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16. Abstract  An annotated bibliography of translations of foreign-language articles is presented. The 22 listed entries are concerned with studies of equilibration tests, vestibular function, optokinetic nystagmus, electronystagmography, cardiovascular reactions to noise stress, stress and performance, aptitudes for flying, facial reconstruction techniques in the identification of human remains from accidents, attitudes and performance of air traffic controllers, techniques for determining levels of carbon monoxide in the blood, noise, vision, cardiology, flight safety, and animal responses to sonic booms. Procedures for obtaining copies of the translations are included.			
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## FOREWORD

This annotated bibliography of recently translated, selected research papers is presented as a scientific service of the Civil Aeromedical Institute. The aims of the publication are: (a) to provide interested researchers with information concerning translations of foreign-language articles as soon as the translations are available; and (b) to prevent duplication of translation costs and efforts.

In achieving these aims, bibliographic listings such as the present one are necessarily limited in number. They are also limited by the range of activities represented in the agency preparing the material. Thus, selective factors exist. Further, no attempt is made to evaluate the scientific worth of a given article. By providing a central repository from which such translated material can be obtained, however, it is hoped that interested scientists will derive otherwise unavailable benefits.

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## AVIATION MEDICINE TRANSLATIONS: ANNOTATED BIBLIOGRAPHY OF RECENTLY TRANSLATED MATERIAL. VIII.

Bertoni, R. Les épreuves d'équilibration à l'aide du fauteuil pendulaire appliquées au personnel navigant. (Equilibration tests using pendulum chair applied to flight personnel.) *Revue de Médecine Aéronautique et Spatiale* (Paris), 38:67-70, 1971.

This study is concerned with the neurological reflex of the labyrinth as indicated by nystagmus produced from the pendulum chair test. Two specific areas were studied: (1) Sensitivity (evaluated by intensity and duration of sensation); and (2) the labyrinth reflex (produced in the form of nystagmus and recorded by means of electronystagmographic methods).

Two hundred pilots were tested as subjects. No distinction was made as to type of aircraft piloted or between civilian and military pilots. Distinction was made as to age and the number of hours flown. Three groups were formed from resulting data: (1) Those with a normal range of nystagmus; (2) those with slow nystagmus action, labyrinthine reaction below normal; and (3) those with gross nystagmus, labyrinthine reaction above normal. It was found that the largest proportion (55%) of the subjects had reactions close to what was considered normal. The author confirmed that there was a tendency toward hypoexcitability among experienced personnel. However, this trend tended to change toward hyperexcitability as age was increased. The author concluded that, on the whole, labyrinth reflexes remain undisturbed by the profession of aviation.

Bertoni, R., and G. Bremond. Le comportement de l'appareil d'équilibration chez les pilotes d'acrobatie aérienne. (The behavior of the equilibration apparatus in aerobatics pilots.) *Revue de Médecine Aéronautique et Spatiale* (Paris), 33:29-31, 1970.

This paper documents labyrinthine studies conducted in 1967-1968 with 12 pilots of the French

aerobatics squadron. The centrifugal pendulum test was used to test equilibration. Some subjects were also given caloric tests to confirm results of rotatory tests. Three groups were differentiated on the basis of nystagmus tracings: (1) Normal response from six subjects (a single anomaly was that the vestibular threshold was greatly elevated above normal in half of the subjects); (2) clear hypoexcitability with very abrupt changes in recorded tracings from two subjects; and (3) significant hyperexcitability from four subjects whose tracings resembled pathological ones. The tracings had not changed upon re-examination a year later.

Conclusions drawn were that labyrinth reactions found in proven pilots show great diversity, and that there is no nystagmus pattern peculiar to aviators. Moreover, there was no relation between the age of the pilots, aeronautical experience, and characteristics of the eye movement tracings. On the whole, the tracings were all qualitatively much deteriorated as a consequence of harmful aeronautical factors.

Boutelier, C. Réactions animales au bang sonique. (Animal reactions to sonic booms.) *Revue de Médecine Aéronautique et Spatiale* (Paris), 34:79-81, 1970.

