tucholski (Warszawa)

XXIII OPEN SEMINAR ON ACOUSTICS

Wisła, September 6-11, 1976

The XXIII Open Seminar on Acoustics was held in Wisła between 6-11 September 1976. It was organized by the Committee of Acoustics of the Polish Academy of Sciences, the Polish Acoustical Society and the Physics Institute of the Silesian Technical University.

The Seminar was attended by over 200 participants from Poland and also by invited guests from the Soviet Union, the German Democratic Republic, France and Holland.

The sessions of the Seminar were held in three parallel sections:

Section A – Quantum and molecular acoustics, ultrasonic physics, ultrasonic transducers, the applications of ultrasound in engineering and medicine (65 lectures).

Section B – Methods of noise control, architectural acoustics (38 lectures).

Section C – Psychological and physiological acoustics, musical acoustics, cybernetic and telecommunication acoustics (49 lectures).

Each day began with a plenary lecture. The individual lectures delivered in the different sections together gave a review of the actual state of the work being carried out in Poland in the different fields of acoustics.

The next XXIV Acoustics Seminar will be held in September 1977 in Gdańsk.

Plenary lectures

1. A. Rakowski – *Fundamentals of musical hearing.*
2. J. Kacprowski – *Acoustic modelling of speech organs in medical diagnosis.*
3. B. Zapiór – *A review of the problems of present-day sonochemistry.*
4. F. Kuczera – *The theory of the liquid state and acoustical information.*

Section lectures

Section A

1. J. Tabin – *Some problems in the calculation of the field of the ultrasonic echo from long objects.*
2. M. Szalewski – *Properties of active piezoelectric CdS layers obtained by single-source evaporation.*
3. A. Opilski, Z. Cerowski, T. Pustelny, M. Urbańczyk – *Measurement of the velocity and attenuation of Rayleigh surface waves.*
4. M. Szustakowski – *The reverberation echo of magnetoelastic waves in YIG monocrystals.*
5. A. Opilski, T. Pustelny – *The effect of a boundary layer on the propagation of a Rayleigh waves.*
6. R. Dyba – *Analysis of the size of the discontinuity region in an inert-gas for waves with continuous spectra.*
7. A. Kawalec, B. Węcki – *Some effects of surface waves in piezosemiconductors in the semiconducting layer.*
8. J. Lewandowski, J. Ranachowski, F. Rejmont – *Propagation of plane longitudinal waves in inhomogeneous solid bodies.*
9. B. Niemczewski – *Interaction of the surface tension and the acoustic impedance of a fluid.*
10. A. Opilski – *The effect of surface trapping on the propagation of surface wave in a piezoelectric-semiconductor.*
11. M. Dobrzański – *Quasicorpuscular properties of phonons.*
12. J. Berdowski, A. Opilski – *Investigations of the acousto-optical anomalies of DADA crystals near phase transitions with photon-phonon interactions.*

