3,609

Miller, C. O. and J. D. Horgan 1958 STRESSES AFFECTING THE PILOT DURING POST-STALL MANEUVERS OF HIGH PERFORMANCE AIRCRAFT
J. of Aviation Medicine 29(3):180-186, March 1958

ABSTRACT: The advent of high performance aircraft has resulted in post-stall flight characteristics which can surpass the pilot's ability to perceive, judge, and act correctly to alleviate the situation. The various stresses are discussed and recommendations made for comprehensive research to provide the necessary design parameters for safe flight.

3,610

Miller, C. O. 1960 THE OMNI-SONIC FLIGHT CAPSULE--A PRACTICAL REALITY
Society of Experimental Test Pilots Quarterly Rev. 5(2):22-38, Winter 1960

ABSTRACT: This article reports on the work done at Vought Aircraft on the design, development, and testing of the Omni-Sonic Flight Capsules; it also argues for a more optimized recovery system through a flight rather than escape capsule approach. Highlights of the system discussed include: boost rocket installations, capsule-parent vehicle system integration, seat and restraint system design, automatic escape system design, and capsule-fuselage separation methods. (Tufts)

3,611

Miller, C.O. 1963 SYNTHESIS OF IMPACT ACCELERATION TECHNOLOGY FOR AVIATION CRASH INJURY PREVENTION. (PROJECT SIAT)
(U.S. Army Transportation Research Command, Fort Eustis, Va.)
TRECOM TR 63-31A. June 1963.
See Cambeis, L., 1963. TRECOM TR 63-31B

ABSTRACT: This report was prepared by Flight Safety Foundation, Inc., New York, New York. It describes a project to search for and collate information on the topics of (1)Hazard Exposure to Impact Acceleration (2) Crash Loads (3) Design for Impact Acceleration (4) Test and Analysis Methodology and (5) Human Tolerance to Impact Acceleration. An information retrieval system utilizing IBM cards is detailed and code indexes provided. (CARI)

3,612

Miller, D.R. 1942 LYNN RIVER WORKS SHOCK STAND. ACCELERATION MEASUREMENTS ON U.S NAVY LIGHTWEIGHT HIGH IMPACT SHOCK STAND (General Electric Co., Schenectady, N.Y.) Data Folder no. 72316; 20 May 1942; ASTIA AD-146 132

ABSTRACT: This data folder records measurements of maximum accelerations on the U.S. Navy light-weight high impact shock stand in the Laboratory of the General Electric Company, Lynn River Works. Measurements were made on the main plate at the eight holes used for supporting apparatus mountings and also on various mountings. The holes in the main plate and sketches of two of the mountings are shown on an enclosed drawing. Other points of measurement are described in Table I. Results showed that the maximum accelerations fall in the same range as those previously reported for tests on similar shock stands at Schenectady, Philadelphia, and Pittsburg. This comparison applies to measurements at the four mounting holes nearest the center of the thin plate, these having been chosen as most significant in the report referred to. A range of 3200 to 5940 g maximum acceleration on the main plate at all eight mounting holes was recorded for back blows of 2000 ft-lb impact energy. A range of 1080 to 1370 g maximum acceleration was recorded on the various mountings for back blows of

3,613

Miller, E. F., II 1961 COUNTERROLLING OF THE HUMAN EYES PRODUCED BY HEAD TILT WITH RESPECT TO GRAVITY.
Acta Oto-laryngol 54(6):479-501.

ABSTRACT: A photographic method of measuring torsional eye movements (counter-rolling) yielded, on the average, a precision of ±5.3 minutes of arc. Using this method, torsional eye movements compensatory to head (body) tilt were found in all planes tested except the sagittal. In the two intermediate ($\pm 45^{\circ}$) planes the overall counterrolling response was quite similar and somewhat less than that found in the case of lateral tilt. Counterrolling always occurred opposite to the lateral component of head tilt and increased fairly rapidly up to a maximum at a head inclination of between 60° and 90°. From this point on counterrolling decreased, but at a lesser rate than it increased, reaching about zero when the head was positioned vertically downward. A difference in absolute amount of torsion of the right eye found between tilting the head (body) leftward and rightward could not be established. However, no difference in counterrolling could be attributed to the order (clockwise or counterclockwise) in which the measurements were made. Variability in counterrolling response was found to be considerable at every position of tilt. A theory attempting to explain the mechanism of otolith organ stimulation is presented.

3,614

Miller, E.F. II. 1962 COUNTERROLLING OF THE HUMAN EYES PRODUCED BY HEAD TILT WITH RESPECT TO GRAVITY. (Naval School of Aviation Medicine, Pensacola, Fla.) Research Report No. 75, Sept. 1962. ASTIA AD 294 479.

ABSTRACT: The photographic method of measuring counter-rolling yielded, on the average, a precision of $\pm$ 5.3 minutes of arc. Compensatory torsional eye

movements were found in all planes tested except the sagittal. In the two intermediate (± 45 degrees) planes the overall counterrolling response was quite similar but somewhat less than that found in the case of lateral tilt. Counter rolling always occurred opposite to the lateral component of head tilt and increased fairly rapidly up to a maximum at a head inclination of between 60 and 90 degrees. From this point on counterrolling decreased, but at a lesser rate than it increased, reaching about zero when the head was positioned vertically downward. A difference in absolute amount of torsion of the right eye found between tilting the head (body) leftward and rightward could not be established. However, no difference in counterrolling could be attributed to the order (clockwise or counter-clockwise) in which the measurements were made. Variability in counterrolling response was found to be considerable at every position of tilt. A theory attempting to explain the mechanism of otolith organ stimulation is presented. (Author)

3,615

Miller, E. F. 1959 EFFECT OF EXPOSURE TIME UPON THE ABILITY TO PERCEIVE A MOVING TARGET. (Naval School of Aviation Medicine, Pensacola, Fla.) MR005.13-6001.2.2., 1/6/59

3,616

Miller, E. F. 1962 COUNTERROLLING OF THE HUMAN EYES PRODUCED BY HEAD TILT WITH RESPECT TO GRAVITY. Acta Oto-Laryngologica (Stockholm) 54:479-501
NOTE: Reel 7, Flash 7, Item 17

ABSTRACT: A photographic method of measuring torsional eye movements (counterrolling) yielded, on the average, a precision of ± 5.3 minutes of arc. Using this method, torsional eye movements compensatory to head (body) tilt were found in all planes tested except the sagittal. In the two intermediate (± 45 degree) planes the overall counterrolling response was quite similar and somewhat less than that found in the case of lateral tilt. Counterrolling always occurred opposite to the lateral component of head tilt and increased fairly rapidly up to a maximum at a head inclination of between 60 degrees and 90 degrees. From this point on counterrolling decreased, but at a lesser rate than it increased, reaching about zero when the head was positioned vertically downward. A difference in absolute amount of torsion of the right eye found between tilting the head (body) leftward and rightward could not be established. However, no difference in counterrolling could be attributed to the order (clockwise or counterclockwise) in which the measurements were made. Variability in counterrolling response was found to be considerable at every position of tilt. A theory attempting to explain the mechanism of otolith organ stimulation is presented. (AUTHOR)

3,617

Miller, E. F., II, & A. Graybiel 1962 A COMPARISON OF OCULAR COUNTERROLLING MOVEMENTS BETWEEN NORMAL PERSONS AND DEAF SUBJECTS WITH BILATERAL LABYRINTHINE DEFECTS. (Naval School of Aviation Medicine, Pensacola, Fla.) BuMed Project MR005.13-6001 Subtask 1, Rept. No. 68; NASA Order No. R-47, 18 Feb. 1962

ABSTRACT: Counterrolling as a function of head(body) tilt was measured by a photographic technique in nine normal and ten labyrinthine defective (L-D) subjects to determine the functional status of their otolith organs. The findings in the normal subjects revealed a characteristic pattern of counterrolling. Ocular torsion as a function of head tilt rightward or leftward was greatest in the first 25 degrees from the upright, less from 25-50 degrees where it usually reached peak value, and thereafter in most cases tended to reverse direction. The average maximum value (counterrolling index, C1) ranged from 286 to 465 mins. of arc. The L-D subjects did not disclose the "normal" counterrolling pattern in most instances and their C1 ranged from only 30-176 mins. of arc. The highly significant intergroup differences were attributed to loss of function of the auricular sensory organs; intraindividual differences in the L-D group were explained by the presence of some residual otolith function. (AUTHOR)

3,618

Miller, H., M.B. Riley, S. Bondurant, & E.P. Hiatt 1958 DURATION OF TOLERANCE TO POSITIVE G.
(Paper, 1958 Meeting of Aero Medical Association, Statler Hotel, Washington, D.C., March 24-26)

ABSTRACT: Acceleration forces of great magnitude or of long duration will be encountered with anticipated flight velocities. A study was designed to evaluate the duration of tolerance of the unprotected seated subject to a sustained positive G as produced by the human centrifuge. Fifteen subjects made thirty-one runs at 3.0, 3.5, 4.0, 4.5, or 5.0 G. Acceleration was increased 0.07 G per second and the selected G-level was maintained until a subjective limit of tolerance was reached. Electrocardiograms were monitored continuously. At 3.0 G two subjects ran until stopped arbitrarily at the limit of one hour. Tolerance varied as follows: (in minutes) 3.0 G, 18-60; 3.5 G, 3-9; and 5.0 G, 1/2-3. Tolerance was limited usually by general fatigue, neck and back pains. Blackout above 4 G, and pre-syncope (once) also occurred. Petechiae were common. There were no significant electrocardiagraphic abnormalities. It now seems evident that the unprotected human subject may safely tolerate positive acceleration for durations much longer than previously supposed. The influence of G-suits upon tolerance is now being examined. (J. Aviation Med. 29(3):243, March 1958)

3,619

Miller, I, G.B. Simon & E. Cohen 1960 A DEVICE AND TESTS FOR MEASURING INTELLECTUAL FUNCTIONS DURING ACCELERATION. (General Precision, Inc., Binghamton, N.Y.) WADD TR 60-366 May 1960. ASTIA AD 234 635

ABSTRACT: In manned space flights, a vehicle operator will be expected to perform control functions or act as a systems monitor under high levels of acceleration. To determine the extent to which man's intellectual functions might be impaired under high G, a device was designed for use with the WADD human centrifuge. This device, the Link Intellectual Functions Tester (LIFT), can be operated up to 14 G, and features automatic scoring tabulation of responses, and automatic pacing of stimulus presentation. Three test batteries of 14 one-minute tests were used to evaluate verbal, reasoning, mathematical, and perceptual abilities under the limitations of high G on the centrifuge. The median reliability on the one-minute tests was 0.27; the estimated reliability of the 14-test battery was 0.83. Until new data actually gathered during acceleration are made available, the reliability of all the tests remains undetermined for any values above 1 G. The LIFT and associated test materials constitute a diversified and useful set of materials for preliminary study of intellectual functions under acceleration, however, additional refinement and extension are recommended. (Author)

3,620

Miller, I., G. B. Simon, & E. Cohen 1960 A DEVICE AND TESTS FOR MEASURING INTELLECTUAL FUNCTIONS DURING ACCELERATION. (Wright Air Development Division, Wright-Patterson AFB, Ohio) WADD TR 60-366; ASTIA AD-243 635

ABSTRACT: In manned space flights, a vehicle operator will be expected to perform control functions or act as a systems monitor under high levels of acceleration. To determine the extent to which man's intellectual functions might be impaired under high G, a device was designed for use with the WADD human centrifuge. This device, the Link Intellectual Functions Tester (LIFT), can be operated up to 14 G, and features automatic scoring, tabulation of responses, and automatic pacing of stimulus presentation.
Three test-batteries of 14 one-minute tests were used to evaluate verbal, reasoning mathematical, and perceptual abilities under the limitations of high G on the centrifuge. The median reliability of the one-minute tests was 0.27; the estimated reliability of the 14-test battery was 0.83. Until new data actually gathered during acceleration are made available, the reliability of all the tests remains undetermined for any values above 1 G.
The LIFT and associated test materials constitute a diversified and useful set of materials for preliminary study of intellectual functions under acceleration, however, additional refinement and extension are recommended. (AUTHOR)

3,621

Miller, I. 1961 GRAVITY ANOMALIES: A SELECTIVE BIBLIOGRAPHY (Autonetics of North American Aviation, Inc.) EM-6538, ASTIA AD 255 309

ABSTRACT: A bibliography is presented of references on gravity anomalies which are representative of both foreign and domestic literature available on the subject. Articles are included which deal with theory, instrumentation, proposed projects as well as actual numerical results. There are 246 partially annotated references followed by author, source and subject indexes.

3,622

Miller, J. et al. 1953 A BIBLIOGRAPHY FOR THE DEVELOPMENT OF STRESS-SENSITIVE TESTS. (Psychological Research Associates, Washington, D.C.) PRB Technical Research Note 22, October 1953. ASTIA AD-41773.

ABSTRACT: The items in this bibliography have been selected and assembled with view to providing a survey of the background material useful in the preparation of stress-sensitive tests. It contains a list of references cited by title only and abstracts of those references which were deemed most important and having the most direct bearing on the present research.

3,623

Miller, James W. & James E. Goodson 1960 MOTION SICKNESS IN A HELICOPTER SIMULATOR
Aerospace Medicine, 31 (3): 204-212, March 1960

ABSTRACT: Simulation of operational aircraft has become an increasingly important aspect of flight training for reasons of economy, safety, expediency. In 1956 a helicopter simulator was designed and installed as a training device in Pensacol Florida, for the dual purpose of evaluating a point source system of optical projection and as a possible means of facilitating the training of helicopter pilots. During the initial stages of utilization a number of problems arose concerning the desirability of employing this device as a training instrument. One of the most serious difficulties encountered was that of so called "motion sickness" in a cockpit that did not actually move. The problem became so serious that it was one of the chief reasons for discontinuing the use of the simulator.

3,624

Miller, J.W., ed. 1962 VISUAL PROBLEMS OF SPACE TRAVEL (National Academy of Sciences, National Research Council, Washington, D.C.) June 18, 1962. ASTIA AD 276 513

ABSTRACT: The problems of space flight as they relate to the visual mechanism are discussed. Substantial portions of the Brown report are quoted in the present report. This report, in addition to updating the Brown report presents a considerable amount of additional information regarding specific critical visual problems, as well as a recently compiled, extensive bibliography of research in this field. (Author)

3,625

Miller, J.W. 1962 ACCURACY OF ORIENTATION AND POSITIONING IN HOMOGENEOUS VISUAL FIELDS

Paper: 33rd Annual Meeting of the Aerospace Medical Association, Chalfonte-Haddon Hall, Atlantic City, N.J., April 9-12, 1962

ABSTRACT: Although many studies have been conducted recently pertaining to stimulus impoverishment, few have been concerned with the problem of visual orientation in the absence of retinal stimulation. Recent studies, completed by the authors, have shown that the individual possesses a surprising amount of accuracy with respect to the positioning and re-positioning of objects in an illuminated or darkened homogeneous visual field. The data indicate that the accuracy achieved is due to an internal bodily reference system exclusive of any external co-ordinate system. In addition, the data suggest that in the absence of a stimulus background, information can be displayed effectively and arranged in terms of the observer's internal co-ordinate system. The results will be discussed in terms of their theoretical implications and with respect to the role of the visual system in high altitude and orbital rendezvous.

3,626

Miller, W.H. 1938 ANALYSIS OF THE AVIATION MEDICINE SITUATION AND RECOMMENDATIONS FOR A BUREAU PROGRAM. (Civil Aeronautics Authority, Washington, D.C.) Technical Development Rept. No. 9, April 1938.

SUMMARY: The purposes of the work reported herein are to conduct a survey of various research facilities adptable to or engaged in a study of pilot fatigue factors and outline a program of investigation. It was necessary to obtain information relative to existing or projected efforts of this nature as well as their state of attainment and desirability. Attention was given to the administration, personnel, and physical properties of many institutes and agencies. Conclusions have been reached and recommendations made for Bureau sponsorship of investigation in this field.

The main effort is toward the determination of effects of pressure changes and of anoxemia on human and animal physiology. Simulated and actual flying conditions are used to produce symptoms. Study is being made regarding centrifugal, centripetal, and gravitational forces and the resultant physiological alterations. Some study has, in the past, been made regarding the effects of acceleration, deceleration, and gravitational forces. (CAA)

3,627

Milliron, J.R. 1960 SPACE ENVIRONMENTAL EFFECTS
In: Wright Air Development Ctr., Wright-Patterson AFB, Ohio, Proceedings of WADC Space Technology Lecture Series, Volume I, Technical Areas. WADC TR 59-732, Pp. 61-74. ASTIA AD 235 424

ABSTRACT: The environments described may occur individually or in combination, and certain combinations cause more significant effects than others. The effects are a function of many variables including the components, the characteristics of the component materials, and the environmental conditions. To achieve reliable performance the designers of systems will need to acquire an understanding of the associated environments and their combined effects. Test conditions should relate directly to the actual conditions encountered in space. (Author)

3,628

Mills, G. J. 1957 DEVELOPMENT AND FABRICATION OF SUPERSONIC WIND BLAST AND DECELERATION HELMET FOR HUMANS AND CHIMPANZEES. (Holloman Air Development Center, Holloman AFB, New Mexico) Progress Report No. 2, Contract No. AF 29(600)-1104, 18 April 1957.

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Ministry of Aviation 1960 TRANSLATIONS INDEX
(Technical Information and Library Services, Ministry of Aviation) TIL/BIB/38 January 1960 ASTIA AD 233 563

ABSTRACT: The titles, authors and references to translations made by the Ministry of Supply (TIL) now the Ministry of Aviation (TIL) are given in this translations index.

3,630

Minkler, L. F. 1960 LOUNGE COMPARTMENT AREA, BULKHEAD AND SEAT BACK HEAD IMPACT DEVELOPMENT TESTS, MODEL 22. (Convair, San Diego) Rept. No. SL-59-364, Jan. 1960

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Minneapolis-Honeywell Regulator Co 1959 ROTATIONAL SPACE FLIGHT SIMULATOR FOR THE USAF SCHOOL OF AVIATION MEDICINE. (Minneapolis-Honeywell Regulator Co., Aeronautical Div., Minneapolis, Minn.) MH Aero Document R-ED 7755, 9 Nov. 1959.

ABSTRACT: This document describes Honeywells proposal for design and fabrication of a rotational flight simulator.

3,632

Ministry of Aviation 1961 INSTRUMENTATION BIBLIOGRAPHY. (Ministry of Aviation, Great Britain) Rept. no. TIL/BIB/54 ASTIA AD-260 785, June 1961

ABSTRACT: References are given in this bibliography to published and unpublished papers on measurements, in particular, displacement, flow, stress, strain, and temperature measurements.

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Minkler, L. F. 1959 PASSENGER SEAT CRASH RESEARCH TESTS MODEL COMMERCIAL JET. (Convair, San Diego, Calif.) Rept. No. SL-59-423, 2 Dec. 1959

3,634

Minutello, R.V. 1961 F-106 FLIGHT TEST OPERATIONS. (Convair, San Diego, Calif.) Rept. no. ZC-8-652-18; ASTIA AD-256 455; May 1961

ABSTRACT: A brief summary with results is presented of the Convair flight test program of the F-106 for the time period between 1 January 1959 and the present.

3,635

Miroliubov, G.P. 1961 INCREASE OF RESISTANCE TO IMPACT ACCELERATIONS. (Povyshenie ustoichivosti k udarnym uskoreniiam) Biofizika (Moskva), 6(1):109-113. In Russian.

ABSTRACT: Experiments with mice immersed in water in a container and then dropped from different heights showed that water immersion raises their tolerance

to impact accelerations. This makes it possible to perform airdrops from six-times-greater heights. In impact accelerations, one of the main forces acting on the immersed animal is the increasing pressure of water. The effectiveness of protection accorded by immersion in water is determined by the height of the hydrostatic column of fluid above the immersed animal, the firmness of the container walls, and the distance of the animal from the bottom of the container. (Author's summary, modified) (Aerospace Med. 32(7):679, July 1961.)

3,636

Mirolyubov, G.P. 1962 ON THE PROBLEM OF THE MECHANISM OF PROTECTIVE ACTION OF FLUID MEDIA IN SHOCK ACCELERATION. Biofizika 7:468-472, 1962 (Russian)

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Missiuro, W. and W. Kondratovich. 1929 [EFFECT OF FLIGHT ON PHYSIOLOGIC FUNCTIONS OF AVIATORS.] Przegl. sport. lek., 1:5-30

3,638

Missenard, A. R., & R. Gelly 1961 PROBLEMES POSES PAR L'ETUDE PSYCHOLOGIQUE DES TROUBLES DE L'ADAPTATION EN AERONAUTIQUE (PROBLEMS POSED BY THE PSYCHOLOGICAL STUDY OF ADAPTATION DISORDERS IN AVIATION) Revue de medecine aeronautique (Paris) 1(1):9-34, Sept. 1961

ABSTRACT: The following clinical aspects may be responsible for lack of adaptation of flying personnel to the aeronautic environment: emotional reactions, fear of flying, mental disorders (neurotic and psychotic states), psychosomatic disorders, functional disorders (fatigue, sleep disorders, the so-called psychasthenic disorders), anxiety, and the effects of anoxia and accelerations. Lack of adaptation may be responsible for aircraft accidents. It may appear at any time in the aviator's career: during the scholastic and training period, under daily work conditions, induced by the aircraft and its equipment, by transition to new types of aircraft, by changes in the psychological environment and problems of leadership, or by extra-aeronautical responsibilities (marriage, personal problems). A clinical case of inadaptation is reported with psychotherapy. Motivation constitutes the headstone of adaptation. Reviewed are the mechanism of adaptation, disruption of the adaptation process, selection and control of flying personnel, therapeutic and medical administrative measures, research, and the flight surgeon's responsibilities in cases of inadaptation. (J. Aerospace Medicine 33(8):1034, Aug. 1962)

3,639

Miura, Minoru 1942 ON THE INFLUENCE OF CENTRIFUGAL FORCES ON THE INTERMEDIARY CARBOHYDRATE METABOLISM (ÜBER DEN EINFLUSS DER FLIEHKRAFT AUF DEN INTERMEDIÄREN KOHLEHYDRATSTOFFWECHSEL) Tohoku Jornal of Experimental Medicine 42(2):134-177, March 1942.
Translated in J. G. B. Castor, "Acceleration (G-Forces) Research Equipment, Studies, Results and Training," Air tech. Intell. Rev. No. F-IR-127-RE; ASTIA ATI No. 12710.

3,640

Miyamoto, T., K. Noro, H. Sato 1943 RAPID FREEZING TECHNIQUE APPLIED TO THE RABBITS DURING THE ACCELERATION STRESS. Kokuigaku 1:64

ABSTRACT: Rapid freezing technique immersing the rabbit body to liquid N_2 was used in order to obtain the precise finding of that movement during G-force. Distal portion of the brain to the center of rotation showed marked ischemia, and proximal portion has congested. The heart was filled with blood and right atrium has marked congestion. There is no particular finding in the lung, liver and kidney.

3,641

Miyamoto, T., et al. 1943 ONE EXPERIMENTAL METHOD TO OBSERVE RAPIDLY FROZEN LIVING BODY. Kokuigaku, 1(1) Oct. 1943.

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Mohrlock, H.F. 1957 THE DEVELOPMENT OF THE RESCU. (ROCKET EJECTION SEAT CATAPULT, UPWARD) MARK I. A.R.S. Preprint 414-57, 4-6 April 1957.

ABSTRACT: Fast-paced development of today's military aircraft permits the breaking of speed and altitude records with striking regularity. This continual increase in the flight performance envelope has aggravated the task of design engineers in providing an escape system for each new configuration. The problems associated with escape from these high performance aircraft may be categorized as:

a. Low Level Ejection
b. Fin Clearance
c. Tumbling (Seat Instability)
d. Windblast

3,643

Money, K.E. 1959 RELATIONSHIPS BETWEEN VESTIBULAR ACTIVITY AND THE AUTONOMIC NERVOUS SYSTEM. (M.A. thesis, University of Toronto)

3,644

Money, K.E. 1961 FUNCTIONS OF THE SEPARATE SENSORY RECEPTORS OF THE NONAUDITORY LABYRINTH OF THE CAT. (Ph.D. thesis, University of Toronto)

3,645

Money, Kenneth E. & John W. Scott 1962 FUNCTIONS OF SEPARATE SENSORY RECEPTORS OF NONAUDITORY LABYRINTH OF THE CAT
Amer. J. Physiol. 202(6):1211-1220, June 1962.

ABSTRACT: A technique for plugging individual semicircular canals of cats was developed, and it was established that the plugging of a semicircular canal completely blocked its receptivity without influencing the functions of the other vestibular receptors. It was found that cats with all six semicircular canals plugged were lacking all sensitivity to angular acceleration, but they retained normal responses to linear acceleration. Results of several vestibular tests led to the conclusion that the vertical semicircular canals initiate corrections for fast angular displacements from the normal orientation when the displacements are about horizontal axes and that the otoliths initiate corrections for slow angular displacements about horizontal axes. In tests of single horizontal canals, the durations of postrotatory nystagmus were the same after rotations in opposite directions. It was concluded that in the intact animal both horizontal semicircular canals contribute equally to reception of angular acceleration in both directions.

3,646

Monnier, A. J. 1956 LE MAL DE MER: PATHOGENIE ET TRAITEMENT. (SEASICKNESS: PATHOGENESIS AND TREATMENT) (Revue de Pathologie Générale et Comparee (Paris) 56(683):1800-1830, Dec. 1956.

ABSTRACT: A comprehensive review of the literature on seasickness is presented including such topics as the place of seasickness in relation to motion sickness; incidence; individual predisposition; motion sickness; and clinical aspects. Special consideration is given to the etiology of seasickness in terms of determinant factors (vestibular, position, central nervous system); predisposing factors (visual, visceral, humoral), and psychological factors. Therapy is discussed from the standpoint of previous therapeutic measures; major therapeutic measures (antihistaminics, barbiturates, belladona derivatives, and drug combinations), and lesser therapeutic measures (position, diet, psychotherapy).

3,647

Monnier, A. J. 1956 LE MAL DE MER: NOTIONS RECENTES DE PATHOGENIE ET DE TRAITMENT. (SEASICKNESS: RECENT DATA ON PATHOGENESIS AND TREATMENT) Vie médicale (Paris) 37(2):119-128, Feb. 1956

ABSTRACT: A brief review is presented of the etiology of seasickness and motion sickness with special emphasis on the predisposing vestibular, central nervous system, and extra-labyrinthine (visual, visceral, humoral, psychological) factors. Consideration is given to drug therapy using belladona derivatives, barbiturates, and antihistaminics. Mention is made of a new type of curative and preventive treatment using a suppository containing a combination of Bellafolline (belladona alkaloid), phenobarbital, and dexamphetamine.

3,648

Montgomery, J.W., & T.S. Whitelock 1944 CARDIAC EVISCERATION AND RUPTURE. TWO CASES INCURRED SIMULTANEOUSLY IN AN AIRCRAFT ACCIDENT
Air Surg. Bull., 1:6

3,649

Montgomery, Jr., A.V. 1962 EFFECT OF SPACE ON MAN
In: National Symposium on Effects of Space Environment on Materials, St. Louis, May 7, 8, and 9, 1962. St. Louis, McDonnel Aircraft Corporation.

ABSTRACT: A few principles involved in the definition of a spacecraft environment are outlined and exemplified. These principles involve individual variations, duration of stimulus, discrete range of acceptability, and interactive effects between simultaneously applied environmental factors. (Author)

3,650

Montgomery, J.B. 1959 HUMAN SENSITIVITY TO VIBRATIONS.
(Newport News Shipbuilding and Dry Dock Company)
Unpublished Report of SNAME S-6 Panel, April 1959.

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Moon, V.H. 1938 SHOCK AND RELATED CAPILLARY PHENOMENA.
(London: Oxford University Press, 1938)

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Moore, A.D. 1940 PERCEPTION OF DISORIENTATION DURING LANDING OF AN AIRPLANE Science 92:477-478, 1940

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Moore, E. W. & R. L. Cramer 1961 PERCEPTION OF POSTURAL VERTICALITY. BACKGROUND AND APPARATUS. (USAF School of Aerospace Medicine, Brooks AFB, Tex.) Rept 61-84, Aug. 1961

ABSTRACT: An apparatus for the study of perception of postural orientation was described. It was designed to tilt in the lateral plane and to permit the recording of responses by an ink tracing. With this device, it will be possible to develop experimental research procedures to be used in vestibular physiology and standardized clinical techniques to be used by USAF otolaryngologists. (Tufts)

3,654

Moore, E.W. & R.L. Cramer 1962 PERCEPTION OF POSTURAL VERTICALITY. EFFECTS OF FLYING EXPERIENCE UPON REDUCTION OF ERROR (School of Aerospace Medicine, Aerospace Medical Div., Brooks AFB, Tex.) SAM-TDR-62-72; June 1962

ABSTRACT: Test pilots were compared with nonflyers in their ability to estimate a function of the postural vertical. To minimize kinesthetic cues, the subjects were asked to bisect an angle between 30 degrees left body tilt and the vertical with visual references eliminated. The analysis of the average error and slope for each day of three daily sessions showed no differences between the experimental groups. However, a significant reduction in error demonstrated habituation over the three-day period with a uniform linear reduction within each day. Therefore, habituation was demonstrated for all subjects, but flying experience seems to have no relationship to a person's reduction of error in estimating a function of the postural vertical. (AUTHOR)

3,655

Moore, F., Jr. 1959 SUPERSONIC EJECTION TESTS AT SMART. (Paper, Meeting of Aero Medical Association, Statler Hilton Hotel, Los Angeles, April 27-29, 1959)

ABSTRACT: To investigate further and attempt to define more accurately the human tolerance limits to open ejection seat escape, a program of supersonic

tests was conducted at the SMART facility during the fall of 1956 and spring of 1957. Chimpanzee subjects were ejected and successfully recovered at speeds from approximately MO.9 to M1.4. The problems of equipment and instrumentation design are discussed; a brief resume of test results and conclusions as well as test philosophy will be summarized. An 8 minute 16 mm. color sound film is available for presentation which traces a typical test run from start to finish, including a description of specialized test equipment. (J. Aviation Med.30(3):195, March 1959)

3,656

Moore, J. O. and B. Tourin 1954 A STUDY OF AUTOMOBILE DOORS OPENING UNDER CRASH CONDITIONS. (Automotive Crash Injury Research, Cornell Univ., Med. College, New York, 1 Aug. 1954)

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Moore, J. O., et al. 1954 A STUDY OF INJURIES SUSTAINED BY OCCUPANTS OF AUTOMOBILES INVOLVED IN INJURY-PRODUCING ACCIDENTS. (Automotive Crash Injury Research, Cornell Univ. Med. College) 15 April 1954

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Moore, J.O., B. Tourin, and J.W. Garrett 1955 A STUDY OF CRASH INJURY PATTERNS AS RELATED TO TWO PERIODS OF VEHICULAR DESIGN. A COMPARATIVE STUDY OF ACCIDENT AND INJURY FACTORS IN 1940-49 AUTOMOBILES AND 1950-54 AUTOMOBILES. (Cornell U. Medical College, New York, N.Y.) Contract DA 49-007-md-483, Rept. no. T.R. 4, March 1955. ASTIA AD 103 311

ABSTRACT: "Herein analyzed are accident and injury data on 417 automobiles involved in injury-producing rural accidents during 1953 and 1954 and selected by controlled sampling techniques. The data are analyzed to compare cars manufactured from 1940 to 1949 with cars manufactured from 1950 to 1954 to determine whether 'newer' cars produce more or less injury the 'older' cars are involved in similar injury-producing accidents, (b) 1940-54 and 1940-49 cars produce various injury effects with nearly identical frequency, and (c) the structural and mechanical causes of injury in 1950-54 and 1940-49 cars are similar. Thus, the data in this report show that 15 years of passenger automobile design have, at best, produced no advance in 'crash-worthiness' or decrease of traumatic effects when injury-producing accidents occur." (contractor's abstract)

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Moore, J. O. 1958 A STUDY OF SPEED IN INJURY-PRODUCING ACCIDENTS: A PRELIMINARY REPORT. American Journal of Public Health and the Nation's Health 48(11): 1516-1525, Nov. 1958.

See also: Traffic Safety 3(2), June 1959.

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Moore, J. O., B. Tourin, J. W. Garrett, & R. Lilienfeld 1959 CHILD INJURIES IN AUTOMOBILE ACCIDENTS. (Automotive Crash Injury Research of Cornell Univ.)

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Moracek, M. 1962 AERIAL COMBAT OF A FIGHTER AIRCRAFT WITH A SLOW MOVING TARGET. (Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, Ohio) FTD-TT-62-1356/1, ASTIA AD-292184
Source: Kridla Vlasti, (1):19-20

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Komsomol'skaya pravda P. 4; 6 July 1960.

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Morant, R.B. 1959 THE VISUAL PERCEPTION OF THE MEDIAN PLANE AS INFLUENCED BY LABYRINTHINE STIMULATION J. Psychol 47:25-35, January 1959

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Morehouse, L. E., R. Cochran and W. Reeves 1948 THE INFLUENCE OF POSITIVE RADIAL ACCELRATION FROM HEAD TO FOOT UPON THE RAPIDITY OF MAXIMUM VOLUNTARY MOVEMENTS OF MAN. (University of Southern California, School of Medicine, Los Angeles) Contract N6ori77, Task Order 1, 7 April 1948. ASTIA TIP U52657.

ABSTRACT: Following an observation of the effect of 2,3,4, and 5 G's upon the maximum rate of voluntary movement (tapping), compared with the rate at 1 G, the following findings were noted.

1. The rate of maximum voluntary movement is depressed during the stress of positive G.
2. The depression in maximum rate of voluntary movement under G is probably due to the dynamic force of gravity upon the skeletal and muscular mass of the parts in motion, rather than to a relaxation of the central nervous system. A G-suit offers no protection against the stress. Recovery of maximum rates of voluntary movement is immediate following the cessation of radial acceleration.
3. As far as the rate of voluntary movement is concerned, the pilot of high speed aircraft does not need to support large parts of his arm inorder to make rapid movements with his hand and fingers.

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Morehouse, L. E. and J. G. Wells 1948 AN ELECTROMYOGRAPHIC STUDY OF THE EFFECTS OF VARIOUS POSITIVE G FORCES UPON THE PILOT'S ABILITY TO PERFORM STANDARDIZED PULLS ON AN AIRCRAFT CONTROL STICK. (University of Southern Calif., School of Medicine, San Francisco, Calif.) June 29, 1948 ASTIA TIP U2866

ABSTRACT: Electromyographic analysis of the activity of the Biceps Brachii, Triceps Brachii, and Latissimus Dorsi during 10, 20, 30, 40, and 50 pound pulls on an aircraft control stick under conditions of 1, 2, 3, 4, and 5 G were made on a well-trained subject who exerted pulls with his arm held in a flexed position. These observations were repeated with the arm held in an extended position and again in an intermediate position. The findings are summarized as follows: The Biceps Brachii, Triceps Brachii, and Latissimus Dorsi act as co-contractors in exerting a pull on an aircraft control stick. The extent of the contribution each muscle makes to the total action is altered when the arm position is changed. When the arm is pulling in an extended position the Biceps Brachii dominates the action. With the arm held in flexion or in an intermediate position during the pull, the Triceps Brachii is brought strongly into action. The effect of positive G on stick pull is to increase the activity of all the muscles controlling the stick.

The effect of G is greatest during light pulls (10-20 pounds) and least during heavy pulls (40-50 pounds). The effect of positive G on muscular cativity is least when the arm is held in a position intermediate between flexion and extension. The decrease in muscular activity required to exert pulls on an aircraft control stick as the arm position is shifted from flexion to extension is proportional to calculated values of increased involuntary pull due to gravity as the arm position is shifted from flexion to extension. The linear relationship between calculated values of involuntary pull and experimental values of muographic activity indicates that the reduction in pulling effort as the arm is extended from a flexed position is a dynamic, not a physiological phenomenon. As far as muscular dynamics is concerned, the best arm position of a pilot seated in a conventional upright position and operating a control stick is one which is intermediate between flexion and extension. The stick should be loaded from 40 to 50 pounds as the muscular adjustment to positive G is minimal under these conditions. (Contractor's abstract)

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Morehouse, L.E. and J.G. Wells 1951 AN ELECTROMYOGRAPHIC STUDY OF THE EFFECTS OF VARIOUS POSITIVE G FORCES UPON THE PILOT'S ABILITY TO PERFORM STANDARDIZED PULLS ON AN AIRCRAFT CONTROL STICK. (University of Southern Calif., School of Medicine, Los Angeles) Contract N6ori77, Task 1, 31 March 1951.

ABSTRACT: Electromyographic analysis of the activity of the Biceps Brachii, Triceps Brachii, and Latissimus Dorsi during 10, 20, 30, 40, and 50 pound pulls on the aircraft control stick under conditions of 1,2,3, 4 and 5 G were made on a well-trained subject who exerted pulls with his arms held in a flexed position and again in an intermediate position.

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Morehouse, L.E. and J. G. Wells 1954 AN ELECTROMYOGRAPHIC STUDY OF THE EFFECTS OF VARIOUS POSITIVE G FORCES UPON THE PILOT'S ABILITY TO PERFORM STANDARDIZED PULLS ON AN AIRCRAFT CONTROL STICK. (University of Southern Calif., School of Medicine, Los Angeles) ASTIA AD- 206 272, 28 May 1954

ABSTRACT: Electromyographic analysis of the activity of the Biceps Brachii, Triceps Brachii, and Latissimus Dorsi during 10, 20, 30, 40 and 50 pounds pulls on an aircraft control stick under conditions of 1, 2, 3, 4, and 5 G were made on a well-trained subject who exerted pulls with his arm held in a flexed position. These observations were repeated with the arm held in an extended position and again in an intermediate position.

It was found that as far as muscular dynamics is concerned, the best arm position of a pilot seated in a conventional upright position and operating a control stick is one which is intermediate between flexion and extension. The stick should be loaded from 40 to 50 pounds as the muscular adjustment to positive G is minimal under these conditions.

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Moreland, J. D. 1960 LOADING TESTS ON THE HUMAN CADAVER CHEST. (Dept. of Scientific & Industrial Research, Road Research Laboratory) Research Note No. RN/3786/JDM, June 1960

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Morgan, C.W., & W.L. Moore 1956 CUSHIONING FOR AIR DROP, PART V THEORETICAL AND EXPERIMENTAL INVESTIGATIONS OF FLUID-FILLED METAL CYLINDERS FOR USE AS ENERGY ABSORBERS ON IMPACT. (Structural Mechanics Research Lab., Texas University, Austin, Texas) Contract No. DA-19-129-qm-150, 20 Dec. 1956. ASTIA AD 122 376.

ABSTRACT: In this report is described the design, construction and testing of energy absorbers utilizing metal cylinders either empty or fluid-filled. Energy is absorbed in the crumpling of the metal walls and in imparting kinetic energy to the contained fluid as it is discharged through properly designed orifices in the wall of the container. An equation is derived for the area and spacing of orifices in the wall of the container. An equation is derived for the area and spacing of orifices required to maintain a constant retarding force due to liquid pressure during the crushing of the cylinders. The design of the fluid-filled cylinders is based on this constant retarding force in addition to the force required to crumple the walls of the empty cylinder. The predicted performance of these energy absorbers is shown to be verified by free-fall dynamic tests. The resisting force and the energy absorbed as computed from the force-displacement curves are given. Seamless steel and aluminum tubing, commercial sheet steel cans, and cylinders formed from galvanized sheet steel were tested. A comparison of the various materials is made on the basis of cost per unit of energy absorbed.

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Morgan, H. 1955 BEHAVIOR OF TEXTILES UNDER IMPACT CONDITIONS; AND OTHER ABSTRACTS. (Paper, 22nd Shock and Vibration Symposium, Wright Air Dev. Center, Wright-Patterson AFB, Ohio, 22-23 March 1955)

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Morgan, R., R. D. Summers, & S. P. Reimann 1942 EFFECTS OF VARIOUS TYPES OF MOTION OR DIFFERENCES IN HYDROSTATIC PRESSURE BETWEEN ENDS OF A SEMI-CIRCULAR CANAL. Arch. Otolaryng. 36:691-703

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Morin, L. 1961 LA PHYSIOLOGIE DE L'ESPACE (The Physiology of Space) Laval medical (Quebec), 32(2):161-177, Sept. 1961. In French.

ABSTRACT: This is a review of the physiological effects and ecological problems of space flight. The astronaut will be subjected to acceleration, deceleration, weightlessness, vibration, noise, monotony, extreme temperatures, and the danger of meteorites and radiations.

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Moritz, A.R. 1954 PATHOLOGY OF TRAUMA 2nd Ed. (Philadelphia: Lea & Febiger, 1954)

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Morris, D. P., Jr., D. E. Beischer, & J. J. Zarriello 1958 STUDIES ON THE G-TOLERANCE OF INVERTEBRATES AND SMALL VERTEBRATES WHILE IMMERSED. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. No. NM 19 01 11; ASTIA AD-203 026; March 1958
See also J. Avia. Med. 29(6):438-443, 1958

ABSTRACT: The purpose of this work was to determine the tolerance to acceleratory forces in certain invertebrates and small vertebrates while immersed.

Animals whose habitat is water can be exposed in their natural abode to extra-ordinary high G-forces for prolonged periods of time. Euglena gracilis survived exposure in the ultracentrifuge at 212,000 G for four hours. The limiting conditions for small fishes (Lebistes reticulatus) were 10,000 G for thirty seconds. The chance of survival for small terrestrial mammals is greatly increased in the submersed state. In this condition mice while on oxygen survived a force of 1300 G for sixty seconds. (CARI)

SECOND ABSTRACT: The tolerance to acceleratory forces in certain invertebrates and small vertebrates while immersed was determined. Findings revealed that animals whose habitat is water can be exposed in their natural abode to extra-ordinary high G-forces for prolonged periods of time. Euglena gracilis

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Morris, D. P., Jr., D. E. Beischer, & J. J. Zarriello 1958 STUDIES ON THE G-TOLERANCE OF INVERTEBRATES AND SMALL VERTEBRATES WHILE IMMERSED.
J. Avia. Med. 29(6):438-443
See also (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. No. NM 19 01 11; ASTIA AD-203 026; March 1958

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Animals whose habitat is water can be exposed in their natural abode to extraordinary high G-forces for prolonged periods of time. Euglena gracilis survived exposure in the ultracentrifuge at 212,000 G for four hours. The limiting conditions for small fishes (Lebistes reticulatus) were 10,000 G for thirty seconds. The chance of survival for small terrestrial mammals is greatly increased in the submersed state. In this condition mice while on oxygen survived a force of 1300 G for sixty seconds. (CARI)

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Morris, G. J., et al. 1954 DESCRIPTION AND PRELIMINARY FLIGHT INVESTIGATION OF AN INSTRUMENT FOR DETECTING SUBNORMAL ACCELERATION DURING TAKE-OFF. (National Advisory Committee for Aeronautics, Washington, D. C.) NACA TN 3252, Nov. 1954

ABSTRACT: The instrument is actuated by longitudinal acceleration and impact pressure. A preliminary evaluation from flight tests of a prototype instrument mounted in a jet trainer has been made. The instrument was found to be satisfactory.