Observations were made of the Jéricho-Focalization operation dealing with animal experimentation. The article is specifically concerned with the behavior of army dogs (German Shepherds) subjected to high-intensity (500 to 1200 N/m<sup>2</sup>), frequent sonic booms. Included is a brief review of the literature pertaining to animal reactions when subjected to sonic booms.

Eleven dogs were tested over a two-day period. On the first day, the influence of sonic booms on cardiac frequency and behavior of dogs at rest was observed. The second day was devoted to studying the influence of booms on conditioning. The three types of conditioning used were:

Slight demand on attention (warm-up exercises), greater demand (searching procedure), and very great demand (guarding an object).

Results were divided into two major areas, the first being the influence of the frequency of sonic booms. Subdivisions of this area included heart rate, the behavior of dogs at rest, and behavior while being trained. It was found that heart rate was influenced only slightly and can be compared to that observed in man. However, the sonic booms had a considerable influence on the behavior and conditioning of the dogs, the reactions of which can be summarized in three parts: Fear or flight reaction depending on the dog's psychological state; a reaction of unoriented aggressiveness; and a reaction of aggressiveness directed toward the plane or any other object or individual the dogs were not accustomed to seeing. If the dog failed in focusing his attention, his nervousness increased.

The second major area investigated the relationships between sonic boom overpressure and behavior. No relation between the disturbances of behavior and the intensity of the booms was found.

The author felt that the observations need to be confirmed on greater numbers of animals, taking into account the fact that different animal species are more excitable than others. The author also felt work should be done in the area of the effects of less intense booms on domesticated animals.

Caporale, R., and L. Bianco. L'apparato vestibolare e le accelerazioni complesse. (Effect of complex accelerations on the vestibular apparatus.) *Rivista di Medicina Aeronautica e Spaziale* (Rome), 33:24-39, 1970.

This is a study of the phenomena occurring in the vestibular apparatus when a subject is displaced from the axis of rotation and is subjected to accelerated or decelerated rotary movement, i.e., the effect on the labyrinth of imparted angular acceleration combined with centrifugal acceleration. The study consists of two parts: (1) A consideration of the dynamic problems involved in the study of complex accelerations from a physical and mathematical approach; and (2) an experimental contribution to the problem of complex accelerations involving the use of the Stille-Werner rotating chair and an electronystagmograph.

In complex accelerations, the duration of nystagmus did not change significantly with a variation in distance from the axis of rotation; the number of beats in the accelerative phase was consistently lower than the number in the decelerative phase. When the subject was placed away from the axis of rotation, the velocity of the slow phase was found to be greater during acceleration than during deceleration; this difference decreases as the distance from the axis of rotation increases. The variations are also discussed in the light of the current state of knowledge about vestibular reactions and behavior.

Carré, R., J. C. Richart, J. Salvagniac, and F. Plas. Expertise cardiologique et personnel navigant: ses principales difficultés. (Cardiological examination and flying personnel: Their principal difficulties.) In: Busby, D. E. (Ed.), *Recent advances in aerospace medicine. Proceedings of the 18th International Congress of Aviation and Space Medicine, Amsterdam, 1969*. Dordrecht: D. Reidel Publishing Company, 68-74, 1970.

Included in this study are observations regarding electrocardiographic anomalies, difficulty in interpretation of systolic murmurs, and aspects related to the elasticity of the arterial wall.

The problems of electrocardiographic anomalies (anomalies of repolarization) are discussed from the viewpoint of instability over time or when the subject is under the influence of various functional tests. Four types of tests were used: (1) Exertion test—the Martinet (20 deep knee-bends) or 150-watt exertion exercise (5 min) on an ergometric bicycle; (2) depression test—20 min at an altitude of 8,000 m; (3) injection of 0.8 mg of tartrate of ergotamine; and (4) ingestion of 6 g of potassium chloride. Because of inconsistencies among the results of the four tests, the authors drew no final conclusions. They did, however, cite a rule used when electrocardiographic anomalies were discovered in a subject, viz., if repolarization anomalies were found during an initial examination, the pilot was declared temporarily unfit, giving doctors more time to work the case. In re-examination, pilots were either declared fit when tests showed no coronary problems, or were classified as temporarily unfit if there was the least doubt about coronary soundness. Included in this diagnosis of unfitness was the Wolff, Parkinson, and White



syndrome, based upon the not insignificant risk of paroxysmal tachycardia and the coexistence of cardiopathies which are sometimes difficult to diagnose.