13. Z. KLESZCZEWSKI, M. WOJEWODA — *Materials for the acousto-optical modulation of laser light.*
14. J. NARKIEWICZ-JODKO, P. RAJCHERT, A. LESZCZYŃSKI — *Acousto-optical deflectors.*
15. A. ŚLIWIŃSKI — *Selected acousto-optical properties of liquid crystals.*
16. E. SOCZKIEWICZ — *A new acoustic method for the determination of the volume of holes postulated by the "hole" theory of liquids.*
17. A. DRZYMAŁA, M. CIEŚLAK — *Ultrasonic velocity and attenuation coefficient measurement at phase transitions in cholesterol oleate.*
18. J. KRZYK — *Remarks on the problem of the relation of the velocity of sound and the intermolecular interaction potential.*
19. J. GMYREK — *On an acoustic method for the determination of density as a function of pressure.*
20. S. SZYMA — *Investigation of the degree of dispersion and the degree of homogenization of polydispersed systems by acoustic methods.*
21. W. KASPRZYK — *Determination of the size of aggregation zones in the parakinetic theory of acoustic aerosol coagulation.*
22. J. SMELA — *The velocity of quasilongitudinal wave in regular crystals of fixed reaction potential.*
23. M. URBAŃCZYK — *Numerical analysis of a Rayleigh surface wave resonator.*
24. W. BOCH, J. GOC — *Investigations of complexity in binary solutions of* $ZnCl_2$ *and* LiCl *in water by molecular acoustical methods.*
25. A. SNAKOWSKA, R. WYRZYKOWSKI — *Impedance of the outlet of a semi-infinite pipe with a circular cross-section.*
26. Z. BARTNOWSKI, B. ZAPIÓR, A. JUSZKIEWICZ — *Investigations of the conformation of organic esters using acoustic methods.*
27. A. JUSZKIEWICZ, J. POTACZEK — *Investigations of the hydration of polyethylene glycol by acoustic methods.*
28. J. RANACHOWSKI, E. RYLL-NARDZEWSKA — *Ultrasonic investigations of polymorphic transformations in steatite materials.*
29. NGUEN VIET KINH — *Excitation of Rayleigh waves with a laminated transducer.*
30. E. DANICKI, J. FILIPIAK — *The frequency characteristics and impulse response of interdigital transducers determined on the basis of an equivalent diagram.*
31. Z. JAGODZIŃSKI — *A new method for the calibration of ultrasonic transducers.*
32. W. PAJEWSKI — *The designing of multi-layer transducers.*
33. W. IŁGUNAS — *Problems of the measurement of sound velocity in liquids at low ultrasonic frequencies.*
34. D. CIPLYS — *Acoustic investigations of solids in Vilno University.*
35. A. WOJNAR — *A piezoelectric ultrasonic* 630 *Watt transducer.*
36. E. TALARCZYK, T. CISZEWSKI — *An ultrasonic transducer of high quality factor operating with impulse compression.*
37. J. GOLANOWSKI, T. GUDRA — *Experimental investigations of resonance systems with vibration direction conversion.*
38. L. LIPIŃSKI — *An energetic model of dislocations compared versus with the Granato-Lücke theory.*
39. Z. KACZKOWSKI — *Ferrite ultrasonic transducers for the* 27 kHz-*band.*
40. T. WALECKI — *The effect of a magnetic field on the mechanical quality factor of piezomagnetic ferrites.*
41. Z. KACZKOWSKI, E. MILEWSKA — *The influence of magnetic polarization and thermal treatment on the magnetomechanical coupling, modulus of elasticity and dynamic magnetic capacity of* FeAl 12 *alloys produced on an industrial scale.*
42. T. WALECKI — *Internal friction in alfer materials.*

43. Z. KACZKOWSKI, E. MILEWSKA — *Piezomagnetic properties of high power alfer transducers for the* 22 kHz-*band.*
44. W. BIEŃKO, Z. KACZKOWSKI — *The interaction of a transistorized generator with alfer transducer for the* 33 kHz-*band.*
45. Z. KACZKOWSKI — *Piezomagnetic properties of alfer transducers for the* 82 kHz-*band.*
46. A. KORBICKI, W. PAWLAK, A. ALBINOWSKA — *Ultrasonic generator* CU-22-2500 (UTG 4).
47. J. GÓRCZYŃSKI — *The development of techniques for the active use of ultrasound in Poland in the years 1978-1980.*
48. R. KUKULSKI — *Technical ultrasonic equipment developed in the Intitute of Telephone and Radioengineering.*
49. L. FILIPCZYŃSKI, J. SAŁKOWSKI — *An attempt at real time visualization of the heart by means of ultrasound.*
50. L. FILIPCZYŃSKI — *The effect of high temperatures developed in soft tissues under the action of transient focused ultrasonic fields.*
51. J. C. BAMBER, D. NICHOLAS, C. R. HILL, M. J. FRY, F. DUNN — *Measurement of ultrasound scattering and attenuation in excised human tissues.*
52. J. P. WOODCOOCK — *Transfer function analysis in the study of occlusive arterial diseases.*
53. R. C. CHIVERS, W. NASALSKI — *On the relationship between the object structure and the reconstructed image conveyed by the phase information in ultrasonic holography.*
54. T. SZLAGOWSKA, B. NIEMCZEWSKI — *Results of the measurement of sound velocity and its temperature coefficient in five solvents used for ultrasonic cleaning.*
55. J. OLSZEWSKI — *The scattering ultrasonic waves by bodies similar to erythrocytes and air bubbles.*
56. J. ETIENE — *Applications of an ultrasonic method in arterography.*
57. T. PAWŁOWSKI — *Evaluation of blood flow rate using a continuous Doppler method.*
58. R. KUBAK, A. HOEKS, F. SMEETS — *Digital processing of a Doppler signal spectrum.*
59. B. TAL, J. MAGIERA — *Utilization of ultrasonic energy in periodic fluid-fluid extraction.*
60. J. SOMER — *Some impressions of the Third World Congress on Ultrasonics in Medicine.*
61. G. ŁYPACEWICZ, L. FILIPCZYŃSKI — *The overall sensitivity of ultrasonic diagnostic apparatus measured by means of a fluid of high attenuation.*
62. T. WASZCZUK, J. KAMLER — *The grey scale of oscilloscope tubes in the light of ultrasonic visualization.*
63. K. ZASADZIŃSKI, R. KOZACZEWSKI — *The measuring capabilities of ultrasonic measurement unit* UZP-10.
64. Z. KOZŁOWSKI, A. REKOWSKI — *Ultrasonic flowmeter* PU-10.
65. A. MARKIEWICZ — *On the possibility of developing a non-reflective piezoelectric ultrasonic transducer.*