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Morrison, R. B., & J. L. Patterson 1945 ACCELERATIVE FORCES ACTING ON THE HUMAN BEING IN FLIGHT AND ON THE HUMAN CENTRIFUGE. (Naval School of Aviation Medicine, Pensacola, Fla.) Research Rept. X-723., 11 Sept. 1945

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Morrison, S.C. 1956 SLED ENVIRONMENT INVESTIGATION PLAN. (Thompson Ramo Wooldridge, Inc., LosAngeles, Calif.) Report no. GM TN 10; WDD Document no. 56-6549; ASTIA AD-217 304

ABSTRACT:

This report includes:

Aerojet General Corp, Azusa, Calif. WS 107A TEST SLED. TEST PLAN FOR NOSE SECTION ENVIRONMENT AND ROCKET MONITORING. 29 Feb. 1956

Morrow, C.T. and R.B. Muchmore 1954 SHORTCOMING OF PRESENT METHODS OF MEASURING AND SIMULATING VIBRATION ENVIRONMENTS. Jnl. of Applied Mechanics. Paper no. 55-SA-2 5 Jan. 1954

A sled vibration environment investigation has been established as a part of the WS 107A - WS 315A sled test program. The purpose of the sled test program is to determine the effects of sled acceleration on certain specimen missile components to be carried in the nose sections of two liquid-fueled rocket sleds. The purposes of this note are to outline the environment study. (Author)

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Morrow, C.T., D.P. LeGalley & L.D. Ely 1961 PROCEEDINGS OF THE FOURTH AFBMD/STL SYMPOSIUM, ADVANCES IN BALLISTIC MISSILE AND SPACE TECHNOLOGY, VOLUME 2. PROPULSION (LIQUID, SOLID, NUCLEAR, PLASMA, ETC.) AUXILIARY RE-ENTRY. (Space Technology Labs., Inc., Los Angeles, Calif.); ASTIA AD 274 225.

ABSTRACT: This volume contains 36 unclassified, contributed papers in the following fields: Propulsion (liquid, solid, nuclear, and plasma), Auxiliary power systems, Preliminary design, Aerodynamics and structures, Hypersonics, and Re-entry. (Author)

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Mortensen, M.A. 1923 BLOOD-PRESSURE REACTIONS TO PASSIVE POSTURAL CHANGES. AN INDEX TO MYOCARDIAL EFFICIENCY.
Am. J. Med. Science 165:667-675

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Morton, G. and D. McEachern 1942 EXPERIMENTAL STUDIES ON THE SUSCEPTIBLE INDIVIDUAL. MOTION SICKNESS (NRC, Canada) Report No. C 750, August 1942

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Morton, G. 1942 SUSCEPTIBILITY OF ANIMALS TO INDUCED MOTION SICKNESS (NRC, Canada) Report No. C 748, August 1942

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Morton, G., & Lehman, P. 1949 NEW MOTION SICKNESS PREVENTIVE.
Bull. U.S. Army M. Dep., 9:335

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Morway, D.A., R.G. Lathrop, L. Hitchcock, & R.M. Chambers 1963 THE EFFECTS OF PROLONGED WATER IMMERSION ON THE ABILITY OF HUMAN SUBJECTS TO MAKE POSITION AND FORCE ESTIMATIONS.
(U.S. Naval Air Development Center, Johnsville, Pa.) NADC-MA-6115, June, 1963.

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Moseley, Alfred L. 1962 PATH OF BODY TRAVEL
(In: Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography, National Academy of Sciences, National Research Council, Publication No. 977, pp. 323-332)

ABSTRACT: One of the basic principles to be formulated in understanding of deceleration injuries concerns the path of body travel. This must be evaluated on an objective basis because the testimony of survivors is useless. In death cases involving the fixed-object collision, the descriptions may be made: (a) at the moment of impact the deforming structures exhibit a deceleration gradient; (b) the rear of the vehicle exhibits vertical motion; (c) the long axis of the vehicle pivots about the front of the vehicle in a horizontal plane. Items (b) and (c) occur simultaneously.

As an operational matter, it is observed that the path of body travel may be predicted by a connecting line between the seated position of the occupant and the impact site. This is referred to as the expected path of body travel. When the prediction is applied to the cases, it is seen that on occasion the path diverges. The actual path is referred to as the observed path of body travel. Special investigation procedures are required to understand the reason for the discrepancy.

The design of structures for protection during sudden deceleration must take into account the expected path of body travel for the possible impact locations. The design of a given device has application only when it is in the body deceleration path.

Multiple impacts occur as decelerative forces are dissipated. Designs for protection must be adequate for several impacts at the same location occurring during a fraction of a second.

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Moseley, A. L. 1962 VARIETIES OF AUTOMOBILE DEATH. (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration Conference, Sept. 14-16, 1961). Pp. 94-104.

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Moseley, H.G. June 1955 INJURIES INCURRED IN AIRCRAFT ACCIDENTS. Military Medicine 116:440-445

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Moseley, H.G. 1956 AN ANALYSIS OF 2,400 PILOT ERROR ACCIDENTS. (Paper, Aero Medical Association, twenty-seventh annual meeting, chicago,Illinois) Directorate of Flight Safety Research, USAF, Norton AFB, California, Report No. M-40-56

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Moseley, H.G. 1957 AIRCRAFT ACCIDENT INJURIES
(Paper, 1957 Meeting of Aero Medical Association, Denver, Colo., May 6-8)

ABSTRACT: The injuries incurred by all occupants of Air Force aircraft involved in accidents during calendar years 1953 and 1955 have been reviewed. All traumatic lesions, both fatal and nonfatal, have been analyzed as to type, location, aspect and frequency. Insofar as possible, the injuries have been related to identifiable causes such as force of deceleration, body position and objects inflicting injury. The role of protective equipment and factors bearing on the prevention of such injuries have been explored. (J. Aviation Med. 28(2):212)

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Moseley, H. G. 1957 AERO MEDICAL INVESTIGATION OF AIRCRAFT ACCIDENTS
(Directorate of Flight Safety Research, Norton AFB, Calif.) 25 Jan. 1957

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Moseley, H.G., 1957 U.S. AIR FORCE EXPERIENCE WITH EJECTION SEAT ESCAPE
(PROBLEMS OF ESCAPE FROM HIGH PERFORMANCE AIRCRAFT: A SYMPOSIUM)
J. Aviation Med. 28(1):69-73

SUMMARY: Escape from high performance aircraft by use of the ejection seat to date has been attended with an incidence of 23 percent fatalities and 14 per cent major injuries. The great majority of ejection attempts were medium and low altitudes and medium and low speeds. The outstanding cause of fatalities has been inability to separate from the seat and deploy the parachute prior to striking the ground when ejection was attempted at low altitudes, particularly when the aircraft was out of control or in a dive. Airspeed has had little effect upon the outcome, with the exception that ejection attempts at or near the speed of sound may be attended with incapacitating results of deceleration with the type of seat now being used. It is concluded that if the fatality rate is to be lowered, there must be improved provisions for escape at low altitudes and low speeds where the great majority of emergencies occur, and that if escape at supersonic speeds where the great majority of emergencies occur, and that if escape at supersonic speeds is to be successful, the effects of deceleration and other phenomena must be mitigated.

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Moseley, H. G. 1957 INFORMAL MEDICAL REPORT - USAF AIRCRAFT ACCIDENTS.
1 JULY THROUGH 31 DECEMBER 1957. (Aero Medical Safety Div., Directorate of Flight Safety Research, Office of the IG. U. S. Air Force)

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Moseley, H.G., and Stembridge, V.A., 1957 THE HOSTILE ENVIRONMENT AS A CAUSE OF AIRCRAFT ACCIDENTS.
J. Aviation Med. 28(6):535-540

SUMMARY: The frequency of the causative events in aircraft accidents in the U.S. Air Force is divided into three categories: unsafe acts (58 per cent), unsafe conditions (28 per cent), and cause undertermined (14 per cent). In a tabulation of the physical and physiologic factors governing the pilot's environment which may lead to an aircraft accident, these adversities are responsible for many of the "unsafe acts" accidents and probably play a leading role in many of the "cause undetermined" accidents. Particular consideration is given to four major problem areas: the adversity of space, the adversity of altitude, and adversity of velocity, and the adversity of intolerance. The areas demanding attention and which are the most promising of reward, indicate the necessity for a thorough study of: (1) the pilot's environment, (2) the pilot's actions, (3) cockpit factors, and (4) pathologic investigation. When confronted with a "cause undetermined" accident, the aeromedical specialist should consider it due to an environmental or physiologic adversity until proven otherwise.

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Moseley, H. G. 1958 AIRCRAFT ACCIDENT INJURIES IN THE US AIR FORCE; A REVIEW OF 2,011 CASES IN 1953 AND 1955.
J. of Aviation Medicine 29(4):271-282, April 1958

ABSTRACT: During the calendar years 1953 and 1955, over 8,000 persons were involved in major U. S. Air Force aircraft accidents. Eighteen and seven-tenths per cent of these occupants received fatal injuries and 5.2 per cent received major injuries. However, 76.1 per cent received monor or no injury. Most fatalities were caused by multiple traumatic lesions. Most major non-fatal lesions were fractures, especially of the vertebrae. Burns and surface wounds were frequent. The head and the distal third of the extremities received the majority of injuries and were associated with failing of these unsecured body portions during deceleration. When impact forces in deceleration were moderate or negligible, there were few injuries; when impact was severe, injury was frequent and often fatal; when it was extreme, fatal results were the rule. In all accidents there was increased injury if the seat tore loose or if the seat belt was not used. If the occupant was in a seat facing the rear of the aircraft, he was less liable to be injured than if he faced forward. This was especially true in low impact accidents where the seat was more liable to remain moored to the floor.

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Moseley, H.G., F.M. Townsend and V.A. Stembridge 1958 PREVENTION OF DEATH AND INJURY IN AIRCRAFT ACCIDENTS.
AMA Arch. Indus. Health 17(2):111-117, Feb. 1958

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Moseley, H. G. and A. F. Zeller 1958 RELATION OF INJURY TO FORCES AND DIRECTION OF DECELERATION IN AIRCRAFT ACCIDENTS
J. of Aviation Medicine 29(10):739-749, October 1958

ABSTRACT: All major cargo and transport type aircraft accidents in the U. S. Air Force during a two-year period were reviewed to determine the path that such aircraft follow during actual crashes and to relate this to variations in aircraft attitude and to injury of occupants. The results indicate that the airframe tends to follow its established course even though major components are destroyed. With decreased velocity, major course and attitude deviations may result primarily from striking impeding objects. Most injuries are sustained when the aircraft is experiencing little deviation from its established path. The most obvious and most easily effected remedial measures would involve improvement of structural and retention strength of aircraft seats and moorings. These should be designed to provide maximum protection against fore to aft deceleration with additional consideration being given to designing for relatively small yaw deviations.

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Mosely, H.G. 1958 INJURIES SUSTAINED IN EJECTION SEAT ESCAPE
(Report by Directorate of Flight Safety Research, Hq., USAF, 31 Mar. 1958)

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Moseley, H. G. & R. H. Shannon 1958 USAF EJECTION ESCAPE EXPERIENCE, 29 AUGUST 1949 THROUGH 30 JUNE 1958 (USAF, Directorate of Flight Safety Research, Norton AFB, Calif.) Rept. M 12 58, Nov. 1958

ABSTRACT: This study analyzes 1,462 United States Air Force ejection seat emergency escapes from the period 29 August 1949 through 30 June 1958. Results to personnel are studied in relation to altitude, airspeed, attitude, availability and use of automatic equipment, and other pertinent factors. Problem areas associated with ejection escape from high performance aircraft were sought although few cases of attempted escape at supersonic speeds were available. Recommendations designed to reduce the incidence of unsuccessful (fatal) ejections are made in the areas of 1) operations and training, and 2) research and development.

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Moseley, J.D. & J.P. Stapp 1958 THE EFFECTS OF RAPID DECELERATION: LETHAL AND INJURIOUS LIMITS.
(Paper, 1958 Meetinf of Aero Medical Assn., Statler Hotel, Washington, March 24-26, 1958)

ABSTRACT: Twenty experiments using chimpanzee subjects were conducted on the rocket sled track facility at Holloman Air Force Base, New Mexico. After acceleration to supersonic speeds the sled was decelerated by a water brake system. Injurious levels were found at 120 G with rate of onset in excess of 5,000 G per second. Lethal effects were noted at 237 G with rate of onset 11,250 G per second. (J. Aviation Med. 29(3):245)

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Moseley, H.G. 1959 AIRCRAFT ACCIDENT FATALITIES: A CHALLENGE TO AVIATION MEDICINE. (Paper, Meeting of Aero Medical Association, Statler Hilton Hotel, Los Angeles, April 27-29, 1959)

ABSTRACT: During World War II, approximately 70 per cent of USAF combat fatalities were due to aircraft accidents. During the same period, over 14,000 military personnel were killed in aircraft accidents in the United States. Since this time there has been no significant decline in deaths due to this cause, and aircraft accidents currently account for more fatalities among USAF flying personnel than all diseases and other injuries combined. Concerning future flight, increased aircraft performance carries increased destructive potential. The causes of aircraft accidents and fatalities are known and are not expected to change significantly. These causes are discussed in detail and remedial measures are reviewed. The role and responsibilities of aviation medicine in this enterprise are emphasized. (J. Aviation Med. 30(3):196, March 1959)

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Mosely, J.D. and J.E. Cook 1960 VISCERAL DISPLACEMENT IN BLACK BEARS SUBJECTED TO ABRUPT DECELERATION.
Aerospace Med. 31(1):1-8, Jan. 1960.
See also (Air Force Missile Development Ctr., Holloman AFB, N. Mex.) AFMDC TN 60-6; ASTIA AD 234 200

ABSTRACT: Eight American black bears, utilized in abrupt deceleration studies, showed considerable promise as comparative abrupt deceleration subjects. They approximate man's confirmation and weight and stand alone easily on the rear limbs with the head at a normal inclination. Their tolerance to plateau, onset and duration g depends entirely upon positioning and restraint as does man. In the rearward facing position based upon necropsy findings and statements from human volunteer subjects, it appears that the bears' tolerance to abrupt deceleration of less than 0.2 seconds durations is close to that of man. In the forward facing position with a full harness they have sustained g levels with reversible lesions which would be unusually painful and not recommended for human volunteers. (Author)

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Moseley, J.D. 1961 TO WHAT EXTENT CAN ANIMALS INSTEAD OF MAN BE USED IN IMPACT TESTING. (Paper, Symposium on Impact Acceleration Stress, Brooks AFB, Texas, Nov. 27-29, 1961)

ABSTRACT: The general use and reasons for use of animal subjects in impact testing are examined. The selection of different species for testing is discussed with emphasis on the selection by body area to be examined. The differences in tolerance criteria are discussed with emphasis on the need for human and animal tests using performance decrement as added means of assessing effects.

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Motobayashi, F. and M. Oshima 1957 A METHOD OF MEASUREMENT OF AVIATION FATIGUE BY THE ACCELERATION LOAD. (Institute of Labour Science) March 1957.

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Moul, M. T., A. A. Schy & J. L. Williams 1961 DYNAMIC STABILITY AND CONTROL PROBLEMS OF PILOTED REENTRY FROM LUNAR MISSIONS (National Aeronautics and Space Administration, Washington, D.C.) NASA TN D 986, Nov. 1961.

ABSTRACT: A fixed-base simulator investigation was made of stability and control problems during piloted re-entry from lunar missions. Re-entries were made within constraints of acceleration and skipping, in which the pilot was given simulated navigation tasks of altitude and heading angle commands. Vehicles considered included a blunt-face, high-drag capsule, and a low-drag lifting cone, each of which had a trim lift-drag ratio of 0.5. Three-axis automatic damping was included and results were presented for various damper-failure conditions. (Tufts)

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Mowrer, O.H. 1932 CONCERNING THE NORMAL FUNCTION OF THE VESTIBULAR APPARATUS. Ann. Otol., 41:412-421

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Mowrer, O.H. 1934 ANALYSIS OF EFFECTS OF REPEATED BODILY ROTATION WITH ESPECIAL REFERENCE TO POSSIBLE IMPAIRMENT OF STATIC EQUILIBRIUM Ann. of Otol. 43:367-386

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Mowrer, O. H. 1934 THE MODIFICATION OF VESTIBULAR NYSTAGMUS BY MEANS OF REPEATED ELICITATION. Comp. Psychol. Monog. 9(45):1-48

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Mowrer, O. H. 1934 INFLUENCE OF "EXCITEMENT" ON THE DURATION OF POSTROTATIONAL NYSTAGMUS. Arch. Otolaryng., Chicago 19:46-54

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Mowrer, O.H., 1935 SOME NEGLECTED FACTORS WHICH INFLUENCE THE DURATION OF POST-ROTATIONAL NYSTAGMUS. Acta Oto-Laryng. 22: 1-23

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Mowrer, O. H. 1935 THE NYSTAGMIC RESPONSE OF THE PIGEON TO CONSTANT ANGULAR ACCELERATION AT LIMINAL AND SUPRALIMINAL INTENSITIES. J. Comp. Psychol. 19:177-193

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Mowrer, O. H. 1935 THE ELECTRICAL RESPONSE OF THE VESTIBULAR NERVE DURING ADEQUATE STIMULATION. Science 81:180-181

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Mowrer, O. H. 1936 "MATURATION" OR "LEARNING" IN THE DEVELOPMENT OF VESTIBULAR AND OPTOKINETIC NYSTAGMUS. J. Genet. Psychol. 48:383-404

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Mowrer, O. H. 1937 THE INFLUENCE OF VISION DURING BODILY ROTATION UPON THE DURATION OF POST-ROTATIONAL VESTIBULAR NYSTAGMUS. Acta oto-laryngol. 25:351-364

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Mozell, M. M., & D. C. White 1958 BEHAVIORAL EFFECTS OF WHOLE BODY VIBRATION. (Naval Air Development Ctr., Johnsville, Pa.) NADC MA-5802; ASTIA AD-156 470 28 Jan. 1958

See also J. Avia. Med. 29:716-724

ABSTRACT: A study was made of the effect of whole body vibration on the ability of humans to read the digits of an aircraft mileage indicator and their ability to do a tracking task which simulated the control of an aircraft. Vertical sinusoidal vibration of frequencies ranging between 0 and 50 cycles per second (cps) with amplitudes of 0.05, 0.1, and 0.16-inch double amplitude were used. It is concluded that increasing the frequency of vibration above 8 cps has an increasingly detrimental effect on visual performance. This effect reaches a maximum between 40 and 50 cps. The increase of amplitude of vibration from 0.05 to 0.1-inch double amplitude has no effect upon visual performance. Therefore, a case was made for using frequency and amplitude rather than G as vibration coordinates. It is further concluded that vibration, within the limits of the experiment, has little effect upon tracking ability. (AUTHOR)

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Mueller, C. E. G. 1961 CARDIOVASCULAR EFFECTS OF FORWARD ACCELERATION. In Bergeret, P., ed., Bio-Assay Techniques for Human Centrifuges and Physiological Effects of Acceleration. (London, New York, Paris: Pergamon Press, 1961) AGARDograph 48. Pp. 119-129.

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Mueller, D.D. 1962 RELATIVE MOTION IN THE DOCKING PHASE OF ORBITAL RENDEZVOUS (Aerospace Med. Div., 657oth Aerospace Medical Research Lab., Wright-Patterson AFB, Ohio) AMRL-TDR-62-124; Proj. no. 7184, Task no. 718405; Dec. 1962;

ABSTRACT: The purpose of this report is to analyze the relative motion which exists between an interceptor and target vehicle in the final stages of orbital rendezvous. Four distinct types of nearby parking orbits were defined. It was assumed that a man wearing an extravehicular suit and a self-maneuvering unit would exit the interceptor and traverse the remaining distance to the target. Both two impulse transfers and continuous thrust, line-of-sight transfers were analyzed. It was found that the direction in which the man should aim himself to make a two-impulse transfer depends only on the time he wished to consume in the rendezvous and does not depend on the distance to be traveled. Comparisons of fuel consumption for the two-impulse technique and the line-of-sight technique were made and an optimum transfer combining both these techniques was suggested. The results of this study indicate that Coriolis forces and tidal effects cannot be neglected even at the relatively short ranges associated with orbital docking.

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Müller, B. 1956 FLUGMEDIZINE: KOMPENDIUM DER LUFTFAHRTMEDIZIN (Aviation Medicine: Compendium of Aviation Medicine)
(Dusseldoff: Droste, 1956) Nordrhein-Westfalen. Ministerium fur Wirtschaft und Verkehr. Verkehrswissenschaftliche Veroffentlichungen. Heft 34.

ABSTRACT: This monograph surveys the field of aviation medicine and is intended for use by medical students, students of aerotechnology, physicians, engineers, and fliers interested in aeromedical problems. The chapters deal with the historical development of aviation and aviation medicine, high-altitude flight and the effects of altitude, acceleration and centrifugal forces, motion sickness, sensory organs and sensory illusions in flight, orientation as to the position in space and movement, psychophysiology of fliers, flight hygiene, flight accidents, physical and psychological examinations of fliers, flying fatigue -- symptoms and therapy, and some problems of space medicine.

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Mullin, C. S. Jr. 1953 ACUTE ANXIETY REACTION VS. "BLAST CONCUSSION"
U. S. Armed Forces Med. J. 4:1748-1752.

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Murcia, G. F. 1961 THE PROGRESSIVE ACCELERATION-DECELERATION TEST IN VESTIBULAR EXPLORATION.
In Rev. Esp. Otoneurooftal. 20:410-415, Nov.-Dec. 1961 (Spain)

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Murphy, A.C. 1949 GROUND SEAT EJECTION TEST ON XF-90 AIRPLANE
(Lockheed Aircraft Corp., Burbank, Calif.) Oct. 1949. ASTIA ATI 65300

ABSTRACT: Ground seat ejection test was conducted on an XF-90 fighter airplane, to determine the suitability of the seat installation. The seat attained a velocity of 54 ft/sec and an acceleration of 13 g's. It reached a vertical height of 35 ft above the cockpit and traveled a horizontal distance of 72 ft. The seat was successfully caught in the net, and no damage was sustained by the airplane, except over the claw on the actuator disconnect, however, this did not interfere with the ejection of the seat. The catapult seat installation was found satisfactory for flight.

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Murphy, C. W. & R. A. Cleghorn 1956 STUDY ON ADRENOCORTICAL PHYSIOLOGY IN JET FLYING
Canad. J. Biochem. Physiol. 34:534-542.

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Mur Vilaseca, Tomas 1953 LA ASTRONAUTICA. QUE DEBEMOS PENSAT ACERCA DE LA POSIBILIDAD DE LOS VIAJES POR EL ESPACIO? (Astronautics. What Ought We to Know About the Possibility of Voyages Through Space?)
Rev. Obras Publicas 101: 269-279, June 1953

ABSTRACT: Survey of astronautics, including propulsion of a space vehicle, historical outline, fundamental equations of the rocket, the space station, and the trip to the moon.

3,724

Mustin, G.S. 1960 SIMPLIFIED APPROACH TO DESIGNING SHOCK ISOLATION FOR THE ROTATIONAL DROP TEST. (Paper, 28th Symposium on Shock, Vibration and Associated Environments, The Departmental and Commerce Auditoriums, Washington, D.C., February 9-11, 1960) ASTIA AD 244 857

ABSTRACT: Previously published papers on the rotational drop test appear to be analyses of existing designs or require certain unwarranted assumptions concerning distributions of accelerations. No satisfactory designer's approach to the use of nonlinear cushioning materials for rotational drop test cushioning has been found in the literature. This paper summarizes an approach found to be useful in designing with shock mounts and covers an extension of the method to tangent elasticity.

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Myers, D.A. 1942 CAN THE HUMAN BODY KEEP PACE WITH THE AIRPLANE?
California & West. Med., 56:287-293

ABSTRACT: Keen perception is an essential factor in pilot-make-up, especially perception of the surroundings and the environment, as well as the ability to estimate quickly all situations, including those of approximate altitude of the airplane, character of the terrain, direction of the wind, etc.

Some of the most important maintenance problems which aviation medicine has to deal with are: oxygen and altitude flying; altitude sickness; blacking out; effect of glare, cold, heat and light; effects of flight on the eyes; bends or decompression sickness; aerial equilibrium and spatial orientation (blind flying); aero-embolism and anoxia.

During altitude flights the nitrogen in the blood is given off in the lungs, and that in the tissues begins to enter the blood stream. If the ascent is fast, nitrogen bubbles form in the blood and tissues. If the tissues have a high fat content and poor blood supply, they become favorable sites for bubble formation. Nitrogen bubbles have been shown in the spinal fluid at 18,000 feet; and in the blood and tissues. Sulfathiazole was used orally and locally in large doses. The tiny particles of rock, sand, carbon or gunpowder remaining on the cornea after removal of larger fragments will usually disappear within a couple of days with little or no loss of vision following application of atropine and a 5 per cent sulfathiazole ointment in a white petrolatum base. The American Optical Malingering apparatus was found best for detection of malingerers. Various methods of testing malingerers and hysteric subjects are discussed.

ACCELERATION

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Nack, A. 1946 THE FIST LAND AIRPLANE CATAPULT K1 12 (GENERALLUFTZEUGMEISTER FIB-6 BERLIN-ADLERSHOF DIE FIST-LANDFLUGZEUGSCHLEUDER K1 12)

ABSTRACT: A description is given of the Fist mobile airplane catapult. It is sued for assist take-off of heavily loaded airplanes, and take-off on short and soft runways. It supplies additional required acceleration forces which ordinarily cannot be supplied by propeller thrust. The catapult consists of a main and an auxilliary unit. The main unit accelerates the airplane by means of a "brake cable" and detaches it from the airplane after completed acceleration. Operation of the catapult is explained in detail.

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Nadel, A. B. 1958 HUMAN FACTORS REQUIREMENTS OF A MANNED SPACE VEHICLE. (General Electric Co., Santa Barbara, Calif.) Rept. RM 58TMP 10, Apr. 1958

ABSTRACT: This report presents an analysis of human factors requirements of a manned space vehicle in light of present knowledge. One section deals with the physical environment of the operator, covering the effects of physical stimuli from space external to the craft, their possible effects on the operator and protective measures needed. Another section is concerned primarily with inputs from space received via the sensory system of the operator. Phenomena apprehended through the perceptual system are described together with their possible effects and practices recommended to avoid undesirable effects. The information processing function (information items needed, displays, and display-control relations) is discussed at length.

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Nadel, A. B. 1959 SUPPORTING MAN IN SPACE: 1970-1975 (General Electric Co., Santa Barbara, Calif.) RM 59 TMP-85, 30 Nov. 1959

ABSTRACT: This report discusses progress in space technology that is expected to take place by 1970 and anticipates several bold adventures into space during

the period 1970-1975, such as successful trips to the moon and the beginning of interplanetary travel (Mars, Venus, etc.). Needed requirements and capabilities for such accomplishments are discussed in the following areas: 1) the physical environment - atmosphere, gravitational forces (acceleration and zero g), temperature, and radiation; and 2) acoustic noise and vibration.

3,729

Nagoya U. Research Inst. of Environmental Medicine 1962 ANNUAL REPORT, 1961. (Nagoya U. Research Institute of Environmental Medicine, Japan) In Japanese.

ABSTRACT: Contents include:

1. "Annual Review of Progress in the Aeromedical Department" Fushiro Motobayashi, p. 1-2
2. "Preliminary Study on the Biological Phenomena In Rocket Flight" Shigeru Ando and Sadaharu Takagi, P. 2-4
3. "How is the Mento-Physical Condition Measured? (1. Preliminary Study)" Fushiro Motobayashi, Sukeo Sugimoto, Tamotsu Somiya, and Sadaharu Takagi, p. 5-12.
4. "Neuroglial Response and a Theory of Neuroglialneuronal Interaction" Genyo Mitarai, p. 12-17.
5. "Adient Reaction Potential and Abient Reaction Potential as a Function of the Fistance (From the Object (3) Tamotsu Somiya, P. 17-21.
6. "Experimental and Theoretical Studies on Behavior in Space" Tamotsu Somiya, p. 21-31.

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Napier, A. 1963 SUPERSONIC SCARECROW. AFTER SOLVING THE "RAILBIRD" PROBLEM, ROCKET SLED ZIPS ON AT 3,753 MPH. National Observer 2(36):8, 9 Sept. 1963.

ABSTRACT: The fastest known earth-bound vehicle is the spike-nosed rocket sled used on the long track (35,000) at Holloman AFB, New Mexico, which has hit a peak velocity of 3,753 mph. (over mach's). This was partly possible because a solution to the 5 year-old "railbird problem" was found. A "bird bouncer" sled is now run along the track 60 feet ahead of the test sled on runs to clear birds from the acceleration track. (CARI)

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Napier, D. & Son n.d. INSTRUCTIONS FOR OPERATING AND MAINTAINING THE NAPIER 100 g CENTRIFUGE (Gt. Brit.) ASTIA AD-40 785

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National Aeronautics and Space Administration 1962 RESULTS OF THE SECOND UNITED STATES MANNED ORBITAL SPACE FLIGHT (National Aeronautics and Space Administration, Washington, D. C.) NASA SP-6

ABSTRACT: This document presents the results of the second United States manned orbital space flight conducted on May 24, 1962. The performance discussions of the spacecraft and launch systems, the modified mercury network, mission support personnel, and the astronaut, together with analyses of observed space phenomena and the medical aspects of the mission, from a continuation of the information previously published for the United States manned orbital Flight, conducted on February 20, 1962, and the two manned suborbital space flights.

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NATIONAL RESEARCH COUNCIL, Washington, D.C. See U.S. National Research Council

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National Research Council of Canada 1942 PROCEEDINGS OF THE FOURTH MEETING OF THE SUB-COMMITTEE ON SEASICKNESS OF THE SUB-COMMITTEE ON NAVAL MEDICAL RESEARCH OF THE ASSOCIATE COMMITTEE ON MEDICAL RESEARCH, 27 NOV. 1942. (National Research Council of Canada)

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National Research Council of Canada, Ottawa 1944 PROCEEDINGS OF THE 13TH MEETING OF THE ASSOCIATE COMMITTEE ON AVIATION MEDICAL RESEARCH. (National Research Council of Canada, Ottawa, 25 Feb. 1944)

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National Research Council, Canada 1944 PROCEEDINGS OF THE 14TH MEETING OF THE ASSOCIATE COMMITTEE ON AVIATION MEDICAL RESEARCH (National Research Council, Canada) 29 Sept. 1944

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National Research Council 1944 MEMORANDUM ON TEMPORARY DUTY OF W/CW.R. FRANKS TO SUB-COMMITTEE ON ACCELERATION OF THE UNITED STATES NATIONAL RESEARCH COUNCIL MAYO AERO MEDICAL UNIT, ROCHESTER, MINNESOTA. (National Research Council, Canada) Report # C-2681, 23 February 1944

ABSTRACT: This liaison report covers the meeting of the above Sub-Committee. The recent medical researches on acceleration are reviewed.

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Navarrane, P. 1956 LE MAL DES TRANSPORTS (TRAVEL SICKNESS) Revue du praticien (Paris) 6(19):2095-2104, 1 July 1956

ABSTRACT: A general discussion is presented of motion sickness with emphasis on its etiology and pathogenesis, clinical aspects, and susceptibility of persons. Preventive measures considered in during airplane flight include the use of the seat belt in turbulent weather, use of ear plugs to eliminate vibrations, and the use of dark glasses. Chemical measures used in prevention and therapy include central nervous system depressants (barbiturates); parasympathicolytics (belladonna and hyosciamine alkaloids); synthetic antihistaminics (dramamine, nautamine), or chlorpromazine. The following measures are recommended for persons susceptible to motion sickness during airplane flight: chlorpromazine or antihistaminics prior to departure and use of belladenaldexamphetamine suppository at the first symptom.

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Nayler, J.L. 1932 THE EFFECT OF ACCELERATIONS ON HUMAN BEINGS. J. Roy. Aero Soc. 36:251

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Naylor, J.L. 1932 MAN'S ABILITY TO WITHSTAND HIGH ACCELERATIONS STUDIED. Astronautics, pp. 6-7. 20 June, 1932.

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Neal, E. 1926 VISUAL LOCALIZATION OF THE VERTICAL Amer. J. Psychol., 37:287

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Nebiker, F.R. 1961 FEASIBILITY STUDY OF AN INFLATABLE TYPE STABILIZATION AND DECELERATION SYSTEM FOR HIGH-ALTITUDE AND HIGH-SPEED RECOVERY. (Goodyear Aircraft Corp., Akron, Ohio) WADD TR 60-182, Dec. 1961. ASTIA AD 272 754.

ABSTRACT: On the basis of the theoretical and experimental wind tunnel test data obtained, it was concluded that an inflatable sphere is a practicable stabilization and deceleration system for initial recovery from high-altitude, high-speed flight regimes (up to Mach 4.0 at 200,000 feet). Inflatable spheres tested were fabricated utilizing standard manufacturing methods and readily available materials. The recovery system tested exhibited considerable potential as an initial stabilization and deceleration recovery system for a disoriented or tumbling high-altitude, high-speed payload. Included are theoretical and wind tunnel test data on the effects of various shaped primary bodies on a secondary spherical body at various trailing distances. Also included is a limited amount of experimental data on flight testing of a full-scale operational unit. (Author)

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Neely, S.E., & R.H. Shannon 1958 VERTEBRAL FRACTURES IN SURVIVORS OF MILITARY AIRCRAFT ACCIDENTS. J. Aviation Med. 29(10):750-753, Oct. 1958.

SUMMARY: Vertebral fractures are a significant problem in the medical management of aircraft accident survivors. The responsible medical officer should be prepared to recognize and handle this type of injury. Because the rate of these injuries is increasing, improved methods of restraint and protection for the vertebral column must be found. The most frequent type of major non-fatal injury, vertebral fracture, was examined and analyzed in terms of the role seats and seat cushions play and in terms of the force factors involved. Suggestions for counteracting the apparent causes of vertebral injury are set forth.

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Neely, S. E., et al. 1960 INJURY AND FATALITY USAF AIRCRAFT ACCIDENTS (Directorate - Flight Safety and Missile Safety Research) Rept. M-3-60, March 1960

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Nefedov, P. 1960 THE PRIDE OF THE 20TH CENTURY
Izvestiya P. 1; 24 August 1961

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Neiswander, R.S. & H.T. Armstrong 1947 MOTION ASPECTS OF FLIGHT STIMULATION (Link Aviation Devices, Inc., Binghamton, New York) Eng. Rept. No. 164.233

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Nelson, D.M. 1957 A MEANS OF OBTAINING HIGH ACCELERATION AT A LOW RATE OF INCREASE IN TRACK TESTS WITH EXISTING SOLID-PROPELLANT MOTORS. (Naval Ordnance Test Station, China Lake, Calif.) NAVORD Report 5561, 1 June 1957. ASTIA AD 140 402

ABSTRACT: A technique for obtaining high acceleration with low acceleration rates in track testing, using available solid-propellant rocket motors, is described. The technique consists of mounting motors having differing thrust characteristics in opposite directions on a test sled and then firing the motors at certain intervals so that the additive effect of their thrust produces the desired acceleration and acceleration rate. A comparison of theoretically predicted and actual sled performance for a SNORT missile-component test using this technique is made. (Author)

3,748

Nelson, S.R.C. 1948 EJECTION OF PILOTS FROM AIRCRAFT
In Marcus, Henri et al, Shock and Vibration Bulletin No. 7, Naval Research Rept. No. S-3229, Pp. 47-58, ASTIA ATI 75 153

ABSTRACT: Tolerance to vertical accelerations and resistance of the body to forces of certain durations are discussed. Observations are made on the effects of air blast upon the body. Safety harness and related automatic devices are described. The problems of installing the gear in aircraft and educating the pilots in the use of the equipments are outlined.

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Neubert, H.K.P. 1954 NOTES ON THE RESPONSE OF A LINEAR VIBRATION SYSTEM TO IMPACT LOADING (Royal Aircraft Establishment, Gt. Brit.) March 1954, ASTIA AD-31 376

ABSTRACT: "In the course of investigations into the effect of impact loading the general equations for deflection, velocity and acceleration of a linear system of one degree of freedom with velocity damping have been derived for a case of a mass being dropped onto a spring (with negligible mass). Response curves are plotted and discussed for two idealized cases of aircraft landing,

and for a drop table test. The possible errors for a proposed integrating touch-down velocity meter are discussed. Frequency spectra for three typical impact curves have been computed, and the error introduced when measuring the impact with an accelerometer of inadequate frequency response is discussed." (RAE summary)

3,750

Neubert, H. K. P., & R. W. Corbin 1954 A NEW BARIUM TITANATE ACCELERATION TRANSDUCER OF A HIGH SENSITIVITY. (Royal Aircraft Establishment, Great Britain) TN No. INSTN. 147, Dec. 1954

ABSTRACT: A general purpose barium titanate acceleration transducer has been designed and two prototypes have been tested for their sensitivity, linearity and frequency response. Errors due to transverse acceleration and temperature are discussed. Its output voltage is comparable with that of vibration transducers of the moving coil type and with acceleration transducers of the unbonded strain gauge type, but it covers a wider field than any of these in range as well as in frequency.

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Neukirch, F. 1937 EINE VERSUCHSPERSON MIT AUSGESPROCHENEN ÄNDERUNGEN DES KREISLAUFES BEI STELLUNGSWECHSEL (A Test Subject with Pronounced Changes in the Circulation During Change of Position)
Skandinavisches Archiv für Physiologie (Berlin) 77: 60-62

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Neuman, H. Aug. 1956 AT THE AEROMEDICAL SECTION OF THE LEARNED MEDICAL COUNCIL ATTACHED TO THE CHIEF OF THE MAIN MILITARY ADMINISTRATION. (AF Technical Translation, AFOIN, Rept. AF 1019403, 13 Aug. 1956)

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Neumann, H. L., J. F. Hegenwald, Jr., & W. R. Santschi 1962 HUMAN SUBJECT GROUND AND WATER IMPACT TESTS OF THE XB-70 ESCAPE CAPSULE. (Paper, 33rd Annual Meeting of the Aerospace Medical Assoc., 9-12 Apr. 1962, Atlantic City, N. J.)

ABSTRACT: A testing program was accomplished to validate the performance of the capsule during ground and water impact. Tri-axial acceleration histories were

obtained for capsule seat structures and for the head and chest of both anthropometric dummy and human subjects under conditions simulating design parachute descent velocities. The engineering aspects of the impact attenuation system are described briefly as well as test methodology and facilities. Physiological responses to the impacts are discussed and acceleration and photographic data of dummy and human subjects are correlated. (J. Aerospace Medicine 33(3):366, Mar. 1962)

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Neustater, W.L. 1946 WHAT IS A "BLACKOUT"? A STUDY OF FIFTY CASES. J. Roy. Army M. Corps 85:139-142

ABSTRACT: Of the 50 cases examined, 25 described a loss of consciousness. 16 a blacking out of the visual field with no loss of consciousness or hearing and 9 are described various symptoms to which the term did not apply. It is stated that 45 of the 50 cases showed a history of psycho-neurosis.

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Newbauer, J. 1959 TRAINING AN ASTRONAUT. Astronautics, Sept. 1959. Pp. 31

ABSTRACT: This article is a review of the schedule maintained by the seven Project Mercury astronauts at Langley Research Center in preparation for the first man-in-space flight.

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Newell, H. E., Jr. 1952 CHARACTERISTICS OF THE HIGH-ALTITUDE ROCKET AS A RESEARCH TOOL. In White, C. S., & O. O. Benson, Jr., eds., Physics and Medicine of the Upper Atmosphere, A Study of the Aeropause (Albuquerque, N. Mex.: Univ. of New Mexico Press, 1952) pp. 405-411

3,757

Newell, H. E., Jr. 1959 U.S., RUSSIAN SPACE EFFORTS COMPARED Aviation Week 71:36, 37, 41, 43, 47, 49-50, Dec. 1959

ABSTRACT: Both the U. S., and Soviet satellites and space probes have produced valuable scientific results. Some spectacular discoveries and achievements are

shown in table form. In addition to the more spectacular output, satellite and space-probe flights are turning out a steady flow of information and results that build up gradually an impressive advancement of mankind's knowledge of the earth and outer space. This review relates the impression that U. S. and USSR scientists are at about equal stages of advancement.

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Newell, H. E. 1963 A WORLD IN SPACE
(National Aeronautics and Space Administration, Washington, D. C.)
NASA AL-B-2-63; N63-13744; Feb. 1963

ABSTRACT: The following areas of space exploration are discussed: geophysics, astronomy, cosmology, extraterrestrial life, manned space flight, space engineering, space environment, measurement of space phenomena, and space phenomena on earth. (NASA)

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Newton, J. A. 1951 THE HUMAN FACTOR IN AIRCRAFT ACCIDENTS.
J. Royal Aeronautical Society 55(482):110-115, Feb. 1951

ABSTRACT: It has been claimed that flying accidents are inevitable due to the necessary reliance on the skill, judgment, memory, and physical and psychological conditions of the human being. Since human error in aircraft operation is less likely to be reduced by improving the human being than by simplifying the task given him, efforts to reduce accidents by providing better personnel and training have not produced an appreciable result. Too high a dependence has been placed on the infallibility of the human organism in every aspect of aerial operation. Everyone in aviation should realize the limits to which man can be subjected.

Most pilots go through four stages in their pilot careers. In the first, flying is exciting and glamorous, bringing a sense of power which may lead the pilot to take undue risks unknowingly. At this time his mind can be molded in the wise use of his powers. The second stage (reached usually after two to four years of experience) may occur gradually or abruptly; the newness has worn off, and the pilot has learned the structural, mechanical and performance limitations of his plane and appreciates the hazards of flying. After about ten years, the third psychological stage is reached, characterized by gradual increase in conservatism. Sustained stresses at work or at home may have produced a marked apprehension towards his occupation. This occasions one of the most critical situations in the career of an airman--the conflict between necessity (to earn a living by flying) and fear (of flying) creates a tension. The fourth stage is not usually reached until the late thirties when the airman has successfully passed through the preceding stages and has acquired that conservatism resulting from increased age and sagacity.

In selecting flying personnel, it is still hard to detect every case of imbalance, nor will careful initial selection entirely eliminate possible later deterioration.

Accidents directly attributed to human error are normally classed as: (1) Errors of judgment, (2) poor technique, (3) disobedience of orders, (4)carelessness, (5) negligence. These main causes result from lack of experience (perhaps the main cause of accidents), poor physical condition or the presence of physical defects, the psychological condition of the airman at the time, or poor reaction. Temperament and habit play a big role in accident frequency. (Journal of Aviation Medicine 23(1):89, Feb. 1952)

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Newton, John M. 1959 TRAINING EFFECTIVENESS AS A FUNCTION OF SIMULATOR COMPLEXITY
(U.S. Naval Training Device Center, Port Washington, New York) Technical Report: NAVTRADEVCEN 458-1 ASTIA AD 230 996

ABSTRACT: The purpose of this study was to compare the effectiveness of training devices having various degrees of simulation of an operation task. The task selected for study was one-man control in course and depth of a high-speed submarine. The performance of depth changing only, course changing only and simultaneous depth and course changing were measured on submarine steering and diving trainers. Although there were no significant differences among the proficiency scores obtained under the 5 conditions, the general trend is for the mean scores to be ranked in order of simulator complexity. Thus, scores of the subjects trained on the same simulator on which they were tested were consistently higher; subjects trained on the PACE computer were second, followed by those trained with the 20-amplifier Donner computer, 18-amplifier Donner computer with motion in tilt-table and the 18-amplifier Donner computer with no motion in the tilt-table. For training device design, this study provides valuable information on the degree to which an operational situation can be simulated for effective training to occur. The results of this study indicate that the submarine equations of motion can be satisfactorily approximated by an analog computer program employing either 18 or 20 amplifiers. However, in view of the increase in effectiveness at relatively small increase in cost, the 20-amplifier trainer is recommended.

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New York Academy of Sciences 1958 SYMPOSIUM ON MAN IN SPACE: A TOOL AND PROGRAM FOR THE STUDY OF SOCIAL CHANGE. Ann. N.Y. Acad. Sci. 72:167-214

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Nichols, G. 1954 DYNAMIC RESPONSE OF RESTRAINED SUBJECT DURING ABRUPT DECELERATION. (Northrop Aircraft Inc., Hawthorne, Calif.) Rept. No. NAI-54-585

ABSTRACT: The tolerance of the human body to the forces, external and internal, encountered during periods of abrupt deceleration has become a factor of considerable importance in modern aviation. When a decelerating force is applied to the supporting vehicle, the subject is exposed to a realistic condition of abrupt deceleration. The G-time pattern of force applied to the supporting test vehicle can be controlled within limitations of the test facility. The G-time pattern encountered by a restrained subject, however, is a dependent complex function---the dynamic response of the combined subject restraint system to the basic forcing function (G-time pattern) applied to the supporting vehicle. The object of this study is to indicate the relationship of the many variables involved in the action and to determine, for given basic forcing functions, the effect that varying the characteristics of various elements of the system has upon the response force patterns imposed upon the restrained subject.