With respect to systolic murmurs, the authors describe the mechanographic techniques employed in the interpretation of murmurs. Three types of systolic murmurs are distinguished: (1) Infundibulopulmonary murmur (Tripier-Devic murmur); (2) the cardiopulmonary murmur (Potain's murmur); and (3) obstructive cardiomyopathy.

A statistical survey over a 12-year period showed that observations of elasticity of the arterial wall produced the highest rate of unfitness for flying personnel; the rate for this reason was 30% and was a particularly prominent cause between the ages of 40 and 50.

Carré, R., J. C. Richart, J. Salvagniac, and F. Plas. Syndrome de Wolff-Parkinson et White et aptitude au personnel navigant. (Wolff, Parkinson, and White's syndrome and aptitude of flying personnel.) In: Busby, D. E. (Ed.), *Recent advances in aerospace medicine. Proceedings of the 18th International Congress of Aviation and Space Medicine, Amsterdam, 1969*. Dordrecht: D. Reidel Publishing Company, 75-79, 1970.

The Wolff - Parkinson - White syndrome (WPW), a bundle branch block with short PR intervals in young subjects predisposed to paroxysmal tachycardia, was studied from the point of view of medico-aeronautic expertise. A working definition of the WPW syndrome is given including characteristic electrical signs which schematically distinguish principal types. The authors also note clinical variations in borderline cases.

Thirty-nine cases of WPW were observed. Thirty-two WPW cases were permanent and seven cases were intermittent. The incidence of WPW syndrome was calculated to be 1.6/1000 which compares well with American statistics.

Applicants who show electrocardiographic anomaly have been declared unfit for duty as flying personnel in France. Justification is based on the following arguments: (1) The risk of paroxysmal tachycardia is variously appraised, producing a diversity of results (three cases were diagnosed by the authors); (2) it has been shown

that the WPW syndrome can occur in pathological hearts exhibiting acquired cardiopathies, and in acquired congenital cardiopathies of various causes; and (3) the pathogenesis of the WPW syndrome is summarized as a double ventricular activation, one that is normally effected by physiological channels and other abnormal activation of ventricular origin.

An intermittent case of WPW allowed the authors to show that the electromechanical interval (Q leg of the apexogram) was elongated. It was concluded that in the case of WPW the time of neural conduction is prolonged and that these individuals have neural excitation and conduction problems. The latter two findings were additional reasons for concluding that individuals so affected are unfit for duties as flying personnel.

Chevaleraud, J., and P. Bouvery. A propos de la vision de près et de la vision intermédiaire chez les navigants civils. (On near and intermediate vision among civil flight personnel.) *Revue de Médecine Aéronautique et Spatiale* (Paris), 37:22-24, 1971.

Results are presented from anonymous questionnaires on the use of corrective lenses which were given to 182 civilian aviation personnel, over 40 years of age, during regular clinical examinations. The questionnaire provided information as to the type of visual problems encountered and of corrections presently employed. Conclusions drawn from the results were: (1) Few of the subjects were rationally equipped for performing their work; (2) bifocal lenses were used little; and (3) trifocals, considered by some aviation ophthalmologists to be the ideal solution, were not being used at all.

The authors discuss the difficulties involved in fitting personnel with proper lenses, and the various methods by which to ascertain maximum efficiency. A major problem noted was that a large part of the work of the pilot and the flight engineer requires intermediate vision (60-80 centimeters), a distance for which glasses are not often adapted. The authors concluded that for maximum results to be achieved, pilots should inform their ophthalmologists carefully about working conditions and that it may be necessary to obtain two prescriptions, one for extended ground work, and the other for aeronautical work.

Gereb, G. "Über einige psychologische Probleme der Monotonie und der Belastung. (Some psychological problems of monotony and stress.) *Studia Psychologica* (Bratislava), 10:313-324, 1968.