Section B

1. T. TYBURSKI — *The investigation of perforated structures used for individual hearing protectors.*
2. W. JANKOWSKI, W. KUSEK, W. BIRECKI — *Intelligibility of speech in tramways during travel.*
3. M. MIROWSKA — *Tests to establish the relationships of the sound-absorbing properties of fibrous materials to their structure.*
4. A. RUDIUK — *Model investigations related to the selection of acoustic systems in aircraft cockpits.*
5. D. KOZŁOWSKA-KOWALCZYK, Z. WROCŁAWSKI — *Permissible levels of sound power of textile machines.*
6. A. LIPOWCZAN, I. KUBIK, H. OLSZYCZKA — *A computer program for the evaluation and classification of noise levels for mining machines.*

7. F. Denderes, J. Zalewski, Z. Worobiec — *Absorbing properties of domestic asphaltic pastes.*
8. J. Jakubczak, W. Tyrchan — *Silent fans for cooling piston compressors.*
9. W. Tyrchan — *The use of a variable cross-section channel as a pressure pulsation damper.*
10. A. Muszyński — *Air bubbles as a sound-absorbing lining for water basins.*
11. N. Mielczarek, A. Puch — *Investigation of acoustic filters.*
12. L. Dunkelmann, G. Budzyński, A. Witkowski — *On the knocks in electronic control.*
13. S. Czarnecki, E. Kotarbińska — *The interaction of sound-absorbing screens with sound-absorbing surfaces in industrial rooms.*
14. R. Makarewicz — *Regional planning in the light of traffic noise.*
15. R. Makarewicz — *The intensity of the acoustic field produced by a moving source in an open space.*
16. P. Schubert — *Experimental results concerning the accuracy of sound power measurement in a reverberant sound field.*
17. W. Bandera, A. Śliwiński — *On the possibilities of using the mechanical impedance measurements to determine the properties of dynamic viscoelastic materials.*
18. Z. Dukiewicz, A. Śliwiński — *Preliminary results of correlation measurements of the propagation of sounds in structures on board M/S A. Garnuszewski.*
19. A. Puch, T. Zamorski — *The real part of the impedance of the radiation from the horn outlet of a dynamic generator.*
20. E. Kozaczka, F. Markiewicz — *Propagation of acoustic turbulence in shallow seas for certain sound velocity profiles.*
21. W. Bartelmus, A. Studziński — *A spectral method for transmission gear diagnosis.*
22. E. Kozaczka, A. Muszyński — *A magneto as a source of acoustic disturbances in water.*
23. E. Kozaczka — *Investigation of the underwater noise produced by a propeller.*
24. J. Motylewski — *Diagnostic acoustic investigations of moulding machines.*
25. J. Karski, P. Pajzderski, W. Śleboda — *Reasons for the development of vibrations in machine tools, with grinding machine* RGF 5/115 *as an example.*
26. M. Rabiega, B. Rudno-Rudzińska, J. Zalewski — *Investigation of the statistical distribution of traffic noise.*
27. P. Leśniewski — *The effect developed when shutting of the sound source and its influence upon the reverberation time.*
28. E. Drescher — *Investigation of the properties of solidifying cement grouts by microscopic and ultrasonic methods.*
29. A. Jaroszewska — *Experimental investigations of the propagation of elastic waves in boreholes.*
30. H. Gawda — *Application of an impulse ultrasonic method to the investigation of the density distribution of ground subject to deformation.*
31. H. Idczak, B. Bogusz, J. Jurkiewicz — *A method for the selection of parameters for spectral analysis.*
32. H. Idczak, A. Jaroch, J. Renowski — *Application of a rotary diffuser in a weakly absorbing measurement chamber.*
33. G. Budzyński, M. Sankiewicz, A. Kulowski — *Acoustics of the cathedral in Oliwa.*
34. Z. Wąsowicz, J. Jaguścik — *Measurement of diffusivity of an acoustic field by a correlation method.*
35. Będkowski, B. Tokarz — *Selected acoustic problems in feature films.*
36. K. Brodnicki — *An anechoic segment chamber.*
37. A. Kulowski, M. Sankiewicz — *Investigation of audio-monitoring systems for tetraphonic recordings.*
38. J. Bień, E. Kowalska, E. Zielewicz — *Filtering properties of sonicated waste sediments.*

