

**PROCEEDINGS of the
INTERNATIONAL CONGRESS
on NOISE as a
PUBLIC HEALTH PROBLEM**

DUBROVNIK, YUGOSLAVIA

May 13-18, 1973

SL 26 30

UNIVERSITÄTSBIBLIOTHEK
HANNOVER
TECHNISCHE
INFORMATIONSBIBLIOTHEK

SPONSORS of the CONGRESS

**Union of Medical Societies of Yugoslavia
Environmental Protection Agency, U.S. Gov't
American Speech and Hearing Association
World Health Organization**



Prepared by

**THE U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Noise Abatement and Control**

TIB/UB Hannover 89
129 942 626



TABLE OF CONTENTS

Session 1

Introduction and Masking Effects of Noise

Chairman: Henning von Gierke (USA)

Page

A Preview of the Congress Content, W. Dixon Ward (USA)	3
Systems of Noise Measurement, Karl S. Pearsons (USA)	7
The Effects of Noise on the Hearing of Speech, John C. Webster (USA)	25
Reception of Distorted Speech, Jerry V. Tobias, F. Michael Irons (USA)	43
Hearing Loss and Speech Intelligibility in Noise, Jerzy J. Kuźniarz (Poland)	57
The Long-Term Planning of a Noise Control Program, Michael J. Sues (Denmark)	73

Session 2

Noise-Induced Hearing Loss (NIHL)—Empirical Data

Chairman: D. Robinson (UK)

Basis for Percent Risk Table, Aram Glorig, William L. Baughn (USA)	79
A Critique of Some Procedures for Evaluating Damage Risk from Exposure to Noise, Karl D. Kryter (USA)	103
The Incidence of Impaired Hearing in Relation to Years of Exposure and Continuous Sound Level, (Preliminary Analysis of 26,179 Cases), A. Raber (Austria)	115
Some Epidemiological Data on Noise-Induced Hearing Loss in Poland, Its Prophylaxis and Diagnosis, Wieslaw Sulkowski (Poland)	139
On the Problem of Industrial Noise and Some Hearing Losses in Certain Professional Groups Exposed to Noise, J. Moskov (Bulgaria)	157
Noise-Induced Hearing Loss from Exposure to Intermittant and Varying Noise, W. Passchier-Vermeer (Netherlands)	169
Evaluation of the Hearing Damage Risk from Intermittent Noise According to the ISO Recommendations, B. Johansson, B. Kylin, S. Reopstorff (Sweden)	201
Noise-Induced Hearing Loss from Impulse Noise: Present Status, R.R.A. Coles, C.G. Rice, A.M. Martin (UK)	211
Hearing Loss Due to Impulse Noise. A Field Study, Tadeusz Ceypek, Jerzy J. Kuźniarz, Adam Lipowczan (Poland)	219
Hearing Damage Caused by Very Short, High-Intensity Impulse Noise, H.G. Dieroff (DDR)	229

Session 3

Noise-Induced Hearing Loss—Mechanism

Chairmen: H.G. Dieroff (DDR), R. Hinchcliffe (UK)

Page

Behavioral, Physiological and Anatomical Studies of Threshold Shifts in Animals, Donald H. Eldredge, James D. Miller, John H. Mills, Barbara A. Bohne (USA)	237
Presbycusis in Relation to Noise-Induced Hearing Loss, A. Spoor (Netherlands)	257
Noise Exposure, Atherosclerosis and Accelerated Presbycusis, Z. Bochenek, W. Bochenek (Poland)	267
High-Frequency Hearing and Noise Exposure, John L. Fletcher, (USA)	271
Susceptibility to TTS and PTS, W. Dixon Ward (USA)	281
Growth of TTS and Course of Recovery for Different Noises; Implications for Growth of PTS, Wolfgang Kraak (DDR)	293
Experiments on Animals Subject to Acute Acoustic Trauma, Wiktor Jankowski (Poland)	301

Session 4 A

Interaction of Noise with Other Noxious Agents in Production of Hearing Loss

Chairman: E. Lehnhardt (BRD)

Influences of Chemical Agents on Hearing Loss, M. Haider (Austria)	307
Hearing Loss of Forest Workers and of Tractor Operators, (Interaction of Noise with Vibration), István Pinter (Hungary)	315
Infrasound and Hearing, Charles W. Nixon, Daniel L. Johnson (USA)	329
The Effects of Airborne Ultrasound and Near Ultrasound, W.I. Acton (UK) . . .	349

Session 4 B

Performance and Behavior

Chairman: D. E. Broadbent (UK)

Psychological Consequences of Exposure to Noise, Facts, and Explanations, Edith Gulian (Romania)	363
Similar and Opposing Effects of Noise on Performance, L. Hartley (UK)	379
The Effects of Different Types of Acoustic Stimulation on Performance, C. Stanley Harris (USA)	389
Behavioral Effects and Aftereffects of Noise, David C. Glass, Jerome E. Singer (USA)	409
Effects of Noise on a Serial Short-Term Memory Process, G. Wittersheim, P. Salame (France)	417
The Effect of Annoying Noise on Some Psychological Functions During Work, Irena Franszczuk (Poland)	425