Stress, as a function of monotonous situations, was studied using methods whereby the fatigue phenomenon was relatively minor in contrast to the monotonous nature of the task. The author developed a methodological procedure and model experiments in two major areas: (1) A model experiment for the establishment of a monotonous state and its "bombardment"; and (2) an experimental investigation of the reciprocal effect of intensive stress and monotonous activity.

The first section, concerning the monotonous state, evaluated several variables including changed time conditions, varied activity units, supplementary operations, and the turning on of music of different rhythms. By introducing procedures requiring strong concentration both prior to and after the monotonous state, the author also studied the relationships between divided attention, manual activity, and monotonous activity. Some conclusions drawn were: (1) In most cases, the most fatiguing activity did not coincide with the most boring or monotonous activity; (2) music distracted attention, but also reduced the extent of boredom; (3) compared to the base level, there were fewer mistakes made when a task was given with a second set of instructions (given with emphasis); (4) there was considerable performance deterioration with musical background; (5) if the stimuli were transmitted rhythmically (emphasized by means of a metronome) improvement was evident; and (6) introduction of pauses tended to reduce the number of mistakes made.

In the second section, dealing with reciprocal effects of intensive stress and monotonous activity, the author studied both how heavy stress affects monotonous activity connected with it and to what extent the activity influenced the degree of effectiveness of concentration, divided attention, and manual skill. Using a stereotometer, the exact quantity of information absorbed and worked out was obtained. These data showed an essential difference between the rested state and the stressed state and no difference in the reciprocal effect between monotonous activity and increased stress connected with strong con-

centration. Highly significant effects were noted as follows: (1) With increased stress, the degree of concentration required to perform the activity increased; (2) values measured before monotonous activity were greater when compared to the values of the rested state; (3) in the state of fatigue, the level of performance was lower than in the rested state; and (4) performance level proved lower prior to monotonous activity and was found to increase after a monotonous task.

Kennholt, I., and M. Bergstedt. Attityder till arbete och arbetsförhållanden bland trafikledningspersonal vid luftfartsverket. (Attitudes toward the work and working conditions among traffic control personnel in the Aviation Administration.) Personaladministrativa Radet Report No. 21.109, Stockholm, 1971.

This study is a detailed report of attitudes and conditions on the job among air traffic control (ATC) personnel in Sweden. Included are the purpose, background, and methods of investigation, contents of both a questionnaire and interview, and an assessment by personnel of such features of the work as professional status, environment and equipment, and actual working conditions.

The authors focused on dissatisfactions voiced by controller personnel about a number of conditions. Air traffic personnel felt that the ATC administration under-evaluated the staff and that viewpoints which the staff presented were given no hearing. "The biggest problem in the profession" was cited as: The administration's way of functioning as concerns personal policy, organizationally and in planning, as well as in its relations with employees. Differences in attitudes appeared among various groups of employees, particularly among different age groups (the older groups on the whole were more positive—or less negative—than the younger groups).

The authors felt that the expressions of dissatisfaction which appeared in both forms of interviews should be given more detailed analysis by the ATC administration and that future planning should involve better cooperation between the administration and ATC personnel.

Lafarge, J. P., M. Laplace, and J. Lebbe. Note technique: Applications de la chromatographie en phase gazeuse à l'examen des gaz du sang

I. Determination de l'oxycarbonémie sans extraction préalable. (Technical note: Applications of gas chromatography to examination of gases in the blood. I. Determination of blood carbon monoxide content without prior extraction.) *Archives des Maladies Professionnelles, de Médecine du Travail et de Sécurité Sociale* (Paris), 31:201-208, 1970.