Section C

1. J. Renowski, S. Hlibowicki — *Selected problems in modelling hearing properties.*
2. J. Renkowski, K. Budno-Rudnicki, R. Toczyk — *The selection of listeners for sound location tests.*
3. S. Hlibowicki — *An analogue model of the basic membrane.*
4. T. Tyburski — *Results of physiological-ergonomic investigations of noise.*
5. A. Rakowski, A. Jaroszewski, E. Bogdanowicz — *A threat to the hearing of performing musicians operating high power equipment.*
6. M. Makowski — *Properties of the hearing image.*
7. A. Preis — *Representation of the physical spectrum of musical sound in a fixed two-dimensional space.*
8. H. Harajda — *Preliminary measurements of the sound range of a violin.*
9. A. Rakowski, M. Morawska — *Investigations of absolute hearing.*
10. Z. Wójcik — *The determination of the parameters of a speech signal with the aid of an instant memory.*
11. D. Szybista — *The influence of vocal context on the spectral features and the recognition of fricative consonants.*
12. M. Kozak, Cz. Basztura, M. Tyburcy — *Subjective measurement of the duration of phonemes and phrases.*
13. J. Zalewski, M. Myślecki, J. Jurkiewicz — *Application of linear prediction to the description of a certain class of phonemes.*
14. J. Kacprowski, W. Mikiel, R. Gubrynowicz, A. Komorowska, A. Szewczyk, W. Tłuchowski — *Acoustic diagnosis of a voice-producing throat.*
15. B. Adamczyk, W. Kuniszyk-Jóśkowiak, E. Smołka — *Correlation between the effect of echo and reverberation on the speech of stutterers.*
16. H. Kusek, W. Birecki — *Speech perception of a young person employed in school workshops.*
17. J. Jarycki, Z. Worobiec — *Investigation of skin vibrations in the throat region during speech articulation.*
18. W. Cholewa — *Optimization of the numerical parameters in the analysis of acoustic signals.*
19. R. Millner, B. Gramlich, M. Millner — *Ultrasonic measurements on bone tissues.*
20. M. Millner, R. Millner, H. Grossmann — *Glottography with ultrasonic waves.*
21. R. Carre — *Investigations in the field of speech acoustics carried out in research centres in France.*
22. E. Tyburcy, J. Zalewski — *Spectral transitions as distinctive features of phoneme connections.*
23. A. Pawlak, C. Basztura, W. Majewski — *Application of the Bayes optimal decision rule for cases with incomplete probabilistic information for the identification of voices.*
24. A. Gos, J. Zalewski, W. Myślecki — *On the relationship between the parameters of the impulse generator for throat excitation and the articulation channel on the tonal quality of short phrases of the Polish language.*
25. J. Jurkiewicz, J. Zalewski, W. Myślecki — *The dependence of the tone of code phrases of the Polish language on the order of the analyzing digital filter.*
26. K. Mytkowski — *The transmission in real time of a speech signal and its parameters between a MERA minicomputer and its steriperipheral units.*
27. H. Kubzdela — *A model for an analogue-digital system to identify Polish vowels in simplified phoneme progressions.*
28. J. Jarycki — *An objective method for the evaluation of transmitted speech quality using throat transducers.*
29. W. Majewski, C. Basztura, H. Holien — *Short-term identification of speakers.*