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Nicholson, F.T. 1957 CHANGES IN AIRCRAFT SIMULATION FOR HUMAN CENTRIFUGE (Naval Air Development Center, Johnsville, Pennsylvania) NADC Technical Note 57-44-DB, 30 July 1957

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Nicoll, N.R. 1954 DESIGN OF THE LIFE COMPARTMENT NECESSARY FOR SPACE TRAVEL Brit. Interplan. Soc. J. 13:277-282, Sept. 1954

ABSTRACT: The composition of the life compartment of a spaceship is dealt with and an overall weight of under one ton is developed as being realistic. The compartment is of double-wall construction, containing equipment for atmosphere control, variations in g and other necessities for the survival of a crew of thirteen for 15 days.

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Nieto Boque M. 1961 GRAVITY AND ITS REPERCUSSIONS ON MAN. STUDY OF ITS PHYSIOLOGICAL ACTION IN "TERRESTRIAL MAN" FOR THE PURPOSE OF UNDERSTANDING ITS ACTION ON "PLANETARY MAN".
In Bol. Cons. Gen. Colleg. Med. Esp. 24:11-32, April 1961 (Spain)

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Nikolaev, A.G. & P.R. Popovich 1962 MY ZHILI I RABOTALI V KOSMOSE (We Lived and Worked in Space) Priroda (Moskva), (9):10-16, Sept. 1962

ABSTRACT: The authors relate their experiences on the orbital flights of Vostok-3 and Vostok-4. While in flight, they did not experience vestibular disturbances, lack of appetite, or insomnia. No unpleasant sensations resulted when moving in the cabin. They regard a six-hour sleep as adequate. Psychologically the most unpleasant moment during the flight was the re-entry. In the opinion of both cosmonauts, a prolonged space flight does not impair the physical capacity of the human organism. (Aerospace Med. 34(8):769, Aug. 1963)

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Nikolayev, A. 1960 ASTRONAUTS ARE DONNING HELMETS
Sovetskaya Rossiya (Moscow) P. 4; 19 May 1960.

ABSTRACT: This article deals with the medical and biological problems which must yet be solved before a human astronaut can be sent into interplanetary space. The principle factor which adversely affects the organisms of humans and animals at high altitudes is oxygen insufficiency. Another problem is great acceleration during take-off. Acceleration seriously affects blood circulation unless the passenger is wearing an anti-G suit. Weightlessness is the third important problem that will be encountered beyond the earth's gravitational pull. Absence of gravitational pull is beneficial to the heart. Respiration and the function of the gastrointestinal tract change substantially in outer space. Disruption in muscular coordination and disorientation have been noted during the period of weightlessness. Supplying the crew of a space vehicle with food and water is a difficult problem. (CARI)

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Nikolayev, A. 1960 ASTRONAUTS PUT ON SPACE SUITS
Sovetskaya Rossiya P. 4; 19 May 1960.

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Novikov, K. & B. Shchandronov 1960 ALTITUDE IS 450 km
Sovetskaya Rossiya P. 4; 20 May 1960.

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Niven, J.I. and Graybiel, A. 1953 DIRECTIONAL SENSITIVITY OF SEMICIRCULAR CANALS FOLLOWING UNILATERAL LABYRINTHECTOMY IN MAN. J. Appl Physiol. 6(6):379-386

ABSTRACT: It has been established that angular acceleration is a sufficient stimulus for the semicircular canals. Another problem, that of whether a given semicircular canal may respond to rotation in either direction in its own plane, has not been answered as satisfactorily. One school of thought holds that response is unilateral, in the direction of rotation. The other holds that there is a two-way response in a given canal, depending on the direction of rotation.

In this study, to find the responses in humans, tests of the duration of oculogyrol illusion were made in patients who had had one labyrinth removed. Periods of twelve to twenty-nine months had elapsed between the operation and these experiments. The patients were exposed to clockwise and counterclockwise rotations at speeds of 1 to 10 rpm. The duration of the oculogyrol illusion and of sensations of apparent bodily rotation after motion was stopped were used as indicants of vestibular functions. Contrary to expectation, no consistent differences were found in durations following rotation in both directions.

The theory of unidirectional sensitivity has been generally attributed to Ewald's Law). He stated that the horizontal semicircular canal is maximally stimulated by an ampullopetal flow of the endolymph causing nystagmus toward the side of the maximally stimulated canal, and minimally stimulated by ampullofugal flow causing nystagmus to the oppostie side. Actually, the findings in this study seem to support a didirectional sensitivity although with a bias in favor of a particular direction. The phrase "directional preponderance" as used by some workers would be preferable.

3,771

Niven, J. I., & A. Graybiel 1953 POSTURAL EQUILIBRIUM IN MAN FOLLOWING UNILATERAL LABYRINTHECTOMY. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. MR005.13-6001.1.34., 16 Jan. 1953, ASTIA AD-8763

ABSTRACT: Standing tests are not of value in discriminating unilateral malfunctioning of the otolith organs. There is no especial advantage in the use of tilted standing boards and indeed, at angles of tilt greater than 20°, effects due to loss of equilibration may be confounded with those due to the overcoming of sliding friction. Five individuals with unilateral labyrinthectomy displayed a considerable reduction in the length of time they were able to maintain a standing position on one leg with vision exkluded. Average times ranged from 2.06 to 5.83 seconds with the right leg and 2.36 to 5.75 seconds with the left leg. (Authors' summary)

3,772

Niven, J. I., & A. Graybiel 1953 RESIDUAL EFFECTS ATTRIBUTABLE TO THE SEMICIRCULAR CANALS FOLLOWING UNILATERAL LABYRINTHECTOMY IN MAN. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. MR005.13-6001.1.36., 21 May 1953, ASTIA AD-17 610

ABSTRACT: It is known that angular acceleration is a sufficient stimulus for the semicircular canals. It has not been established so well as to whether the response of individual canals is bidirectional or unidirectional, especially in the case of man. Ewald's Law states that a given horizontal semi circular canal is maximally sensitive to ampulopetal flow resulting from ipsila teral rotation. In this study five unilaterally-labyrinthectomized, female subjects were exposed to clockwise and counterclockwise rotations at speeds of 1 to 10 rpm. The duration of the oculogyral illusion and of sensations of apparent bodily rotation following cesation of rotation were used as indicants of vestibular functions. Contrary to expectation, no consistent significant differences could be found in durations following rotation in both directions. It was concluded that Ewald's Law as usually defined does not hold for man. (Authors' summary)

3,773

Niven, J.I. 1958 PREVIEW OF THE HUMAN ANGULAR ACCELERATION DEVICE. Contact 16(1):26-28.

3,774

Niven, J. I., & W. C. Hixson 1961 FREQUENCY RESPONSE OF THE HUMAN SEMICIRCULAR CANALS. I. STEADY-STATE OCULAR NYSTAGMUS RESPONSE TO HIGH-LEVEL SINUSOIDAL ANGULAR ROTATIONS. (Naval School of Aviation Medicine, Pensacola, Fla.; In cooperation with National Aeronautics and Space Administration) Rept. No. 58; Proj. MR005.13-6001; ASTIA AD-262 788; 10 March 1961

ABSTRACT: The use of a transition technique for quantifying nystagmic response to semicircular canal stimulation by high level, sinusoidal angular accelerations is presented. The frequency response characteristics were evaluated from corneo-retinal potential recordings obtained at rotation frequencies from 0.02 to 0.20 cps with a constant peak acceleration of 40 degrees. It was found that the human labyrinth behaves as a heavily-damped, second-order mechanical system during steady-state stimulation. (AUTHOR)

3,775

Noble, C. E. 1949 THE PERCEPTION OF THE VERTICAL. III. THE VISUAL VERTICAL AS A FUNCTION OF CENTRIFUGAL AND GRAVITATIONAL FORCES. J. Exp. Psychol. 39(6):839-850, Dec. 1949

SUMMARY: 1. This research has been concerned with establishing the quantitative

relathinship obtaining between the resultant of centrifugal and gravitational forces and the judgment of visual verticality in three Ss deprived of a visual frame of reference in a human centrifuge.

2. The experimental procedure was as follows: Ss were placed individually in a human centrifuge and exposed to eight different velocities of rotation. A luminous line was presented in darkness, and S was required to adjust it to phenomenal verticality a number of times under both stationary and rotary conditions, according to the psychophysical method of average error.

3. Statistical analysis of the data was made in terms of constant and variable errors.

4. The function investigated has been found to be a linear relationship; i.e., the visual vertical varies directly with the angle of resultant force.

5. There were individual differences in constant and variable errors during stationary conditions, but the combined data indicated that judgment of the visual vertical was both accurate ($\overline{CE} = -0.38^{\circ}$) and percise ($\sigma = 1.30^{\circ}$).

6. Intra-individual differences were greater during rotation than during stationary conditions.

7. These findings are interpreted as confirmation of Mach's hypothesis of the physical force determinants of psychological verticality. They are also consistent with the viewpoint that visual orientation, under the conditions of these experiments, is primarily dependent upon somesthetic factors rather than upon visual Gestalten.

3,776

Noble, Clyde E. 1949 THE PERCEPTION OF THE VERTICAL. IV. THE VISUAL VERTICAL AS A FUNCTION OF CENTRIFUGAL AND GRAVITATIONAL FORCES
(U.S. Naval School of Aviat. Med., Pensacola, Fla. and Tulane University, La.)
Joint Project Report No. 7 Proj. NM 001 037 ASTIA ATI 80 465
See also: J. Exper. Psych. 39: 839

ABSTRACT: This investigation was designed to establish the quantitative relationship obtained between the resultant of centrifugal and gravitational forces and the perception of the visual vertical in humans deprived of a visual frame of reference. Three Ss were used in a series of experiments in a human centrifuge which was provided with blackout arrangements and electrical devices for recording the angle of resultant force and Ss determinations of the visual vertical. Ss were exposed to eight velocities of rotation, varying from 4 rpm. to 11 rpm. They were required to adjust a luminous collimated line to phenomenal vertically a number of times under both stationary and rotary conditions, according to the psychophysical method average error. The results of these experiments are interpreted as evidence in support of Mach's hypothesis, that subjects adjust the visual vertical in accordance with the resultant of centrifugal and gravitational forces. They are also consistent with the viewpoint that visual orientation, under the specified conditions, is primarily dependent upon postural factors.

3,777

Noble, C.E. 1949 THE PERCEPTION OF THE VERTICAL. IV. THE VISUAL VERTICAL AS A FUNCTION OF CENTRIFUGAL AND GRAVITATIONAL FORCES.
J. Exper. Psych. 39: 839-
See also: U.S. Naval School of Aviat. Med., Pensacola, Fla. Proj. NM 001 037 Joint Rept. No. 7 with Tulane University

ABSTRACT: The quantitative relationship between the resultant of centrifugal and gravitational forces, and the perception of the visual vertical in humans deprived of a visual frame of feference, was established. The experiments were performed on a human centrifuge provided with blackout arrangements and electrical devices for recording the angle of resultant force and the test-subjects' determinations of the visual vertical. Statistical analysis of the data was made in terms of constant and variable errors. The visual vertical was found to vary directly with the angle of resultant force. The results of the experiments are interpreted as evidence in support of Mach's hypothesis that subjects adjust the visual vertical in accordance with the resultant of centrifugal and gravitational forces.

3,778

Noble, H & L.P. Domzalski 1961 EVALUATION OF HUMAN SUBJECT REACTION IN THE FORWARD AND AFT FACING SEATED POSITIONS.
(Air Crew Equipment Lab., Naval Air Material Center, Philadelphia, Pa.)
Report No. NAMC-ACEL-424, 9 Feb. 1961. ASTIA AD 259 071

ABSTRACT: This report presents a comparative examination of the reactions of human subjects to simulated crash acceleration forces, when seated in a standard Navy passenger seat aligned in either the forward of aft facing position. Environmental parameters such as seat acceleration, and velocity; anthropomorphic dummy motion and acceleration; human subject motion and acceleration; and distribution of seat member loads during a series of simulated crashes are discussed. (Author)

3,779

Noble, R.L. & J.B. Collip 1942 A QUANTITATIVE METHOD FOR THE PRODUCTION OF EXPERIMENTAL TRAUMATIC SHOCK WITHOUT HEMORRHAGE Quart J. Exper. Physiol., 31:187

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Noble, R. L. 1945 OBSERVATIONS ON VARIOUS TYPES OF MOTION CAUSING VOMITING IN ANIMALS. Canad. J. Res. E. 23:212-225

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Noble, R.L 1946 STUDIES ON EXPERIMENTAL MOTION SICKNESS Bull New Eng. Med. Ctr. 8:49

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Noble, R.L. 1946 TREATMENT OF EXPERIMENTAL MOTION SICKNESS IN HUMANS. Can. J. Res. E. 24:10-20

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Noble, R.L., E.A. Sellers, and C.H. Best 1947 THE TREATMENT OF MOTION SICKNESS (A REVIEW OF THERAPEUTIC STUDIES). Canad. M.A.J., 56:417

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Noble, R.L. 1948 MOTION SICKNESS: WITH SPECIAL REFERENCE TO AIRSICKNESS. Practitioner 160:453-458.

3,785

Noble, R.L. & N.B.G. Taylor 1953 ANTIDIEURETIC SUBSTANCES IN HUMAN URINE AFTER HEMORRHAGE, FAINTING, DEHYDRATION AND ACCELERATION. J. Physiol. 122:220-237

ABSTRACT: The urine of human subjects, voided after venesection, fainting and black-out due to centripetal acceleration, has been extracted by a method employing adsorption on zinc ferrocyanide and the extracts tested for anti-diuretic activity by the rat method of Burn.

In fourteen venesection experiments, seven subjects fainted and seven did not. There was no quantitative correlation between the amount of blood withdrawn and the occurrence of fainting.

Three additional subjects fainted following physical or psychic trauma not associated with venesection or more than slight blood loss.

All subjects who fainted subsequently excreted an antidiuretic substance in the urine.
No antidiuretic substance was found: (1) in the urine of subjects who did not faint; (2) in the pre-syncopal urine of the subjects who fainted; and (3) in the urine voided before or after black-out.

The failure to detect antidiuretic substance in the urine of normal subjects should not be taken as a statement that such urine contains no anti-duretic substance. The point to be made is that, under standardized conditions of extraction and assay, antidiuretic substance was found under experimental conditions and not in the controls.

The excretion of antidiuretic substance appears to be related directly to fainting and only indirectly to the stimulus which initiates the faint or to cerebral anoxia. Fainting and black-out are basically different reactions.

Our observations are in agreement with the hypothesis of Brun et al. that there is a liberation of hormone from the neurohypophysis during or after fainting.

3,786

Noble, R.L. 1955 MEDICATION FOR MOTION SICKNESS PRIOR TO AND DURING WORLD WAR II. Int Rec Med 168:1-12, Jan 1955

3,787

Nolan, A. C., H. W. Marshall, L. Cronin, & E. H. Wood 1962 DECREASES IN ARTERIAL OXYGEN SATURATION AS AN INDICATOR OF CARDIOPULMONARY STRESS DURING FORWARD (±Gx) ACCELERATION. (Paper, 33rd Annual Meeting of the Aerospace Medical Assoc., Atlantic City, N. J., 9-12 April 1962)

ABSTRACT: Blood oxygen saturation was recorded by ear oximetry and by cuvette oximetry in blood withdrawn continuously from the radial artery during 3-4 minutes at 2.1, 3.7, 5.4 and 6.5 G in eight subjects. Observations were made when air and 99.6% oxygen were breathed. Thoracic roentgenograms were obtained before the 30-50 seconds and 5 minutes after 5.4 and 6.5 G. In five subjects pressure was recorded in the aorta, radial artery, right atrium, esophagus and rectum (intra-abdominal). While air was breathed, a progressive decrease in arterial oxygen saturation from control value of 97.5% occurred with increasing levels of G, beginning about 10-25 seconds after onset of peak acceleration, which attained a stable level of 87.5% by cuvette and 86% by earpiece after 130 seconds at 5.4 G. When the centrifuge was stopped, a return toward control value occurred, but recovery was incomplete during the ensuing 1 minute or more. When oxygen was breathed, the decrease was prevented or its onset delayed, and its magnitude reduced, 93% being the minimal figure obtained. Comparative studies in the mercury couch (legs flexed) position and with legs extended parallel to the floor of the cockpit yielded closely similar results. Progressive increase in right atrial pressure occurred with increasing G, reaching a mean of 29 mm. Hg (3 times control) at 5.2 G. Esophageal pressure increased similarly, but to a lesser mean of 20 mm. Hg (control -1) at 5.2 G. It is postulated that the oxygen desaturation is due to blood flow past atelectatic alveoli in dependent portions of lungs, atelectasis resulting from increased segmental blood volume and pressure due to hydrostatic effects, plus an apparent increase in intrathoracic pressure. Changes indicative of atelectasis in lower lung fields were demonstrable roentgenographically after exposures to 5.4 and 6.5 G when oxygen was breathed. (J. Aerospace Medicine 33(3):347, Mar. 1962)

3,788

Nolan, A.C., H.W. Marshall, L. Cronin, W.F. Sutterer & E.H. Wood 1963 DECREASES IN ARTERIAL OXYGEN SATURATION AND ASSOCIATED CHANGES IN PRESSURES AND ROENTGENOGRAPHIC APPEARANCE OF THE THORAX DURING FORWARD ($+G_x$) ACCELERATION Aerospace Medicine 34(9): 797-813

ABSTRACT: Progressive decreases in arterial oxygen saturation with increasing degrees of forward acceleration have demonstrated in eight normal subjects. At 5.6 G, arterial oxygen saturation began to decrease from the control value of 97% after about 10 to 20 seconds and reached an average value of 86% after 130 seconds of exposure. Changes compatible with atelectosis were seen in thoracic roentgenograms made after exposures to 5.6 and 6.4 G when 99.6% oxygen was breathed. It is postulated that arterial desaturation during forward deceleration is due to flow of pulmonary capillary blood past poorly ventilated or atelectatic alveoli in dependent portions of the lungs, so that large veno-arterial shunts are created. The atelectosis is thought to result from the increased effective weight of the blood and lung parenchyma caused by acceleration resulting in increased segmental blood volume, increases in intravascular and extravascular pressures due to hydrostatic effects in the dependent regions of the lungs plus associated increases in intrapleural pressure in these regions.

3,789

Nonweiler, T. 1951 DESCENT FROM SATELLITE ORBITS USING AERODYNAMIC BRAKING Brit. Interplan. Soc. J. 10:258-274, Nov. 1951.

Also in Carter, L.J. ed. The Artificial Satellite. Proceedings of the Second International Congress on Astronautics (London, British Interplanetary Society, 1952), pp. 26-42.

3,790

North American Aviation 1960 CENTRIFUGE PROGRAM FOR A3J-1 SPIN SIMULATION, ENCLOSURES 8-20, JANUARY, 1960. (North American Aviation, Inc., Los Angeles, Calif.)

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North American Aviation, Inc. 1960 TECHNICAL FEATURES OF THE DYNAMIC FLIGHT SIMULATOR (G SEAT). (Columbus, Ohio) Report No. NA 60 H-442, 12 Sept. 1960.

3,792

North American Aviation, Inc., 1961 AERIAL AND SLED TESTING OF THE B-70 AIRCREW ESCAPE CAPSULE. (North American Aviation, Inc., Los Angeles) Rept. no. NA 60-1133, ASTIA AD-268 511, Oct. 1960

ABSTRACT: Aerial and sled ejection tests are described wherein the B-70 escape capsule has passed or favorably exceeded specification in the following categories: (1) parachute deployment through complete range of indicated airspeeds. (2) rate of descent; (3) low altitude airdrops of capsule; (4) 20,000 and 40,000 ft airdrops of capsule; and (5) safe escape at ground level at airspeeds of 90 knots through maximum. Remaining to be tested are performance at high Mach number and high dynamic pressure, with continued development in the areas of ground and water impact and environmental control. (Author)

3,793

North American Aviation, Inc. 1961 PROJECT APOLLO; PRE-CONTRACTURAL DOCUMENTATION AND ORBITAL RENDEZVOUS: A LITERATURE SURVEY (North American Aviation, Inc. Downey, Calif.) Rept. no. SID 61-470, 29 Dec. 1961

ABSTRACT: A review of literature on Project Apollo and Orbital Rendezvous, in two parts, from August 1959 to December 4, 1961 is given. The references are listed alphabetically bycorporate author and periodical title in one alphabet. Following the bibliography are both author and subject indexes. (Author)

3,794

North American Aviation, Inc. 1962 PARAGLIDER SPACE SCIENCES COMMITTEE BRIEFING (North American Aviation, Inc. Space and Information Systems Div., Downey, Calif.)20 July 1962 NAA-SID-62-915

3,795

North Atlantic Treaty Organization 1955 COLLECTED PAPERS ON AVIATION MEDICINE. (presented at Aero Medical panel meetings of the Advisory Group for Aeronautical Research and Development, Palais de Chaillot, Paris.) (London: Butterworth Scientific Publications, 1955)

See entry under AGARD, NATO 1955.

3,796

North, W. C., & J. A. Wells 1952 MODIFICATION BY PREVIOUS TRAUMA AND TEMPERATURE OF TOLERANCE TO TUMBLING SHOCK IN RATS. (Dept. of Pharmacology, Northwestern Univ. Med. School, Chicago, Ill.)

ABSTRACT: It has been reported that rats subjected to previous trauma become resistant to an otherwise surely fatal amount of tumbling by the method of Noble and Collip. In our studies a significant degree of protection from normally fatal trauma (700 turns) was provided by tumbling rats at 400 turns 24 hours previously. This protection was complete if the pretrauma was given 48 hours before, and absent if given 0.5, 3, or 6 hours prior to testing. Another experiment demonstrated that the amount of preliminary trauma was of importance; 100 and 200 turns 24 hours before tumbling did not confer tolerance to 700 turns, whereas 300 and 400 turns did. Tolerance thus acquired appears to persist over a period of at least 6 months. Variation in susceptibility to other types of shock with temperature change has been reported. In our studies significant protection can be conferred by heating rats at 40 degrees C. for 4 hours immediately after tumbling is significantly greater than that of unheated controls. Placing rats in a refrigerator at 4 degrees C. for 4 hours before, or 4 hours after tumbling did not alter their mortality. Adrenalectomized animals are more susceptible than normal rats to this type of trauma, but prolonged administration of cortisone or ACTH to intact rats failed to affect their susceptibility to tumbling.
(Federation Proceedings 11(1):380, 1952)

3,797

Northrop Aircraft Inc., Mfr. n.d PHOTO, CREW DECELERATION DEVICE.

ABSTRACT: This is a human decelerator--a device built in 1947 for producing and studying the effects on human beings of the conditions that occur in crashing, ditching, and parachute-opening shock. Controlled decelerations up to 50 G for a duration of 0.1 second can be obtained. (coming to a full stop in 3 ft from 60 mph is equal to 46.6G)

This 1500 lb tubular--steel carriage operates on a 2,000 ft railroad track. Speeds up to 200 mph are attained by using 1 to 4 rocket motors. This decelerator is now in the museum at Wright-Patterson AFB, Ohio.

3,798

Northrop Aircraft, Inc. Sept. 1946 INVESTIGATION OF BRAKE SHOES FOR CREW DECELERATION DEVICE, PROJECT 27. 25 Sept. 1946 (not prepared for distribution)

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Northrop Aircraft, Inc. Oct. 1947 STATUS REPORT - CREW DECELERATION DEVICE, PROJECT 27. Rept. No. SP-1, 31 October 1947

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Northrop Aircraft, Inc. 1955 NORTHROP DEMONSTRATION DECELERATOR
Northrop Aircraft, Inc., Report Nr NAI-55-821, September 1955.

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Northrop Aircraft, Inc. 1955 EQUIPMENT FOR ABRUPT DECELERATION EXPERIMENTATION (Northrop Aircraft, Inc.,) Rept. NAI-55-202, Feb. 21, 1955

3,802

Northrop Corporation 1960 THE SPACE STABILITY SIMULATOR, AN ADVANCED CONCEPT IN SPACE TRAINING DEVICES DESIGNED AND ENGINEERED BY ADVANCED SYSTEMS SECTION (Norair Division, Hawthorne, California) June 1960

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Norton, F.H. and E.T. Allen 1921 ACCELERATIONS IN FLIGHT.
(National Advisory Committee for Aeronautics) NACA Rept. No. 99.

3,804

Norton, F.H. and F.P. Warner 1921 ACCELEROMETER DESIGN.
(National Advisory Committee for Aeronautics) NACA Rept. No. 100

3,805

Norton, F.H. & T. Carroll 1923 THE VERTICAL, LONGITUDINAL AND LATERAL ACCELERATIONS EXPERIENCED BY AN S.E. 5A AIRPLANE WHILE MANEUVERING.
(National Advisory Committee for Aeronautics, Washington, D.C.)
NACA Rept. No. 163.

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Norton, T.W., & L.E. Manning 1932 THE PHYSIOLOGY OF ACCELERATION. ASTRONAUTICS, No. 21, 4-6, 20 July 1932

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Noto, B. and G. Sortino 1951 SINDROME DI KUMMEL-VERNEUIL APPARENTEMENTE CONSECUTIVA A INCIDENTE DI VOLO (Kummel-Verneuil Syndrome Apparently Following An Airplane Accident) Rivista di Medicina Aeronautica, Rome, 14:480-484, July-Sept. 1951

3,808

Notterman, J.M. 1960 VISUAL DSICRIMINATION OF VELOCITY AND ACCELERATION (Princeton U., N.J.) Project 9778(805); Contract AF 49(638)-381; AFOSR, DLS

ABSTRACT: Research will be undertaken on the human ability to detect velocity and acceleration differences, and on the relation of perceived to actual velocity as it influences response capability. This exploratory work on the correlation between the human's visual error-detection characteristics and error-correction behavior has as its objectives the addition of new knowledge relating to visual discriminatory processes, and theoretical implications with respect to visual sensory and perceptual mechanisms.

3,809

Numeroso, N. 1951 UN LABORATORIO VOLANTE PER RICERCHE PSICO-FISIOLOGICHE. (A Flying Laboratory For Psychophysiologic Research) Rivista di Medicina Aeronautica, Rome, 14:111-116, Jan.-March 1951

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Nuttall, J. B., & W G. Sanford 1956 SPATIAL DISORIENTATION IN OPERATIONAL FLYING. (Directorate of Flight Safety, USAF) Publication M-27-56, 12 Sept. 1956

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Nuttall, J. B. 1958 THE PROBLEM OF SPATIAL DISORIENTATION. J. American Medical Assoc. 166(5):431-438, Feb. 1958

ABSTRACT: Eighteen cases of spatial disorientation due to illusions of attitude and motion are summarized in this article and used to illustrate the

requency with which this type of disorientation causes aviation accidents. he following factors contributing to the illusions of attitude and motion are onsidered: (1) misinterpretation of gravitational forces, (2) erroneous sensa- tions of rotation, and (3) Coriolis acceleration, or the illusion caused by head movement. The recommendations which are made concern the more thorough indoctrination of pilots in the causes of spatial disorientation and the necess- ity for better cockpit designs.

ACCELERATION

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3,812

Oakes, W. F., & J. H. Hollis 1959 EFFECTS OF ACCELERATION FORCES ON LEVER PRESSING BY THE WHITE RAT. Psychol. Rept. 5:143-147

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Oberth, H. 1929 CITES TSIOLKOVSKII ON IMMERSION IN LIQUID TO COUNTERACT G In Wege zur Raumschiffahrt (Munich: Oldenburg, 1929) p. 108

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Oberth, H. 1929 ACCELERATION In Wege zur Raumschiffahrt (Munich: Oldenburg, 1929) pp. 90-99

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Oberth, H. 1954 MENSCHEN IM WELTRAUM
(Dusseldorf: Econ, 1954)
English Translation: MAN INTO SPACE
(New York: Harper, 1957)

3,816

Oberth, Hermann 1957 MAN INTO SPACE, NEW PROJECTS FOR ROCKET AND SPACE TRAVEL.
(New York: Harper, 1957)

ABSTRACT: "One of the earliest and most widely known of the rocket research pioneers gives here some of his theories regarding man's first ventures into space. He discusses rocket satellites, the equipment necessary for individual survival, and the construction of space stations and vehicles for exploration of the moon..." (Booklist 53:553, July 1957)

3,817

O'Bryan, T.C., & H.G. Hatch 1959 LIMITED INVESTIGATION OF CRUSHABLE STRUCTURES FOR ACCELERATION PROTECTION OF OCCUPANTS OF VEHICLES AT LOW IMPACT SPEEDS. (National Aeronautics and Space Administration, Washington, D.C) NASA Technical Note D-158, Oct. 1959. ASTIA AD 227 649

ABSTRACT: A limited investigation was made to determine the characteristics of three materials to see how they can be applied for human protection against accelerations encountered at low impact speeds. As a result, if given man's physiological tolerance to abrupt acceleration, which has not yet been well defined, an alleviation system can be designed. Foamed plastics require considerable depth to provide a given stopping distance for impact alleviation and their use would require some control of rebound. They can be made soft enough to obtain the low onset of acceleration that may be necessary for man where depth is not limited. Aluminum honeycomb is an efficient material for impact load alleviation from the standpoint of usable material depth and it exhibits very little rebound. The stiffness of the material results in a very high initial onset rate of acceleration. For many installations this may be controlled by reducing the initial loading area of contact to get the material to start failing. (Author)

3,818

O'Donnell, A. 1958 LIST OF R.A.E. TRANSLATIONS ISSUED UP TO 30TH SEPTEMBER, 1958 (Royal Aircraft Establishment, (Farnborough) Ministry of Supply, London, W.C. 2) Library Bibliography No. 208 October, 1958 ASTIA AD 214325

ABSTRACT: This list supersedes the previous list (Library Bibliography No. 191). A number of the earlier translations in this list were subsequently issued as R.T.P. Translations, and have only been included for completeness.

3,819

O'Donnell, A. 1961 LIST OF R.A.E. TRANSLATIONS ISSUED UP TO 30TH SEPTEMBER, 1961. (Royal Aircraft Establishment, Farnborough) Library Bibliography No. 231, Oct. 1961. ASTIA AD 266614

ABSTRACT: This list supersedes the previous list (Library Bibliography No 225). A number of the earlier translations in this list were subsequently issued as R.T.P. Translations, and have only been included for completeness.

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Ogg, Richard N. 1957 PILOT DESCRIBES STRATOCRUISER DITCHING. Aviation Week, 66(12):133-142, 25 March 1957

3,821

Ogle, D.C. 1952 NEW CONCEPTS IN AVIATION MEDICINE Military Surgeon, 110(2): 87-91

ABSTRACT: The first part of the paper is dedicated to a brief review of the advances and problems of aviation medicine. Aviation medicine is not-as it is widely believed- a "general practice" type of medical endeavor; it is a science and a profession in its own right, tying together a variety of branches of medical and related natural sciences as well as engineering and such remote fields as astronomy and meterorogy. - In the second part the author discusses briefly, but in more detail, techniques developed recently to determine the effects of aging on flight personnel. A laboratory method is discussed for measuring the degree of physiological aging by making use of the correlation between the cholesterol content of the blood and arteriosclerosis (atheromatosis In conclusion, periodical, standardized, and exhaustive physical tests of pilots and airplane crews are recommended.

3,822

Ogle, D.C. 1957 PEOPLE FOR SPACE VEHICLES: SPACE MEDICINE. In: The Age of Space, pp. 25-29. (Birmingham, Ala: Southern Research Inst. 1957)

ABSTRACT: Many areas must be fully studied before the selection and training of human candidates suitable to withstand the traumatic influence of prolonged space living. These include the provision of air, water, food, and recreation within the sealed space vehicle as well as devising a means of waste elimination . Consideration must also be given to the protection of the astronauts from accelerative and decelerative forces; management of monotony and the break-off phenomenon, and protection from the hazards of magnetic storms, cosmic and ultraviolet radiations, temperature extremes, and meteorites.

3,823

Ogle, D. C. 1957 MAN IN SPACE VEHICLE U. S. Armed Forces Med. J. 8(11):1561-1570, Nov. 1957.

ABSTRACT: Discusses the hazards of the upper atmosphere and the physiological forces acting on man during a flight in space.

3,824

Ogle, D.C. 1958 THE THRESHOLD OF SPACE. AUQR 10:2-6.

ABSTRACT: An introduction to the AUQR's special issue "The Human Factor in Space Travel."

3,825

Ohmura, Y., M. Kawamata & M. Oshmia, Eds. 1959 SPACE MEDICINE
Summary trans. of mono. Uchu Igaku, Tokyo, 1959.
(Office of Technical Services, W shington, D.C.)
June 24, 1959 59-18432

ABSTRACT: The summary translation consists of the title of the book, the preface, the table of contents, which lists 20 chapters by 37 authors, and the translation of 2 Japanese reference titles.

3,826

Okunev, R. A. 1961 EXPERIMENT ON THE USE OF HYPNOSIS AND SUGGESTION FOR THE PROPHYLAXIS AND TREATMENT OF MOTION SICKNESS. Voyenno-meditsinskiy zhurnal 1961(12):72

ABSTRACT: The author carried out a special investigation to study the effectiveness of hypnosis in the prophylaxis and treatment of motion sickness in artificial (revolving in a Barani chair) a natural (sea travel) conditions. Sea sickness was considerable reduced, treatment effectiveness being directly proportional to the depth of the induced trance. After the treatment course, which averaged about 30 sessions, booster sessions were necessary at least twice weekly to maintain effectiveness. No harmful effects of treatment were recorded and machine conducted sessions were as effective as those conducted by a medical hypnotist.

3,827

Oliver, R.E. 1957 THE DESIGN OF THREE HORIZONTAL MOMENTUM EXCHANGE WATER BRAKES FOR THE U.S. NOTS 'SNORT' LIQUID ENGINE SLED (AER, Inc., Pasadena, Calif.) Contract N123(60530)11868A), NOTS TP 2390, NAVORD rept. no. 7024, Dec. 1957, ASTIA AD-236 335

ABSTRACT: Three momentum exchange water brakes were designed to produce decelerations of 10.6g $\pm$ 1.0g, 5.0g $\pm$ 0.5g, and 2.5g $\pm$ 0.25g for sled weights of 4,254, 4,254, and 10,800 lbs respectively, and water-contact velocities of 1,250, 1,250, and 636

ft/sec respectively. These decelerations were to be maintained until the sled velocity decreased to 300 ft/sec. The water surface profile was not specified beforehand, but was determined in conjunction with the design of the scoop shapes. One water surface profile was to be used for all three brakes. The combination of scoop shapes and water surface profile was obtained as a compromise between simple strong-scoop designs and minimum changes in the water surface from the 'natural' profile. This aspect of the design required the calculation, by numerical methods, of several sled trajectories (space-time histories). A primary consideration in the structural design of the brakes was simplicity. The stress analysis was carried out on the basis of a design stress of one-half the ultimate stress of the material. (i.e., a safety factor of 2.0 based on ultimate strength). In order to provide an experimental check on the predicted forces on the brakes, force-measuring mounts were included in the design. (Author)

3,828

Olmer, D. & I. Jacques 1928 TRANSIENT INCREASE IN BLOOD PRESSURE AND DECREASE IN PULSE RATE PRODUCED BY LEANING FORWARD
Compt. Rend. Soc. de Biol. 99: 169-170

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Olmer, D. & I. Jacques 1928 [TRANSIENT TACHYCARDIA CAUSED BY LEANING FORWARD.]
Compt. Rend. Soc. de Biol. 98:1141-1144, April 1928.

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Olof, Perey 1962 BIOMECHANICAL PROBLEMS OF THE LUMBAR SPINE
(In: Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography, National Academy of Sciences, National Research Council, Publication No. 977, pp. 25-26)

ABSTRACT: This paper is a detailed report of studies made on injuries to the vertebral column. The authors studied fractures of several age groups of the vertebral end-plates. Also, the static stress which can be tolerated by the lumbar veryebrae was a subject of research.

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Olson, O. C. 1945 MEETING OF THE 4TH CRASH INJURY CONFERENCE OF THE COMMITTEE ON AVIATION MEDICINE OF THE NATIONAL RESEARCH COUNCIL. (Aero Med. Lab, Air Tech. Service Command, Wright Field, Ohio) Memo Report TSEAL-3-698-32, 10 March 1945.

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Oppenheimer, M.J. & E.A. Spiegel 1940 ACQUISITION OF CONDITIONED REACTIONS TO ANGULAR ACCELERATION AFTER CORTICAL LESIONS Proc. Soc. exper. Biol. a. Med. 45:411-420 1940

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Ordway, F. I., III, & H. E. Canney, Jr. 1955 THE RESPECTABILITY OF ASTRONAUTICS AS REFLECTED BY RECENT DEVELOPMENTS IN THE UNITED STATES. In Hecht, F., ed., Bericht uber den V. Internationalen Astronautischen Kongress, Innsbruck, 5-7 Aug. 1954 (Wien, 1955) pp. 226-247

ABSTRACT: Traces the activities of various scientific disciplines toward the space flight goal.

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Ordway, F. I., III, & H. E. Canney, Jr. 1955 PHYSICAL AND MEDICAL RESEARCH OF THE UPPER ATMOSPHERE AND APPROACHES TO SPACE. In Hecht, F., ed., Bericht uber den V. Internationalen Astronautischen Kongress, Innsbruck 5-7 Aug. 1954 (Wien, 1955) pp. 238-244

3,835

Ordway III, F.I., & H.E. Canney, Jr. 1955 ASTRONAUTICS IN THE UNITED STATES Journal of Astronautics 2:9-13 Spring; Summer, pp 57-61, 77.

ABSTRACT: Part I quotes and comments on the ideas of some leading rocketeers on the possibilities of space flight; Part II discusses US developments in the field.

3,836

Ordway, F.I., III 1958 A SURVEY OF ASTRONAUTICAL PERIODICALS
Sky and Telescope 17:169-171, Feb. 1958

ABSTRACT: Surveys the leading periodicals, arranged by country, that are devoted primarily to rocketry and astronautics. Many include space flight and artificial satellite material.

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Ordway, F. I., III, J. P. Gardner, and M. R. Sharpe, Jr. 1962 BASIC ASTRONAUTICS: An Introduction to Space Science, Engineering, and Medicine. (Englewood Cliffs, N. J.. Prentice-Hall, Inc., 1962). (In C. W. Besserer and F. E. Nixon, Eds., The Prentice-Hall Space Technology Series, Mar. 1962).

3,838

Ordway, F. I. 1962 ANNOTATED BIBLIOGRAPHY OF SPACE SCIENCE AND TECHNOLOGY, WITH AN ASTRONOMICAL SUPPLEMENT.
(Washington Arfor Publication, 1962)

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O'Reilly, J.N. & S.R. Gloyne 1941 BLAST INJURY OF LUNGS The Lancet 241:423-8, Oct 11, 1941

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Orlacchio, A. W., & G. Hieber 1957 ACCELEROMETERS--WHICH TYPE FOR THE JOB?
Electron. Industr. & Tele-Tech 16:75-77, March 1957

ABSTRACT: The acceleration range, frequency response and accuracy of seven types of accelerometers are discussed. Ambient temperature conditions are also considered.

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Orlacchio, A. W., & G. Hieber 1957 TRENDS IN ACCELERATION MEASUREMENT
IRE Trans. I-6(2):93-98, June 1957

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Orlebar, A. H. 1933 DISCUSSION OF THE PAPER "The Physiological Limitations of Flying." J. Roy. Aero. Soc. 36:402.

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Ormerod, F.C. 1960 FUNCTION OF THE INNER EAR
(London U, Gt. Brit.) Contract AF 61(052)-221; Project 9777(805); AFOSR, DLS

ABSTRACT: The objective of this research is to elucidate the mechanism by which physical energy is transformed into nerve activity within the inner ear, particularly of the vestibular portion. The composition of the intimate structures of this area will be investigated, as well as the nature of their secretory products. Chemical substances known to alter the function of the ear will be applied and their effects on the secretory epithelium explored by isotopic techniques. Physiological and histological changes after degeneration of certain nerve fibers will be followed. These experiments will be done in various normal, injured and congenitally abnormal animals.

3,844

Orr, W.A. and J.W. Tucker 1958 GETTING MAN INTO SPACE
Aviat. Age 28:30-31, 102-105, March 1958

ABSTRACT: An overall view of the problems involved in space flight.

3,845

Orr, W. A. & J. W. Tucker 1958 DEVELOPMENT OF MANNED SPACE FLIGHT
Aviatiion Age 28:14-20, March 1958.

ABSTRACT: A visual summation of the many factors determining the development of manned space flight.

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Osborn, G.R. 1941 PULMONARY CONCUSSION ("BLAST") Brit. Med. J. 1:506-510

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Ostroumov, G. 1961 AN INTERVIEW WITH YURI GAGARIN
Soviet Rev. 2(5):47-52, May 1961.

ABSTRACT: An interview with the world's first astronaut, Yuri Gagarin, as reported in Izvestia on April 14, 1961, is reprinted here. Questions relating to the astronaut's emotional reactions toward his mission, sensations on weightlessness, what he could see from the spaceship, and various personal items are answered. (Tufts)

3,848

O'Sullivan, J. J. 1958 SPACE FLIGHT GROUND FACILITY REQUIREMENTS PROBLEMS - LAUNCHING FACILITIES.
(The RAND Corporation, Santa Monica, California) Rept. No. P-1431, 24 February 1958.

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Oswald, W.C. 1957 JEEP SEAT RIDE TEST
U.S. Army Contract No. DA-11-022-ORD-2480 14 Oct. 1957

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Ozolins, G. and V. Pelipeiko 1960 CILVEKS PASAULES TELPA (Man in Space)
Astronomiskais kalendars 1960 gadam (Rĭga), 8:102-112, (in Latvian).

ABSTRACT: This is a status report of the progress made towards space flight in the past year. Findings from laboratory experiments, rocket flights, and artificial satellites are briefly summarized in regard to the biological effects of weightlessness, g-forces, dysbarism, oxygen regeneration, etc. It is suggested that the gas exchange cycle may be better maintained by an artificial atmosphere of an oxygen-helium mixture, wherein nitrogen is replaced by helium. Among the problems raised are (1) the importance of maintaining the diurnal cycle on longer flights, (2) the movement of air within the cabin, and (3) the possible reaction of the human organism to the lack of rare gases in the cabin atmosphere.

ACCELERATION

P

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Pace, N. 1958 PROBLEMS IN SPACE PHYSIOLOGY
Publ. Astronaut. Soc. Pacific, 70(415):349-359, Aug. 1958.

ABSTRACT: A review of problems encountered in space flight including air content and pressure, waste disposal, food and water, radiation, g tolerance, and weightlessness.

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Page, H. E. 1950 VERTIGO INCIDENCE AMONG NAVAL AVIATORS (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. NM 001 110 500. 16., 15 March 1950

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Palmer, D.F. 1961 AN ACCURATE SHOCK CALIBRATOR FOR ACCELEROMETERS (Sandia Corp.) SCTM 96-61 (73)

ABSTRACT: A pendulum device using a force transducer is found to be an accurate shock calibrator for accelerometers.

3,854

Palmer, M. A., & R. S. Harper 1955 TECHNICAL PHOTOGRAPHY (HIGH SPEED - BLAST BIOLOGY) (U. S. Atomic Energy Commission, Wash., D. C.) Operation TEAPOT Rept. WT-1197, Dec. 1955 ASTIA AD-109 762

ABSTRACT: "The purpose of this project was to provide the photographic requirements for Civil Effects Test Group projects concerned with the biological phenomena of blast. Preshot and postshot photographs were obtained of animals and/or structures utilized by the above projects. High-speed motion picture sequences of group-shelter interiors containing animals were attempted-two during Apple I and two during Apple II. Traid 16-mm cameras were utilized at a speed of 200 frames/sec. Cameras started at H-2 sec and ran for a total of 20 sec. For various reasons, only one of the sequences was at all successful. Medical photographs of gross

specimens were obtained at the time of autopsy of experimental animals. Documentary and technical photographs were obtained for a project studying missile behavior Styrofoam cells showing evidence of missile penetration were photographed in a specially constructed grid providing a system of coordinates for accurate reference. A recommendation for such a project to maintain on-site processing facilities was made. Several conclusions were drawn regarding changes necessary to better assure motion picture results under extreme circumstances."