The authors sought to find an analytical method capable of detecting and determining, without the risk of physical-chemical interferences, carbon monoxide in the appreciably different environment of normal blood samples. The method used for determination of carbon monoxide contained in the blood was gas chromatography. The article describes methods, procedures, operating conditions, qualitative analyses, quantitative analyses, and statistical examinations. Some advantages of this system are: (1) Its sensitivity range enables chronic intoxications to be studied; (2) it requires only a small amount of blood (0.1 cm<sup>3</sup>), making it applicable to small animal experimentation; and (3) by using an ultrasonic detector, only several microliters of blood are required making this approach convenient to use when it is impossible to effect venous punctures. Other advantages noted were high specificity (enabling carbon monoxide to be determined without error, especially during the process of blood decomposition) and great simplification in comparison with conventional methods.

Lehmann, G., and J. Tamm. Über Veränderungen der Kreislaufdynamik des ruhenden Menschen unter Einwirkung von Geräuschen. (Modification of circulatory dynamics in resting individuals under the effect of noises.) *Internationale Zeitschrift für angewandte Physiologie einschliesslich Arbeitsphysiologie* (Berlin), 16:217-227, 1956.

The effects of sounds of varying intensities and frequencies were studied for fluctuations in response of the human circulatory system. Circulatory investigations were carried out using the ballistocardiogram and the Wezler-Boeger method with a total of 34 experimental subjects exposed to noise. The noise was in the form of white sounds in the octaves 200-400, 400-800, 800-1600, and 3200-6400 Hz. Some industrial sounds were also included. The majority of the subjects exhibited an increase in arterial flow

resistance and a decrease in stroke volume for all sounds with an intensity of 90 phon. In the 800-6400 Hz range, a definite reduction in circulatory reactions was observed with 60 phon being the starting point of decreasing intensity.

Mackensen, G. Untersuchungen zur Physiologie des optokinetischen Nystagmus. (Investigations in the physiology of optokinetic nystagmus.) *Albrecht v. Graefes Archiv für Ophthalmologie* (Leipzig), 155:284-313, 1954.

This paper describes the use of optokinetic nystagmus as an aid in clinical investigations and to differentiate the various types of elicited nystagmus among different individuals. It is limited to individual differences produced by optokinetic nystagmus within two fields: very large and very small stimuli.

The subjects were all examined under identical conditions, using a rotating cylinder (large stimulus) and rotating loop (small stimulus). Electronystagmography was used to record nystagmus. Twenty experimental subjects were used to establish the mean value of nystagmus measures, while standard deviations provided an indication of variability. Deviations included the following details: (1) curve height (above height of maximum); (2) shape of the curve (determined by position of the maximum point); and (3) constancy and regularity of curve. Tables and frequency distributions were constructed to indicate mean and maximum values of the frequency, amplitude, and strength of nystagmus for both the rotating device and the rotating strip.

Individual peculiarities of optokinetic nystagmus could be distinguished by observing the behavior of nystagmus to the left and right of each subject. (Right and left nystagmus were generally found to be equally strong with some exceptions.) Clarity of observation was especially true in cases of large deviations from the mean. The subjects tended to have high- or low- frequency nystagmus for both the rotating cylinder and rotating loop. Frequency and amplitude were mutually compensating; it was determined that high frequency and low amplitude and high amplitude and low frequency tended to correlate highly with each other.

Miller, U. Experimentelle Untersuchungen zur schnellen Bestimmung der Leistungsfähigkeit des Menschen als Regler sowie der Steuerbar-

keit von Systemen. (Experimental investigations regarding methods of rapidly determining a human being's performance as a controller and also regarding the controllability of systems.) In: Gubser, F. (Ed.), *Aviation psychological research: Western European Association for Aviation-Psychology, 8th Conference, Zurich, September 2-5, 1969*. Zurich: Swissair AG, 228-253, 1970.

This series of investigations aimed at securing a method of objectively evaluating the suitability of control systems for human beings and finding a unified procedure for judging individual performance capability in the human being as he functions as a controller. The dynamic behavior of man in this function was difficult to describe. Description by means of the linear transmission theory remains unsatisfactory because that theory does not take into account the non-linear and non-constant characteristics of man.