30. W. Hamer — *A model of an artificial head.*
31. K. Musialik, W. Majerowski, W. Myślecki — *Multi-channel acoustic output from Electric Digital Computers with limited information store.*
32. W. Mikiel — *A computer system for the measurement and processing of acoustic data.*
33. J. Zalewski, W. Myślecki — *Investigations concerning the optimal parameters of throat excitation for the synthesis of short phrases of Polish speech.*
34. A. Rakowski, T. Łętowski, R. Litwin — *Analysis of the possibilities of using a microphonic system in an artificial head for recording music.*
35. J. Konieczny — *An attemp at a theoretical definition of the active surface of a dynamic microphone membrane.*
36. J. Florkowski, B. Rewińska — *Directorial properties of an impulse excited loudspeaker.*
37. S. Hlibowicki — *Relationships between the loudspeaker efficiency and its characteristic frequencies.*
38. A. Dobrucki, Cz. Roszkowski — *Measurement of the complex Young's modulus of the cellulose used for loudspeaker membranes.*
39. K. Rudno-Rudziński — *Multiple-loudspeaker systems.*
40. A. Dobrucki — *Equations of the vibrations of loudspeaker membranes.*
41. Z. Sołtys, Z. G. Wąsowicz — *The rooms for the audiometric investigation of loudspeakers in the Institute of Telecommunications and Acoustics.*
42. J. Florkowski — *The location of virtual sound sources for signals of various durations.*
43. A. Gabor, J. Zarzycki — *The accuracy of the determination of the (linear) transmittance function of real electroacoustic channels.*
44. J. Zarzycki, A. Gabor — *A sinusoidal method for the measurement of quantities fully characterizing non-linear deformations.*
45. S. Nuckowski, J. Szymbor — *A method for the automatic measurement of multidimensional functions of the transmittance of non-linear inter systems.*
46. W. Głowacki, W. Sułkońska — *Analysis of deformations and noise in electroacoustic channels.*
47. B. Rogala, R. Szkop, R. Zmonarski — *Evaluation of the effect of the nonlinearity and the inertia of an electroacoustic system on its impulse response.*
48. S. Nuckowski, B. Rogala — *Measurement of non-linear deformations in the low frequency channels of radiophonic receivers using a "break in the spectrum of the measurement signal".*
49. W. Kulesza, B. Rogala, J. Sobolewski — *An attempt at the evaluation of transmittive properties of musical signals on the basis of their statistical characteristics.*

Aleksander Opilski (Gliwice)

IV CONFERENCE ON «NOISE CONTROL»

Warszawa, October 13-15, 1976

The conference was organized by the Acoustical Committee of the Polish Academy of Sciences and the Polish Acoustical Society with the assistance of the Institute of Fundamental Technological Research of the Polish Academy of Sciences and the International Institute of Noise Control Engineering I/INCE.

The conference was the Fourth National Conference of a series of conferences organized every three years, and at the same time the First International Conference. The international character of the conference contributed to its high level and permitted closer contacts to be made between Polish and foreign specialists.

The Conference was held in the Palace of Science and Culture, and included an exhibition of measuring devices, sound-proofing and anti-vibratory materials and systems.

Lectures were presented in three forms: invited papers delivered by internationally eminent scientists at the invitation of the organizing committee, contributed papers presented in two parallel lecture sections, and lectures presented in poster sessions.

The poster form is a relatively new form of information exchange and the organizing committee therefore devoted much attention to it. The participants who had expressed their desire to present their lecture in poster form were each given a numbered stand, confined from three sides and open at the front. This enabled them to lecture to standing groups of up to 15 listeners. In order to facilitate discussion in groups of 2 to 4 people, each stand was equipped with a small table and chairs.

Materials in the form of large-scale illustrations were hung on the internal walls of the stands whose area was 2 m^2. Participants were provided with note-pads for use in discussions.