3,855

Palmer, M. A. 1958 HIGH-SPEED MOTION PICTURE PHOTOGRAPHY AS AN AID IN BIO-MEDICAL INVESTIGATION. (London: Pergamon Press, 1958) AGARDograph 25

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Palmisano, C. 1951 STUDIO DEL TONO LABIRINTICO E DEI RIFLESSI VEGETATI-VOLABIRINTICI IN SOGGETTI IMBARACTI SU NAVI DI SUPERFICIE E STUDIO DELLE VARIAZIONI DELL'ECCITABILITA VESTIBOLARE PER LO STI'MOLO FIXICO DI MOVIMENTI NAVE NELLA NAUPATIA (Labyrinth Tone and Autonomic Labyrinth Reflexes in Sailors and Variations of Vestibular Excitability Due to the Physical Stimulus of Ship Movements in Seasickness)
Annali di medicina navale e coloniale (Rome) 56(4): 424-426. July-Aug. 1951.

3,857

Pando, M. Velasco 1958 [ARTIFICIAL SATELLITES AND INTERPLANETARY TRAVEL: PHYSIOLOGICAL EFFECTS OF CHANGE IN GRAVITY.]
Revista de la Real Academia de Ciencias de Medris 52(2):141-145

ABSTRACT: A corrected and extended version of an analytical study on the launching of space rockets. Attempts to correlate a mathematically basic physiological and physical parameter.

3,858

Paolucci, G. 1961 [BODY LESIONS IN RELATION TO DECELERATION VALUES AND IMPACT TIME]
Rivista Di Medicine Aeronautica E Spaziale 24:234-244.

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Paolucci, G. 1961 [CORPOREAL LESIONS AS A FUNCTION OF DECELERATION VALUES AND DURATION OF IMPACT]
In Riv. Med. Aero. 24:234-244, April-June 1961 (Italy)

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Pape, R. W., & D. E. Goldman 1960 OBSERVATIONS ON DAMAGE TO EXPERIMENTAL ANIMALS EXPOSED TO MECHANICAL VIBRATION. (Paper, 31st Annual Meeting of the Aerospace Medical Association, Americana Hotel, Bal Harbour, Miami Beach, Fla., May 9-11, 1960)

ABSTRACT: Anesthetized male cats have been exposed to mechanical vibration in the range from 5 to 20 cps. Pulmonary hemorrhage and evidence of traumatic myocardial damage may occur if the acceleration exceeds about 5 G for a sufficient time. Both the frequency and severity of the injuries increase as the acceleration increases. When the acceleration exceeds about 10 G, death may result from the exposure. Minimal injury is indicated by delayed changes in cardiac potentials, which may, however, be reversible. Confirmatory evidence is obtained from post mortem and histological examination of tissues. Other observations have revealed a definite effect of the method of supporting the animals during exposure. (Aerospace Med. 31(4):317)

3,861

Pappas, Angelo 1961 REPORT OF HAZARD CLASSIFICATION TEST ON ROCKET CATAPULT MK2
(Ogden Air Materiel Area, Hill Air Force Base, Utah) November 1961
OOY-TR-61-44 ASTIA AD 267 292

ABSTRACT: The Safety and Inspection Branch requested the Explosives Evaluation Branch to conduct the necessary tests to establish the hazard classification of the completely assembled Rocket Catapult MK 2 used in the F-106A and F-106B aircraft.

To establish the hazard classification of the complete assembly, tests were devised to determine if propagation would occur between explosive items. One rocket motor of a catapult in a shipping container was primed and detonated to determine if propagation would occur between the two rocket motors of the catapult within the container.

Tests to determine propagation from one container to another were not performed because no propagation occurred within the single container.

The cook-off tests to determine the effect of fire on the firing mechanism, igniters and rocket motors resulted in ignition of one or both of the twin rocket motors of the catapult.

In the cook-off tests, five rocket motors ignited out of the six tested. Three catapults were used each containing two twin rocket motors.

As a result of these tests it is recommended that the explosive hazard classification of Quantity Distance Class 2, Storage Compatibility Group F and ICC Class B be assigned to the Rocket Catapult MK 2.

3,862

Parin, V. V. 1957-1959 O DEYATEL'NOSTI AKADEMII MEDITSINSKIKH SSU ZA 1957-1959 GG. (Activity of the Academy of Medical Sciences USSR in 1957-1959)
(Trans. of Akademiya Meditsinskikh Nauk SSSR. Vestnik, 15(5):8-22, 1960)
(Office of Technical Services, Washington, D.C.) 60-41255

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Parin, V.V. 1959 CERTAIN OUTCOMES AND FUTURE PROSPECTS OF RADIOELECTRONICS EMPLOYMENT IN MEDICINE AND BIOLOGY
(Trans. of Akademiya Meditsinskikh Nauk SSSR. Vestnik, 14(5):27-40, 1959)
(Library of Congress, Washington, D.C.) 59-13768

3,864

Parin, V. and V. Yazdovskiy 1959 COSMIC BIOLOGY
Trans. of Bol'shaya Meditsinskaya Entsiklopediya (USSR) 13:1176-1182, 2d ed., 1959.
July 13, 1960 JPRS: 5029

ABSTRACT: The accumulation of experimental data by means of rockets and artificial earth satelities has made it possible to solve many medical-biological problems associated with the penetration of man into space.

3,865

Parin, V. V. 1960 MAN IN SPACE
Tekhnika molodezhi 1960(11):19

ABSTRACT: The author describes the problems still to be solved before man can expect to set out on space travels. These problems include environmental effects upon the organism and the elaboration of methods and means to ensure its normal functioning. In the first place it is necessary to study, in all details, the factors of the means intended to safeguard the vital action of the organism and general flying safety. The knowledge of acceleration effects if also of importance. Seclusion over a long time in an isolated and narrow room, as is the flyers' cabin, is apt to cause severe psychological complications. The absence of habitual stimuli, the complete silence, darkness, weightlessness, perturbation in the normal alternation of day and night, work and rest, may cause distrubances in the psychic sphere and in blood circulation as well. Food and water supplies are one of the main problems, and so is the study of nutritive conditions. The conquest of space has to go through three stages: instruments, animals, man. The first two stages are being pushed on by powerful efforts, and have already yielded abundant and valuable material. While man has not yet launched on space travels himself, he has nevertheless succeeded in gaining insight into the mystery of space thanks to the latest complicated trials.

3,866

Parin, V.V. 1960 MAN WILL FLY TO THE STARS
Trans. of Zdorov'e (USSR) 6(11):2-3, 1960.
(Office of Technical Services, Washington, D.C.)
April 3, 1962 62-24914

3,867

Parin, V.V., M. Naydenov and others 1960 ELECTRONICS IN BIOLOGY AND MEDICINE
(Trans. from Znaniye-Sila (USSR) (4):8, 10-11, 1959)
(Office of Technical Services, Washington, D.C.) 60-11874

3,868

Parin, V.V. 1960 ON THE EVE OF THE SOLUTION OF THE PROBLEM
Trud P. 2; 17 May 1960.

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Parin, V. V., V. N. Chernigovskii, & V. I. Iazdovskii 1960 SOME RESULTS AND PERSPECTIVES OF RESEARCH IN THE AREAS OF COSMIC BIOLOGY. Izvestiia Akademii Nauk SSSR, Seria Biologicheskaia 25(1):3-18, Jan.-Feb. 1960
German Translation: Sovietwissenschaft: Naturwissenschaftliche Beitrage (Berlin) No. 7:677-689, July 1960
Abstract: Aerospace Medicine 31(11):958, Nov. 1960

ABSTRACT: The first stage of Soviet studies in cosmic physiology consisted in launching six rockets with two dogs in each. In this experimental series the possibility was proved of animal survival in a hermetic cabin during a rocket flight to an altitude of 100 km at a velocity up to 4212 km/hr. In the second series (nine rockets with two dogs in each) it was shown that the animals can be rescued when kept in nonhermetic cabins, by catapulting from altitudes as high as 100 km, and at velocities of 700 to 725 m/sec, as well as from 50-km altitudes, and velocities ranging from 1000 to 1150 m/sec. During the flight the condition of the animals was physiologically quite satisfactory. In the third series the altitudes were increased to 200-212 km, and some details of the experiment were modified. The results were on the whole similar to those referred to previously. Similar results have also been obtained from dogs in further experiments at altitudes up to 450 km. The experiment carried out on the second artificial Soviet satellite (Sputnik II) rendered it possible to study the effect upon the organism of acceleration, noise, and vibrations from the moment of launching up to entering the orbit as well as of prolonged absence of gravitation during the orbital flight. The general conclusion to be drawn from the biological experiment on the second Sputnik is that conditions still more like those of cosmic flight than those obtained in rockets are fairly well tolerated by highly organized

animals. The experiments should therefore be continued and extended still more actively. To solve the problem of the flight of the first cosmic ship with a man aboard, it is necessary to develop scientifically grounded principles of selection of people for this purpose. As to regeneration of the air, food provision, water supply, elimination of excretions, these questions are to be considered as more or less settled for relatively short cosmic flights. Prolonged journeys necessitate the development of devices which would transform the cosmic ship into a kind of a closed microcosm with its own cycle of substances.

3,870

Parin, V. 1960 GREAT EVE
Izvestiya P. 3; 17 May 1960.

3,871

Parin, V. V. 1960 FASTER AND HIGHER
Zdorov'ye (Moscow) 5:1-2, May 1960

ABSTRACT: The author recounts a number of electronic, atomic, and other marvels which would confront this man, after which he discusses the conquest of space, one of the most intriguing of contemporary problems. Space medical scientists have concluded that the efficiency and normal activity of a human organism is not disrupted in any way as a result of weightlessness. A long period of weightlessness may cause an inaccurate idea of the position of articles in space, a sensation of falling, mild vertigo, and weakness. All these manifestations are the result of disturbance of the normal function of the organs of equilibrium and the apparatuses of perception situated in the skin, muscles, tendons, etc. Sufficient data on the effects of acceleration on the organism have been collected. Experiments in which dogs were sent to altitudes of 100-450 kilometers, performed in the USSR since 1950, have made it possible to conclude that a living organism tolerates accelerations satisfactorily if it is placed in the cabin in the proper position. The action of G forces can be reduced considerably if special compensating garments which compress certain parts of the body and prevent vessels from being overfilled with blood, are worn. (CARI)

3,872

Parin, V. 1960 GET TO KNOW: SPACE BIOLOGY
Trud P. 3; 15 October 1960.

3,873

Parin, V. 1961 THANKS TO THIS DAY LIFE IS WORTH LIVING
Vestnik vozdushnogo flota 4: 53-55

3,874

Parin, V.V. & V.I. Iazdovskii 1961 PUT' SOVETSKOI KOSMICHESKOI FIZIOLOGII (Advances in Space Physiology in the Soviet Union)
Fiziologicheskii zhurnal SSSR (Moskva) 47(10): 1217-1226, Oct. 1961

ABSTRACT: The first and second stages of animal experiments in Soviet space medicine and biology were carried out with rocket flights. Satisfactory data were obtained on physiology and behavior under space-equivalent stresses and on the adequacy of heremetic cabins, cabin equipment, space suits, and recovery equipment. The orbital flight of the dog, Laika, confirmed that a highly organized organism can survive space flight in a satisfactory condition. Other satellite flights with different types of animals allowed continuous observations of their condition throughout the flight and during landing. The final stage was preceded by the selection and training of cosmonauts. The training program subjected the cosmonauts to simulated stresses gradually increasing in intensity until the levels expected in space were exceeded. Careful medical observations were made throughout the training. The results of this preparation were seen in the successful flight of Gagarin. In Titov's flight prolonged weightlessness affected his vestibular sense organs but not his efficiency. Recovery after the flight was rapid.

3,875

Parin, V. V. and V. K. Yazdovskii 1961 ADVANCES IN SOVIET SPACE PHYSIOLOGY. LIFE SUPPORT SYSTEMS: SOVIET LITERATURE.
Trans. of Fiziologicheskii Zhurnal (USSR) 47(10):1217-1226, 1961.
(Office of Technical Services, Washington, D.C.)
July 3, 1962 62-32110

3,876

Parin, V. 1961 TRAINING FOR SPACE FLIGHT
Znaniye - sila 1961(4):23-24

ABSTRACT: The article comments on the suggestion advanced recently by a group of American scientists of creating a "cyberneticized man". Such a man could function normally in space on, say, the moon without the encumbrance of a space suit. However, there is no guarantee that he would function benignly for prolonged periods. Better results, would be achieved by pretraining future astronauts to function under space conditions. Proper physical and psychological training of the astronaut is the best preparation for space flight, together with the development of all devices and equipment necessary to sustain life. Man can withstand

considerable gravitational stress if he is located transversely to the rocket's line of movement so that the stress acts laterally and not from head to foot along the body. Repeated exposure to acceleration was found to increase the subject's endurance. Automatic devices incorporated in the spacesuit could be set to constrict certain parts of the body depending on the acceleration. American scientists the author feels, underestimate the body's physiological and mental reserves. (CARI)

3,877

Parin, V. V. 1961 THE ROLE OF SPACE MEDICINE IN REALIZING THE FIRST MANNED SPACE FLIGHT. Meditsina i kosmicheskiye polety; sbornik 1961(9):4-12

ABSTRACT: The space flight by Yuriy Gagarin was the final stage of the initial period of space exploration, i.e., that of becoming familiar with space conditions Investigations were started 10-12 years ago into space medicine and biology. Dogs and small animals were used to ascertain the physiological reactions of space conditions. Acceleration from zero to first cosmic velocity with its displacement effect was one factor of great physiological importance. Another factor was the vibration transferred from the rocket to the beings in the capsule. The animal tests indicated that manned space flight in Soviet space-ships did not endanger health and working capacity of the astronaut. (CARI)

3,878

Parin, V. V. 1961 COSMOS -- EARTH.
Trans. of Ogonek (USSR) 39(17):26-27, 1961.
(Office of Technical Services, Washington, D.C.)
Jan. 21, 1963 63-15529

ABSTRACT: A nontechnical review of Soviet space biology experiments.

3,879

Parin, V. V. 1961 HOW THE FLIGHT WAS READIED.
Trans. of Zdorov'e (USSR) 7(6):4-5, 1961.
(Office of Technical Services, Washington, D.C.)
Jan. 18, 1963 63-15525

ABSTRACT: An account on medical and biological experiments, performed in preparation for the Soviet manned space flight program.

3,880

Parin, V. 1961 BIOLOGY AND SPACE.
Translated by Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio. Trans. no. FTD-TT-61-168, 21 November 1961 of Izvestiya, p. 6, 28 March 1961. ASTIA Doc. No. AD-267 714.

ABSTRACT: This report is a record of the problems solved by Soviet scientists in the field of space biology and medicine.

3,881

Parin, V.V. 1961 PRIMENENIE RADIOELEKTRONIKI V MEDITSINE I BIOLOGII
(Application of Radio-Electronics to Medicine and Biology)
(Trans. of mono. Elektronika v Medtsine (Electronics in Medicine) Moscow/Leningrad, p. 19-37, 1960)
(Office of Technical Services, Washington, D.C.) 61-28051

3,882

Parin, V. 1961 [BIOLOGY, TECHNIQUES AND SPACE]
Przeglad techniczny 1961(31):6-7

ABSTRACT: The article describes and praises Soviet space achievements, broadly outlines the need for close cooperation between the various scientific fields participating in the space program and the training of cosmonauts. After mentioning the April 12, 1961 flight of Gagarin, the author points out that a new science has been created as a result of the exacting demands of cosmic flight-space biology and medicine. In contradiscinction to the former concepts of biology, space biology and medicine are closely related and combine a number of other fields. A number of factors may influence the living organism in space. These were first determined in animals by the radiotelemetering method. The results of these first investigations in space physiology showed that during flight, right up to peak velocity and again during the space vehicle's deceleration period, the living organism is subjected to great strains on the heart and careful increase in acceleration; careful medical control was carried out during all training stages, assuring the perfect health of the cosmonaut. (CARI)

3,883

Parin, V. 1962 CAPACITIES OF THE HUMAN ORGANISM: DEFENSE MECHANISMS AND ADAPTATIONS IN CONDITIONS OF MAXIMUM OVERLOAD AND THE STATE OF WEIGHTLESSNESS.
In Perspect Biol. Med. 5:527-533, Summer 1962.

3,884

Parin, V. V. et al 1962 DEVICES TO PROTECT THE ORGANISM FROM G-FORCES AND IN THE WEIGHTLESS STATE.
Trans from Meditsinskli Rabotnik (USSR) 25:3, Feb. 6, 1962.
(Office of Technical Services, Washington, D.C.)
March 21, 1962 62-24337

3,885

Parin, V. V., V. I. Yazdovskiy, & O. G. Gazenko 1962 [EFFECT OF G FORCES ON THE CENTRAL NERVOUS SYSTEM](USSR) Meditsinskiy rabotnik, 6 Feb. 1962, p. 3, cols. 3-5

ABSTRACT: It is noted that reactions of astronauts to acceleration in actual space flight are more marked than indicated by data obtained in centrifuge tests and that the accompanying emotional stresses affect the response of the organism to various physical factors. In view of this, a study has been undertaken to determine the mechanism by which G forces affect the central nervous system. Certain pharmacological agents have been used to lessen or change the bioelectric reaction of the respiratory and cardiovascular systems to effects of excess G's. The ultimate goal of this study is to establish objective criteria which would enable biosensors to detect incipient functional disorders and to activate counter measure equipment before physiological malfunctions develop.

3,886

Parin, V. 1962 SPACE MEDICINE REACHES ANOTHER STAGE
Moscow News, April 7, 1962, page 9

ABSTRACT: The author states that the numerous tests of all life-sustaining systems the thorough evaluation of the state of animals during the flights and for a long time after their recovery have led to the conclusion that man's space flight was fully prepared from both the technical and the medical points of view.
Both Gagarin's and Titov's flights opened up wonderful prospects for space research. It has become clear that manned space flight can last for many days. The author feels sure that after the creation of a closed ecological system, man will be confronted with unlimited opportunities for the exploration of outer space. (CARI)

3,887

Parin, V.V. & O.G. Gazenko 1962 SOVIET EXPERIMENTS AIMED AT INVESTIGATING THE INFLUENCE OF THE SPACE FLIGHT FACTORS ON THE ORGANISM OF ANIMALS AND MAN. (Paper, 3rd International Space Science Symposium and Fifth COSPAR Plenary Meeting, April 30 - May 9, 1962, Washington, D.C.) NASA N 62-15217.

ABSTRACT: This is a presentation of the results of the biological experiments

conducted on Space ship-satellites II, III, IV, and V and of scientific observations made during Gargarin and Titov's flights aboard space ships Vostok I and II. The physiological reactions to various flight stresses were not fatal. Neither the cosmonauts nor the animals had any observable change in health. The most important task is the study of the influence on the human organism of the various flight stress factors, including emotion strain.

3,888

Parin, V.V., O.G. Gazenko, & V.I. Yazdavkiy 1962 THE POSSIBILITY OF PROTECTIVE ADAPTATIONS OF THE ORGANISM AND LIMITS OF ADAPTATION UNDER CONDITIONS OF MAXIMUM OVERSTRAIN AND WEIGHTLESSNESS. Vestnik Adad. Med. Nauk SSR (Moscow, JPRS-15187, NASA N 62-17962 10 Sept. 1962.

ABSTRACT: A study is made of the possibility of protective adaptations and limits of adaptation of an organism under conditions of maximum overstrain and weightlessness. A study of the rate of blood circulation and oxygen content in arterial blood shows a direct dependence of the degree of blood oxygenation on the rate of circulation. This can serve as evidence of the active participation of the hemodynamics of the lesser pulmonary circulation in blood oxygenation during transverse overloads. As a result of ground experiments and human space flights, the limits of admissible values of prolonged accelerations have been established; and preliminary results on the possibility of raising the physiological tolerance of man to the action of accelerations by the training exercise method have been obtained. An alteration of afferentation was observed under conditions of weightlessness after prolonged space flight. (STAR)

3,889

Parin, V., V. Yazdovskiy, & O. Gazengko 1962 SPACE MEDICINE REPORT FBIS, USSR & East Europe, No. 23, 1 Feb. 1962.

ABSTRACT: The effects of space flight factors and man's potential defensive adaptation mechanisms under the conditions of maximum acceleration and weightlessness were the subject of a paper presented to a current session of the USSR Academy of Medical Sciences in Moscow.

Three groups of factors encountered in outer space are discussed in this paper. The first group of physical factors includes extremely low barometric pressures, ionizing radiations, meteorites, and so on. The second group of factors, depending on the rocket flight itself, include noise, vibration, acceleration, and weightlessness. The third group of factors affecting the cosmonaut depend on conditions inside the spaceship and safety facilities for the crew in flight. Scientists believe that the strongest operating factors of space flight are acceleration, weightlessness, cosmic radiation, and emotional tension. (CARI)

3,890

Parin, V. V., & O. C. Gazenko 1962 SOVIETS GIVE VOSTOK PHYSIOLOGICAL DETAILS Aviation Week and Space Technology, May 28, 1962, pp. 67, 71

ABSTRACT: The first flights of the astronauts were made in paths already tested in launchings of space ships with animals aboard. Animals in this case were specific indicators of danger. Close investigation of animals during flight and after recovery to Earth enabled us to conclude that there are no considerable changes dangerous for life and health of cosmonauts. A combination of physiological methods and the corresponding medical research apparatus was used in order to make studies of the influence of space flight factors on the cosmonaut's organism. During Gagarin's and Titov's flights physiological methods were used chiefly for the purposes of physician's control.
Before the launch, at all the portions of the flight trajectory and after it the Gagarin's health was satisfactory. After lift-off during the gradual increase of velocity of the ship the heart rate increased to 140-158 beats per minute, the respiration rate was 20-26. At the end of the powered period, the heart rate decreased to 109 beats and the respiration rate reduced to 18 per minute. Gagarin pointed out some unusual sensations under conditions of zero-gravity, though no disorders of functions were observed, he felt and performed his program well. When he approached the Earth his respiration became not frequent, smooth and calm. In three hours after landing indices were fixed characteristic of the normal, calm condition of the space pilot. (CARI)

3,891

Parin, V.V. 1962 ROZHDENIE KOSMICHESKOI BIOLOGII (Birth of Space Biology) Priroda (Moskva), (10):9-11. Oct. 1962. In Russian.

ABSTRACT: Beginning with 1949, high-altitude rocket experiments have definitely established the feasibility of manned space flight. During 1960-61 a wide selection of biological objects were tested on Sputniks 3, 4, and 5. A wealth of information has been gained during these flights, which made it possible to take concrete steps toward manned space flight. Since no adverse effects were observed on the first orbital flight in Vostok-1 by Iu. A. Gagarin, it was considered possible to extend the duration of orbital flights. Since G.S. Titov reported vestibular disturbances during the flight in Vostok-2, special corrective measures had to be devised. Subsequent flights of A.G. Nikolaev (Vostok-3) and P.R. Popovich (Vostok-4) have completely vindicated the training methods used previously, and laid a firm foundation for further manned exploration of space. (Aerospace Medicine 34(8):769, Aug. 1963)

3,892

Parin, V.V. 1963 MAN IN COSMOS
Smena, No. 13, 1961, pp. 22-23
(Translation Services Branch, Foreign Technology Division, Wright Patterson AFB, Ohio) FTD-TT-62-1606/1, 17 Jan. 1963. ASTIA AD 295 806

ABSTRACT: Overload is one of the serious problems faced by a cosmonaut during space flight. Scientists are now trying to solve the problem by placing the cosmonaut dressed in an airtight suit into a special chamber filled with liquid. In it, he will be situated in a suspended state. It is hoped that the specific weight of the liquid will become equalized with the specific weight of the cosmonaut and thus, make it possible for him to endure overloads. Observations of animals on board cosmic ships explained that the vital activity of the organism under conditions of weightlessness is normal. One of the yet unsolved problems of space flight is that of radiation. One method under investigation to increase the stability of the organism to radiation is by artificially slowing down the vital processes in the organism. This would be done by cooling the living organism.

3,893

Parin, V.V. 1963 THE COSMONAUT IS FEELING FINE, SAID A SOVIET SCIENTIST
Literaturnaya Gazeta, Aug. 15, 1961, p. 1
(Translation Services Branch, Foreign Technology Division, Wright-Patterson AFB, Ohio) FTD-TT-62-1602/1, Jan. 17, 1963. ASTIA AD 295 798

ABSTRACT: A discussion of the good physical condition of both Yuriy Gagarin and German Titov during and following their space flights provides scientists with a good outlook for future space flights. After the flights, scientists concluded that weightlessness does not interfere with normal activities. Moreover, it does not appear to be a hindrance in manual control of the ship. Furthermore, Titov spent 24 hours in the cabin of the Vostok-2 in which time, day and night changed 17 times. This change in the customary time period had no effect on the health of the cosmonaut. Titov's flight also proved that weightlessness has no adverse effect on the functions of man's organism. Finally, the flight proved that man can without greater strain and without harm live under conditions of cosmos--for a time necessary to carry out such flight.

3,894

Parin, V.V. 1963 IT HAS BEEN ACCOMPLISHED
Smena, No. 7, 1961. pp. 3-4
(Translation Services Branch, Foreign Technology Division, Wright-Patterson, AFB, Ohio) FTD-TT-62-1607/1, 18 Jan. 1963. ASTIA AD 295 805.

ABSTRACT: Behind the flight of Communist Yuriy Alekseyevich Gagarin are years of scientific achievements in the field of space flight. An unforgettable day

was when the first soviet satellite weighing 83.6 kg made a round trip around our planet. From that memorable day, more than three years have passed. The flight of the Dog Layka and later, the first trip of the Zoo-Botanical Garden headed by dogs Byelka and Strelka. Dogs were used instead of monkeys because it is difficult to train a monkey to calm behavior under flight conditions. The blast off of dogs can be carried out without chemically doping their nervous system. After the flights of various dogs, came photography of the reverse side of the moon. Finally, flights of the third, fourth, and fifth cosmic ships. All of these flights brought about the conclusion by scientists that mans flight into the cosmos on board a soviet space ship is connected with no danger to his health or life.

3,895

Parin, V.V. 1963 COSMOS, MEDICINE, MAN
Komosomol'skaya Pravda, 10 March 1961, 1 p.
(Translation Services Branch, Foreign Technology Division, Wright-Patterson AFB, Ohio) FTD-TT-52-1603/1, Jan. 17, 1963. ASTIA AD 295801

ABSTRACT: Four questions were directed to Prof. active member of the Academy of Medical Sciences USSR, V.V. Parin. His answers to the following four questions are contained in this report: (1) What is the characteristic trait of cosmic investigations, carried out in our country? (2) Has the analysis of data obtained during the flight of the second ship-satellite been completed? What new facts have these investigations given to medicine? (3) What is the effect of cosmic flight conditions on the higher nervous activity? (4) Why are dogs employed in the role of experimental animals in cosmic investigations?

3,896

Park, J. 1942 THE CORRELATION BETWEEN SWING SICKNESS AND AIR SICKNESS AND HISTORY OF MOTION SICKNESS.
(British Air Ministry, Flying Personnel Research Comm., Farnborough) FPRC Rept. No. 485, August 1942.

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Park, J. 1942 AIRSICKNESS IN GLIDERS.
(Flying Personnel Research Committee, Air Ministry) F.P.R.C. Rept. 510, December 1942

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Parker, G. H. 1961 ENGAGEMENT LIMITATIONS OF STEEL WIRE WHEN USED AS A VEHICLE ARRESTING DEVICE. (Air Force Missile Development Ctr., Holloman AFB, N. Mex.) MDC TDR 61-38; Proj. No. 6876; ASTIA AD-270 863; Dec. 1961

ABSTRACT: Extensive tests were performed in the past using steel cables with hemp cores as pendants of arresting gear, but little attention was directed towards the limitations of a homogeneous steel wire as the pendant of an arresting device. In a series of sled tests on the Holloman track, limits for successful engagement velocities were partly established for steel wire. The phenomena that exist at the engagement of vehicle and arresting device are considered, and a comparison made of experimental results with predicted theoretical values. (AUTHOR)

3,899

Parker, J.F., Jr. H.E. Price et al. 1957 AVIATION MEDICAL SAFETY TRAINING: RECOMMENDED TRAINING AIDS AND DEVICES (Psychological Research Associates, Arlington, Va.) Technical rept. NAVTRADEVCEN 1339-28-3; 31 Aug. 1957; ASTIA AD-150 185

3,900

Parkin, G.B. 1945 BLOWER TUNNEL TESTS ON THE FLIGHT PATH OF A MAN EJECTED NORMALLY FROM AN AEROPLANE MOVING AT HIGH SPEED. (Royal Aircraft Establishment, Farnborough) Technical Note No. Aero. 1618, March 1945. Appendix 4 to Lovelace, W.R., E.J. Baldes, & V.J. Wulff, The Ejection Seat for Emergency Escape from High Speed Aircraft, ASTIA ATI 7245

SUMMARY: Blower tunnel tests have been made to determine the flight path of a man when ejected with the seat from an aircraft. It has been found that for the pilot to clear safely the tail unit of a Meteor travelling at 750 F.P.S. his ejection velocity should not be less than 50 F.P.S. if he and the seat are free to part or 40 F.P.S. if he is attached to the seat. He is liable to be rotated in any direction at a rate up to 1 1/2 revs./sec. while travelling from cockpit to tail, when ejected from the aircraft at this air speed. (Author)

3,901

Parnell, J., E. L. Beckman, & L. H. Peterson 1953 DEVELOPMENT OF BIOLOGICAL RESEARCH APPARATUS FOR USE IN ACCELERATION AND DECELERATION STUDIES. PHASE I. THE EVALUATION OF PRESSURE TRANSDUCER SYSTEMS. (Naval Air Development Ctr., Johnsville, Pa.) NADC-MA-5206; ASTIA AD-1061; 15 Jan. 1953

ABSTRACT: Response measurements were made of various pressure transducers, transducer fittings, and coupling systems using pressure-step function, sine-wave pressure, and absolute calibration techniques. The accurate standard methods of

transducer-system evaluation demonstrated that these systems may be treated as lumped systems. A capacitance-type transducer with a long polyvinyl catheter was used as the test system for consideration of a transducer system with more than 1 degree of freedom. Measurement of physical constants of this system were carried out and the electrical-transmission-line theory was applied to the catheter Theoretical consideration was given to the effect of varying physical constants upon the response of the system. A damping segment, based on the theoretical concepts, improved the amplitude vs frequency response of the system and reduced acceleration artifacts.

3,902

Parry, J. H., Jr. 1962 U. S. ARMY NATIONAL GUARD. H-13E HELICOPTER ACCIDENT AMITYVILLE, NEW YORK, 5 JANUARY 1962. (Aviation Crash Injury Research, Phoenix, Ariz.) Rept. AvCIR 62-7; Contract DA 44-144-tc-802, TREC TR 62-64, Aug. 1962, ASTIA AD 285787L

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Partel, G. 1960 XI CONGRESSO ASTRONAUTICO INTERNAZIONALE (XITH INTERNATIONAL ASTRONAUTICS CONGRESS) Rivista Aeronautica, Italy, 36(10):1517-1561, Oct. 1960

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Passavanti, L. 1955 DEVELOPMENT OF BIOLOGICAL RESEARCH APPARATUS FOR USE IN ACCELERATION AND DECELERATION STUDIES. PHASE III. (Naval Air Development Ctr., Johnsville, Pa.) Project NM 001 100 303; 31 Dec. 1955

ABSTRACT: Infrared sensitivity of the television camera has been found to be of no practical value. A snooperscope type of image converter was used with negative results. The object of using a TV camera with infrared lighting is to reduce the light on the subject so as not to interfere with the subject's ability to view signal lights. These become difficult to see when the subject is under G near the blackout level.

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Passera, A.L. and R.G. Willoh,Jr. 1956 AN OPTIMUM SWITCHING CRITERION FOR A THIRD-ORDER CONTRACTOR ACCELERATION CONTROL SYSTEM (National Advisory Committee for Aeronautics, Washington, D.C.) Aug. 1956, TN 3743, ASTIA AD-105 243

ABSTRACT: "A switching criterion for optimum performance of a third-order contactor acceleration control system having complex roots is presented. Analytical and analog computer methods are utilized to determine this criterion. The resulting optimum transient responses are presented and compared with those of an equivalent linear system" (NACA Abstract)

3,906

Passey, G. A. 1948 ACCELERATORY PATTERNS IN FLIGHT OF AIRCRAFT; INSTRUMENTS AND TECHNIQUES OF MEASUREMENT.
(A report of research under contract with the Office of Naval Research, February 1948)

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Passey, G.E. and F.E. Guedry, Jr. 1949 THE PERCEPTION OF THE VERTICAL: III. ADAPTATION EFFECTS IN FOUR PLANES J. Exp. Psychol 39:700-707

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Passey, G. E. & F. E. Guedry 1949 THE PERCEPTION OF THE VERTICAL. III. ADAPTATION EFFECTS IN FOUR PLANES.
(U.S. Naval School Aviation Medicine & Research, Pensacola, Fla.)
Proj. No. NM 001 037, Research Rept. NM001 110 500.6., June 21, 1949.

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Passey, G. E. 1949 THE PERCEPTION OF THE VERTICAL. VI. ADJUSTMENT TO THE VERTICAL WITH NORMAL AND TILTED VISUAL FRAMES OF REFERENCE. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. NM 001 110 500.10., 22 Nov. 1949

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Passey, G. E., & J. T. Ray 1950 THE PERCEPTION OF THE VERTICAL. X. ADAPTATION EFFECTS IN THE ADJUSTMENT OF THE VISUAL VERTICAL. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. NM 001 110 500.17., 20 Oct. 1950 ASTIA ATI 14320

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Passey, G.E. 1950 THE PERCEPTION OF THE VERTICAL: I. ADJUSTMENT TO THE VISUAL VERTICAL FROM VARIOUS MAGNITUDES OF BODY TILT (U.S. Naval School of Aviation Medicine, Pensacola, Florida and Tunland University) Report No. 15, Project NM 063.01.15, 10 March 1950.

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Paton, C. R., E. C. Pickard & V. H. Hoehn 1940 SEAT CUSHIONS AND THE RIDE PROBLEM. S.A.E. Journal 47:273-283, July 1940.

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Patrick, L. M. n.d. IMPACT DAMAGE TO INTERNAL ORGANS (Department of Engineering Mechanics, Wayne State Univ.)

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Patrick, L. M., H. R. Lissner, M. Lebow, & F. G. Evans 1960 EFFECTS OF CONTROLLED ACCELERATIONS ON STRAIN IN THE INTACT VERTEBRAL COLUMN. Anat. Rec. 136:256, Feb. 1960

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Patrick, L. M. 1962 CAUDO-CEPHALAD STATIC AND DYNAMIC INJURIES TO THE VERTEBRAE. In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration Conference, Sept. 14-16, 1961, Pp. 171-181.

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Patrick, Lawrence M. & F. Gaynor Evans 1962 IMPACT DAMAGE TO INTERNAL ORGANS In: Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography, National Academy of Sciences, National Research Council, Publication No. 977, pp. 159-171

ABSTRACT: Contusions, lacerations, and ruptures of the thoracic, abdominal, and pelvic viscera, arising from the various types of stresses and strains produced by impacts to different parts of the human body in automobile and aircraft accidents, are discussed. Results indicate that damage or injury produced in the human body by acceleration is due to the internal organs behaving as viscoelastic materials. Furthermore, the magnitude of the stress and acceleration, or dynamic response, can be increased by the elasticity of the human torso, as is known from the theory of elastic structures.

3,918

Patterson, J. L., Jr., J. T. Doyle, D. W. Richardson, S. I. Said & E. L. Hardie 1961 THE CIRCULATION AND RESPIRATION IN INDUCED ACUTE HEAD INJURY. (Paper, Symposium on Biomechanics of Body Restraint and Head Protection, Naval Air Materal Center, Philadelphia, Penn., June 14-15, 1961).

ABSTRACT: Circulatory and respiratory responses to severe cranial injury

inflicted by a sledgehammer have been studied during the processing of 15 unanesthetized cows (Bes taurus) in the abattoir.

The results demonstrate that in these animals respiration was the function critically affected. It appears probable that in the early post-injury period, the brain must recover from the concussion sufficiently to reinstitute breathing or be rapidly and irreversibly trapped by the falling arterial O_2 and rising CO_2 tensions. The possibility of salvage of some of these animals by artificial respiration in the early post-injury period is suggested.

3,919

Pavlok, Jan 1958 BIOLOGICKE ZABEZPENCENI MEZIPLANETARNICH LETU (Biological Safety in Interplanetary Flights)
Vojenske zdravotnicke listy (Prague) 27(6): 257-262, 1958

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Payne, C. F., Jr., & R. A. Bosee THE MECHANISM AND CAUSE OF VERTEBRAL INJURIES SUSTAINED ON EJECTIONS FROM U. S. NAVAL AIRCRAFT. (Air Crew Equipment Lab., Naval Air Material Center, Philadelphia, Pa.)

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Payne, C.F., Jr., & R.A. Bosee 1962 THE MECHANISM AND CAUSE OF VERTEBRAL INJURIES SUSTAINED ON EJECTION FROM U.S. NAVAL AIRCRAFT. (Paper, 33rd Annual Meeting of the Aerospace Medical Assoc., 9-12 April 1962, Atlantic City, N.J.)

ABSTRACT: Considering the available evidence, the basic mechanism responsible for the high incidence of vertebral injury on ejection from U.S. Naval aircraft is the concentration of inertial and restraint force components on the front of the vertebrae by spinal felxion. Flexion occurs because of poor positioning, lack of support, and inadequate restraint of the body. Until further improvements are made in these areas and spinal flexion.kept to a minimum, it will not be possible to subject the body to its potentially tolerable limit of ejection acceleration without perpetuating the high incidence of vertebral injury.
(Aerospace Medicine 33(3):348, Mar. 1962)

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Payne, C. F. 1963 STUDY OF PHYSIOLOGICAL STRESSES WITH EJECTION LOADS. (Air Crew Equipment Lab., Naval Air Material Center, Philadelphia, Pa.) NAEC ACEL 467, 8 July 1963. ASTIA AD 409 465L.

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Payne, C. F., Jr. 1963 STUDY OF PHYSIOLOGICAL STRESSES WITH EJECTION LOADS. (Paper, Thirty-Third Annual Meeting of the Aerospace Medical Association, April 1962, Atlantic City.)

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Payne, P. R. 1960 THE PHYSICAL BASIS FOR HUMAN FACTORS ACCELERATION CRITERIA AND EXPERIMENTAL DATA. (Stanley Aviation Corporation, Denver, Colorado) Stanley Aviation Report No. 743, July 1960.

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Payne, P.R. 1960 ANALYSIS OF B-58 CAPSULE LANDING IMPACT TRANSVERSE ACCELERATION DATA WITH HUMAN AND DUMMY OCCUPANTS. (Stanley Aviation Corporation, Denver, Colorado) Stanley Aviation Report No. 742.

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Payne, P.R. 1960 THE PHYSICAL BASIS FOR HUMAN FACTORS ACCELERATION CRITERIA AND EXPERIMENTAL DATA. (Stanley Aviation, Denver, Colo.) Report No. 743, July 1960.

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Payne, P.R. 1960 PRELIMINARY INVESTIGATION OF THE DYNAMICS OF A MAN-CARRYING CAPSULE SUBJECTED TO EXTERNAL FORCES. (Stanley Aviation Corp.) Rept. No. 1189, 8 June 1960

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Payne, Peter R. 1961 AN ANALOG COMPUTER WHICH DETERMINES HUMAN TOLERANCE TO ACCELERATION
(Paper, National Academy of Sciences Symposium on "Impact Acceleration Stress", Nov. 27-29, 1961, Brooks Air Force Base, San Antonio, Texas)

ABSTRACT: The purpose of this paper is to describe and demonstrate a small analog computer which is designed to show the physiological effect of short period acceleration on man. An arbitrary acceleration-time history can be set up on the front of the computer by "plotting" a graph with sliding beads. Calibrated dials enable the dynamic characteristics of the restraint system to be specified, and the computer can then be started. A mater reads out the peak value of the "Physiological Index", which is an arbitrary numerical scale. An analog of this type is only as good as the experimental data upon which

its analogy is based. but within this limitation it can be used to:
(a) Assess the tolerability of any short period acceleration
(b) Vary the dynamic characteristics of the restraint system in order to minimize the physiological effect of a given acceleration
(c) Feed in rational physiolgical information to an engineering optimization program for an aerospace vehicle
(d) Correlate experimental information by correcting for the difference introduced by different restraint systems
(e) Plan experimental test programs, thus permitting many "feeling the way" experiments to be eliminated, with substantial savings in time and money.

The paper concludes with a description of possible future developments and particularly the inclusion of non-linear terms and the long period acceleration tolerance limits established in centrifuge testing.

An appendix deals with the statistical theory of scatter in the tolerance of individuals, in which an Individual Tolerance Index is defined. Such a concept could become important in such fields as the optimization of space vehicle re-entry trajectories, for example, and in including physiological components in the reliability model of an aerospace vehicle.

3,929

Payne, P. R. 1961 THE DYNAMICS OF HUMAN RESPONSE TO ACCELERATION.
(Paper, 32nd Annual Forum of the Aerospace Medical Association, Chicago, April 24-27, 1961)

ABSTRACT: Although most of the published work on human tolerance and response to short period acceleration is wholy empirical in character, there is no reason why this subject should not benefit from the mathematical back-up which has proved virtually indispensible in most other engineering disciplines. Important pioneering work in this respect has already been carried out at WADD by the Bio-Medical Laboratory team, who are investigating the response of the human body to sinusoidal oscillations. The purpose of the present summary is to describe in a very simplified form, the work of Stanley Aviation on the response to a "step" or irregular linear acceleration input.

It is shown that a simple linearized single degree of freedom dynamic model adequately explains most of the experimental data obtained so far, that it leads to more logical methods of correlating experimental results, and that it permits extrapolation of allowables into areas for which no experimental evidence now exists.

Future developments expected from a NASA-funded program are outlined, and an appendix contains an introduction to the theory of the most elementary dynamic model. In the interest of brevity, the discussion is limited to the case of positive spinal acceleration, but is equally applicable to all other vectors.

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Payne, P. R. 1961 TECHNICAL PROPOSAL: INVESTIGATION OF THE DYNAMICS OF HUMAN RESTRAINT SYSTEMS.
(Frost Engineering Corp., Denver, Colo.) Rept. 77-1, July 1961.

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Payne, Peter R. 1961 THE DYNAMICS OF HUMAN RESTRAINT SYSTEMS. (Paper, National Academy of Sciences Symposium on "Impact Acceleration Stress." Brooks AFB, Texas , 27-29 November 1961)

ABSTRACT: Acceleration is most logically divided into three distinct regimes, from a physiolgical point of view. (1) In an impact acceleration, where velocity change is the important criterion, a cushion or any other resiliency in series with the man is always beneficial, in that it reduces the physiological effect of the shock. (2) In a short period acceleration, which may be roughly defined as having a duration of less than one second, the effect of the restraint system may be either harmful or beneficial, depending upon its dynamic characteristics. (3) For long period accelerations, where "hydraulic" limitations predominate, restraint dynamics are of no importance, and we are concerned primarily with adequate support.

In the case of impact accelerations, the only parameter of importance is the total energy which the restraint system can absorb before bottoming, so that a pure spring could yield as great an attenuation as a visco-elastic cushion. But for short period accelerations, both damping and "bottoming depth" assume enormous importance, whilst the energy absorption capability becomes relatively unimportant.

Although some simple generalizations can be deduced from closed form solutions to analytically simple acceleration input histories, an analog computer must be used to determine the optimum restraint dynamics for minimum phsyiological effect from the irregular accelerations usually experienced in practice. Since a restraint system is merely a damped spring system, in the normal engineering sense, it is obviously both more accurate and far less expensive to determine the optimum parameters by this means, however. To try to determine even optimum cushion characteristics by experimental means is almost impossible, unless we are concerned with a relatively fixed acceleration time history, such as the thrust of an ejection seat catapult.