Session 5

Non-Auditory Physiological and Pathological Reactions

Chairmen: E. Grandjean (Switzerland), S. Kubik (Czechoslovakia)

Page

Non-Auditory Effects of Noise, Physiological and Psychological Reactions in Man, Gerd Jansen (Germany)	431
Industrial Noise and Medical, Absence, and Accident Record Data on Exposed Workers, Alexander Cohen (USA)	441
Factors Increasing and Decreasing the Effects of Noise, D.E. Broadbent (UK)	455
Examples of Noise-Induced Reactions of Autonomic Nervous System during Normal Ovarian Cycle, Barbara Griefahn (DDR)	459
The Influence of Noise on Auditory Evoked Potentials, J. Gruberová, Š. Kubík, J. Žalčík (Czechoslovakia)	469
Some Data on the Influence of Noise on Neurohumoral Substances in Tissues and Body Fluids, Lech Markiewicz (Poland)	473
Stress and Disease in Response to Exposure to Noise—A Review, Gösta Carlestam, Claes-Göran Karlsson, Lennart Levi (Sweden)	479
Some Laboratory Tests of Heart Rate and Blood Volume in Noise, Karl D. Kryter (USA)	487

Session 6

Sleep and Its Disturbance by Noise

Chairmen: B. Metz (France), M. Levi (Yugoslavia)

Effects of Noise on Sleep—A Review, Harold Williams (USA)	501
Predicting the Response to Noise During Sleep, Jerome S. Lukas (USA)	513
The Effects of Noise-Disturbed Sleep on Subsequent Performance, M. Herbert, R.T. Wilkinson (UK)	527
Effects on Sleep of Hourly Presentations of Simulated Sonic Booms (50 N/m ²), William E. Collins, P.F. Iampietro (USA)	541
Prolonged Exposure to Noise As a Sleep Problem, Laverne C. Johnson, Richard E. Townsend, Paul Naitoh, (USA), Alain G. Muzet (France)	559
Relationship between Subjective and Physiological Assessments of Noise-Disturbed Sleep, A. Muzet, J.P. Schieber, N. Olivier-Martin, J. Ehrhart, B. Metz (France)	575
The Effects of Aircraft Noise on Sleep Electrophysiology as Recorded in the Home, Gordon Globus, Joyce Friedmann, Harry Cohen, Karl S. Pearsons, Sanford Fidell (USA)	587
Noise and Mental Health—An Overview, W. Hausman (USA)	593
Observations of the Effects of Aircraft Noise Near Heathrow Airport on Mental Health, C.F. Herridge, L. Low-Beer (UK)	599

Session 7

Community Response I

Chairmen: G. Thiessen (Canada), P.N. Borsky (USA) Page

Methodological Aspects of Studies of Community Response to Noise, Erland Jonsson, Ola Arvidsson, Kenneth Berglund, Anders Kajland (Sweden) . . .	611
Decision Criteria Based on Spatio-Temporal Comparisons of Surveys on Aircraft Noise, Ariel Alexandre (OECD)	619
Psycho-Social Factors in Aircraft Noise Annoyance, Aubrey McKennell (UK) . .	627
A Survey on Aircraft Noise in Switzerland, Etienne Grandjean, Peter Graf, Anselm Lauber, Hans Peter Meier, Richard Müller, (Switzerland)	645
Aircraft Noise Determinants for the Extent of Annoyance Reactions, Ragnar Rylander, Stefan Sörensen (Sweden)	661
Reaction Patterns in Annoyance Response to Aircraft Noise, Stefan Sörensen, Kenneth Berglund, Ragnar Rylander (Sweden)	669
The Reduction of Aircraft Noise Impact Through a Dynamic Preferential Runway System, Martin Gach (USA)	679
A Causal Model for Relating Noise Exposure, Psychosocial Variables and Aircraft Noise Annoyance, Skipton Leonard, Paul N. Borsky (USA)	691
Community Responses to Aircraft Noise in Large and Small Cities in the USA, Harrold P. Patterson, William K. Connor (USA)	707

Session 8

Community Response II

Chairman: R. Rylander (Sweden)

Measurements of Street Noise in Warsaw and Evaluation of Its Effect on the Acoustic Climate of Dwellings, Schools, Offices, Hospitals, Hotels and Parks; the Degree of Offensiveness to Inhabitants in the Light of a Questionnaire, Aleksander Brodniewicz (Poland)	721
A New Field Survey-Laboratory Methodology for Studying Human Response to Noise, Paul N. Borsky, H. Skipton Leonard (USA)	743
An Interdisciplinary Study on the Effects of Aircraft Noise on Man, B. Rohrmann, R. Schümer, A. Schümer-Kohrs, R. Guski, H.-O. Finke (Germany)	765
Rating the Total Noise Environment. Ideal or Pragmatic Approach? D. W. Robinson (UK)	777
Motor Vehicle Noise: Identification and Analysis of Situations Contributing to Annoyance, William J. Galloway, Glenn Jones (USA)	785

Session 9

Summary and Integration

Chairmen: G. Žarković (Yugoslavia), W.D. Ward (USA)

Page

Summary, I.J. Hirsh (USA) 807