The procedure for the presentation of poster lectures was the following: the authors were given 5 minutes at the plenary sessions to present briefly the assumptions and theses of their work. During this time they could project slides and use a print projector. The purpose of this was to communicate to all participants the scope of the lectures, thus enabling them to select poster lectures which would be of particular interest to them.

The main part of the poster lectures took place for one-hour session on each of 3 days during which the authors were present at their stands for a predetermined half hour to present more extensively their results and for discussion. The remaining time allowed authors to hear other poster lectures of interest to them.

The poster form created optimal conditions for discussion between participants working on similar problems and anxious to establish closer contacts. Its popularity with the participants proved both its practicality and its contribution to the success of the conference.

The conference proceedings «76 Noise Control Proceedings», of 462 pages, have been published and distributed to the participants and other interested. They are available from prof. S. Czarnecki, Institute of Fundamental Technological Research of the Polish Academy of Sciences, 00-049 Warszawa, Poland.

LIST OF PAPERS PRESENTED

Invited papers

F. Ingerslev — *Planning against transportation noise*
M. J. Crocker — *Reduction of diesel engine noise*
H. G. Leventhall — *Developments in active attenuators*
F. P. Mechel — *Why are silencers symmetrical?*
W. Schirmer — *The vibro-acoustical transmissibility of machine structures*
Z. Maekawa — *Noise shielding on highway*
P. Liénard — *Acoustic propagation in the low atmosphere*
C. Bardone-Sacerdote, G. Sacerdote — *A critical survey of the damage criteria on noise exposure in industry*

Contributed and poster-form papers

S. Gruhl — *Sound propagation in workshops with different arrays of sources*
U. J. Kurze — *Methods and examples of noise reduction in industrial halls*
J. Regent, L. Kałmucki — *Investigation of sound absorption efficiency by absorption lining in the field of the reflected sound wave*
R. Friberg — *Industrial noise control obtained by acoustic enclosures and acoustical treatment of ceilings and walls*

R. Makarewicz, G. Kerber — *Relationship between road traffic and the values of equivalent level L_{eq}*

S. Czarnecki, E. Kotarbińska — *Model investigations of the efficiency of acoustic barriers in industrial halls and urban areas*

J. Grabek, R. Kucharski — *Acoustic map of Warsaw; graphical presentation of acoustic climate trends (reasons and conclusions)*

M. Stawicka-Wołkowska — *Investigations on traffic noise annoyance on the territories adjacent to express routes*

P. François — *Reference sound sources-characteristics, calibration and utilization*

Cz. Cempel, M. Majewski — *Estimation of the plant rooms acoustical properties by means of coherence function*

E. Ozimek — *Fast Fourier transform in acoustic diagnostic research of diesel engine*

Z. Kyncl — *On the spectral analysis of single acoustic impulses*

W. Cholewa — *Problems concerning the practical realisation of Fourier's fast transform with the purpose of analysing acoustic signals*

A. Darwen, J. Ludlow — *A computer based system for monitoring aircraft noise exposure*

J. Adamczyk, P. Krzyworzeka — *A method of identification for diagnostic in vibroacoustics*

W. Rajchert, A. Grzejszczyk, K. Szymański — *Infra- and ultrasounds in building construction equipment*

J. Sentek — *Reduction of noise accompanying the outflow of compressed gas or steam to the atmosphere*

R. R. Armstrong, H. V. Fuchs, A. Michalke, U. Michel — *Influence of Mach number on pressure fluctuations relevant to jet noise*

A. Bigret, J. Delcambre — *Steam turbine generator design and noise*

R. Agnon, M. Bartenwerfer, T. Gikadi, W. Neise — *Noise reduction at the source in centrifugal fans*

W. M. Jungowski, W. C. Selerowicz, K. J. Witczak — *Some features of choked air jets generating discrete frequency noise*