Considerable gains from these techniques are seen for the future, in that we hope to reduce the physiological shock of accelerations imposed by existing vehicles and escape systems, by means of relatively simple changes in the restraint systems. It is quite possible that the materials currently used -- in cushions for example -- are nowhere near the true optimum, and that quite dramatic improvements can be obtained.

Secondly, many physiological tests will be wasted, or at least less useful than they might be unless we have a reliable means of currecting for the different restraint systems used.

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Payne, P. R. 1961 INVESTIGATIONS OF CREW ESCAPE SYSTEM SURFACE IMPACT TECHNIQUES FOR ADVANCED AEROSPACE VEHICLES. (Frost Engineering Corp., Denver, Colo.) Rept. No. 74-1, July 1961

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Payne, Peter R. and Ernest L. Stech 1962 HUMAN BODY DYNAMICS UNDER SHORT-TERM ACCELERATION
(Frost Engineering Development Corporation, 830 South Lipan Street, Denver 23, Colorado) U.S. Navy Contract #167-19747X Report #115-2 June 23, 1962

ABSTRACT: This report reviews the development of the theory of "body dyanmics" and shows how it can be used to obtain solutions to important engineering problems.

3,934

Payne, Peter R. 1962 PRELIMINARY STUDY OF ACCELERATION PROTECTION FOR CREW MEMBERS OF A SHIP SUBJECTED TO AN UNDERWATER EXPLOSION
(Frost Engineering Development Corporation, 830 South Lipan Street, Denver 23, Colorado) U.S. Navy Contract No. 167-18, 423X Report No. 115-1 March 12, 1962

ABSTRACT: This report is the end product of a study performed for the David Taylor Model Basin to determine the feasibility of applying dyanmic analysis and specialized analog computer techniques to a unique problem in human tolerance to impact and accelerations. This is the special case of injuries caused to shipboard personnel by the effect of nearby underwater explosions on the ship structure.

Two extremely valuable findings have resulted from this study: From examination of the dynamics of "take-off" in some detail, it is concluded that laboratory measurements of this parameter with the HYGE acceleration tester will enable us to calculate, for the first time, the damping losses in the human body. The theory also shows that more precise estimates of the natural frequency of the human body can be obtained from the same measurements.

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Payne, P. R., et al. 1962 DETERMINATION OF VARIABILITY IN HUMAN TOLERANCE TO SHORT TERM ACCELERATION. (Frost Engineering Corp., Denver, Colo.) Tech. Prop. No. 146-1, 6 Aug. 1962

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Payne, P. R., et al. 1962 THE LIMITS OF HUMAN TOLERANCE TO LONG-PERIOD ACCELERATION. (Frost Engineering Development Corp., Denver, Colo.) Tech. Prop. No. 151-1, 20 July 1962

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Payne, P. R. 1962 SUPPLY OF SPECIAL PURPOSE COMPUTERS AND CONSULTING SERVICES IN CONNECTION WITH HUMAN TOLERANCE TO ACCELERATION. (Frost Engineering Dev. Corp., Denver, Colo.) Prop. No. 120-1, 5 March 1962

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Payne, P. R. 1963 A DYNAMIC MODEL OF THE HUMAN BODY SUBJECTED TO SPINAL ACCELERATION WHEN SITTING ERECT.
(Frost Engineering Dev. Corp., Colo.) Tech. note 122-103, Jan. 1963.

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Payne, R.B., E.W. Moore, and J.L. Bethurum 1952 THE EFFECT OF CERTAIN MOTION SICKNESS PREVENTIVES UPON PSYCHOLOGICAL EFFICIENCY (Sch. Avn. Med. Randolph AFB) Proj. No. 21-32-019, August 1952 ATI 171316

ABSTRACT: The effects of selected drugs (hyoscine, dramamine, benadryl, and benadryl-hyoscine) upon a wide variety of psychological processes are systematically explored by standardized testing techniques. The drugs differ widely from one another in magnitude of effects produced, but they uniformly impair implicit processes more than explicit processes.

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Payne, R. B. & G. T. Hauty 1953 THE EFFECT OF MOTION SICKNESS PREVENTIVES UPON CERTAIN PERCEPTUAL MOTOR COMPONENTS OF THE PILOTS' TASK.
(Sch. Avn. Med., Randolph AFB, Tex.) Proj. No. 21-1601-0004, Rept. No. 3, May 1953.

ABSTRACT: Sixty-four subjects received preliminary training on a complicated compensatory pursuit task involving simulated aircraft instruments and controls, then continued work for four hours under conditions designed to appraise the side effects of certain motion-sickness preventives. A significant, persistent, adverse effect having a latency of about one hour was produced by a mixture consisting of 0.65 mg. hyscine hydrobromide and 50 mg. diphenhydramine hydro-chloride (benadryl-byoscine), but performance under hyoscine alone was indistinguishable from those of control and lactose groups.

3,941

Payne, R.B. Osier, D.R. and P.A.S. Tomlinson 1953 THE EFFECTS OF CERTAIN MOTION SICKNESS PREVENTIVES UPON NAVIGATOR PROFICIENCY (Sch. Avn. Med. Randolph AFB) Project No. 21-1601-004, Report No.1, May 1953

3,942

Payne, R. B. 1955 SOME EFFECTS OF MOTION SICKNESS REMEDIES UPON PSYCHOLOGIC PERFORMANCE. Internat. Record Med. 168:32

ABSTRACT: Studies on the antihistamine and anticholingeric drugs have been emphasized by three considerations: (1) The pharmacologist desires a rough simple index of autonomic activity so he can better understand the drug's prophylactic mechanisms; (2) Transportation industries wish to find the most potent remedy against motion sickness with the fewest unpleasant side effects; and (3) Military aviation has had to weigh the potentialities of drugs preventing motion sickness against performance deficit due to peripheral and central impairment. Questionnaires, interviews, rating scales, checklists and other modes of subjective observation offer suitable test methods for the answers commercial transportation desires. Synthetic test situations are useful to delineating the military answers provided they are reliable estimates of what they measure, correlate with the task to which the outcomes are extrapolated and take cognizance of the interaction of such concomitant conditions as noise, vibration, anxiety, lowered oxygen tension, fatigue and motivation. The possibility of research is the scope and magnitude of impairment is unlimited. Only hyoscine and dramamine have been comprehensibly studied as to sensory functions, perceptual intellectual functions, perceptual-motor functions, and secondary factors affecting impairment so that a generalization can be made that they present a minimal, and perhaps negligible, risk of behavioral incapacitation. (J. Avia. Med. 26(4):348, Aug. 1955)

3,943

Pearson, R.G. 1957 THE EFFECTS OF MOTION-SICKNESS PREVENTIVES IN ORIENTATION IN SPACE. (School of Aviation Medicine, Randolph Air Force Base, Tex.) Report no. 58-7, ASTIA AD-152 815, Nov. 1957

ABSTRACT: Evaluations are made of the effects of meclizine, cyclizine, and promethazine on a test of spatial orientation. Dextroamphetamine sulfate, a mixture of scopolamine with diphenhydramine hydrochloride, and lactose placebo were also included in the experimental design. Ninety-six subjects were tested in a darkroom on a luminous rod-and-frame apparatus under upright and body-tilt conditions. Following this, they were randomly assigned in equal numbers to the drug treatment groups, then were tested again. Analysis of constant errors in adjusting the rod to the vertical for the post-treatment data revealed no significant drug effects. These results seemed to constitute evidence against the possibility that these drugs would have an untoward effect upon the spatial orientation of aircrew personnel.

3,944

Pearson, R. G. 1961 IMPACT-INJURY RELATIONSHIPS IN LIGHTPLANE ACCIDENTS. Reprint, Archives of Environmental Health 3:514-518. November 1961.

ABSTRACT: In the present study attention was focused more closely on not only degree of injury but also area of injury and how these are related to impact conditions for a group of occupants whose tie-down did not fail.

3,945

Pearson, Richard G. 1961
INJURY SEVERITY AS RELATED TO SEAT TIE-DOWN AND BELT FAILURE IN LIGHTPLANE ACCIDENTS
(Aviation Crash Injury Research, Phoenix, Ariz.)
Rept. no. AvCIR 61-4; TREC Tech. rept. no. 61-96 August
ASTIA AD 265 092L

ABSTRACT: The purpose of this study was to evaluate the relationship between tie-down effectiveness and injuries sustained by 1,025 occupants of light-planes involved in ground-object collisions, or in spin-stall crashes. Critical injuries to the head and upper torso were found to occur even though there was adequate seat-belt restraint. In approximately one-third of the 1,025 cases either seat failure or belt failure yet injury severity was greater when seats failed than when belts failed. The need for additional safety measures is emphasized by the findings. (AUTHOR)

3,946

Pearson, R. G. 1961 RELATIONSHIP BETWEEN IMPACT VARIABLES AND INJURIES SUSTAINED IN LIGHTPLANE ACCIDENTS (1942-1952)
Aviation Crash Injury Research, April 1961.
See also (U.S. Army Transportation Research Command, Ft. Eustis, Va.) TR 61-96, Aug. 1961.

3,947

Pedersen, A. H. 1959 PROJECT MERCURY HUMAN QUALIFICATIONS FOR DESIGN LANDING CONDITIONS. (McDonnell Aircraft Corporation, St. Louis, Missouri) Rept. 7062, Serial No. 18, 21 Sept. 1959

ABSTRACT: The objective of this program is to verify that humans can sustain the limit ground landing impact of the Mercury capsule such that pathological damage will not occur.

3,948

Pedersen, Herbert E., F. Gaynor Evans & H.R. Lissner 1949 DEFORMATION STUDIES OF THE FEMUR UNDER VARIOUS LOADINGS AND ORIENTATIONS
Anatomical Record 103(2): 159-185, Feb. 1949

ABSTRACT: (1) The results of "stresscoat" deformation studies on the femur under both static and dynamic loading were described and illustrated. Fifteen bones were subjected to vertical dynamic loading when the infracondylar plane made a laterally opening angle (3^{o}) with the horizontal plane; 12 bones were

subjected to static and dynamic loading in the "abduction" position; and 12 bones to static torsion loading. (2) Deformation patterns characteristic of each type of loading were produced. From an examination of the pattern, the point of application of the force and hence the type of loading can be deduced. Conversely, if the point of application of the force is known, the type and site of the resulting deformation can be predicted. Such knowledge would be of particular help to the radiologist in searching for a suspected fracture as the result of a blow at a known point. (3) The deformation patterns were little affected by minor variations in the orientation of the bone. (4) All other factors being equal the degree of deformation increases with increasing load but varies inversely with the mass of the bone. (5) Additional evidence is presented that failure (fracture) of bone occurs under tension stress, the fracture starting at the site of greatest stress concentration. This was true regardless of the method of loading. (6) The spiral torsion fracture was shown to be another example of failure under tension stress and not the result of shearing stress as has often been stated.

3,949

Pedersen, N. L., J. H. Mathewson & D. M. Severy 1958 AN ENERGY-ABSORBING BARRIER FOR HIGHWAYS.
(Highway Research Board Bulletin 185, 1958)

3,950

Pedrazzini, F. 1938 DE LA CIRCULATION CEREBRO-SPINALE PARTICULIEREMENT PAR RAPPORT AUX EFFETS QUE LA FORCE CENTRIFUGE EXERCE SUR CE SYSTEME ET SUR LA CIRCULATION GENERALE CHEZ LES AVIATEURS (Cerebrospinal Circulation and Pressure of Cerebrospinal Fluid: Effects of Centrifugal Force on Cerebrospinal and General Circulation of Aviators)
Presse Medicale (Paris) 46: 1164-1167

ABSTRACT: The author quoted Heinz von Diringshofen as having noticed during his investigations: a sensation of darkness, narrowing of the visual field like that of a beginning narcosis, loss of consciousness, variation of arterial pressure and pulse frequency, with sanguinary engorgement of the lower limbs.

The author's own work was on the effect of centrifugal force on the circulatory system, and there is no specific mention of the effect on the eye.

3,951

Peiffer, H. 1939 KREISLAUF UNTER BESCHLEUNIGUNG. RONTGENKYMOGRAPHISCHE AUFNAHMEN BEI BESCHLEUNIGUNGSANDERUNG (Blood Circulation During Acceleration: Roentgen Kymographic Studies in Apes During Changes in Acceleration)
Luftfahrtmedizin 3: 82-96

3,952

Peiser, A. M. & M. Wilderson 1945 A METHOD OF ANALYSIS OF V-G RECORDS FROM TRANSPORT OPERATIONS.
(National Advisory Committee for Aeronautics, Washington, D.C.)
NACA Rept. 807 (Supersedes NACA ARR L5J04)

3,953

Pellini, W.S. 1961 ANALYSIS OF THE THERMOSTRUCTURAL REQUIREMENTS FOR THE ATMOSPHERIC RE-ENTRY OF SATELLITES AND SPACE VEHICLES. NRL. Rept. 5655, ASTIA AD- 264 753, 15 August 1961

ABSTRACT: The thermostructural requirements of re-entry vehicles are determined by the kinetic energy of the vehicle on penetration of the atmosphere and by the program of the dissipation of this energy by conversion to heat, which is generated by the aerodynamic braking effects of the atmosphere. The vehicle velocity and entry angle may be classed as approach variables and the aerodynamic characteristics of the body as vehicle variables. These variables are discussed, with particular emphasis on the wide range of energy conversion programs which are made available by choice of the vehicle design. The possible types of re-entry vehicles are analyzed by a description of the aerodynamic characteristics of the various principal types. The aerodynamic features of re-entry vehicles may be classified into the two broad subdivisions of lift and drag flight. Lift flight vehicles are represented primarily by the glide aircraft and lifting capsule families, and drag flight vehicles by drag capsules, satellites bodies, and nose cones. The primary distinction between bodies that rely on aerodynamic lifts, with the associated drag for gradual deceleration from orbital to subsonic velocity and bodies that under go a shocklike deceleration to terminal fall velocity. (Author)

3,954

Pendleton, M. E., & R. S. Paine 1961 VESTIBULAR NYSTAGMUS IN NEWBORN INFANTS. Neurology 2:450-458

3,955

Penny, A.R. 1956 JUMPERS DOWN AND UP
Med. Technicians Bull. 7(4):139-141, July-Aug. 1956

ABSTRACT: The personnel of a naval parachute unit conduct tests in connection with the design, use, improvement and adaptation to naval aircraft operations of parachute and ejection seat systems; pilot's personal safety equipment and flight gear; and aerial delivery of supplies and cargo. A medical corpsman equipped with medical kit is in attendance during all jumps to treat any injuries that may occur. Injuries sustained during test jumps are usually minor, consisting of bruises about the face and neck sustained from parachute lines and risers and due to opening shock forces. More serious injuries consist of leg sprains and fractures usually caused by ground impact.

3,956

Penrod, K.E. 1942 BAILING OUT ABOVE 30,000 FEET.
(Wright Air Development Ctr., Wright-Patterson AFB, Ohio)
Memo Rept. EXP-M-49-696-6A, 27 Nov. 1942.

3,957

Penrod, K.E., G.L. Maison, & F.G. Hall 1945 COMPARISON OF SHOCK FORCE OF OPENING OF SILK AND NYLON PARACHUTES AT VARIOUS ALTITUDES.
(AAF, Aero Med. Lab) Rept. Serial TSEAL 3-696-66C, 5 May 1945.

3,958

Penrod, Maison and Hall 1945 COMPARISON OF SHOCK FORCE OF OPENING OF 24 and 28 FOOT NYLON PARACHUTES AT VARIOUS ALTITUDES.
(War Dept., Air Forces) TSELA-3-696-66G, 22 May 1945

3,959

Perdriel, G. & R. Creton 1958 REGARDING MACULAR HEMORRHAGES AMONG FIGHTER PILOTS FLYING FREQUENTLY AT HIGH ALTITUDES. (Apropos d'hemorragies maculaires apparues chez les pilotes de chasse frequentant la haute altitude.)
Medecine Aeronautique (Paris), 13(4):353-358, 1958.

ABSTRACT: The authors cite five cases of permanent, chorioretinal perifoveal hemorrhage which appeared in fighter pilots after high-altitude flight. Except for a deficiency of prothrombin in the blood, there was no evidence of any other somatic or humoral change. Anoxemia, hyperoxia, and acceleration are discounted as direct causes of the macular hemorrhages, but a comparison with some aspects of general ocular pathology leads to the hypothesis of some kind of chorioretinal vascular injury which occurs during quick changes of partial oxygen pressure. (Author)

3,960

Perey, Olof, trans. by C. A. Grant 1957 FRACTURE OF THE VERTEBRAL END-PLATE IN THE LUMBAR SPINE. An Experimental Biomechanical Investigation.
Acta Orthopaedica Scandinavica, Supplementum No. XXV.

3,961

Perilhou, P. & H. Pieron 1942 QUELQUES CARACTERISTIQUES DES SENSATIONS VIBRATOIRES (Some Characteristics of the Vibratory Sensations)
C.R. Soc. Biol. (Paris) 136: 448-449.

3,962

Perlman, H.B. 1945 REACTION OF THE HUMAN CONDUCTION MECHANISM TO BLAST Laryngoscope 55:427-444

3,963

Perry, D. R. and Lidie C. Dyer 1956 INCIDENCE, NATURE, AND EXTENT OF INJURY IN CRASH LANDINGS AND BAILOUTS
(Arctic Aeromedical Lab., Ladd Air Force Base, Alaska) Nov. 1956
Proj. no. 8-7956 Rept. no. 1 ASTIA AD 116 239

ABSTRACT: Data were analyzed to establish the effects of terrain, weather, and type of aircraft upon the number and extent of injuries in crash landings and bailouts. Based on data obtained from a worldwide survey of major airplane accidents, the rate of fatal or major injury in swampy terrain is 3.4% for a bailout and zero for a crash landing. For flat farmland, the probability of a fatal or major injury for either a bailout or a crash landing is about 2 out of 10 persons. For desert terrain the probability of fatal or major injuries in a bailout is 2 out of 10 as compared to 1 out of 10 in a crash landing. For terrain consisting of small hills, the probability of a fatal or major injury is 1 in 10 for bailouts and 3 in 10 for a crash landing. For a crash landing in wooded areas, the probability of fatal or major injury is 9 out of 10. In mountainous terrain, the indicated probability of fatal or major injuries is 2 out of 10 for a bailout and 6 out of 10 as compared to 3 out of 10 for a bailout. Major accidents occurring in Arctic regions are studied with reference to bomber- and jet-type aircraft, jet fighters, trainer aircraft, and all other aircraft. A total of 33 persons were involved in bomber crash landings, of which 6.1% were fatalities. For cargo aircraft, 21.7% of bailouts were fatal, and 17.4% of the crash landings were fatal. Bailouts from jets resulted in 23.1% fatalities. Crash landings involved 28.6% fatalities. No fatalities were reported from trainer aircraft. All other types of aircraft involved 4 fatal injuries. (ASTIA)

3,964

Perrin, R.A., Jr. 1962 THE DEVELOPMENT OF AN ELECTRICAL STRAIN GAGE DYNAMOMETER FOR MUSCLE USE
(Department of Mechanical Engineering of the Graduate School of Tulane U.)
A Thesis for the degree of Master of Science. ASTIA AD 290 142

ABSTRACT: This paper reviews the theory of torsion in a circular tube, then presents a method of its use in the development of an electrical strain gage dynamometer which can be used universally to measure the performance of a muscle or muscle group. Results of the tests indicate that muscle strength can

be quantitatively evaluated by an electrical strain gage dynamometer. These results can be averaged and used as a basis of comparison. Isometric muscular contraction has been used successfully in the strengthening and training of the muscle groups. It is recommended that the dynamometer be adopted for such muscular training purposes. It is also recommended that the use of the dynamometer be expanded to include measurement of muscle groups in the lower limbs.

3,965

Pertzoff, V. A. & S. W. Britton 1945 EFFECTS OF HIGH ACCELERATORY FORCES. Fed. Proc. 4(1):55-56, March 1945.

ABSTRACT: Responses of monkeys, dogs, cats, rats and other animals to high acceleration (centrifugation) have been studied over the past four years. In most cases forces up to 6 gram have been considered; in some instances, however, tests at 50 gram were also observed in a few experiments.

Respiration, pulse, blood pressure and flow, E.C.G. and E.E.G. changes have been specially studied. Other circulatory conditions, bloodglucose and electolytes, and skin resistance were also noted under acceleratory stresses.

The effects of protective devices, belts and bandages, various gases, vasopressors, etc., have also been determined.

3,966

Pertzoff, V. A., S. W. Britton, & R. F. Kline 1946 FURTHER OBSERVATIONS ON EFFECTS OF G FORCES. (Physiological Lab., University of Virginia Medical School, Charlottesville)
Federation Proceeding 5(1):80, 1946.

ABSTRACT: Determinations of blood pressure and blood flow on exposure to high accelerations have been made on monkeys, dogs and other animals. Both head and foot ends of animals (carotid, brachial, femoral arteries) were studied under various forces. Comparison of pressure changes was made with a hydrodynamic model on the centrifuge under similar experimental conditions.
The protective influence of various devices, injected materials, etc., was studied Extended observations were also made on E.E.G. changes under different conditions.

3,967

Pertzoff, V.A., & S.W. Britton 1948 FORCE AND TIME ELEMENTS IN CIRCULATORY CHANGES UNDER ACCELERATION: CAROTID ARTERIAL PRESSURE DEFICIENCY AREAS. Am. J. Physiol., 152:492-8

3,968

Pescador, L. 1943 STUDY OF DISTRUBANCES IN AVIATORS DURING ACROBATIC FLIGHT: CEREBRAL FACTOR. J. Am. M. Ass., 121:378

3,969

Pesek, R. 1961 [MAN IN SPACE]
Ceskoslovenska akademie ved. Vestnik 1961(4):447-457

ABSTRACT: This is a review of the Soviet space program starting with the launching of an improved, multistage rocket towards a Pacific ocean target area on Jan. 20, 1960, until the first manned space flight. It further briefly compares the Soviet manned space flight with A.B. Shephard's flight and also deals with controversy whether space ships for space exploration should be manned or just equipped with automatic instruments. Gagarin's flight proved that acceleration and deceleration of about 10 G caused less difficulties than expected. The noise and heat did not significantly affect the organism. The flight has shown that man cannot only endure the space flight conditions but also perform the entrusted tasks and functions. (CARI)

3,970

Pesman, G. J. 1953 APPRAISAL OF HAZARDS TO HUMAN SURVIVAL IN AIRPLANE CRASH FIRES.
(Lewis Flight Propulsion Lab., Cleveland, Ohio; issued by National Advisory Committee for Aeronautics, Washington, D.C.) Tech. Note no. 2996, Sept. 1953. ASTIA AD 16 305.

ABSTRACT: The factors which affect the survival of human beings in airplane accidents followed by fire were studied by conducting full-scale crashes of transport- and cargo-type airplanes. STudies of burning airplane hulks supplemented the information obtained from the crash fires. The time interval during which occupants could escape from a burning airplane was determined by using the time histories of cabin temperatures and toxic gas concentrations in conjunction with data that define the environmental conditions which can be tolerated by human beings. Other hazardous factors, such as flying detached airplane parts, explosiions, and crushing of the airplane structure, were also studied.

3,971

Pesman, G. J., & A. M. Eiband 1956 CRASH INJURY
(National Advisory Committee for Aeronautics, Washington, D. C.)
Technical Note TN 3775; ASTIA AD-112 617; Nov. 1956

ABSTRACT: "Data from full-scale experimental airplane crashes were studied to determine how impact injuries occur and how the chance of such injuries may be reduced. The following hazards were considered: (1) being crushed, (2) being struck by missiles, (3) striking objects by tearing loose or flailing about, and (4) being injured by the crash decelerations. Transport, cargo, fighter, and light airplane crashes were studies." (NACA)

3,972

Pesman, G. J. 1961 TERMINOLOGY FOR ACCELERATION FORCES AS APPLIED TO APOLLO ASTRONAUTS. (National Aeronautics & Space Administration, Washington, D. C.) 17 March 1961

3,973

Pesman, G. J., & H. F. Scherer, Jr. 1963 EXTENSION OF THE MEASURED EXPERIENCE OF HUMAN IMPACT LOADS. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 29-May 2, 1963)

SUMMARY: The limits described in the previous paragraph will suffice if the spacecraft does not tumble during the landing. If the vehicle does tumble, data upon which to base the acceptable limits for impact forces having backward acting (EBO or -Gx) components must be obtained. Phase III of the impact program has been initiated to provide such data. This phase of the program, however, will encounter all of the problems associated with producing optimum restraint systems. Past experience has shown that restraint harness problems are usually complex and a particular magnitude of impact force may be quite acceptable with one harness design and completely unacceptable with a design that appears to be only slightly different. The reasons for such differences must be determined. It will then be possible to specify harness arrangements to satisfy specific problems and to select impact limits for the direction not studied in Phases I and II. (AUTHOR)

3,974

Peters, G.A and H.F. Glassner 1960 BIO-ELECTRONIC ANALYSIS OF PERFORMANCE. (Douglas Aircraft Co., El Segundo, Calif.) Engineering paper no. 897, ASTIA AD-235 969, March 1960

ABSTRACT: Recent conceptual and experimental work is described which deals with the methods of recording, analyzing, and interpreting multiple physiologic responses. Emphasis is placed on the possible use of bio-electronically monitored phenomena as a criteria of human performance and physical well being. Data is presented on the physiological changes which were obtained during the performance of complex psychological tasks. Interesting developments from this research are presented which relate to response variability, performance criteria, bio-electronic indices, and the calibration of human experimental plug-in units. Special emphasis is placed on the implications which relate to the analysis and interpretation of bio-electronic data obtained from experimental air and space vehicles. (Author)

3,975

Peterson, N. V., ed. 1958 PROCEEDINGS, FOURTH ANNUAL MEETING, AMERICAN ASTRONAUTICAL SOCIETY, 29-31 JAN. 1958, NEW YORK

CONTENTS:
Riddell, F. R., & R. W. Detra, "Returning Alive from Space,"
Strughold, H. O., "Advances in Astrobiology,"
Conover, D. W., E. G. Aiken, & C. M. Whitlock, "The Selection and Training of a Bio-Satellite Crew "

3,976

Peterson, N.V. & H. Jacobs, Eds. 1958 AMERICAN ASTRONAUTICAL SOCIETY (Proceedings of the Western Regional Meeting, Aug. 18-19, 1958, Palo Alto, Calif.)
(American Astronautical Society, New York, 1958)

ABSTRACT: Contents include:
Ward, J.E., "Considerations of Weightlessness", Special lecture, 5 pp. 6 refs.
Hoover, G.W., "Man's Operational Environment in Space", Paper no. 4, 12 pp., 13 figs.
Kornhauser, M., "Impact Protection for the Human Structure", Paper no. 38, 9 pp. 8 figs., 8 refs.

3,977

Peterson, N.V. & R.S. Swanson c.1960 RENDEZVOUS IN SPACE - EFFECTS OF LAUNCH CONDITIONS. (Proceedings, Manned Space Stations Symposium, Inst. Aero. Sci., c. 1960)

3,978

Peterson, R.L. 1962 AN INVESTIGATION OF THE SUSTAINED ACCELERATION PROPERTIES OF THE NET SEAT (Flight Dynamics Lab., Aeronautical Systems Div., Wright-Patterson AFB, Ohio) ASRMDD-TM-62-58, Aug. 1962. NASA N 62-17259

ABSTRACT: This report presents the results of an in-house net seat sustained acceleration text program to evaluate the acceleration capability of the net seat concept during simulated launch and reentry profiles. Results of these human centrifuge experiments indicate that the prototype net seat provides the space crew member with an excellent support-restraint system with which to withstand application of transverse (chest to back) accelerations up to 16.5G's

3,979

Petter, C. K. 1933 METHODS OF MEASURING THE PRESSURE OF THE INTERVERTEBRAL DISC. J. Bone and Joint Surg. 15:365, April 1933

3,980

Pettitt, J. A., S. I. Cohen, et al 1958 MULTIPLE PSYCHOPHYSIOLOGIC MEASURES DURING GRADUAL ONSET ACCELERATION.
(Wright Air Development Ctr., Wright-Patterson AFB, Ohio)
WADC TN 57-234, Feb. 1958. ASTIA AD 130 796.

ABSTRACT: To investigate psychophysiological factors associated with the response of subjects to gradual onset of acceleration (G), 15 subjects were tested. Prior to the experiment blood was drawn for blood sugar determination, then the subject was exposed to four "stress" periods during which time skin resistance, blood pressure, tracking performance, and pulse were measured. The periods were (1) tracking for 90 seconds with centrifuge at rest, (2) 2G, (3) 4G, and (4) blackout level or 7 G. Prior to each G exposure there was a one-minute control period. Subjective symptoms and post-run performance estimates were obtained after each run. The relation between level of central nervous system arousal and vascular changes to blackout and performance decrement were analyzed.

3,981

Petty, C.M. 1960 INTERPLANETARY MANEUVERS USING RADIAL THRUST.
(Lockheed Aircraft Corp., Sunnyvale, Calif.) Rept. No. LMSD-703036;
ASTIA AD-341 277; Aug. 1960

ABSTRACT: Basic interplanetary maneuvers are considered, with emphasis placed on simplicity in instrumentation. First, a general theory of radial thrust is developed geometrically, since it reveals a proper perspective of the opportunities and limitations of the theory. The special case of constant radial thrust acceleration is treated in detail. Finally, an example of a Martian capture maneuver is given where the initial portion of the maneuver has constant radial thrust acceleration and in the terminal portion the thrust acceleration varies to maintain constant radial speed. The associated characteristic velocity and other parameters are computed. (Author)

3,982

Pfingstag, C.J. 1953 PRELIMINARY INVESTIGATION INTO THE STUDY OF THE FUNDUS OCULI OF HUMAN SUBJECT UNDER POSITIVE ACCELERATION (U.S. Naval Air Development Center, Johnsville, Penna.) Rept. No. NADC MA 5303, Bureau of Medicine and Surgery Rept. No. NM 001 060.12.01, TED NADC AE 1402.00 and TED ADC AE-6303

3,983

Pfingstag, C. J. 1953 PILOT'S ABILITY TO SIMULATE AN EMERGENCY ESCAPE WITH VARIOUS TYPES OF EJECTION SEATS WHILE SUBJECTED TO A FLUCTUATING ACCELERATION (Naval Air Development Ctr., Johnsville, Pa.) Proj. TED No. ADC AE-6303; ASTIA AD-54 281; 3 Nov. 1953

ABSTRACT: To determine some of the difficulties a pilot experiences in operating an ejection seat under emergency conditions, three types of seats (Air Force "arm rest" upward, Air Force "D-Ring" downward, and Navy "face curtain" upward) were tested by Air Force and/or Navy pilots in full flight gear while subjected to a fluctuating acceleration on the Aviation Medical Acceleration Laboratory Human Centrifuge. The advantages and disadvantages of each type are enumerated. It is concluded that performance may be improved on all seats by training and practice. The following modifications on the seats are suggested: (1) that the catapult strokes be shortened to 52 in. and ejection force increased for 60 ft./sec. ejection velocity, and (2) that they have the "D-ring" on the leading edge of the seat bucket as a pre-ejection and firing mechanism.

3,984

Phillips, D. G. 1945 INVESTIGATION OF VESTIBULAR FUNCTION AFTER HEAD INJURY. J. Neurol, Neurosurg., Psychiat. N.S. 8(2):79-100.

ABSTRACT: Experimental and clinical investigations of vestibular function and its relation to the symptom of post-traumatic giddiness have been carried out. It is concluded that focal injury to the vestibular pathway is the major factor, and that vasomotor disorder is the most important secondary factor in causation of the symptom.

3,985

Phillips, J. N., Jr. 1961 BIOLOGICAL SYSTEMS IN SPACE VEHICLES. Lectures in Aerospace Medicine, 16-20 January 1961. (School of Aviation Medicine, Brooks AFB, Texas)

3,986

Phillips, P. B. and G. M. Neville 1958 "EMOTIONAL G" IN AIRSICKNESS J. of Aviation Medicine 29(8):590-592, August 1958

ABSTRACT: Sixty-nine of 2,893 primary flight students developed moderate or severe airsickness in the primary phase of their flight training. Fifty-eight per cent of these students completed their primary phase of flight training after interview and reassurance by the flight surgeon. No medications were used. A past history of motion sickness was common to both those who did and those who did not complete primary. Anxiety toward flying was

marked in the majority of those who failed and motivation for flying was poor. A careful interview of an airsick flight student by a trained flight surgeon permits a reliable estimate of a student's motivation and his anixiety level. When anxiety is marked and motivation is poor his airsickness may be a manifestation of "emotional G." A new equation is offered to relate the direct proportion of the degree of anxiety and inverse proportion of the motivation.

3,987

Phillips, P.B. & J. Zarriello 1959 BRAIN INJURY FROM HIGH-G PULLOUT? (Paper, Meeting of Aero Medical Association, Statler Hilton Hotel, Los Angeles, April 27-29, 1959)

ABSTRACT: A young flight student experienced a stuck trim tab in a dive bombing run and had to exert exceptional force to stop the dive and save his life. He experienced a 9 G force which apparently resulted in a cerebellar injury with ataxia, dyssynergia, past pointing dysarthria, and dysgraphia. After medical and neurological examination he was grounded, and followed carefully for approximately six months during which all symptoms gradually cleared. He was checked by EEG, the human centrifuge, psychological tests, and by several actual test flights, and finally approved for full flight duty and has been an instructor for several months. No similar case could be found in the literature. This is reported because of the clinical interest it should be to flight surgeons. (J. Aviation Med. 30(3):198, Mar. 1959)

3,988

Phillips, P.B., and J.J. Zarriello 1959 CENTRAL NERVOUS SYSTEM INJURY FROM HIGH RADIAL G FORCE. Aerospace Medicine 30(11):847-851

ABSTRACT: This is the case of a young flight student who apparently suffered a central nervous system injury, possibly an alteration in blood flow and subsequent edema, while under a positive 9 G stress in an airplane during an emergency. The clinical findings cleared without specific treatment. Clinically, and from a laboratory standpoint as well as from practical testing in flight, the patient was considered physically fit and aeronautically adapted for resuming his career in Naval aviation. He was returned to flight status by the Permanent Board of Medical Examiners. For the past nine months, this young officer has been serving as a primary flight instructor at his own request in the Naval Air Training Command at Pensacola, and his superiors report his efficiency and ability to be above average. Upon reviewing the literature, no previous case report was found of similar central nervous system trauma resulting from exposure to positive radial acceleratory force occurring during actual flight.

3,989

Phillips, P. B. & J. J. Zariello 1959 EPILEPTIFORM SEIZURE AND LOW G TOLERANCE. A Case Report.
J. Aviation Med. 30(1):35-37.

SUMMARY: This is a case report of a twenty-three year-old aviation officer candidate who was referred for a complete medical evaluation after having experienced "black-out" during unusually low G forces while flying. This report contains the history and physical examination of the young man. It also reports on his mental status, centrifuge tests, and the electroencephalography results. After a thorough investigation, the physicians agreed that his reaction was a classical epileptiform tonic-clonic seizure.

3,990

Phillips, R. B. & C. Sheard 1939 AMAUROSIS FUGAX: EFFECT OF CENTRIFUGAL FORCE IN FLYING.
Proc. Mayo Clinic 14:612-618, 27 Sept. 1939.

ABSTRACT: The transitory or fleeting blindness in amaurosis fugax lasts from 1 to 20 seconds, being occasioned by sudden change of direction at high speed. Transverse accelerations up to 16 g. gause no untoward effects on experimental animals and, up to 10 g. do not produce disturbances of vision. Armstrong and Hein found that, flying in the vertical (positive) direction, in man, vision was lost after 5 g. was attained; coma ro fainting developed between 6 g and 9 g. Tears were thrown off in a stream at -4 g, and at -4 g and -4.5 g there were hemorrhages into the conjunctival membranes and a feeling that the eyes were protruding from their sockets. The return of vision occurs suddenly and dramatically.

Generally the loss of sight is attributed to the compression exerted by the intra-ocular pressure on the central retinal artery and its branches, but various facts point to the conclusion that the local conditions in the eyes form only part of a chain of factors affecting the lower visual centers and the corticovisual areas concerned with conscious mental processes.

3,991

Phillips, R. L. 1958 DESCENT TRAJECTORIES FOR MANNED SPACE VEHICLES.
(Space Technology Labs., Inc., Ramo-Wooldridge Corp., Los Angeles, Calif.)
GM-TR-0165-00416, 29 June 1958.

3,992

Phillips, R.L. and C.B. Cohen 1958 THE USE OF DRAG MODULATION TO REDUCE DECELERATION LOADS DURING ATMOSPHERIC RE-ENTRY
(Space Technology Laboratories, Ramo-Wooldridge Corp., Los Angeles, Calif.)
GM-TR-0165-00352 April 9, 1958

ABSTRACT: The design of a space vehicle capable of entering the earth's

atmosphere involves among other things, consideration of the accuracy with which its landing point can be predicted, the maximum deceleration loads which the vehicle will experience, and the aerodynamic heating to which the vehicle is exposed. Since minimization of the landing-point dispersion may require the use of entry angles sufficiently large to cause subsequent excessive deceleration loads to the vehicle and its occupants, a scheme is examined whereby these loads may be reduced to a tolerable level. This is accomplished by variation of the drag of the vehicle (either discretely or continuously) in a properly programmed fashion. It is found that the use of continuous drag modulation can reduce the deceleration loads by as much as 50% without significantly affecting the total aerodynamic heating of the vehicle. Particular numerical solutions of the complete equations of motion are also included. These substantiate the results of the approximate analysis. In addition, several specific applications of drag modulation have been considered, such as application to a vehicle returning from the moon.

3,993

Phillips, W. H. & D. C. Cheatham 1950 ABILITY OF PILOTS TO CONTROL SIMULATED SHORT-PERIOD YAWING OSCILLATIONS.
(National Advisory Committee for Aeronautics, Washington, D. C.) NACA RM-L50D06, 13 Nov. 1950.

3,994

Phoebus, C.P. 1958 ACCOMMODATING THE SPACE MAN.
Research Reviews pp. 6-12, June 1958

ABSTRACT: This article discusses problems which must be solved before space ships can be built which accommodate man's needs sufficiently to permit weeks or months of flight. These problems arise primarily because of the continuously closed environment, hence are discussed in the light of experience with submarine design. Problem areas include: respiratory mechanisms, food and waste, radiation, psychological factors, information from human engineering studies, the crew, acceleration and deceleration, environmental temperature, waste disposal and weightlessness.

3,995

Pickard, D. 1959 MEASURING BIOPHYSICAL CHANGES ON A CENTRIFUGE.
Automatic Control 11(4):13-16, Oct. 1959

3,996

Pickering, J.E., W.L. Brown, H.D. Stallings, R.E. Benson et al 1959 PRIMATES IN SPACE: REPORT NO. 2, BIOASTRONAUTICS ADVANCES IN RESEARCH (Air Force School of Aviation Medicine, Randolph AFB, Texas) March 1959

3,997

Pickering, J. E. 1960 RESEARCH PROGRAMS - III. FUTURE PROBLEMS. Lectures in Aerospace Medicine, 11-15 January 1960. (School of Aviation Medicine, USAF Aerospace Medical Center, Brooks AFB, Texas)

3,998

Pickering, J. E. 1961 ANIMAL AND MAN IN THE SPACE ENVIRONMENT. In Bergeret, P., ed., Escape and Survival: Clinical & Biological Problems in Aero Space Medicine. (London, New York, Paris: Pergamon Press, 1961) AGARDograph 52. Pp. 104-107.
ASTIA AD 261 881

ABSTRACT: Bioscientists and engineers have enthusiastically met the challenge for the conquest of space. Tremendous strides are being made in the biophysics of the space environment, particularly in defining: (1) physiological effects, (2) the creation of an intra-cabin environment that meets the human requirements, (3) proper nutrition, and (4) normal respiratory exchange. Additionally, unique approached to the biodynamics of space vehicles programmed through launch and re-entry profiles with compensation for man's limitations is receiving research emphasis. If man is to travel far and for extended periods of time, a very careful definition of the problem and man's responses to the stresses of weightlessness and radiation will heavily influence judgment for such ventures. Although much has already been presented on these two areas, one must realistically admit that of all of the biological hazards involved in space operations, the exposure of living tissue to ionizing radiation is perhaps still the most important and certainly the one with the most far-reaching consequences. This paper deals with various categories of radiation and their possible effects on man.

3,999

Pickering, W. H. 1959 MAN IN SPACE In Alperin, M., & H. F. Gregory, eds., Vistas in Astronautics, II (New York, N. Y.: Pergamon Press, 1959)

4,000

Pierce, T.F. 1952 CLOSED LOOP CONTROLS HUMAN CENTRIFUGE. Electronics 25(10): 132-134

ABSTRACT: A human centrifuge developed at the Naval Air Development Center, Johnsville, Pennsylvania, is described. In developing acceleration forces up to 40 g, it simulates stresses encountered in high-speed flight and will be used to test physiological effects of acceleration and anti-g devices (protective clothing). It consists of basically of a 50-foot tubular-steel arm attached to the shaft of a 4000-hp motor, carrying at its end an oblate spheroidal gimbal-suspended gondola for the test subject. The centrifuge can be accelerated to a gondola speed of approximately 173 mph. in less than 7 seconds and decelerated at the same rate. The main accelerating motor and the two gimbal control motors are electronically controlled. Observation of the test subject is achieved with television, motion picture cameras, high-speed X-ray equipment, and special physiological sensing and measuring equipment.

4,001

Piercy, M. 1957 EXPERIMENTAL DISORIENTATION IN THE HORIZONTAL PLANE Quart. J. Exp. Psychol. 9:65-77

4,002

Pieron, H. 1953 THE SENSATIONS.
(Cambridge: Yale University Press, 1953)

4,003

Pigg, L.D., & W.N. Kama 1961 THE EFFECT OF TRANSIENT WEIGHTLESSNESS ON VISUAL ACUITY. (Behavioral Science Lab., Aerospace Medical Division, Wright-Patterson AFB, Ohio) WADD TR 61-184, March 1961. ASTIA AD 261 906

ABSTRACT: Visual acuity was measured on subjects while they were exposed to short periods of weightlessness aboard an aircraft flown through zero-g trajectories involving transition from 1 g to 2-1/2 g to zero g. Monocular and binocular acuity of near and far vision were measured on both Snellen and checkerboard targets. Control measurements were made on the ground and inflight at 1 g in counter-balanced sequence with the zero-g measurements. Results show that the weightless environment produced from this study has a detrimental effect on visual acuity as measured. The decrement is not considered to have practical significance. (Author)

4,004

Pigg, L.D. 1962 VISUAL ACUITY IN RELATION TO BODY ORIENTATION AND G-VECTOR. (Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio) Final Report. MRL-TDR-62-74. July 1962. ASTIA AD 285 552

ABSTRACT: The Armed Forces Vision Tester, fitted with checker-board targets was used in tests of visual acuity under viewing conditions involving various combinations of gravity effects. Twenty-four subjects were tested for left, right, and binocular acuity of near and far vision in each of four body positions: standing upright, prone, supine, and inverted upright. The latter condition effectively produced- 1 G acceleration. Intercomparisons of scores from these positions from the basis for useful generalizations concerning the effects on visual acuity of various acceleration environments, including 0 G. By comparison with their acuity at 1 G, subjects experience a decrement at 1 G of approximately 15 percent. This is comparable to the decrement found by other investigators at 3 G's. Since both 1 G and 3 G's are 2 G-units removed from 1 G, it appears that equal changes in either direction from the normal acceleration environment produce equal losses in visual acuity as a function of the amount of change. This conclusion is supported by results of a previous study of acuity at 0 G, in which a small but statistically significant decrement comparable to that at 2 G's was found.