A series of experiments was begun to find easily measured parameters whose values provided a criterion of performance-capacity and stress in man, as well as the controllability of a system. Several groups of subjects (pilots and non-pilots) were placed in a simple simulator and required to perform various pursuit and compensatory tracking tasks. A forcing function, with varying amplitudes and frequencies, drove the tracking device. After each experiment, an analog computer furnished the mean square error, stick-velocity, and other measures of performance. The results show mathematical interrelationships which in part contradict the linear transmission theory. However, they justify the hope that the new, unconventional formulations will enable scientists to calculate the dynamic behavior of man.

Radl, G. W. Untersuchungen zur Quantifizierung der psychischen Beanspruchung bei simulierten Fahrzeugfuehrungsaufgaben. (Investigations regarding quantification of the psychic stress in simulated vehicle guidance tasks.) In: Gubser, F. (Ed.), *Aviation psychological research: Western European Association for Aviation-Psychology, 8th Conference, Zurich, September 2-5, 1969*. Zurich: Swissair AG, 177-202, 1970.

This article treats the development of tests which would enable more precise, quantitative

judgments of momentary psychic stress accompanying simple and complex vehicle guidance tasks. Working under the hypothesis that a relation exists between the complexity of the task and the degree of psychic stress, the author attacked the problem in four major areas: (1) Observation and evaluation of performance efficiency at secondary tasks assigned in addition to primary control-task work; (2) development of rating techniques for the explicit purpose of obtaining judgments of psychic stress experienced by the subjects; (3) evaluation of physiological data obtained from observations during the simulation experiments (heart rate, eye-blink, and electromyogram readings); and (4) observation and evaluation of performance of complex tasks (both primary and secondary tasks). Details about each task and variations in the simulation procedures were extensively described. In addition, descriptions of the secondary-task performance data (stick guidance and stabilizing acceleration system), rating scales, and evaluation of physiological quantities were presented.

Among the statistically significant findings were the following: (1) Low correlations for control error and stick activity, and between eye-blink frequency and stick activity; (2) moderate correlations for control error and eye-blink frequency, and for control error and rating judgment; and (3) a very high correlation between eyelid frequency and rating judgment.

The author concluded that the methods used would all provide desired routes toward a quantification of psychic stress during simulated guidance tasks. It was also found that respiratory frequency, eye-blink frequency and electromyogram readings tended to vary in accordance with task difficulty. These results agreed with the author's initial hypothesis and were suited to serve as measures of psychic stress. Heart-beat frequency (selected from random samples), however, showed no connection with task-difficulty during individual portions of the test experiments.

Rahlfs, V. W., and A. Schaaf. Eine psychometrische Untersuchung der Lästigkeit von Geräuschen. (A psychometric study of noise stress.) *Acustica* (Stuttgart), 24:340-346, 1971.

A wide range of synthetic noises (wide-band noises with a narrow-band noise component

superimposed), often found in both domestic and industrial machines, formed the basis for this research. A scale of impression of annoyance was obtained through a method of paired comparisons by asking subjects which of two paired noises seemed more pleasant. The annoyance was scaled and its dependence on order of stimulus presentation and intensity of individual noise components was investigated. Procedural methods pertaining to the scaling method, composition of the test noises, arrangements for recording noises, presentation of noises, and reliability tests are also detailed.

The authors determined that annoyance increases with increasing frequency of the superimposed components, and also with increasing intensity as a function of frequency. Intensity and frequency showed only 0.05 correlation, suggesting that annoyance can be unidimensional.

Rosberg, G. Regulation, Leistungsfähigkeit und Trainierbarkeit des Vestibularissystems. (Can the efficiency of the vestibular system be increased by means of physical training?) *Practica Oto-Rhino-Laryngologica* (Basel), 33:278-288, 1971.

Vestibular reactions following rotatory stimuli presented at different levels of intensity to 18 subjects (athletes and gymnasts) before, during, and after physical training were studied to see if the efficiency of the vestibular system could be increased by means of the training. The increasing effect of training on the vestibular system was a progressive depression of vestibular reactions (post-rotatory nystagmus) leading to temporary abolition of nystagmic movements. While the training effect lasted, there appeared subjectively an increased security in balance exercises and objectively an improvement in gymnastic achievement. The author concluded that although evaluations of the induced reactions were relative to each individual case, dexterity improved in general and was especially evident in exercises on the bar, the horse, and the trampoline.