M. Czechowicz, S. Czarnecki — *Attenuation of choked airflow by chamber-disc suppressor*

R. Stuff — *Analytic solution for the sound propagation through the atmospheric wind boundary layer*

S. Till — *Silencing main ventilation mining fans avoiding energetic power loss*

V. D. Naylor — *Experiments on elemental efficiencies and damped vibrations*

L. Millei — *Shock and vibration response of art memorial church to sonic boom and road traffic*

G. Siudyła, M. Zabawa — *Vibroacoustical model of a plate driven by an impulse force*

W. J. Stojanowski — *Theoretical vibroacoustic model of a driving system*

Z. Engel — *Noise reduction of chosen casting machines*

A. Lipowczan, L. Fajfrowski, H. Olszyczka, T. Malinowski, T. Rabsztyn, W. Beble, R. Wagstyl, W. Mrukwa, J. Klepacki — *Noise prevention system in the Polish coal industry*

J. Rutkowski — *Analysis of the possibilities on improvement of acoustic conditions in prefabrication plants by means of acousticobuilding protections*

M. Makomaski, J. Kaźmierczak — *Total absorption of rolling mill house*

J. Kaźmierczak, M. Makomaski — *Investigations concerning the means and ways of reducing noise emitted by an electric arc furnace for the smelting of steel*

A. Zmysłowski — *Some aspects of the reduction of noise in the case of an electric steel arc furnace*

L. Pimonow — *Discomfort caused by noise*

I. Ratajska, R. Makowiecka — *The hearing and equilibrium condition in the ultra-sound defectoscope operators*

Z. Bochenek, I. Ratajska, K. Stelmaszek — *The dynamics of the chronic acoustic trauma in subjects with the postinflamatory changes of tympanic membranes*

L. W. Tweed, D. R. Tree — *Close fitting acoustical enclosures*

Bo Nyström — *Noise reductions in heavy constructions by means of thin viscoelastic damping layers*

I. Żuchowicz — *Acoustic properties of sound absorbing perforated construction*

A. Gackiewicz, W. Orliński — *Searching and practical usage of sound-proofed materials basing on building machines*

St. Czareński, J. Kowal — *Vibroisolation of rubberlike materials*

M. Menżyński, B. Niewczas, A. Troszok — *Sound insulating covers for industrial fittings*

S. Będkowski, S. Duda, Z. Jakubek, M. Staffa — *Prefabricated sound-absorbing cabins for industry*

M. Jessel — *Noise control by means of active absorbers* (part I: theory)

G. Mangiante — *Noise control by means of active absorbers* (part II: Sound absorbers in a long duct)

M. Vogt — *Correlation analysis of phase cancellation in an acoustic field*

M. Vogt, S. Czarnecki — *Analysis of sound source phase cancellation conditions*

G. Canévet — *Noise control by means of active absorbers* (part III: Experiments)

W. F. King III and D. Bechert — *Radiated noise from high-speed trains*

G. Engler — *The possibilities to reduce the noise outside of vehicles by the construction of the body*

H. Kusek, W. Birecki — *Industrial noise influence on the audibility of acoustic warning signals*

B. Buna, J. Miazga — *Estimation of noisiness of motor vehicles admitted to traffic with the aid of the measuring device* AS-2

J. Miazga — *Acoustic estimation of the country vehicle stock*

A. Rudiuk — *Methods applied on the territory of the Polish People's Republic for investigating external noise produced by light aircraft*

O. J. Pedersen — *Standards for the measurement of noise from household appliances*

A. G. Jhaveri — *Compatibility of the noise control legislation with those involving energy environment and land use planning*

S. Majoros, A. Csekö, Z. Ficsor — *Combustions noise amplification and feedback generation*

P. L. Timár — *Inverter fed induction motor and its noise*

Stefan Czarnecki, Ewa Kotarbińska (Warszawa)

MOLECULAR AND QUANTUM ACOUSTICS SECTION

The Central Board of the Polish Acoustical Society (PTA) has established a Molecular and Quantum Acoustics Section (AMK), which has its seat in Gliwice. The activities of the Section will comprise:

1. the initiation of investigations in Poland in molecular and quantum acoustics and in sonochemistry,

2. the education of young scientists and the exchange of information on the state and conditions of investigations being carried out in this field. The implementation of this aim will be effected during winter schooling organized every year in cooperation with the Upper Silesian PTA-Department.

At the meeting on September 8th, 1976, in Wisła, the Board of the Section was formed. It comprises a chairman: Aleksander Opilski (Gliwice), a vice chairman: Antoni Śliwiński (Gdańsk), a secretary: Joachim Gmyrek (Gliwice), and two members: F. Kuczera (Gliwice), M. M. Dobrzański (Warszawa).