4,005

Pilizzi di Sorrentino, A. 1951 UNA RARA FRATURA CRANICA DA INCIDENTE DI VOLO (Unusual Cranial Fracture Caused By An Airplane Accident) Rivista di Medicina Aeronautica, Rome, 14:538-545, July-Sept. 1951

4,006

Pilz, G.F., 1926 ON THE RELATION OF THE AFTER-NYSTAGMUS TO ROTATION NYSTAGMUS. Amer. J. Physiol. 77: 428-442

4,007

Pinc, B.W. & B.L Ettelson 1961 DEVELOPMENT OF AN INTERNALIZED ANIMAL TELEMETRY SYSTEM.
(Paper, 32nd Annual Meeting of the Aerospace Medical Association, Chicago, April 24-27, 1961)

ABSTRACT: This paper describes a program which successfully developed a surgically implanted single channel biological telemetry system. The limitations of conventional approaches to instrumentation of experimental animals in rigorous environments is described. The practical advantages to be derived from advanced bioinstrumentation techniques is discussed. The background, rationale, design objectives and technical approach employed are outlined. The program results are summarized and some conclusions are presented. A film illustrating the program is shown. (Aerospace Medicine 32(3):244. March 1961)

4,008

Pinc, B. W., M. Brian, M. D. Ross, & N. L. Barr 1962 SMALL PRIMATE RESPONSES TO SIMULATED RE-ENTRY ACCELERATION PROFILES. (Paper, 33rd Annual Meeting of the Aerospace Medical Assoc., 9-12 April 1962, Atlantic City, N. J.)

ABSTRACT: A re-entry acceleration profile simulator, capable of producing very high accelerative loads over broadly variable periods of onset, duration, and decay, was used to expose small squirrel monkeys in miniaturized versions of current restraint and support devices to various +Gx loads. Biological and physical data were directly and indirectly collected during the exposures. The response of the animals to "conventional" accelerative stresses is presented, as well as data on small primate response to unconventionally high accelerative environments with special attention to reversible tissue damage as an endpoint. Modifications to the restraint and support devices to improve tolerance to acceleration stresses are described. Some preliminary and tentative conclusions are drawn and future work is outlined. (Aerospace Medicine 33(3):367, March 1962).

4,009

Pine, N.W. ed. 1961 THE BIOLOGY OF SPACE TRAVEL.
(London: The Institute of Biology, 1961)

(A collection of space Biology papers)

4,010

Ping, B. W. & B. L. Ettelson 1961 DEVELOPMENT OF AN INTERNALIZED ANIMAL TELEMETRY SYSTEM.
(Paper 1961 Meeting of Aerospace Medical Association, Chicago, April 24-27).

ABSTRACT: This paper descirbes a program which successfully developed a surgically implanted single channel biological telemetry system. The limitations of conventional approaches to instrumentation of experimental animals in rigorous environments is described. The practical advantages to be derived from advanced bioinstrumentation techniques is discussed. The background, rationale, design objectives and technical approach employed are outlined. The program results are summarized and some conclusions are presented. A film illustrating the program is shown. (Aerospace Med. 32(3):244, March 1961)

4,011

Pinkel, I. I. & E. G. Rosenberg 1956 SEAT DESIGN FOR CRASH WORTHINESS. (National Advisory Committee for Aeronautics, Washington, D. C.) Tech. Note TN 3777; Oct. 1956. ASTIA AD 109 316.

ABSTRACT: Data are presented from full-scale laboratory and crash studies on the

deceleration loads measured on dummy passengers in seats of standard and novel design. Included are charts for obtaining the maximum deceleration loads experienced by the seat and passenger in response to the crash deceleration pulses. In addition, a method is described for determining the seat strength, spring stiffness, and deformation beyond the elastic limit required to serve in a crash deceleration pulse of a given type.

4,012

Pinkel, I. I. and E. G. Rosenberg. 1957 SEAT DESIGN FOR CRASH WORTHINESS. NACA Rep. 1332, 1957 (Supersedes NACA TN 3777.) ASTIA AD 109 316

ABSTRACT: On the basis of deceleration data obtained in full-scale crashes, a description of crash deceleration pulses is presented which is suitable for seat design. Charts are presented for obtaining the maximum deceleration loads experienced by the seat and passenger in response to their crash deceleration pulses. Finally, a method is presented for determining the seat strength, spring stiffness, and deformation beyond the elastic limit required to serve in a crash deceleration pulse of given description. Measurement of passenger decelerations in full-scale laboratory and crash studies shows that the general principles presented in the report apply.

4,013

Pinneo, L.R. and M.L. Kesselman 1959 TAPPING THE ELECTRIC POWER OF THE NERVOUS SYSTEM FOR BIOLOGICAL TELEMETERING (Rome Air Development Center, Griffiss AFB, N.Y.) RADC-TN-59-15

ABSTRACT: Two experiments are reported in this document wherein electric power is measured from the central nervous system (CNS) of a living mammal, and an FM radio transmitter is operated on voltages supplied largely by the organism. Also discussed are the neurophysiological basis of the CNS currents, the physical characteristics of minumum voltages necessary to operate transistors; and a description of methods of combining the two techniques for biological telemetering.

4,014

Pinson, E. A. 1940 AIRSICKNESS, ITS CAUSE AND PREVENTION. (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) Memo Rept. EXP-M-54-653-21; 31 July 1940

4,015

Pinson, E. A. 1941 DARK ADAPTATION APPARATUS (ROTATING HEXAGON) (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) Memo Rept. EXP-M-54-653-69A; 29 November 1941

4,016

Piollet, L. 1960 LE VOYAGE TERRE LUNE - SERA-T-IL UN JOR UN VOYAGE D'AGREMENT? (The Earth-Moon Trip - Will It One Day Be a Pleasure Trip?) L'air, pp. 16-18, May 1960, (in French).

ABSTRACT: Discussion of the environmental conditons against which an astronaut will have to be protected. These are (1) the accelerations of launching and landing, (2) extreme temperature variations, (3) the noise and vibration of the rocket, (4) the state of weightlessness, (5) ionizing and nonionizing radiation, and (6) meteoritic impact. It is suggested that when these problems have been solved, man will have a 98% chance of surviving a journey in space.

4,017

Piorry, P.A. 1826 RÉCHERCHES SUR L'INFLUENCE DE LA PESANTEUR SUR LE COURS DU SANG; DIAGNOSTIC DE LA SYNCOPE ET DE L'APOPLEXIE; CAUSE ET TRAITEMENT DE LA SYNCOPE (Research Upon the Influence of the Gravity on the Blood Circulation; Diagnosis of the Syncope and the Apoplexy; Cause and Treatment of the Syncope.)
Archives générales de médecine (Paris) 12: 527-544

4,018

Piquet, J. & J. J. Piquet 1958 CENTRAL SEQUELAE OF CLOSED CRANIAL INJURIES: POST-CONCUSSION VERTIGO AND THEIR OBJECTIVE MANIFESTATIONS. Rev. Otoneuroophthal. 30:29-47.

4,019

Pisarev, D. I. 1957 NEUROLOGICAL EXPERIENCES OF AVIATION MEDICINE Trans. of mono. Neurologische Erfahrungen der Luftfahrtmedizin, Berlin, 1957, trans. from mono. Opyt Raboty v Oblasti Aviatsionnoy Nevrologii i Voprosy Profilaktiki (Experimental Work in the Field of Aviation Neurology and Problems of Prevention) ed. by Rudolf Mitzscherling. (Office of Technical Services, Washington, D.C.) 1959 60-13091

4,020

Pisarev, D. I. 1959 NEUROLOGICAL EXPERIENCES OF AVIATION MEDICINE (Trans. from mono. Opyt Raboty v Oblasti Aviatsionnoy Nevrologii i Voprosy Profilaktiki (Experimental Work in the Field of Aviation Neurology and Problems of Prevention) ed. by Rudolf Mitzscherling. (Office of Technical Services, Washington, D.C.) 60-13091

4,021

Pivotti, G. 1957 EXPERIMENTS ON LATERAL NYSTAGMUS EVOKED BY SIMULTANEOUS BILATERAL THERMAL STIMULATION OF THE VESTIBULAR APPARATUS.
(Esperienze sul nistagmo laterale evocata da bilaterale, contemporanea stimolazione termica del apparato vestibolare.)
Archivio di fisiologia,(Firenze), 57(2-3):117-135. Nov 12, 1957

ABSTRACT: No lateral nystagmus was observed in normal subjects in a supine position (corresponding to a horizontal situation in relation to the force of gravity of the plane connecting the ampullae of the horizontal semicircular canals) exposed to bilateral, simultaneous, equal thermal stimulation of the vestibular apparatus. This is termed the position of indifference. In this position, if the head was turned either right or left, nystagmus developed directed towards the side contrary to rotation. The duration and frequency of the nystagmus attains maximal values after a 90° lateral rotation of the head. In this position, after a certain period of time, even if thermal stimulation persists, lateral nystagmus terminates. This may be due to exhaustion of the endolymphatic current with return of the cupula to its original position. By bringing the head back in the medical position (rotatation of 90° in the direction contrary to the preceding one) nystagmus reappears. This is an expression of the endolymphatic current of balance that reinstates the original equilibrium. (Author)

4,022

Platonov, K. K. 1957 MAN IN FLIGHT 2D. ED. REV. 1958
(Trans. of Chelovek v Polete, 2d ed. rev., Moscow, 1957.
(Office of Technical Services, Washington, D.C.) 59-11879

4,023

Platonov, K.K. 1957 MAN IN FLIGHT (SECOND REVISED AND EXPANDED EDITION)
Technical Documents Liaison Office, MCLTD, Wright-Patterson Air Force Base, Ohio
F-TS-9381/V; ASTIA AD 162 876
(Original Source: Military Publishing House, Ministry of Defense, USSR, Moscow)

ABSTRACT: This book discussed the principal questions of aviation medicine, with which the pilot must in practice be acquainted. The book is intended for students of aeroclubs and flying schools, for the flight personnel of the regular military units of the Soviet Army Air Force, and for the wide circle of youth interested in aviation. It will also be useful to physicians serving aviation units, schools, and aeroclubs.

4,024

Platonov, K.K. 1959 PSIKHOLOGICHESKIE PROBLEMY KOSMICHESKOGO POLETA (Psychological Problems of Space Flight) Vosprosy Psikhologii (Moskva), 5(3):56-65
German Translation: Psycholgische Probleme des Raumfluges, in Sowjetwissenschaft: Naturwissenschaftliche Beitrage (Berlin), 1959(12):1213-1222, 1960

ABSTRACT: The psychologic effects of the conditions of space flight are reviewed with reference to published reports on the reactions of experimental subjects to these conditions. It is concluded that the adverse effects of acceleration, weightlessness, confinement, isolation, and exposure to danger may satisfactorily be counteracted by the proper conditioning and motivation of space pilots.

4,025

Platonov, K. K. 1959 PSYCHOLOGICAL PROBLEMS OF OUTER-SPACE FLIGHT (Psikhologicheskiye Problemy Kosmicheskogo Poleta)
Trans. of Voprosy Psikhologii (USSR) 5(3):56-65, 1959.
(Office of Technical Services, Washington, D.C.)
Dec. 16, 1959 60-13520

4,026

Pletcher, K. E. 1959 THE HUMAN ELEMENT IN AIRCRAFT ACCIDENTS (Conference, U. S. Air Force Flight Safety, 14-18 Sept. 1959, Riverside, Calif.)

4,027

Poe, A. C., & V. W Lyon 1952 THE EFFECTIVENESS OF THE CYCLORAMIC LINK TRAINER IN THE U. S. NAVAL SCHOOL, PRE-FLIGHT. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. NM 001 058.07.01., 17 March 1952

4,028

Pogrund, R. S., S. W. Ames and C. F. Lombard 1949 BIOCHEMICAL AND BLOOD PRESSURE CHANGES IN GOATS UNDER NEGATIVE G (ACCELERATION TAILWARD)
(Office of Naval Research, Washington, D. C.)
December 1949 Contract N6ori77
See also J. Avia. Medicine, 22(1), February 1951

SUMMARY: Blood pressure and biochemical changes of blood have been determined in goats repeatedly exposed to negative radial acceleration on the human centrifuge at the University of Southern California.

4,030

Pogrund, R.S. 1962 PHYSIOLOGICAL ASPECTS OF THE SPACEMAN
In: Brown, K., and L.D. Ely, eds., Space Logistics Engineering (New York: John Wiley and Sons, 1962) pp. 55-135

ABSTRACT: The complexity of space logistics engineering for the comfort of the astronaut in a space vehicle is described as a function of mission duration and of the operational requirements and performance capabilities expected. The following physiological parameters are reviewed: (1) vehicle-induced stresses (propulsion, noise, vibration, accelerations, zero gravity, re-entry, emergency escape); (2) internal environment of the space capsule (sources of oxygen supply, handling food, biological photosynthesis systems, methods of carbon dioxide elimination, water and waste control, toxicological considerations, temperature and humidity regulation); (3) radiation hazard shielding requirements, low-level chronic exposure hazard; and (4) psychological stress (isolation, confinement, and sensory deprivation).

4,031

Pokorovski, A.V. 1956 STUDY OF THE VITAL ACTIVITY OF ANIMALS DURING ROCKET FLIGHTS INTO THE UPPER ATMOSPHERE. (Report presented at the Congres Internationale des fusees et engins guides, Paris, Dec. 3-8, 1956)
In Etudes Sovietiques (Paris) 106:65-70, Jan. 1957.
R.A.E. Translation No. 625, ASTIA AD 124191
Alsoin Krieger, F. J., ed. Behind the Sputnik (Washington: Public Affairs Press, 1958)

ABSTRACT: In the first stage of this work, vital activity of the body at high altitudes has been observed in dogs, carried in a hermetically sealed compartment in the nose of a rocket. Equipment carried in the compartment allowed observations to be made on conditions, and on the behaviour of the animals during flight, and during the free fall of the cabin from the rocket.

The second stage involved the placing of the dogs, in space suits, in a compartment not hermetically sealed. In one case the animal was ejected at about 75 to 85 km, its parachute opened, and it was subjected to all the external influences of the upper atmospheric layers during 50-65 min.

4,032

Pokrovskiy, B. 1961 MAN'S SPACE FLIGHT
Vestnik vozdoshnogo flota 4: 59-62

4,033

Pokrovskiy, G. 1961 MAN GOES OUT INTO SPACE
Kryl'ya rodiny 6: 17-18

ABSTRACT: The article deals with the first cosmic flight of Major Yu. A. Gagarin in the spaceship "Vostok", which proved that man can exist and function normally in space. K.E. Tsiolkovskiy was amongst the first scientists to point out that man in a cosmic fl ght would experience two distinctly different states, i.e. overloads which would be felt during the acceleration and deceleration in the atmosphere before landing, and a state of weightlessness while the spaceship is in orbit. Insignificant "g" loads would be possible during change-over from one orbit into another or before landing. "g" loads have been known to high-speed pilots, and momentary weightlessness to aerobatic pilots. Checking of a prolonged state of weightlessness had to be carried out under conditions of a real cosmic flight. Three aspects of the phenomena were observed: (1) weightlessness reduces the load on blood vessels and facilitates the heart functions. It lowers the strain of the human body, and could be used as a treatment for heart diseases; (2) it affects the intake of food, which becomes weightless; further investigation as to the food's progress in the digestive system was required; (3) the force of gravity must play an important part in man's orientation in space as it acts on the body as a whole, and on the vestibular apparatus, which governs the sensation of "Top" and "Bottom". After Major Yu. A. Gagarin's flight in space it was found that the human body withstands all unexpected and unusual conditions quite well. (CARI)

4,034

Pokrovskiy, G. 1961 DECELERATION OF SPACE VEHICLES
Tekhnika-molodezhi (Meteor-rocket) No. 1, 1961, 37. Air Information Division Report 61-51, ASTIA AD 255 793

ABSTRACT: The electric charge on the nose of a rapidly flying body considerably changes the intensity of the body's deceleration. Professor G. Pokrovskiy discusses the use of this effect in the development of a deceleration engine for space vehicles. The method of decelerating a space body would thus be based on the use of the kinetic energy of that body.

4,035

Pokrovskiy, G. 1961 MAN, TECHNOLOGY, AND SPACE
Ekonomicheskaya Gazeta 102(774):3-4, Sept. 27, 1960
(Aerospace Technical Intelligence Ctr., Wright-Patterson AFB, Ohio, Trans. No. MCL-851/1; ASTIA AD-258 837; March 27, 1961)

4,036

Pokrovskiy, G. 1961 METEOR-ROCKET
(Tekhnika Molodezhi, No. 1, 1961, pp. 37) Foreign Technology Division, WP-AFB, Ohio. FTD-TT-61-190/1+2 ASTIA AD 268070

ABSTRACT: Description of the study of meteors in relation to the problem of slowing down spaceships and re-entering the earth's atmosphere.

4,037

Pokrovskiy, I. 1961 MIRACLE OF THE TWENTIETH CENTURY.
Ekonomicheskaya Gazeta 88(941):4
(Aerospace Technical Intelligence Center, Wright-Patterson AFB, Ohio)
Transl. No. MCL-1150, 13 April 1961. ASTIA AD 261 824

ABSTRACT: This report is an evaluation on the individual and technical achievements of Soviet scientists, designers, and workers in the field of cosmic flights and other fields. It emphasizes the importance of sending a man into space to make it possible for him to work in this medium.

4,038

Polis, B. D., L. Jedeikin, and E. Polis 1952 EFFECTS OF ACCELERATION UPON THE CEREBRAL METABOLISM AND CEREBRAL BLOOD FLOW. PHASE III: The Activation of Aerobic Phosphorylation by the Addition of Xanthines and Analogous Compounds to the Inhibited Enzyme Systems. (Avia. Med. Acceleration Lab., U.S.Naval Air Development Center, Johnsville, Pa.) Rept. No. NADC-MA-5205; Rept. No. NM 001 060.03.04, 9 Dec. 1952; ASTIA AD-1031

ABSTRACT: This investigation was concerned with the increase in the efficiency of aerobic phosphorylation obtained by the addition of xanthines and analogous structural compounds to enzyme systems with the phosphorylation efficiency decreased by the addition of a Mg-ATPase, or by the use of suboptimal concentrations of ATP in the reaction mixture. Compounds such as caffeine, xanthine, and theophylline may function as a substitute for ATP with an in vitro enzyme system for aerobic phosphorylation. The opposing actions of pentothal and caffeine on aerobic phosphorylation may be due to a competitive action for the same enzyme site. Experimental results demonstrating the release or bypass of phosphorylation inhibition produced by dinitrophenol, pentothal, or Mg-ATPase by the addition of xanthines indicated that these compounds may function as a bypass to ATP in the coupling reaction of aerobic phosphorylation.

4,039

Polis, B. D., et al. 1955 MISCELLANEOUS TESTS AND MINOR INVESTIGATIONS. PHASE VI. AN INVESTIGATION INTO THE EFFECT OF ACCELERATION AND CERTAIN STRESSOR AGENTS ON THE INTERMEDIARY METABOLISM OF THE BRAIN. (Naval Air Development Ctr., Johnsville, Pa.) Project NM 001 103 300; TED ADC AE-1402; 31 Dec. 1955

ABSTRACT: Cerebral blood flow, cerebral oxygen consumption, and glucose metabolism were determined in groups of monkeys under the influence of the hallucinatory drug mescaline and under control conditions. Although the mescaline caused a considerable increase in blood flow, there were no changes in the total oxygen used relative to glucose. The experimental results did indicate the metabolism of an unknown reducing substance by the brain under stress. Mescaline apparently increased the brain utilization of this substance.

4,040

Polis B.D. 1959 HORMONAL FACTORS IN THE RESISTANCE OF THE MAMMAL TO ACCELERATION STRESS. (Paper, Meeting of Aero Medical Association, Statler Hilton Hotel, Los Angeles, April 27-29, 1959)

ABSTRACT: The reactions of the mammalian organism to acceleration stress involves circulatory, central nervous and respiratory responses to such an extent that the importance of the endocrine system in adjustment to this adverse environment is self evident. These studies were designed to reveal possible hormonal factors operative in the utilization of biological energy at a cellular level that would contribute to the survival of the animal under high acceleration forces. The heart rate obtained by a transistor amplified ECG adapted for use on an eight-foot animal centrifuge defined a physiologic end point of tolerance to 20 G as the time for the heart rate to fall from an initial rate of 7 beats to a final rate of 2 beats per second. With this criterion normal Sprague-Dawley rats survived 20 G for 10 minutes (50 per cent lethal level). Hypophysectomy provided an appreciable measure of protection against G stress in that the mean survival time was increased to 30 minutes. Injection of ACTH decreased the protective action of hypophysectomy. Adrenalectomy decreased the tolerance of the animal to G stress as indicated by a mean survival time of 4 minutes under 20 G. Adrenalectomy and hypophysectomy reversed the decreased tolerance to G stress obtained with adrenalectomy alone. The data were interpreted to indicate that the protective action of hypophysectomy was due to the elimination of adrenocortical hormones and pituitary hormones which are important for the resistance to other forms of stress.
(J. Aviation Med. 30(3):198, March 1959)

4,041

Polis, B. D. 1960 HORMONAL DETERMINANTS OF MAMMALIAN TOLERANCE TO ACCELERATION STRESS.
(Naval Air Dev. Ctr., Johnsville, Pa.) Rept. NADC-MA-6025; 12 Aug. 1960; ASTIA AD 242 447.
See also J. Appl. Physiol. 16(2):211-214, March 1961.

ABSTRACT: The pituitary-adrenal hormonal axis has been implicated as a critical factor in the survival of the rat to acceleration stress. The physiological endpoint for the tolerance of animals to high positive acceleration stress was obtained by determining the time to reduce the heart rate from eight to two beats per second at 20 G. With this technique a significant increase (300 percent) in the survival time of rats to 20 G was found following hypophy-sectomy. A significant loss (60 percent) of tolerance to high acceleration stress was found in adrenalectomized rats. The procedures of hypophysectomy and adrenalectomy essentially cancelled the effect of each operation alone in the rat to yield an animal approximately similar to the normal rat in its ability to tolerate acceleration. Possible mechanisms for these effects are offered. (Author)

4,042

Polis, B. D. 1961 HORMONAL DETERMINANTS OF MAMMALIAN TOLERANCE TO ACCELERATION STRESS.
J. Appl. Physiol. 16(2):211-214, March 1961.
See also (Naval Air Development Ctr., Johnsville, Pa.) NADC-MA-6025, 12 Aug. 1960. ASTIA AD 242 447.

ABSTRACT: The pituitary-adrenal hormonal axis has been implicated as a critical factor in the survival of the rat to acceleration stress. The physiological endpoint for the tolerance of animals to high positive acceleration stress was obtained by determining the time to reduce the heart rate from eight to two beats per second at 20 G. With this technique a significant increase (300 percent) in the survival time of rats to 20 G was found following hypophysectomy. A significant loss (60 percent) of tolerance to high acceleration stress was found in adrenalectomized rats. The procedures of hypophysectomy and adrenalectomy essentially cancelled the effect of each operation alone in the rat to yield an animal approximately similar to the normal rat in its ability to tolerate acceleration. Possible mechanisms for these effects are offered. (Author)

4,043

Polis, B. D. 1961 INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-DIMETHYLAMINOETHYL P-CHLOROPHENOXY-ACETATE (LUCIDRIL) (Naval Air Development Ctr., Johnsville, Pa.) NADC-MA-6136, 27 Nov. 1961
See also Aerospace Medicine 33(8):930-934, Aug. 1962

ABSTRACT: A simple chemical molecule, the dimethyl-aminoethyl ester of para-chlorophenoxyacetic acid has been found to enhance significantly the tolerance of rats to acceleration at 20 G. The median survival time of treated animals

increased to 33.3 minutes, almost a three-fold increment over the control survival time of 12.5 minutes. The effectiveness of the drug persisted only for a period of four hours after injection. A latent period of 3 to 4 days treatment with the drug seemed necessary before the enhanced tolerance to acceleration become apparent. The activity of the drug was dose dependent in that no significant changes in acceleration tolerance were found with a total injection of 50 mg; significant increments in tolerance were obtained with 75 mg of the drug; much larger increases in the tolerance to acceleration followed administration of 100 mg of Lucidril. The nature of the parmacologic effect suggests that the drug action per se is mediated via the hypothalamic area of the brain, possibly by interplay with the biogenic amines. Its structural relationship to acetylcholine suggests additional areas for investigation of the mechanism of its action and also for the investigation of the role of this hormone in acceleration stress tolerance. The low toxicity of the drug and the fact that it has already been used in humans in high doses with no deleterious and some presumptive beneficial effects leads to the proposal that the compound might be effective in increasing human tolerance to acceleration stress. (AUTHOR)

4,044

Polis, B. D. 1961 INCREASE IN THE TOLERANCE OF ACCELERATION STRESS WITH THE DIMETHYLAMINETHYL ESTER OF P-CHLOROPHENOXYACETIC ACID. (Paper, 32nd Annual Meeting of the Aerospace Medical Association, 24-27 April 1961, Chicago, Ill.

ABSTRACT: Previous studies from this laboratory have demonstrated a pronounced enhancement of the tolerance to acceleration stress in the rat following hypophysectomy. The studies implicated the pituitary adrenal axis as a critical factor in the survival of the rat and pointed to possible involvement of the hypothalamic area of the brain. Attempts were then made to attain a similar enhancement of the resistance to acceleration stress without some of the deleterious effects of hypophysectomy. The new drug lucidril (dimethylaminoethyl ester of p-chlorophenoxyacetic acid) has been shown to enhance the vasopressor effects of adrenalin applied topically to the brain. Administration of lucidril to rats increased the tolerance of a rat population from a median survival time of 10 minutes at 20 G to a median survival time of 24 minutes at 20 G. The low toxicity of the drug and striking effects in animals suggests its possible use to increase the tolerance of humans to high G. (Aerospace Medicine 32(3):244, Mar. 1961)

4,045

Polis, B. D. 1962 INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-DIMETHYLAMINOETHYL P-CHLOROPHENOXY-ACETATE (LUCIDRIL) Aerospace Medicine 33(8):930-934, Aug. 1962
See also (Naval Air Development Ctr., Johnsville, Pa.) NADC-MA-6136, 27 Nov. 1961

ABSTRACT: A simple chemical molecule, the dimethyl-aminoethyl ester of parachloro phenoxyacetic acid has been found to enhance significantly the tolerance of rats

to acceleration at 20 G. The median survival time of treated animals increased to 33.3 minutes, almost a three-fold increment over the control survival time of 12.5 minutes. The effectiveness of the drug persisted only for a period of four hours after injection. A latent period of 3 to 4 days treatment with the drug seemed necessary before the enhanced tolerance to acceleration become apparent. The activity of the drug was dose dependent in that no significant changes in acceleration tolerance were found with a total injection of 50 mg; significant increments in tolerance were obtained with 75 mg of the drug; much larger increases in the tolerance to acceleration followed administration of 100 mg of Lucidril. The nature of the parmacologic effect suggests that the drug action per se is mediated via the hypothalamic area of the brain, possibly by interplay with the biogenic amines. Its structural relationship to acetylcholine suggests additional areas for investigation of the mechanism of its action and also for the investigation of the role of this hormone in acceleration stress tolerance. The low toxicity of the drug and the fact that it has already been used in humans in high doses with no deleterious and some presumptive beneficial effects leads to the proposal that the compound might be effective in increasing human tolerance to acceleration stress. (AUTHOR)

4,046

Polis, B. D., H. W. Schumukler, & M. Chianti 1962 CHANGES IN THE AMINO ACID COMPOSITION OF RAT BRAIN CAUSED BY ACCELERATION STRESS. (Paper, 33rd Annual Meeting of the Aerospace Medical Assoc., 9-12 April 1962, Atlantic City, N. J.)

ABSTRACT: Previous work from this laboratory showing the importance of hormonal and other cellular factors in the tolerance to acceleration stress suggested the possibility of a reversible "metabolic lesion" that results from acceleration stress. The following study was undertaken in an effort to reveal the metabolic defects in cerebral metabolism induced by acceleration. Rat brains were rapidly excised from normal and centrifugal animals, frozen, weighed, deprotenized with picric acid and analysed for the complete free amino acid pool composition by ion exchange chromatography. Large decreases (>50%) were found for the new amino acid β-hydroxyaspartic acid, as well as for serine, urea, and glutathione. A large increase in the concentration of free ammonia was also found. The interrelationships of the changes in amino acid composition suggest a block in the energy yielding mechanisms from the respiratory enzyme systems in mitochondria. (Aerospace Medicine 33(3):349, March 1962)

4,047

Polis, B. D., & H. W. Shmukler 1963 BIOCHEMICAL PHARMACOLOGY IN THE TOLERANCE TO ACCELERATION STRESS. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 28 - May 2, 1963)

ABSTRACT: Experimental work from this laboratory defined the tolerance of the rat to acceleration stress in terms of a heart-brain interaction mediated by

hormones of the pituitary-adrenal axis and demonstrated a 300 per cent increase in acceleration tolerance by the rat after hypophysectomy. Efforts to reproduce by pharmacological means this high tolerance to acceleration were realized in part with the drug Lucidril. Since pharmacological studies in animals suggested involvement of the hypothalamic area of the brain as a mode of action for this drug, some basic studies of biochemical changes in the brain during acceleration were carried out with the hope that a logical chemical approach to acceleration tolerance might be attained. These revealed a striking decrease in the brain concentration of a component identified as B-hydroxyaspartic acid by its position in ion exchange chromatography. This component also was increased significantly in the brain of hypophysectomized animals; it therefore appeared to be a critical metabolite of brain under anoxic stress. The parenteral administration of synthetic B-hydroxyaspartic acid to rats resulted in a significant increase in the median survival time from 7 minutes at 20 G for the litter mate controls to 14 minutes for the treated animals.

4,048

Pollitzer, Robert 1961 SELECTED ABSTRACTS FROM SOVIET BIOMEDICAL JOURNALS No. 6
(The Institute of Contemporary Russian Studies, Fordham University, New York 58, New York) Contract No. DA18-108-405-CML-867, June, 1961, ASTIA AD 262007

ABSTRACT: A selected group of abstracts on biomedical journals by Russian authors.

4,049

Pollitzer, Robert 1961 SELECTED ABSTRACTS FROM SOVIET BIOMEDICAL JOURNALS No. 8
(The Institute of Contemporary Russian Studies, Fordham University, New York 58, New York) Contract No. DA 18-108-405-CML-867, December 1961, ASTIA AD 271 923

ABSTRACT: A selected group of abstracts on biomedical journals by Russian authors.

4,050

Pollock, L. J. 1943 BLAST INJURIES OF THE CENTRAL NERVOUS SYSTEM. Illinois Med. J. 83:196-168, 1943.
ASTIA AD 74 028

4,051

Popov, A. P. 1938 THE EFFECT OF THE FORCES OF CORIOLIS ON THE BLOOD PRESSURE IN HUMAN BEINGS.
Vestnik Oto-rhinolaryngology (5):510-516.
Collected Transactions Inst. Av. Med. Voyengiz 1 (1939).

4,052

Popov, A. P. 1956 ZAME CHANIYA K STAT'YAM D. YE. ROZEMBLYUMA "OB OSNOVNYKH VOPROSAKH V FISIOLOGII USKORENIY" I G. L. KOMENDANTOV "O SPORNYKH VOPROSAKH V OBLASTI FIZIOLOGII USKORENIY". (NOTES TO PAPERS BY D. YE. ROZENBLYUMS "FUNDAMENTAL PROBLEMS IN PHYSIOLOGY OF ACCELERATION" AND BY G. L. KOMENDANTOV "CONTROVERSIAL PROBLEMS IN THE FIELD OF PHYSIOLOGY OF ACCELERATION.").
Voyenno-meditsinskiy Zhurnal (Military Medical Journal). 6:85-91, 1956.
(Translation in USAF Air Intelligence Information Report "Physiology of Acceleration: A Controversy Between D. Ye. Rozenblyum and G. L. Komendantov" IR-1407-57. 21 May 1957.)

4,053

Poppen, J. C. & E. L. Hendler 1950 PROTECTIVE HELMETS — THEIR INTEGRATION WITH OTHER EQUIPMENT.
J. Aviation Med. 21(5):414-418.

SUMMARY: 1. The impetus to the development of protective helmets is outlined.
2. Methods of construction and general configuration of the more commonly worn protective helmets are briefly described.
3. The need for better integration between the helmet and contiguous equipment is defined.
4. The need for better integration of all personal equipment is emphasized.

4,054

Poppen, J. R. 1932 REPORT ON THE PHYSIOLOGICAL EFFECTS OF SUDDEN CHANGES IN THE SPEED AND DIRECTION OF AIRPLANE FLIGHT. (Dept. of Physiol., Harvard School of Pub. Health, Boston, Mass.) April 1932.

4,055

Poppen, J. R. 1934 REPORT ON POSSIBLE METHODS OF REDUCING THE SYMPTOMS PRODUCED BY RAPID CHANGE IN THE SPEED AND DIRECTION OF AIRPLANES.
(Dept. of Physiology, Harvard School of Public Health, Boston, Mass.)
Feb. 1934.

4,056

Poppen, J. R. 1934 AERIAL EQUILIBRATION.
J. Aviation Med. 5(1):96-106.

ABSTRACT: Three mechanisms are involved in the function of equilibration: the vestibular apparatus, the somatic senses with their one fairly homogeneous function, and vision, the purely telesceptive sense. This article details the functions of each of the three mechanisms.

4,057

Poppen, J.R. 1938 EFFECTIVENESS OF PNEUMATIC BELT IN COUNTERACTING ACCELERATION. (Discussion.) J. Aviation Med. 9:214-215, 233

4,058

Poppen, J. R. 1941 THE CARDIOVASCULAR ASPECTS OF AVIATION MEDICINE.
New England J. of Medicine 225(23):892-896.

ABSTRACT: Aviation medicine is peculiarly subclinical in its field of interest and application. In this respect, it is the acme of preventive medicine.

The selection of flying personnel requires, first of all, freedom from organic disease. Flying requires adjustment to a new and unusual set of circumstances in its three-dimensional fields. With rapid changes in altitude come the problems of anoxia and high accelerations. The profound changes in blood distribution incident to the centrifugal forces encountered in certain maneuvers place a peculiar burden on the circulation, in which the heart has its share. The responsibility of repeatedly and suddenly requiring an effort to preserve the circulation against profound reduction and inadequate filling of the right heart is peculiar to flying.

For the determination of actual or incipient organic heart disease, doctors must depend on the diagnostic methods commonly used in physical examination. C reful history, keen inspection, accurate percussion and clear auscultation continue bot be the most reliable diagnostic tools. Adjunctive aids in the form of electrocardiograms and x-ray plates must remain supplementary for those cases in which commoner methods of examination do not suffice to make the diagnosis clear.

In discussing the cardiovascular aspects of flying in its application to the maintenance of flying fitness, emphasis is placed on two major considerations: the cardiovascular demands peculiar to flying, and tests for determining cardiovascular efficiency.

4,059

Poppen, J. R. 1941 INFLUENCE OF AIRCRAFT PERFORMANCE ON SELECTION AND CARE OF MILITARY AVIATORS.
War Med. 1:180-187.

4,060

Poppen, J.R. 1941 PHYSIOLOGICAL EFFECTS OF SUDDEN CHANGES IN SPEED AND DIRECTION OF AIRPLANE FLIGHT. (RAF, Institute of Aviation Medicine, Farnborough) FPRC Report 263(a), March 1941.

4,061

Poppen, J.R. 1941 POSSIBLE METHODS OF REDUCING THE SYMPTOMS PRODUCED BY RAPID CHANGE IN THE SPEED AND DIRECTION OF AIRPLANES. (RAF, Institute of Aviation Medicine, Farnborough) FPRC Report 263(b), March 1941.

4,062

Poppen, J. R. 1942 THE EFFECTS OF COLD AND HIGH SPEED ON THE FLYER Int. Clin., N. ser. 5, 1:60-67, 1942.

4,063

Poppen, J.R. 1946 PILOTS ESCAPE FROM HIGH PERFORMANCE AIRCRAFT. INTERIM REPORT ON LIVE EJECTION FROM AIRCRAFT IN FLIGHT AT LAKEHURST, N.J. ON 30 Oct '46. (Naval Air Experimental Station, Philadelphia, Pa.) Dec. 1946. ASTIA ATI 48167

ABSTRACT: The first live ejection from high performance aircraft was made from a JD-1 bomber at 5000 ft with airspeed of 250 mph. Prior to the live ejection from the bomber, 42 live ejections were made in the test tower using powder charges and catapults to approximately duplicate the acceleration expected, and 5 dummy ejections at 200-350 mph were made from the bomber. The 28-ft chute attached to the seat failed on the live ejection and at approximately 2000 ft the subject left the seat, fell 500 ft. and opened his seat chute and made an uneventful descent. The subjective reaction of the subject are described and the cause of the failure of the 28-ft parachute is explained.

4,064

Poppen, J.R., & D.T. Watt 1947 HUMAN TOLERANCE TO HIGH POSITIVE ACCELERATION OF SHORT DURATION. Fed. Proc., 6:181

4,065

Poppen, J. R. 1948 HIGH ACCELERATION OF SHORT DURATION.
Mil. Surg. 103(1):30-32, July 1948.

ABSTRACT: A brief outline of the historical background of acceleration studies is given, starting with the early work of the Germans in 1939 and discussing the advances of the British during World Warr II and the postwar work continued here in the United States.

4,066

Poppen, J. R. & C. K. Drinker 1950 PHYSIOLOGIC EFFECTS AND POSSIBLE METHODS OF REDUCING SYMPTOMS PRODUCED BY RAPID CHANGES IN SPEED AND DIRECTION OF AIRPLANES AS MEASURED IN ACTUAL FLIGHT.
J. Appl. Physiol. 3:204-215.

ABSTRACT: Dogs anesthetized with Nembutal were mounted in an airplane in a position similar to that occupied by the aviator and subjected to rapid horizontal turns and to dives. Direct records of arterial pressure were made during these maneuvers. A drop in arterial pressure occurs which is directly proportional to the severity and time of application of the abnormal forces. This causes a severe cerebral anoxemia which accounts for the symptom of going black. Other dogs were mounted in an airplane in a similar manner and direct records taken from the carotid artery, the jugular vein and the femoral artery and vein. They were flown through horizontal turns and dives.

A belt embracing the entire abdomen and containing an inflatable bag was strapped about the dog. Inflation of this bag produced an increase in intra-abdominal pressure. This was done at different times in relation to the maneuvers. Raising the intra-abdominal pressure by inflation of the belt at least one-half minute before the high accelerations produced a marked improvement in the physiological changes. The improvement was a preservation of carotid cerebral circulation at a level above that resulting in severe anoxemia and consistent with freedom from subjective symptoms.

4,067

Poppen, J.R. 1956 MAN'S ADAPTATION TO INCREASING ALTITUDE.
In Society of Automotive Engineers. (Paper, presented at meeting April 9-12, 1956) Paper no. 749

ABSTRACT: Barriers to man's ascent to higher altitudes listed; atmospheric barriers can be met by pressurized and conditioned compartments with equable artificial environment; adaptation to velocity accomplished by designing protective equipment; barrier of vision surmounted by providing realistic data presentation, direct electronic control and appropriate illumination. Protective means available to obviate harmful effects of unusual radiations.

4,068

Poppen, John R. 1957 INTRODUCTION AND HISTORY OF THE AIRCRAFT ESCAPE PROBLEM The Journal of Aviation Medicine 28: 57-59, Feb., 1957

ABSTRACT: The history of escape from aircraft starts with the parachute which was followed by the Martin-Baker upward ejection seat. There are four physiologic aspects of the gravitational forces involved in ejection just as there are for all gravitational forces in flying. Research on the ejection seat has been performed by all branches of the military services to determine the best design criteria and to define the human tolerance factors.

4,069

Poppen, J. R. 1958 SUPPORT OF UPPER BODY AGAINST ACCELERATIVE FORCES IN AIRCRAFT.
J. Aviation Med. 29(1):76-84, Jan. 1958.

ABSTRACT: A prototype harness intended to provide support against vertical forces was designed on the basis of an analysis of the support structure and mass distribution characteristics of the upper part of the body. The harness provides support under the axillae, crosses over the manubrium, extends along lines consonant with the resultant of anticipated forces, and ends in two points for attachment to an aircraft seat structure. Comparison of data from tower drop tests conducted with the prototype and standard military harnesses indicated that support of the upper body mass eliminates compressive loads on the lumbar spine by reduction of the dynamic response between the upper and lower masses.

4,070

Posner, D.L. 1953 CRASH SURVIVAL AND CRASH FIRES. (Daniel and Florence Guggenheim Aviation Safety Center, Cornell University, Presented to Wash. Sect. Institute of Aeronautical Sciences, 7 April 1953)

4,071

Powell, T. J. 1954 ACUTE MOTION SICKNESS INDUCED BY ANGULAR ACCELERATIONS. (RAF, Institute of Aviation Medicine, Farnborough) FPRC Rept. No. 865; ASTIA AD-39 215; Feb. 1954

ABSTRACT: Acute motion sickness was produced in susceptible subjects seated in a Bárány chair by rotating the chair at 16 rpm in a counterclockwise position and flexing the subjects' heads in a controlled manner. Records were made of the revolutions of the turntable, sweating on the forehead, diving-climbing sensations, lateral tilting sensation, head movements, and onset of nausea. Significant positive associations were found (1) between test reaction and motion-sickness

susceptibility, as determined by the subjects' replies to a questionnaire, and (2) between the onset of sweating and the onset of nausea. More nonpilots were susceptible to motion sickness than pilots. In the severely motion-sick subject, there was a falling systolic blood pressure, a slowing of the pulse, and vasodilatation. All subjects who were severely nauseated on the test procedure had a secondary nausea lasting from 2 to 12 hours. (ASTIA)

4,072

Powell, T. J. 1956 EPISODIC UNCONSCIOUSNESS IN PILOTS DURING FLIGHT. J. Aviation Med. 27(4):301-316.

SUMMARY: Nine cases of unconsciousness of ten seconds to six minutes, occurring in pilots while flying, have been observed and the patients investigated. Apart from hypoxia, and a few other external causes, the reason for unconsciousness is considered to be a summation of physiological factors.

The factors noted in these cases are: (1) anger or anxiety; (2) probable hypoglycemia; (3) increased prolonged G; (4) probably hyperventilation; and (5) paroxysmal type of EEG. The condition could not be reproduced under laboratory conditions.

4,073

Powell, T. J., T. M. Carey, H. P. Brent & W. J. R. Taylor 1957 EPISODES OF UNCONSCIOUSNESS IN PILOTS DURING FLIGHT IN 1956. J. Aviation Med. 28(4):374-386.

SUMMARY: Eight cases of unconsciousness or diminished consciousness while flying were investigated at the Institute of Aviation Medicine in Toronto during 1956. Five of these cases satisfied the criteria for the diagnosis of "physiologic unconsciousness in medically fit aircrew." The factors seem to be: (1) Previous or concomittant G; (2) hypoglycemia occurring a few hours after a light carbohydrate meal; and (3) hyperventilation. Anxiety or anger, and early slow electroencephalogram activity with hyperventilation seem to be associated factors.

All these findings contribute to diminished cerebral activity and can summate. It is considered that this summation is the cause of the unconscious episodes, and therefore these episodes may be prevented by removing one or more of the factors.

4,074

Powers, E.E. 1945 VELOCITY AND ACCELERATION MEASUREMENTS OF PILOT SEAT EJECTION CATAPULT. (Army Air Forces Materiel Command) 27 Nov. 1945. ASTIA ATI 52658

ABSTRACT: Ultra high-speed motion pictures were made of four tests of the

firing of the pilot-seat ejection catapult in order to study the velocities and accelerations involved when the ejection gun is fired. A pneumatic brake was used to preload the system, thus increasing the initial load, and the catapult under initial braking loads of 1.2g, 1.6g and 1.9g. The motion pictures were assessed for space-time-evaluation, and the values of velocities and accelerations were plotted. Acceleration curves show a fluctuation of acceleration prior to reaching maximum acceleration. It is recommended that further tests be conducted to determine whether the fluctuation in acceleration is consistent.