Shatalov, N. N., and M. A. Murov.

**ВЛИЯНИЕ ИНТЕНСИВНОГО ШУМА И НЕРВНО-ПСИХИЧЕСКОГО НАПРЯЖЕНИЯ  
НА УРОВЕНЬ АРТЕРИАЛЬНОГО ДАВЛЕНИЯ  
И ЧАСТОТУ ГИПЕРТОНИЧЕСКОЙ БОЛЕЗНИ**

(The influence of intensive noise and neuropsychic tension on the level of arterial pressure and the incidence of hypertensive vascular disease.) *Klinicheskaya Meditsina* (Moscow), 48:70-73, 1970.

Research conducted on the effect of noise and neuropsychic tension on the level of arterial pressure and the incidence of hypertensive disease is reported. Data are based on 3,930 subjects, the majority of whom (62.4%) were young and middle aged (20-39 years). Subjects were divided into four groups depending upon the character of their work. Extensive statistics on levels of systolic and diastolic pressure indices with respect to age, sex, group, and reliability variance are presented. The same procedure was followed for hypertension incidence.

Conclusions indicate that industrial noise caused an increase in systolic pressure (up to age 40) and an increase in incidence of hypertension in comparison to the control group. The action of noise as an industrial factor was found to be equal to neuropsychic tension in the degree of their effects on frequency of development of hypertensive disease. The combined action of both industrial factors tended to increase vasomotor activity in conjunction with hypertensive disease incidence.

Steininger, K. Psycho- und neurovegetative Belastungssyndrome beim fliegenden Personal. (Psychovegetative and neurovegetative stress syndromes in flying personnel.) In: Gubser, F. (Ed.), *Aviation psychological research: Western European Association for Aviation Psychology, 8th Conference, Zurich, September 2-5, 1969*. Zurich: Swissair AG, 284-296, 1970.

This article concerns a discussion of psychovegetative and neurovegetative stress syndromes among flying personnel based upon the following hypothesis: Organic or nonorganic psychovegetative morbid personality disorders have psychic conditions of origin which manifest certain signs long before the outbreak of illness. The psychic behavior pattern of the psychovegetatively disordered personality is marked beforehand by inclination to anxiety and/or by unmastered feelings of inadequacy, as well as by inability to relax and gain perspective in regard to oneself and the environment. The author urges

development and confirmation of the hypothesis by developing a multivariable psychological and physiological data compilation. The suggested data compilation would embrace: (1) Biographical events; (2) qualitative descriptions of behavior; (3) quantitative rating of behavior by qualified observers; (4) self-observation profile; (5) objective psychological test results; and (6) physiological indices.

It was suggested that such a method would enable psychologists to uncover multivariable, interwoven relationships between psychic and somatic forms of experience and behavior, and could be used for clinical purposes and aptitude diagnosis.

Szvitalski, H. Die Toten ohne Gesicht: Wie die Kripo das Aussehen von Menschen rekonstruiert, von denen es nur noch Knochen gibt. (The faceless dead: How the Bureau of Criminal Investigation reconstructs the appearance of persons when only their bones are left.) *Stern* (Hamburg), 49, 1970.

This article describes the method used to show how the face of a murder victim was reconstructed by a detective sergeant in the Wiesbaden State Bureau of Criminal Investigation. The author describes this case as well as others in which criminologists have identified decomposed bodies by covering the bones with flesh-colored plastic. The method is based on the theory that the shape of the skull of a person also shapes his face, making it possible to identify the victim as to appearance of mouth, nose, ears, and eyes.

Tabusse, L., H. Arnoux, and R. Bertoni. Troubles de l'adaptation aeronautique et anomalies électronystagmographiques. (Disturbances in flight adaptation and electronystagmographic anomalies.) *Revue de Médecine Aéronautique et Spatiale* (Paris), 33:23-27, 1970.

Observations were made of 13 subjects with respect to peculiarities both in medico-psychological examination and examination of the labyrinth. The study also deals in part with factors associated with failure in pilot training. Problems detected in training varied in nature and in three cases air sickness was included.