BOOK REVIEW

Reduction of Machinery Noise

Purdue University 1975

The book, edited by prof. Malcolm CROCKER, contains materials from a training course entitled «Reduction of Machinery Noise» organized on December 10-12, 1975, in Purdue University. It contains part of the revised and supplemented lectures from a previous course (May 13-17, 1974) whose conference materials were briefly discussed in issue 3, vol. 10 (1975) of Archiwum Akustyki.

The essential advantage of the book under discussion is a very good balance of the theoretical problems and its practical application. Add to this a very careful and clear elaboration of present day problems it can be seen that the book should arouse interest among acousticians engaged in problems of noise control at all levels: from the fundamental to concrete practical solutions. The book has forewords by the main promotor of the course prof. M. J. CROCKER, and prof. RAY COHEN, director of the Ray W. Herrick Laboratories School of Mechanical Engineering Purdue University, the centre at which the course was organized.

LIST OF PAPERS PRESENTED

Fundamentals of Noise Control

J. W. SULLIVAN — *Sound waves and acoustical definitions*
F. R. FRICKE, D. R. TREE — *Room acoustics*
P. G. VAIDYA — *Sound propagation, outdoors*
W. A. COOPER — *The effects of noise on people*
D. R. TREE — *Instrumentation and noise measurements*
M. J. CROCKER — *Use of anechoic and reverberant rooms for measurement of noise from machines*
M. J. CROCKER — *Noise control approaches*
J. F. HAMILTON — *Fundamentals of vibration and noise control by vibration isolation*
W. SOEDEL — *Noise control by absorption*
M. J. CROCKER — *Noise control by use of enclosures and barriers*
M. J. CROCKER — *Noise control with mufflers*
M. J. CROCKER — *Noise legislation and regulations*

Reduction of machinery noise

D. F. FOWLER — *Instrumentation for noise and vibration measurement*
A. J. SCHNEIDER — *Noise measurements*
P. K. BAADE — *Identification of noise sources*
R. L. STAADT — *Truck noise control*
R. S. LANE — *Sources and reduction of diesel engine noise*
A. F. SEYBERT, M. J. CROCKER — *Noise source identification in diesel engines*
W. R. THORNTON — *Noise control of new and existing petrochemical facilities*
J. B. MORELAND — *Controlling industrial noise by means of room boundary*
R. C. LOCKE — *Automatic strip feed press noise and its reduction*
R. J. ALFREDSON — *Noise source identification and control of noise in punch*
J. M. GUINTER — *Noise from electrical equipment*
G. W. KAMPERMAN — *Operator noise control in construction machinery*
L. F. YERGES — *Noise reduction in metal cutting operations*
R. L. BANNISTER — *Large steam turbine-generator noise control*

K. ARCURI — *Valve and pipeline noise causes and cures*
G. M. DIEHL — *Centrifugal compressor noise reduction*
J. B. GRAHAM — *Noise of fans and blowers*

Noise case histories

W. SOEDEL — *Manifold design of piston machinery using a Helmholtz resonator approach*
L. W. TWEED, D. R. TREE — *The use of acoustical enclosures to quiet small internal combustion engines*
S. L. APPLEGATE, M. J. CROCKER — *Reducing the noise of a rotary lawn mower blade*
M. J. CROCKER, D. R. TREE — *Acoustic enclosures for diesel engines in trucks.*

The questions dealt with in the book do not, of course, include all the problems of noise control but concentrate mainly on the group of problems whose solution is most important in the USA. Amongst them are primarily Diesel engines, where without undertaking long-term systematic investigations, based on modern measuring methods, positive results could not be expected.

Many papers are devoted to concern flow equipment, such as compressors, blowers, valves and fans, and this gives evidence of an extensive development of the problems of aerodynamic noise thus enabling the practical utilization of fundamental investigations.

Many of the papers deal with methods of reducing noise by sound-proofing rooms, and the use of barriers and enclosure for the devices producing the noise. It should be stressed that, independent of their acoustic advantages, the practical developments described are remarkable for their long life, simple light construction, and pleasing appearance.

An essential feature of the papers is that they are concise and well arranged, thus making the book of great practical and didactic importance.

Stefan Czarnecki (Warszawa)