4,075

Pozhariski, P. 1937 PARACHUTE JUMPING FROM THE MEDICAL STANDPOINT
Vasduhopl. Glasn. (10):127-143. 1937

4,076

Preece, C.D. 1960 BANG! ARE YOU ALIVE?
Air Clues, 14(6):176-180 March 1960

ABSTRACT: Between January 1, 1953, and August 31, 1959, 168 RAF personnel ejected, and of these 130 were successful.
The main purpose of this letter is not to analyse the unsuccessful cases, but to pose a question. Are aircrew given, and do they give themselves, a fair chance when the occasion demands that they reach for the handle?

4,077

Preem, R. 1959 KOSMILISTE LENDUDE BIOLOOGILISED PROBLEEMID (BIOLOGICAL PROBLEMS OF COSMIC FLIGHTS. Eesti loodus, Tallinn, Estonia 6:330-338
Abstract: Aerospace Medicine 31(11):959-960, Nov. 1960

ABSTRACT: A review is presented of Russian achievements in the penetration of space, and of U. S. research on the Medical aspects of acceleration and survival of supersonic bailout at low altitudes.

4,078

Presnyakov, A. 1961 THE SECRET OF THE FORCES OF GRAVITY.
(Aerospace Technical Intelligence Center, Wright-Patterson AFB, Ohio)
Translation No. MCL-1057, 14 July 1961. ASTIA AD 261 810.

ABSTRACT: The author gives a brief review of work done in the field of

gravitation. He states that the interest in the problems of gravitation is due to the study of the nature of time and space, investigations of the cosmos and progress in learning of the elementary particles of matter. For research work carried out by Professor Dmitri Dmitriyevich Ivanenko is reviewed. Considerable interest was prompted by reports of this scientist concerning the so-called field quantization, new hypothesis of cosmology, a unified theory of matter and gravitation, and antigravitation.

4,079

Preston, G. Merritt and A Martin Eiband 1955 CRASH IMPACT SURVIVAL IN LIGHT AIRPLANES
(NACA Tech. Film No. 25, 1955)

4,080

Preston, G. Merritt and Jacob C. Moser 1956 CRASH LOADS
(Paper, National Advisory Committee for Aeronautics, April 17, 1956, Cleveland, Ohio)

ABSTRACT: This paper discusses the deceleration data measured on the floor of the fuselage during the NACA crash tests. During this investigation, impact decelerations were measured in fighter, cargo, transport, and light airplanes. Accelerometers were located at several stations on the floor of these airplanes. Accelerations were measured in the longitudinal, vertical, and lateral directions.

4,081

Preston, G. M., & G. J. Pesman 1958 ACCELERATIONS IN TRANSPORT-AIRPLANE CRASHES. (National Advisory Committee for Aeronautics, Wash., D. C.) NACA TN 4158, Feb. 1958. ASTIA AD 152 829.

ABSTRACT: Full-scale aircraft crashes were made with low-wing pressurized and high- and low-wing unpressurized transport airplanes to determine the crash loads that result from a variety of crash events. The crashes simulated take-off and landing accidents involving fuselage damage ranging from moderate to severe. Accelerations were measured by accelerometers installed on the cabin floor. The data (peak magnitude of acceleration, time required to attain peak magnitude, and the time duration and the direction of the acceleration) were analyzed in terms of impact survival possibilities for the various airplane configurations and crash circumstances.

4,082

Preston, G. M. and J. J. Williams 1962 SPACECRAFT PREPARATION AND CHECKOUT. (In Results of the First U. S. Manned Orbital Space Flight, February 20, 1962). (NASA Manned Spacecraft Ctr.) Pp.53-67.

4,083

Preston-Thomas, H., R. Edelberg, J. P. Henry, et al 1955 HUMAN TOLERANCE TO MULTISTAGE ROCKET ACCELERATION CURVES. J. Aviation Med. 26(5):390-398.

SUMMARY: Hyperbolic acceleration curves are derived for three or four stage rockets which could attain the 10 to 11 km./sec velocity necessary for establishment in a practical orbit around the earth.

A preliminary study has evaluated the capacity of nine subjects to perform a dual pursuit task while undergoing a typical series of curves.

Evidence is presented to indicate that select crewmen can be expected to assist in the control of such a vehicle during the critical acceleration phases of the flight.

4,084

Pribil, R. F. 1956 HIGH-SPEED TRACK TESTS OF EJECTION SEAT AND PILOT'S EQUIPMENT, F-100 AIRPLANES. TEST NO. 2. (North American Aviation, Inc.) Report No. NA-56-750-2. 30 August 1956.

4,085

Price, H. W. 1941 ACCELERATOR PROJECT PROGRESS REPORT 1 JANUARY TO 31 MARCH. (National Research Council, Canada) C-2091.

ABSTRACT: A progress statement is made on the construction of the human centrifuge at No. 1 I.T.S. Toronto.

4,086

Price, J. F. 1962 PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF SPACE FLIGHT: A BIBLIOGRAPHY: VOL. I. ACCELERATION, DECELERATION, AND IMPACT. (Space Technology Labs., Inc. Redondo Beach, Calif.) Research Bibliography No. 43, Oct. 1962. ASTIA AD 286 930.

ABSTRACT: This bibliography, consisting of 1020 references (mostly annotated) on acceleration, deceleration and impact studies, is the first of a series of

volumes pertaining to the physiological and psychological effects of space flight. Whenever possible the references listed in the bibliography have been reviewed in order to include the maximum amount of retrieval data. Author, agency, periodical, subject and ASTIA indices are included.

4,087

Price, R.S. 1961 UNDERWATER EXPLOSION TESTS IN A PRELIMINARY HIGH-GRAVITY TANK ACCELERATED BY A CENTRIFUGE. (Naval Ordnance Lab., White Oak, Md.) NAVWEPS rept. no. 7365; DASA-1241, ASTIA AD- 264 760 August 1961

ABSTRACT: NOL is developing a high-gravity tank for simulating large under water explosions at a very small scale. To determine if a centrifuge, rather than the previously proposed linear accelerator, could be used to provide the acceleration, six explosion tests using 50-milligram charges were made. Radial accelerations up to 60 gravities prevailed in a 7-inch square test tank mounted on a 10- foot centrifuge arm. Since the explosion phenomena were not objectionably distorted by the rotation effects, it was concluded that a centrifuge is suitable for providing the acceleration forces required for the proposed NOL High-Gravity Tank. (Author)

4,088

Prince, J. E. 1962 INTRODUCTION: SCOPE - BIOPACK - SATELLITES, LAUNCH TO RECOVERY.
In Biologic Systems of Discoverer Satellites XXIX and XXX. (School of Aerospace Medicine, Aerospace Medical Div., Brooks AFB, Tex.) April 1962.

ABSTRACT: The design of biopacks used to study radiation and weightlessness are based on the following avaiable space in the satelite; weight allotment; internal volume and configuration of the typical canister; center of gravity; time between specimen preparation and return to the laboratory; and environmental temperature.

4,089

Prince, J.E. & J.R. Mabry 1962 ORGAN AND TISSUE CULTURES. 2. CILIARY ACTIVITY OF EMBRYONIC CHICK CHOROID PLEXUS. In BIOLOGIC SYSTEMS OF DISCOVERER SATELLITES XXIX AND XXX (School of Aerospace Medicine, Aerospace Medical Div., Brooks AFB, Tex.) April 1962

ABSTRACT: Ciliary activity was assessed on the basis of percentage of total border with vibrating cilia and the total numbers of active and inactive explants. Satellite cultures are cmmpared to cùltures from the same donors retained under ideal conditions. It was found that the ciliary activity of the ependymal cells of the choroid plexus from the 15-day-old chick embryo was not

adversely affected by the launch, orbit, and recovery of Discoverer satellite XXIX. Similar tissue cultures aboard Discoverer XXX were reduced in ciliary vitality, and further laboratory studies are being conducted to elucidate the factors responsible.

4,090

Proell, W. & N. J. Bowman 1958 A HANDBOOK OF SPACE FLIGHT. (Chicago: Perastadion Press, 1958.)

ABSTRACT: This is a reference book bringing together data and ideas from divergent disciplines which are pertinent to space flight.

In addition to many tables, formulas, equations and diagrams, there are listed job opportunities; companies which build rockets, notable space flight research men; known societies devoted to rockets and space flight; glossary of words; and a bibliography.

4,091

Pryor, W. W., H. O. Sieker & R. L. McWhorter 1952 SPATIAL VECTOR ANALYSIS OF THE ELECTROCARDIOGRAM DURING EXPOSURE TO POSITIVE ACCELERATION. J. Aviation Med. 23(6):550-559, Dec. 1952.

ABSTRACT: (1) Standard limb and unipolar precordial lead EKG's have been recorded simultaneously on seven healthy male subjects during positive acceleration. (2) The records were analyzed by the method of spatial vector analysis in an effort to separate changes caused by rotation of the heart from alterations caused by a change in the electrical activity of the myocardium. (3) At levels of acceleration insufficient to cause visual symptoms only one subject demonstrated alterations in the EKG described by earlier investigators. This subject was also the only one showing changes after being tilted to 90 degrees. The relationship between these Tw changes and the autonomic instability observed in this individual have been discussed in the light of Wendkos' observations on patients with neurocirculatory asthenia demonstrating such EKG changes during tilt. (4) Among the remaining subjects only two showed any Tw changes, even when the acceleration was sufficient to cause "blackout." In these two instances the alterations in the Tw waves are less marked, but also are most likely secondary to changes in autonomic tone and filling of the heart. (5) There was no S-T segment shift to suggest coronary insufficiency in any subject. (6) It is planned to carry out further investigation using the same techniques in the study of the effects of autonomic blocking drugs and/or g-suits on the EKG response of subjects to positive acceleration.

4,092

Public Health Service 1958 BIBLIOGRAPHY OF SPACE MEDICINE (Public Health Service, Washington, D. C.) Publication no. 617 (Bibliography series 21)

ABSTRACT: Contents include references on acceleration, deceleration, partial and zero gravity.

4,093

Puga, C. R. 1950 ACELERACIONES EN AERONAUTICA (FISIOPATOLOGIA). (ACCELERATION: PHYSIOPATHOLOGY) San Aeronaut 1:251-284, Aug. 1950.

4,094

Puxeddu, P. & D. Tarsitani 1962 INDAGINI SULLA SOGLIA DEL RIFLESSO NISTAGMICO DA STIMOLI ACCELERATORI (RESEARCH ON THE THRESHOLD OF THE NYSTAGMIC REFLEX AFTER ACCELERATORY STIMULI)
Bolletino delle malattie dell'orecchio della gola del naso (Firenze), 80 (1): 73-91. Jan.-Feb. 1962. In Italian, with English summary (p. 88)

ABSTRACT: Test subjects were exposed to rotatory accelerations and decelerations of progressively increasing value from 0.2° - $0.6^{\circ}/sec.^2$. Each run consisted of accelerations of the same physical value applied for 60 seconds. The first and third runs were associated with mental activity such as the answering of simple questions, performing a calculation, etc. When no nystagmic reaction was observed after a rest period of not less than thirty seconds, a successive run was carried out and the stimulus intensity increased by $0.1^{\circ}/sec.^2$ but reversing the direction of acceleration in order to avoid habituation phenomena. Results showed that mental activity was effective in lowering the threshold of the nystagmic response. An average threshold value of about $0.4^{\circ}/sec.^2$ was established for these subjects in comparison to previously reported values of 0.7° - $0.8^{\circ}/sec.^2$. Since results were based on evident reactions observed by electronystagmographic recordings, it was assumed that the threshold of excitability of the ampullar receptor was even lower.

4,095

Puxeddu, P. and D. Tarsitani 1962 INVESTIGATIONS OF THE THRESHOLD OF THE NYSTAGMIC REFLEX CAUSED BY ACCELERATION STIMULI.
In Boll. Mal. Orecch. 80:73-91, Jan.-Feb. 1962 (Italy)

ACCELERATION

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4,096

Queijo, M.J. and G.K. Miller, Jr. 1962 ANALYSIS OF TWO THRUSTING TECHNIQUES FOR SOFT LUNAR LANDINGS STARTING FROM A 50-MILE ALTITUDE CIRCULAR ORBIT. (National Aeronautics and Space Administration, Washington, D.C.) NASA Technical note D-1230, ASTIA AD-272 877, March 1962

ABSTRACT: An analytical study was made of 2 modes of thrusting to perform soft lunar landings starting from a circular orbit around the moon. One method made use of constant-thrust, restartable engines. In this landing mode a short thrust period is used to initiate the landing. The second landing mode presupposes the use of engines having 2 levels of thrust. The low thrust level is used to initiate the landing maneuver and is applied until conditions are attained which permit use of the higher thrust level for landing the vehicle. In all instances the thrust vector is directed against the velocity vector. The study showed that either landing mode could be made quite economical by proper choice of maximum thrust available and the range covered in the landing maneuver. Use of a maximum ratio of thrust to initial earth weight of 0.45 combined with a surface travel of about 30 degrees requires a characteristic velocity of about 6,000 fps, which is about 6.5% greater than the value of 5,630 fps required for a 2-impulse Hohmann transfer (Author)

4,097

Quimby, F. H. 1955 SUMMARY OF PROCEEDINGS. (Second Meeting of Aviation Crash Injury Research Steering Committee, Navy Dept. Office of Naval Research, Washington, D.C., 25 October 1955)

4,098

Quimby, F. H. & A. H. Hasbrook 1956 PREVENTION OF INJURIES IN "UNPREVENTABLE" AIRCRAFT ACCIDENTS. Research Reviews, August 1956.

ABSTRACT: Safety activities in aviation, until recent years, have been devoted solely to accident prevention. This was a particularly constructive approach because most accidents in the past followed definite patterns.

4,099

Quinnel, R.K. 1956 THE HUMAN COMPONENT IN EXTRATERRESTRIAL FLIGHT
TAC Surgeon's Bulletin (Langley AFB, Va.) 6(11): 1-24, Nov. 1956
See also: Medical Newsletter 29(4): 27-40 Feb. 15, 1957

ABSTRACT: A general discussion is presented on the physiological stresses to be encountered in extraterrestrial flight such as accelerations, vibrations, cosmic radiations, and weightlessness. Within the cabin, control of pressurization, temperature, oxygen, carbon dioxide, and body odors is required, as well as adequate illumination and presentation of the instrument panel. Vision outside the cockpit may be important only for psychological reasons.

4,100

Quinnel, R. K. 1957 THE HUMAN COMPONENT IN EXTRATERRESTRIAL FLIGHT
Canadian Service Med. J. 13(4):245-258, April 1957.

4,101

Quix, F.H. 1922 LE MAL DE MER ET LE MAL DES AVIATEUR. Monogr L'Oto-Rhino-Laryng Internat. 8:829, Paris: A. Legrand

4,102

Quix, F. H. 1925 THE FUNCTION OF THE VESTIBULAR ORGAN AND THE CLINICAL EXAMINATION OF THE OTOLITHIC APPARATUS.
J. Laryng. 40:425-443; 493-511.

4,103

Quix, F.H. 1928 UN NOUVEL APPAREIL POUR L'EXAMEN DU NYSTAGMUS DE POSITION
(A New Device for the Examination of the Position Nystagmus)
J. de neurol. et de psychiat. (Brussels) 28: 160

4,104

Quix, F. H. 1931 LE ROLE DE L'ORGANE VESTIBULAIRE DANS L'AVIATION (The Role of the Vestibular Organ in Aviation)
5 Congr. internat. Nav. aer. La Haye. Tome 2, p. 1290-1326.

NOTE: Reviewed in Ber. Physiol. 64:551.

4,105

Quix, F.H. 1941 LE LABYRINTHE ET LE MAL DE MER (The Labyrinth and Seasickness)
Folha medica (Rio de Janeiro) 22: 97-100

ACCELERATION

R

4,106

RAAF Flying Personnel Research Committee 1941 LETTER FROM RAAF FLYING PERSONNEL RESEARCH COMMITTEE TO AIR LIAISON OFFICER, AUSTRALIA HOUSE, 3 OCT. 1941 WAM-101-1; FPRC No. 358(b)

ABSTRACT: Reports that Cotton suit gives protection up to 9 to 10 "g".

4,107

RAAF 1944 MINUTES OF THE 1st MEETING OF THE ACCELERATION SECTION OF NO. 2 FLYING PERSONNEL RESEARCH UNIT HELD AT THE OLD MEDICAL SHCOOL, SYDNEY UNIVERSITY.
(Royal Australian Air Force, Flying Personnel Research Committee, Sydney) F.R. No. 78; 29 March 1944.

4,108

RAAF Flying Personnel Research Committee 1944 PLANS FOR A NEW TYPE OF CENTRIFUGE WITH WHICH TO STUDY THE PHYSIOLOGICAL EFFECTS OF ACCELERATION. (Conference held at Department of Physiology, Sidney University, 2 p.m. on 28 October 1944, Min. Acceleration Section, No. 2 Flying Personnel Research Unit) FPRC, RAAF-FR 102, Appendix B. 15 January 1945

4,109

Rabideau, G. F. & D. L. Schloredt 1960 SPACE SYSTEMS TRAINING DEVICES.
(Paper SAE National Aeronautic Meeting, Los Angeles, Calif., Oct. 10-14, 1960)
(Society of Automotive Engineers, Inc., New York, N. Y.) Rept. 245D, Oct. 1960.

ABSTRACT: The high priority given to the development of manned space systems and the difficulties inherent in the development of programs and devices for space crew training have created a need for a review of associated training requirements. This paper presents a number of hypotheses concerning the desirable characteristics of such programs and devices for further verifications. Several guide lines or principles are introduced to facilitate design and development of useful training curricula and equipment for manned space systems. (Tufts)

4,110

Radio Corporation of America 1960 STUDY OF INSTRUMENTATION AND TECHNIQUES FOR MONITORING VEHICLE AND EQUIPMENT ENVIRONMENTS AT HIGH ALTITUDE. INSTRUMENTATION AND MONITORING TECHNIQUES. (Wright Air Development Center, Wright-Patterson AFB, Ohio) WADC TN 59-307 June 1960 ASTIA AD 268 090

ABSTRACT: Instrumentation techniques are presented which are available within the state-of-the-art; an instrumentation system is proposed for the monitoring of high-altitude environments encountered by typical vehicles. The high altitude environmental effects on ptyical vehicles and equipment are summarized. The present airborne-instrumentation state-of-the-art is presented for measuring temperature, pressure, strain, vibration, acceleration, radiation, meteorite detection, and acoustic noise. A feasible instrumentation system is discussed for monitoring these deleterious environments. (Author)

4,111

Raehn, R. V. 1961 THE PROCUREMENT AND SELECTION OF CANDIDATES FOR FLIGHT TRAINING. (Research Paper: U. S. Naval Postgraduate School, 1961) Rept. VF3844

4,112

Raeke, J. W. 1959 IMPACT PROTECTION CHARACTERISTICS OF FLIGHT HELMETS. (Paper, Meeting of Aero Medical Association, Statler Hilton Hotel, Los Angeles, April 27-29, 1959)

ABSTRACT: This study represents an attempt to determine the impact protection characteristics of three types of flight helmets. Tests were conducted at a constant impact velocity of 17.6 ft/sec. and at three impact energy levels: 60,107.5 and 136.5 ft lbs. Peak resultant acceleration, rate of onset of acceleration, energy absorption efficiency and in several cases impact stress, were determined either directly or indirectly. High speed motion pictures of helmet shell deformation augment the aforementioned quantitative data. Results show that even under the relatively mild test conditions each helmet type displayed at least one undesirable characteristic. The impact response of each helmet type could be significantly improved by relatively minor design or fabrication changes; however, the test as a whole points up the need for a set of minimum acceptable performance standards. (J. Aviation Med. 30(3):199, Mar. 1959)

4,113

RAF, Institute of Aviation Medicine 1944 MINUTES OF THE 13TH MEETING OF FLYING PERSONNEL MEDICAL OFFICERS, FARNBOROUGH. 6 Feb. 1944

4,114

RAF, Institute of Aviation Medicine 1952 MEDICAL ASPECTS OF NAVAL AVIATION WITH SPECIAL REFERENCE TO DECK LANDINGS.
(RAF, Institute of Aviation Medicine, Farnborough) July 1952.

4,115

RAF, Institute of Aviation Medicine 1956-1960 UNCLASSIFIED JOURNALS AND REPORTS. PUBLICATIONS ON ACCELERATION AND ALLIED SUBJECTS.
(A mimeographed list of titles, unnumbered, undated)

4,116

RAF Physiological Lab. 1942 DEVICES FOR PROTECTING PILOTS FROM THE EFFECTS OF HIGH ACCELERATION WITH PARTICULAR REFERENCE TO TRIALS OF THE FRANK'S SUIT.
(RAF, Institute of Aviation Medicine, Farnborough) FPRC No. 498, 20 Nov. 1942.

ABSTRACT: At 8 "g", 250 mm Hg aortic blood pressure is needed for clear vision at 20 "g", 625 mm. The heart has difficulty in contracting against even 200 mm Hg. Service trials of FFS in planes show one to two "g" increase in tolerance. Farnborough experimental trials always show 2 "g" increase, often 4.5 to 8 "g" increase with experienced subjects when 3/4 to 1 3/4 gallons of water are used in the suit. Pilots complain of loss of "feel" when wearing suit. The danger of pilot's exceeding "g" load of plane is evident. It is recommended that pilots not be protected beyond 6 "g" and that FFS never be used in planes not cleared for 9 "g". Advantages of FFS is that pressure gradient is produced automatically and independently of any external control.

4,117

RAF Physiological Laboratory 1944 PROGRESS REPORT OF THE RAF PHYSIOLOGICAL LABORATORY, JANUARY 1943 TO JANUARY 1944 (RAF, Institute of Aviation Medicine, Farnborough) FPRC No. 563; 21 Jan. 1944

4,118

Raffone, J. J. 1955 ACCELERATION FORCE AND SPACE FLIGHT.
J. Astronautics 2(3):100-104, Fall 1955.

ABSTRACT: Results of tests on a human centrifuge on the effects of acceleration force measured in positive and negative G units, with an evaluation of the relative merits of the supine position during acceleration periods.

4,119

Raike, J.W. 1958 PHYSIOLOGIC CONSIDERATIONS IN DESIGN FOR HIGH-SPEED HIGH-ALTITUDE FLIGHT SAE J. p. 52-55, Aug. 1958

ABSTRACT: Evaluation of human limitations of importance for the design of high-altitude vehicles -- including oxygen, and pressure requirements, acceleration and cosmic radiation.

4,120

Raines, M.A. 1919 ROTARY VERTIGO IN THE TAIL-SPIN.
Science, 49:266-267

4,121

RAND Corporation 1958 AN ANNOTATED BIBLIOGRAPHY OF RAND SPACE FLIGHT PUBLICATIONS.
(RAND Corporation, Santa Monica, Calif.) AFR 190 16; RM 2113, Feb. 1958. ASTIA AD 150 655.

ABSTRACT: This annotated bibliography lists all The RAND Corporation Research Memoranda, Papers, and Translations related to space flight that are currently available to industrial contractors and commercial organizations with the required need-to-know. The reports that are deposited with the Armed Services Technical Information Agency (ASTIA) have the ASTIA number below the RAND number.

4,122

RAND Corporation 1959 AN ANNOTATED BIBLIOGRAPHY OF RAND SPACE FLIGHT PUBLICATIONS
(The RAND Corporation, Santa Monica, Calif.)
USAF Project RAND, RM-2113-1, March 1, 1959
ASTIA AD 216108

ABSTRACT: This annotated bibliography is a list of RAND Reports, Research Memoranda, Papers (both classified and unclassified), Translations, and Books related to astronautics and space exploration which are currently available to the military and to industrial contractors and commercial organizations with the required need-to-know. (Supersedes RM-2113, Feb. 1958 [AD 150 655]).

4,123

Randall, F.E. 1944 PRONE POSITION.
(U.S. AAF Materiel Center, Engineering Div., Aeromedical Laboratory)
Memo. Rept. ENG-49-695-32P, 25 Feb. 1944.

ABSTRACT: Beginning with a base platform a series of tests was run on the best positions. It was found that a variable adjustment for the chest offered the best concession to individual likes and dislikes. Comfort was a function of liking the position plus time spent in the given position. Periods up to one hour were spent without undue fatigue, providing a head sling was provided. Thus, an adjustable head sling was rigged to aid the individual in holding the head in such a position as to look forward without undue strain on the dorsal neck muscles. It was clearly demonstrated that pads or wells should be provided. Thus, an adjustable head sling was rigged to aid the individual in holding the head in such a position as to look forward without undue strain on the dorsal neck muscles. It was clearly demonstrated that pads or wells should be provided to take weight off the patellae. The variable adjustments of the chest allowed sharp rises of the upper chest region of 1, 2, 3 and 4 inches. A 10° rise in the long axis of the trunk was provided. The legs lay in the plane of flight.

4,124

Randall, F. E. 1945 ATTENDANCE AT THE FOURTH CRASH INJURY CONFERENCE, WASHINGTON, D. C. ON 21 AND 22 FEBRUARY 1945. (Aero Medical Laboratory, AAF Hq, Air Technical Service Command) Memorandum Report Serial No. TSEAL-3-695-32PP, 9 March 1945.

4,125

Randen, T. 1934 ON THE EFFECT OF ACCELERATION ON THE ORGANS OF THE BODY. Abstr: Arch. Méd. belges 87:525

4,126

Randt, C. T. 1960 INPACT OF SPACE EXPLORATION ON BIOLOGY AND MEDICINE J. Am. Med. Assoc. 172(7):663-665, 13 Feb. 1960.

ABSTRACT: The interest in space exploration has stimulated biologic and medical research on the tolerance and adaptability of the human organism to the stresses of acceleration, vibration, temperature, weightlessness, and isolation. It is expected that study of animals and man in actural or simulated space environments will also contribute to understanding of basic processes of consciousness, orientation, thinking, emotion, and motor coordination. The complexity andinter-dependence of problems anticipated in manned space flight call for an integrated approach by both the physical and biologic sciences.

4,127

Randt, C. T. (Dir.) 1960 FIRST PLANNING CONFERENCE ON BIOMEDICAL EXPERIMENTS IN EXTRATERRESTRIAL ENVIRONMENTS. WASHINGTON, D.C., JUNE 20, 1960.
(National Aeronautics and Space Administration, Washington, D. C.)
NASA TN D 781, Feb. 1961.

ABSTRACT: Thirty of the nation's leading experimental biologists conferred with the NASA Office of Life Science Programs staff to establish objectives, important areas of inquiry, and program priorities for space environment biomedical studies. Emphasis on the following were recommended: detection and study of extraterrestrial life, effects of simulated extreme environments, cellular and biological system studies in space conditions, ways and means of decontaminating space probes and vehicles, effects of space on biological rhythms and animals orientation, and photosynthesis in ecosystems. Space related work was recommended for earth-bound laboratories as well as for simulated environments and for upper atmospheric balloons. (Tufts)

4,128

Randt, C. T. 1961 THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LIFE SCIENCE PROGRAMS. In Space Medical Symposium Held in Conjunction with the XIth International Astronautical Congress, Stockholm, Sweden, August 15-20, 1960. Astronautik (Stockholm) 2(4):295-299

ABSTRACT: The objectives of the National Aeronautics and Space Administration (NASA) Life Science Programs are to implement manned space flight to assure man's contribution to the success of space flight missions and to utilize his unique capabilities as a scientific observer in space exploration; and to conduct biological investigations to determine the effects of remote environments on living organisms including the search for extraterrestrial life. Research, development, training, and operations required to implement manned space exploration and to conduct significant biological investigations utilizing extraterrestrial environments for observation of biological phenomena are considered in three broad categories: flight medicine and biology, space medicine and behavioral sciences, and space biology. (Aerospace Medicine 33(8):1030, Aug. 1962)

4,129

Ranke, O. F. 1937 DIE BEDEUTUNG DER LAGE FÜR DIE VERTRÄGLICHKEIT VON BESCHLEUNIGUNGSEINWIRKUNGEN. (The Significance of Body Position to the Tolerance of Acceleration)
Ber. ges. Physiol. (Berlin) 96:671.

4,130

Ranke, O.F. 1937 DER ÜBERLASTUNGSKOLLAPS (The Overloading Collapse)
Deutsche Militärarzt (Berlin) 2: 461-463

4,131

Ranke, O. F. 1937 EFFECT OF CENTRIFUGAL FORCES ON THE CIRCULATORY SYSTEM. Part 4 of 10 Parts. (Kreislauf unter Beschleunigung. Versuche ueber die Wirkung ker Beschleunigung. . . .Tier) March 1937. ASTIA ATI-60741.

ABSTRACT: The effect of centrifugal force on the circulatory system of humans and animals was investigated. The maximum tolerable centrifugal force depends

on its direction and duration, on the constitution of the individual tested, and the pilot's posture which affects the hydrostatic condition of the blood circulation and is largely responsible for a sufficient blood supply to the brain and eyes. The vasomotor control of the blood vessels is limited in its adaptability and can be affected by centrifugal forces which increase faster than the adaptability. The results of experiments on 22 persons are discussed in detail, and conclusions are outlined.

4,132

Ranke, O. F. 1938 BESCHLEUNIGUNGSWIRKUNG (EFFECTS OF ACCELERATION). Luftfahrtmedizin 2:242-258

4,133

Rapp, R., & P. Yudkofsky 1957 MICROCIRCULATORY EFFECTS OF TILTING AND ACCELERATION. Federation Proceedings 16:140, March 1957

4,134

Rappe, G. 1960 SURVIVAL IN SPACE
Cornell Engineer 25(7):27-29, April 1960.

ABSTRACT: This paper points out the problems of survival in space due to man's biological limitations.

4,135

Rashbass, C. & G.F.M. Russell 1961 ACTION OF A BARBITURATE DRUG (AMYLOBARBITONE SODIUM) ON THE VESTIBULO-OCULAR REFLEX
Brain, 84:329, 1961.

4,136

Ratcliffe, H. L. 1955 A POST MORTEM STUDY OF RHESUS MONKEYS (MACACA MULATTA) AT INTERVALS AFTER SINGLE OR REPEATED EXPOSURE TO NEGATIVE ACCELERATION. (U.S. Naval Air Development Center, Johnsville, Pa.) NADC-MA-5004, 26 May 1955.

4,137

Raulston, B.O. 1950 PHYSIOLOGICAL, BIOCHEMICAL AND ANATOMICAL EFFECT OF ACCELERATION ON THE BODY RELATIVE TO PILOT POSITION IN HIGH-SPEED AIR CRAFT. (University of Southern Calif., School of Medicine, Los Angeles) USN Contract N6ori77, Project no. 161-014, Task order 1, March 1950

4,138

Raulston, B. O. and C. F. Lombard 1951 FINAL REPORT: PHYSIOLOGICAL, BIOCHEMICAL AND ANATOMICAL EFFECTS OF ACCELERATION ON THE BODY RELATIVE TO PILOT POSITION IN HIGH-SPEED AIRCRAFT.
(Office of Naval Research, U. S. Department of the Navy, Washington, D.C.)
Contract N6ori77 Project NR-161-014 April 9, 1946 - Aug. 31, 1950.
ASTIA ATI 163 566

SUMMARY: Many of the original objectives have been accomplished. Much progress has been made on the primary objectives as evidenced by the technical reports and published articles abstracted in this report. All of the other objectives have been accomplished.

It is worthy of note that considerable accomplishment has been made in the field on the effects of Negative Accleration; a new field of productive research opened on the effects of acceleration on the extremities of man while controlling aircraft; a new field of productive research opened in the study of the tolerance of the human to impace acceleration of the head; a new field of productive research opened in the study of the effects of acceleration upon respiration and circulation of blood through the lungs and other organs of the body; a new field of productive research opened on the effects of acceleration upon biochemical systems in the body; a new field of productive research opened in the use of the Epicyclic centrifuge in studying methods of restraint of the body and the study of transient dynamic pressure responses to fluctuating accelerational forces, and the establishment of the centrifuge as a primary instrument for psychological investigation of stresses of flight upon the human.

It is recommended that the above-mentioned new productive fields of research be further continued.

4,139

Ray, J. T. 1956 A STUDY OF ADAPTATION TO TILT
(Ann Arbor: Univ. Microfilms, 1956) Publication No. 17,018

ABSTRACT: By means of a lateral tilt chair, subjects were inclined from the gravitational vertical under varying conditions and required to return to that position which "felt upright". It was observed that the constant error of adjustments

increased with the magnitude of inclination, and that the direction of initial inclination has no significant effect upon the adjustment error. Within each experimental session the constant error of adjustment was found to decrease with repeated trials (termed the intraseries decrement). It was further found that introduction of a sufficient rest period tended to restore the constant error of adjustment in the direction of its unpracticed level. Positive transfer of habituation of the response did not take place from one quadrant to the other and apparently the transfer of this effect approximates 100% since none of the differences were statistically significant.

4,140

Ray, J. T. 1959 ARTIFICIAL "G" FIELDS - PERCEPTION OF THE VERTICAL. (Paper, ASME Aviation Conference, 9-12 March 1959, Los Angeles, Calif.) ASME Paper No. 59-AV-8

4,141

Rayevskiy, N.P. and M.I. Subbotin 1963 MEASUREMENT OF LINEAR ACCELERATIONS. (Foreign Tech. Div., Air Force Systems Command, Wright-Patterson AFB, Ohio) ASTIA AD-400 524, 7 March 1963 Trans. No. FTD-TT-62-860; from Izdatel'stvo Akademii Nauk SSR, Moskva, p. 1-62, 1961

ABSTRACT: The characteristic nature of acceleration measurements consists in the fact that accelerations are extremely varied and that accelerometers have a comparatively small range of measurement magnitudes. In addition, the most important characteristic of an acceleration is not its magnitude, but its rise time. Accelerometers are divided into two groups. The large number of maximum-range accelerometers belong to the first group. Accelerometers for recording a process in time must be included in the second group. Descriptions of accelerometers based on the use of various methods of measurement may be found in the literature relating to measurement techniques. There are mechanical, optical, hydraulic, electrical, and other accelerometers which measure accelerations over various frequency and acceleration ranges. Among the electrical accelerometers are slide-wire, inductive, semi-conductive, electrodynamic, and other accelerometers. In operation, electrical linear acceleration sensors with wire-wound strain-gage pickups and piezoceramic sensors made of barium titante are considered the most highly perfected and simplest accelerometers with respect to design. Sections 1.6 to 8 were written by N.P. Rayevskiy and sections 2 to 5 and 9 by M.I. Subbotin.

4,142

Raymond, G.B. 1960 FORCE-BALANCE, DOUBLE INTEGRATING ACCELEROMETER (Raymond Engineering Lab., Inc., Middletown, Conn.) Rept. no. 553, Contract DA 49-186-502-ORD-874; 29 April 1960; ASTIA AD-254 631

ABSTRACT: A force-balance double-integrating accelerometer was developed which offered improved accuracy for safing and arming systems. The system was in the use of stored energy and had no moving mass, the device provided a savings in weight and size. Evaluation indicated that ball bearings for the flywheel were unacceptable because of high lubricant drag during low-temperature, high-speed operation. The effect of flywheel and windage errors were reduced by the feedback nature of the device. The major dynamic effect was that produced by vibration. Vibration caused the device to see false velocities near the start of the integration. Several methods for damping the accelerometer were studied. Damping of the pendulum offered the greatest promise.

4,143

RCA Service Co., Camden, N. J. 1962 TECHNIQUES OF PHYSIOLOGICAL MONITORING. VOL. I. FUNDAMENTALS. (Aerospace Medical Research Labs. (6570th) Wright-Patterson AFB, Ohio) AMRL-TDR-62-98 (I), Sept. 1962

ABSTRACT: This volume is the first of a three-volume handbook covering the applications of electronics in monitoring bioelectric physiological responses. The fundamental concepts and methods presented in this volume form a foundation for the detailed technical discussions in the succeeding volumes and, it is hoped, provide a common language and basis of understanding between the physiologist and electronic engineer engaged in this field. The data obtained by monitoring physiological responses in varied environments can be used to improve the efficiency and increase the safety of a human subject in aircraft and spacecraft. (AUTHOR) (Aerospace Medicine 34(3):282, March 1963)

4,144

RCAF 1941 AIRSICKNESS.
(RCAF Investigations) (RAF Institute of Aviation Medicine, Farnborough) F.P.R.C. Report # 335, May 1941.

4,145

RCAF Institute of Aviation Medicine 1946 THE R.C.A.F. HUMAN CENTRIFUGE AND ACCELERATION LABORATORY, R.C.A.F. INSTITUTE OF AVIATION MEDICINE, TORONTO. J. Canadian Medical Services 4:95, Nov. 1946

4,146

Reals, W. J. and R. E. Danielson 1962 PRACTICAL METHODS IN THE AUTOPSY INVESTIGATION OF MAJOR AIRCRAFT ACCIDENTS. (Paper, 33rd annual meeting of the Aerospace Medical Assn., Atlantic City, N. J. 9-12 April 1962)

ABSTRACT: Investigations into the human factors in major aircraft accidents have contributed greatly to air safety. Autopsy studies have been utilized in this effort as well as biochemical and histologic techniques. The Federal Aviation Agency has a consulting staff of pathologists who are sent to the scene of disasters to study wreckage, environment and other factors. These consultant pathologists join in the human factors team upon arrival working closely with the F.A.A., C.A.B. officials, Federal Bureau of Investigation and local police officers, Armed Forces Institute of Pathology teams and the local coroners or medical examiners, airline flight surgeons and rescue parties. A number of practical points will be emphasized using the experience gained in two recent major air accidents (Denver, Colorado and Chicago, Illinois). Since efforts are now underway to utilize F.A.A. designated Aviation Medical Examiners as investigators in the general aviation field this paper will help in the understanding of the problem encountered. The availability of proper equipment to be carried to the scene as well as the organization of the autopsy procedure will be detailed. The practice methods of liason, utilization of facilities and means of investigations will be presented. (Aerospace Med. 33(3):350, Mar. 1962)

4,147

Reed, J. C. 1949 FACTORS INFLUENCING ROTARY PERFORMANCE J. Psychol. 28:65-92.

4,148

Reed, J. H., B. F. Burgess, & H. Sandler 1963 EFFECTS ON ARTERIAL OXYGEN SATURATION OF POSITIVE PRESSURE BREATHING DURING ACCELERATION. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 29-May 2, 1963)

SUMMARY: Twenty-two centrifuge runs were performed on eight subjects in whom arterial oxygen saturation was continually monitored by means of a Waters cuvette while the subjects were exposed to various transverse accelerations +Gx at a seat angle of 6 degrees head up. These runs were made during conditions of breathing air (control), air positive pressure, pure oxygen (control), and pure oxygen positive pressure. The positive pressure was metered automatically to provide 3 mm Hg per G above ambient pressure.

The results of this experiment show that the slope of the curve of oxygen saturation plotted against time for air and air positive pressure decreased approximately 3 percent every 10 seconds, beginning 10 to 20 seconds after the onset of the acceleration.
During the oxygen breathing studies, a lowering in arterial oxygen saturation was observed approximately 100 seconds after the onset of acceleration.
A method is suggested as a means of estimating physiological limits for theoretical profiles of acceleration G plotted against time. (AUTHOR)

4,149

Reeves, E. 1961 THE EFFECT OF AGEING ON THE G-TOLERANCE OF RATS. (Aviation Medical Acceleration Lab., Naval Air Development Center, Johnsville, Pa.) Rept. No. NADC-MA-6116, Task MR00t.15-0002.3; rept. no. 5; 6 July 1961. ASTIA AD 259 075

ABSTRACT: The erfect of age on the G tolerance of rats was studied in five different age groups - one, three, four, six, nine and twelve months. Each group consisted of 24 male Sprague-Dawley rats. All of the rats were subjected to 20 positive G and their survival times were measured using an EKG end point. The results show that there was a gradual decline in acceleration tolerance with increase of age in this group of 98 rats. (Author)

4,150

Reeves, E. 1961 THE EFFECT OF ACCLIMATIZATION TO COLD ON THE G TOLERANCE OF RATS. (Aviation Medical Acceleration Lab., Johnsville, Pa.) Rept. no. NADC-MA 6117, ASTIA AD- 259 072, 9 June 1961

ABSTRACT: Two groups of rats were acclimatized to cold (4 to 6 C) for 37 days and then exposed to acceleration of 20 positive G until the heart rate decreased to 2 beats per second. No statistically significant difference in tolerance to acceleration was found between the cold-acclimatized animals and their controls. Exposure to cold caused loss of weight and increase in adrenal gland size.

4,151

Reeves, W. and L.E. Morehouse 1948 THE INFLUENCE OF POSITIVE G UPON THE CENTRAL NERVOUS SYSTEM OF MAN. (University of Southern Calif., School of Medicine, Los Angeles) Contract N6ori77, Task order 1, Project Nr 161-014, 19 October 1948

ABSTRACT:
1. The rates of tremor of six college atheletes were determined during the second, fifth and ninth seconds of observation during rest and under

the influence of the stress of positive G, to assess the influence of G upon the activity of the central nervous system.

2. Subjects with high resting tremor rates showed the greatest variability and their rates of tremor tended to increase under G. Subjects with low rates of tremor lowered or did not change their tremor rates under G and the rates were less variable under all conditions.

3. A regular effect of G to stimulate or depress the rate of tremor was not observed.

4. Irregularities in tremor rates repeated during constant exposure to G indicated that the influence of G alone did not enhance or diminish the activity of the central nervous system.

5. These findings do not support the possibility that the diminished performances under G is due to any depression of the activity of the central nervous system and indicate that decreased motor performance is probably due to mechanical effects of increased gravitational forces upon the musculo-skeletal mass.

4,152

Reeves, W., and L.E. Morehouse 1951 THE INFLUENCE OF POSITIVE G UPON THE CENTRAL NERVOUS SYSTEM OF MAN. (University of Southern Calif., School of Medicine, Los Angeles, Calif.) Contract N 6ori77, Task 1 31 March 1951

ABSTRACT: The rates of tremor of six college athletes were determined during the second, fifth and ninth seconds of observation during rest and under the influence of the stress of positive G, to assess the influence of G upon the activity of the central nervous system.

Subjects with high resting tremor rates showed the greatest variability and their rates of tremor tended to increase under G. Subjects with low rates of tremor lowered did not change their tremor rates under G and the rates were loss variable under all conditions.

A regular effect of G to stimulator depress the rate of tremor was not observed.

Irregularities in tremor rates repeated during constant exposure to G indicated that the influence of G alone did not enhance or diminish the

activity of the central nervous system.

These findings do not support the possibility that the diminished performances under G are due to any depression of the activity of the central nervous system and indicate that decreased motor performance is probably due to mechanical effects of increased gravitational forces upon the musculo-skeletal mass.

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Reid, D.D. 1942 SOME FACTORS IN THE CAUSATION OF FLYING STRESS. (RAF, Institute of Aviation Medicine, Farnborough) FPRC 450, June 1942.

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Reid, H. J. E. 1922 A STUDY OF AIRPLANE MANEUVERS WITH SPECIAL REFERENCE TO ANGULAR VELOCITIES. (National Advisory Committee for Aeronautics, Washington, D.C.) NACA Rept. No. 155.

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Reid, H. J. E. 1922 THE NACA THREE COMPONENT ACCELEROMETER. (National Advisory Committee for Aeronautics, Washington, D.C.) NACA Tech. Note 112.

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Reighard, H. L., C. E. Wilbur, J. C. Cherry, & M. Y. McCormick 1962 A STUDY OF GENERAL AVIATION ACCIDENTS. (Paper 33rd Annual Meeting of the Aerospace Medical Assoc. Meeting, Atlantic City, N. J., 9-12 April 1962).

ABSTRACT: General aviation accident notification, investigation, and reporting procedures are examined briefly and the lac k of privileged status for accident reports is emphasized. In an attempt to elicit human factors data, a questionnaire, with privileged status, was sent to 1,570 civilian pilots involved in general aviation accidents during the period June 1960 to May 1961. Completed questionnaires were received in 949 cases —a response rate of 60 per cent. The questionnaires were matched with the corresponding accident reports and studied. The results are presented, along with recommendations. (Aerospace Med. 33(3): 350, March 1962).

4.157

Reihm, H. D. Jr., 1962 HELMET IMPACT TESTS.
(Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio) MRL-TDR-62-19. April 1962. ASTIA AD 283950.