The psychological investigation in each case included a clinical interview backed up with the Minnesota Multiphase Personality Inventory

(MMPI), and the use of one or both of the following: Binois Pinchot vocabulary tests and the D-48 test. The labyrinth examination was performed by use of an ENG recording from a pendulum chair.

All 13 subjects are presented as individual case observations with the treatment for each listed. All cases showed a non-aptitude for flight (11 of which developed among student pilots). Three subjects displayed true psychopathological symptoms, while motion sickness was apparent in another three. The remainder of the cases (seven) showed no somatic or psychopathological symptoms. Occasional suspected psychological conflicts were found to be related to inaptitude in pilot training. For all the subjects (except the three in which psychopathological symptoms were found) anomalies revealed on the nystagmograms were multiple and varied, and did not correspond with similar psychological disturbances. For the three subjects displaying real psychopathological symptoms, the ENG recording was very disturbed.

The authors felt that the student pilot must develop a new structural pattern on the level of the psychomotor mechanisms, especially sensory regulation, which are introduced during pilot training. It was concluded that the ENG-pendulum test alone was not an effective means of diagnosis for non-adaptation to flight, but could serve a function in the understanding and prevention of its disturbances.

Terent'yev, V. G., Ye. Ye. Sheludyakov, and Ye. S. Sviridova.

#### **Реакции нервной и сердечно-сосудистой систем человека на воздействие авиационного шума**

(The reaction of the human nervous and cardiovascular systems to the influence of aviation noise.) *Voenno-meditsinskiy Zhurnal* (Moscow), 55-58, 1969.

Ninety members of a flight engineering and technical work staff who were constantly subjected to noise were examined by a neuropathologist and a therapist for adverse effects. Observations were made before and after work during a period of intense flights and again one month later. Special attention was given to observations of coordinography (observations of movement and coordination), cephalography, and plethysmography.

The majority of the staff members subjected to the influence of noise with an intensity of 130 dB and more complained of general fatigue, reduced working capability, headaches, ringing in the ears, etc. During the course of clinical examinations, accelerated pulse, increased reactivity of the cardiovascular system to physical load, and moderate increases in systolic and diastolic pressure were noted. General excitability, tremor of the fingers, excitability of the tendinous reflexes, and stable red dermographism also were noted. It was determined that the described symptoms developed more frequently with people in whom head trauma, neurocirculatory dystonia, hyperthyroid, and other related illnesses had previously been noted.

An additional 15 subjects were exposed to noise under laboratory conditions and were examined for clarification of data. A similar procedure to that applied in examining the engineering/technical personnel was employed with reactions observed to noise at levels of 100-102 dB, 110-112 dB, 118-120 dB, and 120 dB and over.

It was established that noise of high intensity was irritating to the nervous and cardiovascular systems of man and could cause both physiological (e.g., reduction of hearing) and pathological (e.g., increased arterial wall pressure, disappearance of vasomotor reflexes) changes. In addition, it was found that with an increase in noise

intensity and duration of exposure, changes in the organism increased and were retained for a longer period of time after the end of exposure.

The authors recommend strict medical checking of those working under similar conditions and that emphasis should be given to more effective methodological procedures of examination.

Yannoulis, G., and K. A. Konstas. Netzhautarteriendruck-Veränderungen nach Lärmbelastung. (Blood-pressure changes in the retinal artery after noise stress.) *Acta Oto-Laryngologica* (Stockholm), 57:217-223, 1964.

The blood pressure in the retinal artery was continuously monitored in 28 persons with normal hearing under noise stress. The retinal pressure was compared to pressure in the brachial artery. In the majority of cases, a drop in retinal blood pressure could be observed (found to be significant in 43% of all cases) five minutes after the beginning of noise stress. The pressure in the brachial artery measured at the same time proved almost unchanged. The drop in blood pressure in the central retinal artery was regarded as a consequence of vasodilation in the region of carotid circulation. It has been shown that a vasoconstriction takes place in the vessels of the skin and it was assumed that the two basically different circulatory reactions are partial manifestations of the same reflex of the vasomotor center under the influence of noise.





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