ABSTRACT: Several helmets, designed and tested to determine which shell thickness and which type of suspension afford maximum protection during high-energy collisions and provide comfort during normal use, are discussed. There are many factors which influence the design of a satisfactory crash helmet; however, a combined analysis of three of its basic properties-reduction of acceleration, reduction of the rate of onset of acceleration, and the absorption of kinetic energy-is sufficient to reveal the relative performance of each helmet design. Tests which determine these basic properties are discussed. An analysis of the data correlated in graphical form shows an optimum helmet thickness and most satisfactory suspension system of those studied.

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Reihm, H.D. 1962 HELMET IMPACT TESTS
(International Latex Corp., Dover, Del.) Contract AF 33(600)-39536, Report No. MRL-TDR-62-19; Project No. 6301, Task No. 630104, April 1962.

ABSTRACT: Several helmets, designed and tested to determine which shell thickness and which type of suspension afford maximum protection during high-energy collisions and provide comfort during normal use, are discussed. There are many factors which influence the design of a satisfactory crash helmet; however, a combined analysis of three of its basic properties--reduction of acceleration, reduction of the rate of onset of acceleration, and the absorption of kinetic energy--is sufficient to reveal the relative performance of each helmet design. Tests which determine these basic properties are discussed. An analysis of the data correlated in graphical form shows an optimum helmet thickness and the most satisfactory suspension system of those studied. (Author)

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Rein, F. H., O. Aulhorn, H. Autrum et al 1947 PHYSIOLOGY - PART III. ANIMAL PHYSIOLOGY AND PHYSIOLOGY OF PERCEPTION (WITH TWO APPENDIXES TO GENERAL PHYSIOLOGY) (Animalische Physiologie und Sinnesphysiologie [Mit Zwei Anhangen Zur Allgemeinen Physiologie]). FIAT Review of German Science 1939-1946. ASTIA ATI 68 556.

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Reinhardt, R. F. 1959 MOTION SICKNESS: A PSYCHOPHYSIOLOGIC GASTROINTESTINAL REACTION?
J. Aviation Med. 30(11):802-805.

ABSTRACT: There is much to suggest that motion sickness is a psychophysiologic gastrointestinal reaction in which part of the anxiety is experienced consciously and part is kept from consciousness by visceral expression. Longitudinal studies have been of value in establishing the incidence of motion sickness, analyzing the motions and external conditions which produce it, and understanding its relation to flight failures and successes. Now needed are studies, in depth, of the psychologic make-up of persons subject to motion sickness. Only by an intensive examination of the personality and developmental factors and the psychodynamics involved in such individuals can the presumption that the basic disorder is emotional be validated.

Further research into the relationship between psychologic test results and motion sickness is needed. The psychologic test batteries in use eliminate many applicats for flight training who are subject to motion sickness. Perhaps projective tests can be devised which will measure one's affective response to unclear and confusing spatial situations. Some persons are so insecure in the face of positional uncertainty that they respond with anxiety and nausea symbolic of not being able to "stomach" the situation. It is hoped that such individuals, prone to motion sickness, can be singled out with appropriate tests.

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Reiniger, C.W. 1958 HUMAN SYSTEM IN SPACE. Missiles and Rockets pp. 4, 33-34

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(REM, Inc., Portland, Oregon) Letter #311. 23 July 1959.

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Remky, H. 1960 THE REGULATION OF THE CEREBRAL CIRCULATION. A CONTRIBUTION TO THE DIAGNOSTIC UNDERSTANDING OF HEADACHE AND VERTIGO BY MEASUREMENT OF THE PRESSURE OF THE RETINAL VESSELS.
Muenchen Med Wschr 102:969-73, 6 May 1960

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Renzi, A. A., & L. J. Milch 1956 EFFECTIVENESS OF PAGITANE (CYCRIMINE HYDROCHLORIDE) AND KEMADRIN (PROCYCLIDINE HYDROCHLORIDE) IN PREVENTION OF AIRSICKNESS. Federation Proceedings 15(1, part I):473 March 1956

ABSTRACT: Results based on groups of airmen subjected to a 60-minute flight consisting of motion patterns to produce emesis indicated that the incidence of sickness was highest in the placebo group (38.1%), and that the incidence in the Kemadrin (procyclidine hydrochloride)-treated subjects (17.5%) was far less than in the Pagitane (cycrimine hydrochloride) group (28.5%). In terms of protection, 5 mg. of Kemadrin was 54% effective, while 5 mg. of Pagitane was only 25% effective. Kemadrin compared very favorably with Benadryl which itself showed 50% protection against airsickness. The preparations demonstrated no untoward side effects at the dose level employed. (AUTHOR)

4,165

Renzi, A.A. and L.J. Milch 1957 EFFECTIVENESS OF PROCYCLIDINE HYDROCHLORIDE AND CYCRIMINE HYDROCHLORIDE IN THE PREVENTION OF AIRSICKNESS (School of Aviation Medicine, USAF Randolph AFB, Texas) Rept. No. 58-20, November 1957

4,166

Renzi, A.A. and L.J. Milch 1958 EFFECTIVENESS OF PROCYCLIDINE HYDROCHLORIDE (KEMADRIN) AND CYCRIMINE HYDROCHLORIDE (PAGITANE) IN THE PREVENTION OF AIRSICKNESS Jour. Aviation Med., 29(8):587-589 Aug. 1958

ABSTRACT: The incidence of vomiting during one hour of simulated turbulence in a C-54 type aircraft was determined in subjects treated one hour before flight with the anti-Parkinson drugs procyclidine hydorchloride, cycrimine hydrochloride, or diphenhydramine hydrochlorifed. Administration of 5 mg. of either procyclidine hydrochloride or cycrimine hydrochloride resulted in a decrease in incidence of vomiting similar to that produced by 50 mg. of diphenhydramine hydorchloride. No side effects of the drugs were observed.

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Resch, J. A. 1942 HUMAN CENTRIFUGE. MAYO AERO MEDICAL UNIT. (War Dept., Air Corps, Materiel Div.) EXP-M-49-698-5A, 24 Aug. 1942

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Reviglio, G.M. 1934 CONTRIBUTO ALLA CONOSCENZA DELLE MODIFICAZIONI DEI DIAMETRI CARDIACI E DEL VOLUME DEL CUORE RISCON TRATA ALL INDAGINE ROENTGENOLOGICA NEI PILOTI. (Changes in the cardiac diameter and volume of the heart as shown in the roentgenogram of pilots.)
Rassegna di med. appl. al lavoro indust, 5:154-159, March - April 1934

ABSTRACT: The heart measurements were taken of eighteen military pilots in service from one to three years. Of these, sixteen showed variations in the principal cardiac diameter and less frequently in the longitudinal diameter. The median diameter showed the most conspicuous variation, with a predominant increase in the left segment. The volume of the heart was increased in ten, especially in those pilots who had made frequent very high or speedy flights.
(J. Aviation Medicine, 7 (1): 51, March 1936)

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Reynolds, H. H., M. E. Grunzke, & F. H. Rohles, Jr. 1963 THE EFFECTS OF EXPOSURE TO SIMULATED LAUNCH AND REENTRY PROFILES ON CHIMPANZEE PERFORMANCE.
Aerospace Medicine 34(3):196-200, Mar. 1963

ABSTRACT: One of the most critical factors associated with space flight, insofar as its effects behavior, is the acceleration experienced during launch and reentry. This was demonstrated by the performance of HAM, the first chimpanzee to participate in the Project Mercury Program. With the advent of this ballistic flight, and the acknowledgement by scientists as to its value in the subsequent manned ballistic flights, a research and training program was begun immediately to prepare a chimpanzee for an orbital flight (Mercury-Atlas 5) to precede that of man. In preparing for this flight it became essential to simulate, insofar as possible, the conditions of launch and reentry which exist at the time a capsule is placed into orbit, particularly with regard to the effects of accelerative forces on a key performance task. Thus, the purpose of this study was to determine the effects upon performance of exposure to accelerative forces likely to occur during launch and reentry, which could further serve as a basis for selecting subjects for an orbital flight. (AUTHOR)

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Reznikov, S. and G. Graifer 1935 MEDICAL CONTROL OF PARACHUTE JUMPS FROM TRAINING TOWERS
Vo.-sanit. Dyelo (7):26-31. 1935

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Reynolds, H. H., M. E. Grunske & F. H. Rohles 1962 THE EFFECTS OF EXPOSURE TO SIMULATED LAUNCH AND RE-ENTRY PROFILES ON CHIMPANZEE PERFORMANCE. (Aeronautical Systems Division, Air Force Systems Command, Andrews AFB, Washington, D.C.) ARL-TDR-62-1, March 1962. ASTIA AD 280 029.

ABSTRACT: Five chimpanzees trained to perform a continuous avoidance task were exposed to the acceleration profiles simulating the conditions of launch and re-entry which exist when a capsule is placed into orbit. Performance during launch and re-entry differed from the base-line period which immediately preceded each of the three launches. However, performance immediately following launch and re-entry indicated that the animals recovered rapidly and tolerated the insults well.

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Reynolds, W.C. 1959 BEHAVIOR OF LIQUIDS IN FREE FALL. J. Aerospace Science 26:847

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Rhein, L.W. & E.R. Taylor 1962 INCREASED SKELETAL MUSCLE ACTIVITY FOLLOWING IMPACT. (Aeronautical Research Lab., Holloman AFB, New Mex.) Report No. ARL-TDR-62-26, Dec. 1962.

4,175

Rhein, L. W., & E. R. Taylor 1962 INCREASED SKELETAL MUSCLE ACTIVITY FOLLOWING IMPACT. (6571st Aeromedical Research Laboratory, Holloman AFB, New Mexico) ARL-TDR-62-26; December 1962

ABSTRACT: Seven male human subjects were exposed to impacts of -10 seat Gx, -20 seat Gx (400 G/second), and -20 Gx (800 G/second). An increase in skeletal muscle activity was seen following the 20 G exposures, with involuntary movements of the trunk and extremities. The activity was greater at the higher rate of onset. Possible explanations are discussed in this preliminary report, and the hypothesis of transient alteration of the central nervous system is advanced. (AUTHOR)

4,176

Rhein, L. W., & E. R. Taylor 1962 RELATIVE BRADYCARDIA AFTER IMPACT (6571st Aeromedical Research Lab., Holloman AFB, N. Mex.) Rept. No. ARL-TDR-62-12; Proj. 7850; ASTIA AD-282 688; August 1962

ABSTRACT: Experimental subjects underwent a 15 G abrupt deceleration in both the forward- and backward- facing positions. A continuous electrocardiogram was made on all subjects. As compared with control subjects, a relative bradycardia of clinical and statistical significance occurred in the backward-facing position immediately after impact for at least five beats. This effect was virtually nonexistent in the forward-facing position. The possible mechanisms are discussed and the hypothesis is advanced that the relative bradycardia was due to a vagal reflex. (AUTHOR)

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Rhode, R. V. 1929 THE PRESSURE DISTRIBUTION OVER THE HORIZONTAL AND VERTICAL TAIL SURFACES OF THE F6C-4 PURSUIT AIRPLANE IN VIOLENT MANEUVERS. (National Advisory Committee for Aeronautics) NACA Rept. No. 307.

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Riccabona, A., and A. Jezek 1960 THE DIFFERENTIAL DIAGNOSIS BETWEEN VASCULAR-CAUSED CENTRAL AND LABYRINTH VERTIGO. Wien Klin Wschr 72:68-9, 29 January 1960

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Richardson, H. C. 1926 FLIGHT ACCELERATIONS AND EQUILIBRIUM. U. S. Navy Med. Bull. 24:874-880, Oct. 1926

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Richmond, D. R., M. B. Wetherbe, R. V. Taborelli, T. L. Chiffelle & C. S. White 1957 THE BIOLOGIC RESPONSE TO OVERPRESSURE. I. EFFECTS ON DOGS OF FIVE TO TEN-SECOND DURATION OVERPRESSURES HAVING VARIOUS TIMES OF PRESSURE RISE.
J. Aviation Med. 28(5):447-460. Oct. 1957.

ABSTRACT: An apparatus producing variable environmental pressure conditions is described. Dogs were exposed to overpressures of up to 170 p.s.i. for durations of 5-20 seconds, and baffles were used as protection against high velocity

winds. Fatalities were limited to animals subjected to dynamic decelerative loading when no wind baffles were used. Gross pathology in nondisplaced but restrained animals, even though exposed to overpressures from 60 to 170 p.s.i. was limited to ear drum failure, sinus and middle ear hemorrhage, larygeal petechiae and characteristic marginal, wedge-shaped hemorrhagic lesions of the costophrenic portions of the lung bases. (Author)

4,181

Richmond, D.R. and R.V. Taborelli n.d. SOME RESULTS OF A SHOCK TUBE FOR BIOMEDICAL INVESTIGATION in PROCEEDINGS OF SECOND SHOCK TUBE SYMPOSIUM (Air Force Special Weapons Center, Air Research and Development Command, Kirtland Air Force Base, New Mexico) 5-6 March 1958, ASTIA AD211239

ABSTRACT: This shock tube was designed to investigate the biological effects of long duration overpressure phenomena as recorded inside protective shelters subjected to nuclear blast. It had to be capable of modifying the different parameters of the blast wave such as maximum overpressure, time to maimum pressure and duration and, in addition, produce single, and multiple reflections as recorded in shelters of different geometric configurations. Also, it had to be of sufficien size to test the larger species of experimental animals.

Although the aerodynamic characteristics have not been studied in detail, its general performance as determined empirically shows this to be a versatile apparatus capable of producing a wide range of pressure-time phenomena. In addition, this device permits a broad basic study of the biological significance of overpressure.

4,182

Richmond, D.R., R.V. Taborelli, I.G. Bowen, T.L. Chiffelle, et al 1959 BLAST BIOLOGY - A STUDY OF THE PRIMARY AND TERTIARY EFFECTS OF BLAST IN OPEN UNDERGROUND PROTECTIVE SHELTERS
(Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico, February 1959) WT-1467 Project 33.1 Operation Plumbbob

ABSTRACT: Dogs, pigs, rabbits, guinea pigs, and mice were exposed to nuclear detonations in two open underground partitioned shelters. The shelters were of similar construction, and each was exposed to separate detonations. Each inner

chamber filled through its own "orifice"; thus four separate pressure environments were obtained. An aerodynamic mound was placed over the escape hatch of each structure to determine its effect on the pressure-curve shape inside the chamber. In one test a sieve plate bolted across the top of the mound was evaluated. Wind protective baffles of solid plate and of heavy wire screen were installed in the shelters to compare primary and tertiary blast effects on dogs. The shelters also contained static and dynamic pressure gauges, radiation detectors, telemetering devices, and, in one test, air-temperature measuring instruments, dust-collecting trays, and eight pigs for the biological assessment of thermal effects.

One dog was severely injured from tertiary blast effects associated with a maximal dynamic pressure (Q) of 10.5 psi, and one was undamaged with a maximal Q of 2 psi. Primary blast effects resulting from peak overpressures of 30.3, 25.5, 9.5, and 4.1 psi were minimal. The mortality was 19 per cent of the mice exposed to a peak pressure of 30.3 psi and 5 and 3 per cent of the guinea pigs and mice exposed to a peak pressure of 25.5 psi. Many of the rabbits, guinea pigs, and mice sustained slight lung hemorrhages at maximum pressures of 25.5 and 30.3 psi. Eardrum perforation data for all species, except mice, were recorded.

Following shot 2, thermal effects were noted. Animals of the groups saved for observation have died from ionizing-radiation effects.

4,183

Richmond, D.R., R.V. Taborelli, F. Sherping, M.B. Wetherbe, R.T. Sanchez, V.C. Goldizen, and C.S. White 1959 SHOCK TUBES STUDIES OF THE EFFECTS OF SHARP-RISING, LONG-DURATION OVERPRESSURES ON BIOLOGICAL SYSTEMS. In Proceedings of Third Shock Tube Symposium 10-12 March 1959 pp. 171-194

ABSTRACT: A closed-end shock tube was used to study the effects of single and stepwise, fast-rising overpressures of long duration on four species of experimental animals.

For animals exposed side on against the end-plate to single, sharp-rising pressure pulses, the reflected pressures necessary to kill 50 per cent (LD50) were as follows: for the mouse- 29.8 + 1.1 : rabbit -3314 + 1.2 guinea pig - 36.7 $\pm$ 0.7; and the rat - 38.7 $\pm$ 0.6 psi.

Animals located at short distances away from the end-plate were loaded in a two-step manner. The steps corresponded to the incident and reflected shock fronts. With stepwise increases in pressure, animals tolerated much higher reflected overpressures than when the pressure load consisted of a single-sharp-rising pulse.

The importance of the time interval between step loads was pointed out and briefly discussed.

4,184

Richmond, D.R. R.V. Taborelli, F. Sherping, M.B. Wetherbe, et al 1959 SHOCK TUBE STUDIES OF THE EFFECTS OF SHARP-RISING, LONG-DURATION OVERPRESSURES ON BIOLOGICAL SYSTEMS
(The Lovelace Foundation for Medical Education and Research, Alburquerque, New Mexico) Atomic Energy Commission Project Report TID-6056
AEC Contract No. AT(29-1)-1242 March 10, 1959

ABSTRACT: A closed-end shock tube was used to study the effects of single and step-wise, fast-rising overpressures of long duration on four species of experimental animals.

For animals exposed side-on against the end-plate to single, sharp-rising pressure pulses, the reflected pressures necessary to kill 50 per cent (LD_{50}) were as follows: for the mouse - 29.8 + 1.1; rabbit - 33.4 + 1.2; guinea pig - 36.7 + 0.7; and the rat - 38.7 + 0.6 psi.

Animals located at short distances away from the end-plate were loaded in a two-step manner. The steps corresponded to the incident and reflected shock fronts. With stepwise increases in pressure, animals tolerated much higher reflected overpressures than when the pressure load consisted of a single, sharp-rising pulse.

The importance of the time interval between step loads was pointed out and briefly discussed.

4,185

Richmond, D. R., I. Gerald Bowen and C. S. White 1961 TERTIARY BLAST EFFECTS: Effects of Impact on Mice, Rats, Guinea Pigs and Rabbits. Aerospace Med. 32(9):789-805.

ABSTRACT: The present report deals with the results of exposure of four species of animals to impact. Extrapolation of the mortality data to the 70 kg animal and a comparison of the results with relevant information in the literature dealing with human response to dynamic accelerative or decelerative loading is presented.

4,186

Richmond, D. R., I. G. Bowen and C. S. White 1961 TERTIARY BLAST EFFECTS: THE EFFECTS OF IMPACT ON MICE, RATS, GUINEA PIGS AND RABBITS (Lovelace Foundation for Medical Education and Research Albuquerque, New Mexico) Contract No. DA-49-146-XZ-055, 28 Feb. 1961, ASTIA AD-279672.

ABSTRACT: A total of 455 mice, rats, guinea pigs and rabbits were subjected to impact at velocities ranging between 25 ft/sec. and 51 ft/sec. The desired velocities were generated by allowing the animals to free-fall from various heights to a flat concrete pad. The ventral surface of each animal was the area of impact. Probit analyses of the

24-hr mortality data yielded LD_{50} impact velocities with 95 per cent confidence limits as follows: mouse, 39.4 (37.4 - 42.0) ft/sec; rat, 43.5(42.0-44.8) ft/sec; guinea pig, 31.0(30.0 - 31.9) ft/sec; and rabbit, 31.7 (30.2-33.3) ft/sec. The LD_{50} figures for the mouse and rat were significantly higher, statistically, than those for the guinea pig and rabbit. The small spread in the LD_{50} values suggested little variation in the tolerance of biological systems to impact. Further, the steepness of the mortality curves indicated a narrow survival range to impact. Extrapolation of the experimental data to the 70 kg animal yielded a predicted LD_{50} impact velocity of 26 ft/sec (18 mp). Literature relevant to the human case was reviewed and the tentative applicability of the predicted figures to adult man was discussed.

4,187

Richmond, D. R., V. R. Clare, V. C. Goldizen, D. E. Pratt, R. T. Sanchez, & C. S. White 1962 A SHOCK TUBE UTILIZED TO PRODUCE SHARP-RISING OVERPRESSURES OF 400 MILLISECONDS DURATION AND ITS EMPLOYMENT IN BIOMEDICAL EXPERIMENTATION (Ballistic Research Laboratories, Aberdeen Proving Ground, Md.) BRL Rept. No. 1160; Feb. 1962
See also In Proc. of Fourth Shock Tube Symposium, April 18-20, 1961, pp. 36-59, 1961

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Richmond, D. R., V. R. Clare, V. C. Goldizen, D. E. Pratt, R. T. Sanchez, & C. S. White 1961 A SHOCK TUBE UTILIZED TO PRODUCE SHARP-RISING OVERPRESSURES OF 400 MILLISECONDS DURATION AND ITS EMPLOYMENT IN BIOMEDICAL EXPERIMENTATION. In Proc. of Fourth Shock Tube Symposium, April 18-20, 1961, pp. 36-59
See also (Ballistic Research Laboratories, Aberdeen Proving Ground, Md.) BRL Rept. No. 1160; Feb. 1962

4,189

Richmond, D. R., V. C. Goldizen, V. R. Clare, D. E. Pratt, et al 1962 THE BIOLOGIC RESPONSE TO OVERPRESSURE III. MORTALITY IN SMALL ANIMALS EXPOSED IN A SHOCK TUBE TO SHARP-RISING OVERPRESSURES OF 3 to 4 MSEC DURATION
Aerospace Medicine, 3:1-27, January 1962.

ABSTRACT: The experiments to be reported here are a part of a broad study primarily conceived to establish an interspecies correlation

between the weight of animals and their tolerance to "sharp"-rising overpressures as a function of pulse duration. However, the limited objective of the present report is to set forth the empirically determined relationship between lethality and magnitude of single, "sharp"-rising overpressures of 3 to 4 msec duration for mice, rats, guinea pigs and rabbits, and to record selected, but significant, gross pathological lesions caused by air blast generated in a shock tube specially designed to produce pressure pulses similar to "small", high-explosive charges.
See also: (Defense Atomic Support Agency, Wash., D. C.)
Technical Progress Report on Contract DA-49-146-XZ-055,DASA 1242, June 15, 1961.

4,190

Richmond, D. R. et al. 1961 BIOLOGICAL EFFECTS OF OVERPRESSURE. II. A SHOCK TUBE UTILIZED TO PRODUCE SHARP-RISING OVER-PRESSURES OF 400 MILLISECONDS DURATION AND ITS EMPLOYMENT IN BIOMEDICAL EXPERIMENTS. Aerospace Medicine 32(11):997-1008, Nov. 1961.

ABSTRACT: A shock tube employed for blast biology studies is described. By appropriate modifications a wide variety of wave forms some of which closely resemble those produced by nuclear detonations under certain circumstances can be produced. Mortality data are presented on six species of animals all exposed in a similar geometry to similar pressure-time phenomena that varied among the species mostly with respect to the magnitude of the over-pressure. (Tufts)

4,191

Richmond, D.R., D.E. Pratt, & Clayton S. White 1962 ORBITAL "BLOW-OUT" FRACTURES IN DOGS PRODUCED BY AIR BLAST
(Lovelace Foundation for Medical Education and Research, Alburquerque, New Mexico) Defense Atomic Support Agency of the Department of Defense Contract No. DA-49-146-XZ-005 April 10, 1962 , ASTIA AD-287 636

ABSTRACT: Reported here are 11 cases of orbital "blow-out" fractures involving 9 of 115 dogs that were subjected to shock tube-produced air blast.
Usually, there was failure of the frontal, palatine, sphenoid and lacrimal bones - fragments of which were displaced medially and anteriorly into the nasal fossa with extension into the frontal and maxillary paranasal sinuses. In one instance there was extension into the cranial vault. Eye signs, in the form of proptosis of the globe, subconjunctival hemorrhage, ecchymotic areas of the globe and hemorrhage into the intra-orbital soft tissues, were found associated with all cases of orbital fracture.

The pressure-time histories in which animals did or did not sustain orbital fractures are illustrated along with a tabulation of the corresponding pressure-time parameters. The data indicate that orbital fractures (caused by the eyeball and other intra-orbital tissues hydraulically transmitting the pressure-load to the walls of the orbit more rapidly than counter pressure developed in the air-containing areas bordering the orbit) occurred at maximal pressures above 140 psi provided they reached a peak in less than 30 msec.

The incidence of "blow-out" fractures is discussed along with the significance of this lesion in relation to other blast-produced injuries.

4,192

Richou, M.J. 1936 LA RÉSISTANCE HUMAINE Á LA VITESSE (Human Resistance to Speed)
Ailes (Paris) 16(760): 7

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Richter, H. 1940 PHYSIOLOGISCHE BETRACHTUNGEN UEBER DAS SITZKATAPULTIEREN (Physiological Analysis of the Effects of Catapulting by an Ejection Seat) July 1940. ASTIA ATI 60910

ABSTRACT: The physiological effects of catapulting flying personnel by means of an ejection seat from the He-280 jet fighter were investigated. The seats were released at accelerations of 10 and 12 g. Possible injuries are compression of the spinal column, brain concussion, hemostatic effects and injuries to the inner ear. Cardiograms were taken before the seat was catapulted, during ejection and after the seat was stabilized. In order to avoid possible bodily injuries, it is recommended that the catapult of the ejection seat be made with the pilot in a prone position, in which accelerations up to 16 g can be endured without ill effects.

4,194

Richter, H. 1940 SCHUSSVERSUCHE MIT DEM KATAPULTSITZ (Ejection Seat Test) Oct. 1940. ASTIA ATI 51210

ABSTRACT: An avaluation was made of ejection tests with a German Heinkel catapultseat, and the method is given for determining the piston pressure,

friction, acceleration and velocity. Graphical data represent ejection altitudes dependent on the piston pressure and the maximum accelerations acting on the catapult seat. At a known weight of the occupied catapult seat and the minimum ejection height expected, the minimum piston pressure and the acceleration acting on the body can be determined.

4,195

Richter, H., tr. J.B. Bateman 1945 EJECTION EXPERIMENTS WITH THE CATAPULT SEAT (Ernst Heinkel Flugzeugwerke (Seestadt Rostock) Research Division) V.B. 3009, Appendix 2, Pages A-17138 to A-17155, 7 Nov. 1940. Translated as Appendix 9 to Lovelace, W.R., E.J. Baldes, & V.J. Wulff, The Ejection Seat for Emergency Escape from High-Speed Aircraft ASTIA ATI 7245

ABSTRACT: Following upon the ejection experiments with sandbags, ejections of human subjects were undertaken with the cooperation of Professor Wacholder of the Physiological Institute, University of Rostock, and his assistant, Doctor Aeffner. We made two experiments with Mr. Voss(VSA) and Mr Wegner (Statik); both subjects were ejected, the first at 12 and the second at 10 g. In each case electrocardiograms were recorded with electrodes on the right and left wrists. The procedure was first to record the heart beat before ejection, then during ejection, and finally once again some time after the completion of the ejection. The electro-cardiograms obtained are recorded in Figure 5. Here, having discussed the matter with Professor Macholder, I wish to bring together a statement of all the processes which might cause injuries of any kind to experimental subjects in this work: 1) Compression fractures of the spinal column; 2) Conc ussion of the central nervous system, especially with contrecoup symptoms of the type seen in concussion of the brain, 3) Hemostatic effects; 4) Disturbances in the inner ear (labyrinth)

4,196

Richter, H., tr. J.B. Bateman 1945 CATAPULT SEAT He 280 (Ernst Heinkel Flugzeugwerke G.m.b.H., Seestadt Rostock, Research Division) V.B. 3009, Pages A-17156 to A-17186, 21 Oct. 1940. Translated as Appendix 8 to Lovelace, W.R., E.J. Baldes, & V.J. Wulff, The Ejection Seat for Emergency Escape from High-Speed Aircraft ASTIA ATI No. 7245

ABSTRACT: The investigation dealt with the following subjects: 1) Testing of the catapult cylinder (drawing No. 280.101-25) 2) Tests on rapid opening

valve, drawing No. 280.101-26. 3) Tests on compressed air cylinder with reservoir attachment, Drawing No. 280.101-14. 4) Experiments on ejection of sand bags from mockup He 280 (high speed moving pictures and indicator diagrams) 5) Seat ejections with human subjects on the inclined track (high speed moving pictures and indicator diagrams) together with various types of measurement of acceleration and electrocardiograms). (Author)

4,197

Richter, H. 1949 PHYSIOLOGICAL ANALYSIS OF THE EFFECTS OF CATAPULTING BY AN EJECTION SEAT. 24 Aug. 1949. ASTIA ATI 60-910

ABSTRACT: The ejection seat of the He-280 jet fighter was used to study the effects of catapulting (acceleration) on the human body. Heart cardiograms were taken before the seat was catapulted, during its release, and after it was stabilized. The seats were released at accelerations of 10 and 12 g. The effects of these accelerations could have the following injurious results: compression of the spinal column; concussion of the central nerve system with contrecoup symptoms, as observed in the case of brain concussion; hemostatic effects and injury to the inner ear. To avoid possible injuries to the body it was recommended that catapult with an ejection seat be executed from a prone position, in which accelerations to 16 g can be endured without ill effects.

4,198

Richter, Albert P. 1960 THE RESPONSE OF A TWO-DEGREE-OF-FREEDOM UNDAMPED SYSTEM SUBJECTED TO IMPULSIVE LOADING. (Structural Mechanics Research Lab., The University of Texas)

4,199

Ricks, Luin Blunt 1961 A FEASIBILITY STUDY OF A MAGNETO-HYDRODYNAMIC CENTRIFUGE. (Master's Thesis, Air Force Inst. of Tech., Wright-Patterson AFB, Ohio) Rept. No. GE/EE/61-15; ASTIA AD-269 423; Aug. 1961

ABSTRACT: A study was made of the magneto-hydrodynamic centrifuge, a direct-current motor with a mercury armature. Centrifuging action is derived from the rotating mercury which, at sufficient speeds, assumes the shape of a hollow ring. A development prototype is designed and tested to determine the feasibility of such a centrifuge. Results were promising and indicated that the basic operational principle is sound and feasible. A paddle wheel was rotated at 2000 rpm by a rotating ring of mercury at an estimated mercury input power of 5 watts. (AUTHOR)

4,200

Riddell, F.R. and R.W. Detra 1959 RETURNING ALIVE FROM SPACE.
(Avco Mfg. Corp., Avco Research Lab., Everett, Mass.)

ABSTRACT: The paper discusses three problems of re-entry: deceleration, heat, and terminal landing conditions. Hypersonic gliders and pure drag re-entry vehicles are compared. The drag vehicle has inherent advantages over the hypersonic glider which are usually not generally observed.

4,201

Riddell, Frederick R. and Howard B. Winkler 1961 METEORITES AND RE-ENTRY OF SPACE VEHICLES AT METEOR VELOCITIES
(Paper, National ARS-ISA Joint Meeting, June 13-16, 1961)

ABSTRACT: In the exploration of the solar system, it will soon be of interest to recover instrumented probes, which, if they are not decelerated in some fashion in space, will approach Earth at velocities as high as 140,000 fps. The possibility of decelerating such a recovery vehicle by atmospheric braking is examined. Since this velocity is well into the meteor range, data on meteorites are used to orient the analysis. Meteorites are known to cover a wide range of sizes from a few microns to hundreds of feet in diameter. There is evidence, furthermore, that, in the intermediate-size range from a few inches to a foot or two in diameter, only objects in the lower meteor velocity range survive. Rational designs of recoverable deep-space probes are of this intermediate size. Analysis is performed which shows that, whereas very small and very large objects may survive throughout the meteor velocity range, there may well be an upper limit to re-entry velocity of about 50,000 to 60,000 fps for objects of intermediate size. The reason for this upper limit appears to be that, at meteor velocities the dominant mechanism of heat transmission is radiation. This provides a much more effective route for the transfer of energy than the convective heat transfer processes associated with lower entry velocities.

4,202

Riddell, Frederick R. & Howard B. Winkler 1962 METEORITES AND RE-ENTRY OF SPACE VEHICLES AT METEOR VELOCITIES
ARS Journal, 2(10): 1523-1530

ABSTRACT: In the exploration of the solar system, it will soon be of interest to recover instrumented probes, which, if they are not decelerated in some

fashion in space, will approach Earth at velocities as high as 140,000 fps. The possibility of decelerating such a recovery vehicle by atmospheric braking is examined. Since this velocity is well into the meteor range, data on meteorites are used to orient the analysis. Meteorites are known to cover a wide range of sizes from a few microns to hundreds of feet in diameter. There is evidence, furthermore, that, in the intermediate-size range from a few inches to a foot or two in diameter, only objects in the lower meteor velocity range survive. Rational designs of recoverable deep-space probes are of this intermediate size. Analysis is performed which shows that, whereas very small and very large objects may survive throughout the meteor velocity range, there may well be an upper limit to re-entry velocity of about 50,000 to 60,000 fps for objects of intermediate size. The reason for this upper limit appears to be that, at meteor velocities, the dominant mechanism of heat transmission is radiation. This provides a much more effective route for the transfer of energy than the convective heat transfer processes associated with lower entry velocities.

4,203

Rigal, R. D., F. W. Lovell & F. M. Townsend. 1960 PATHOLOGIC FINDINGS IN THE CARDIOVASCULAR SYSTEMS OF MILITARY FLYING PERSONNEL. The American Journal of Cardiology 6(1):19-25 July 1960.

ABSTRACT: In a group of supposedly healthy young fliers, there is a significant percentage who have moderate or marked atherosclerosis of the coronary arteries. However, in these pilots there is very little arteriosclerosis in the aorta, renal arcuate arteries, and small arteries of the periadrenal fat and the pancreas. The same observations are essentially true of a similar group of non-flying military personnel. This suggests that in young men free of clinical evidence of disease, coronary artery atherosclerosis may develop at a more rapid rate than in vessels of other organs. Fliers and non-fliers in the present study were not basically comparable because of age and other differences. However, the incidence of moderate and marked coronary artery sclerosis was found to be approximately equal in both groups, regardless of age.

In implicating marked coronary artery disease as a causative factor in an otherwise unexplained aircraft accident, extreme caution must be used. The finding of severe narrowing of the lumen of the coronary arteries must be considered in the light of information gained from the investigation of mechanical factors and from reports of the details of the accident.

4,204

Riley, M. B., and Bernardini, A. T. 1959 ANIMAL AND HUMAN STUDIES OF THE EFFECTS OF LOW-FREQUENCY OSCILLATION COMBINED WITH TRANSVERSE ACCELERATION (Wright Air Development Center, Aero Medical Lab., Wright-Patterson AFB, Ohio) WADC TN 59-92, March 1959. ASTIA AD 227 503.

ABSTRACT: Animal and human endurance is reported to low-frequency oscillation combined with acceleration having a resultant force acting in the back-to-chest direction. No significant suggestion of trauma was found in animals subjected to a maximum oscillation-g pattern of 2.8 cycles per second through a 36° arc in a 12 g field. In humans, there was no identifiable endpoint when they were subjected to a maximum oscillation-g pattern of 0.7 cycle per second through a 36° arc in an 8 g field.

4,205

Riley, M. B., and Bernardini, A. T. 1959 ANIMAL AND HUMAN STUDIES ON THE EFFECTS OF LOW-FREQUENCY OSCILLATION COMBINED WITH TRANSVERSE ACCELERATION (Wright Air Development Center, Aero Medical Lab., Wright-Patterson AFB, Ohio) WADC TN 59-92, March 1959. ASTIA AD 227 503.

ABSTRACT: Animal and human endurance is reported to low-frequency oscillation combined with acceleration having a resultant force acting in the back-to-chest direction. No significant suggestion of trauma was found in animals subjected to a maximum oscillation-g pattern of 2.8 cycles per second through a 36° arc in a 12 g field. In humans, there was no identifiable endpoint when they were subjected to a maximum oscillation-g pattern of 0.7 cycle per second through a 36° arc in an 8 g field.

4,206

Riley, R.L., S. Permutt, S. Siad, M. Godfrey, T.O. Cheng, J.B.L. Howell and R.H. Shepard 1959 EFFECT OF POSTURE ON PULMONARY DEAD SPACE IN MAN. J. Appl. Physiol. 14:339-344.

ABSTRACT: Physiologic dead space was determined in the supine and upright postures by simultaneous sampling and subsequent analysis of arterial blood and expired gas for P_{CO_2}. In seven normal men there was invariably a higher dead space in the upright than in the supine position. The difference averaged

83 ml and was statistically significant (S.E. 25 ml and $P > 0.01$). The ratio of dead space to tidal volume also invariably increased on assuming the upright posture. Evidence is presented for believing that most of the change in physiologic dead space resulted from a change in alveolar dead space. Estimated changes in the ratio of alveolar dead space to alveolar tidal volume suggest that approximately one seventh of the total number of alveoli became nonperfused on changing from the supine to the erect posture. These findings are consistent with bronchospirometric and hemodynamic evidence that the apex of the lung is virtually nonperfused in the resting human subject in the upright position.

4,207

Rind, Emanuel 1954 A PHOTOGRAPHIC METHOD FOR DETERMINING VERTICAL VELOCITIES OF AIRCRAFT IMMEDIATELY PRIOR TO LANDING. (National Advisory Committee for Aeronautics, Washington, D. C.) NACA TN 3050.

4,208

Rippon, T. S. 1935 PHYSICAL MEDICINE AND FLYING
Brit. J. Phys. Med. 10:25-26.

4,209

Rinehart, J. S. 1960 STRESSES ASSOCIATED WITH LUNAR LANDINGS
J. Brit. Interplanet. Soc. 17(12):431-436, Nov.-Dec. 1960

ABSTRACT: The probable stresses which would be developed during lunar impact landings are discussed phenomenologically and quantitatively. For landings against rocks in the velocity range from a few hundred feet per second to a few thousand feet per second, the stress is proportional to the first power of the impact velocity, with its magnitude depending upon the particular rock struck and increasing approximately linearly with shear strength and with specific acoustic resistance, but ranging roughly from 6000 lb./in.^{2} at 100 ft./sec. to 2,000,000 lb./in.^{2} at 6000 ft./sec. In landings against loose soils the stress, much lower than for rock impacts, is substantially independent of velocity at low velocities, but begins to depend strongly on the square of the velocity as the velocity is increased. The excursions of a 10,000-lb. vehicle into rock and soil surfaces are compared.

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Risavi, A. 1956 CHANGES IN THE STATO-ACOUSTIC APPARATUS OF PILOTS. (Promjene na statoakustičnom apparatu kod pilota. Vojnosanitetski pregled (Beograd)). 13:(11-12):536-543. Nov. Dec. 1956. In Serbocroation, with English summary. p. 542.

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Risinger, B.W. 1960 PILOT ACCELERATION PROTECTION IN THE INTEGRATED FLIGHT CAPSULE (Chance Vought Aircraft, Inc., Dallas, Texas) CVA EOR-12843, 21 March 1960.

4,212

Ritter, O. L. & S. J. Gerathewohl 1959 THE CONCEPTS OF WEIGHT AND STRESS IN HUMAN FLIGHT. (School of Aviation Medicine, Aerospace Medical Center (ATC) Brooks AFB, Texas) Rept. No. 58-154, Jan. 1959

ABSTRACT: The concepts of weight and stress in human flight are considered. The usage of terms and expressions is analyzed, their diverse meanings disentangled, and some of the physical facts are presented together with a simple and consistent set of concepts for their description.

4,213

Roaf, Robert 1961 SPINAL INJURIES
The Lancet 14 Jan. 1961, pp. 99-102.

4,214

Rob, C. G. 1944 SOME EXPERIENCES WITH A PARACHUTE SURGICAL UNIT
J. R. Army med. Cps. 82:165-167. 1944

4,215

Roberts, Kenneth A. 1961 WE CAN BUILD A CRASH-PROOF CAR
SAGA, Oct. 1961, pp. 17-21; 91-93

ABSTRACT: This article contains a detailed report and illustrations of a "Magic Bumper", seat belt, and "Ensolite" which Professor James Ryan claims

could prevent one-half of all injuries and deaths suffered in automobile accidents every year. The "Magic Bumper" absorbs collision shocks by hydraulic device and would cost less that fifty dollars a car installed. The seat-belt adjuster allows passengers complete freedom of movement but cinches tight upon any impact. Unbelievable "Ensolite" 1-inch cushioning, proposed for padding inside cars, can absorb bouncing raw eggs without cracking them.

4,216

Roberts, W. O. 1957 THE ASTRONOMER'S VIEWS.
In Campbell, P. A., K. Dannenberg, W. O. Roberts, H. Haber, A. S. Crossfield, G. W. Hoover, A. M. Mayo, J. P. Hagen, & H. Strughold, SPACE TRAVEL: A SYMPOSIUM. J. Avia. Med. 28:484-487

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Robertson, A. E. and P. R. Fatianow 1962 OPTIMIZING SPACE PROGRAMS (TAPCO. Div. of Thompson Ramo Wooldridge, Inc. Paper, American Rocket Society, 17-19 July 1962 American Rocket Society Preprint ARS-2468-62.

4,218

Robinette, J. C. 1957 A SELECTED BIBLIOGRAPHY CONCERNING PHYSIOLOGICAL FACTORS IN AERO-MEDICAL RESEARCH AND DEVELOPMENT. (Wright Air Development Center, Wright-Patterson AFB, Ohio) ASTIA AD-126 401; April 1957

ABSTRACT: This bibliography has been prepared to acquaint individuals, interested in physiological factors as they relate to aero-medical research and development, with the scope of project work conducted by the Physiology Branch of the Aero Medical Laboratory, Wright Air Development Center.
The principal topics include thermal physiology and protective garments; toxicity of materials and toxic chemical measurement; respiratory physiology and high altitude protective garments; aircraft visual requirements; nutrition and metabolism. (CARI)

4,219

Robinette, J. C., ed. 1959 BIBLIOGRAPHY ON AEROMEDICAL RESEARCH WITH ABSTRACTS (Wright Air Development Division, Wright-Patterson AFB, Ohio) Dec. 1959 ASTIA AD-247 101

ABSTRACT: This bibliography compiles abstracts of Technical Documentary Reports issued by the Aerospace Medical Laboratory, Wright Air Development Center, from 1957 through 1959.

The major areas comprising the Laboratory's mission are behavioral sciences, biomedical sciences, and engineering as related to human factors in aircraft design and survival equipment. The reports documenting the first two areas are subdivided into more specialized categories: engineering psychology, training psychology, bioacoustics, biophysics, and physiology.

4,220

Robinson, A. C., & A. J. Besonis 1958 ON THE PROBLEMS OF RE-ENTRY INTO THE EARTH'S ATMOSPHERE. (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TR 58 408; ASTIA AD-203 790; Aug. 1958

ABSTRACT: Re-entry into the earth's atmosphere has been studied from the standpoints of deceleration, heating, and accuracy of impact. This has been done for re-entry speeds consistent with return from near satellite orbits, and for speeds consistent with re-entry from a circum-lunar orbit under several configurations of lift and constant or variable drag coefficient assumptions. Heating considerations are based only on stagnation point influences. It is shown that deceleration and peak heating rates are not larger than those occuring in ballistic missile re-entries. The total heat input, however, is much larger as the heating occupies a much longer time. It appears that simple, non-lifting re-entry will be feasible from satellite orbits. The lunar re-entry, on the other hand, presents a severe total heat problem and accuracy requirements are such that some lift or other control will probably be required.

4,221

Robinson, A. C. 1958 ON THE PROBLEMS OF RE-ENTRY INTO THE EARTH'S ATMOSPHERE. In Robinson, A. C., & A. J. Besonis, eds., Advances in Astronautical Sciences (Proceedings AAS Western Regional Meeting, August 1958) (New York: Plenum, 1958) 3:33-1 - 33-24

ABSTRACT: Re-entry into the earth's atmosphere has been studied from the standpoints of deceleration, heating, and accuracy. This has been done for re-entry

speeds ranging from those consistent with re-entry from a near satellite orbit to those consistent with a circumlunar vehicle. It is shown that deceleration and peak heating rates present no major difficulty, being no larger than those occurring in ballistic missile re-entries. The total heat input, however, is much larger than for ballistic missiles, as the heating occupies a much longer time. It appears that a simple ballistic re-entry will be feasible from satellite orbits. The lunar re-entry, however, presents a severe total heat problem, and accuracy requirements are such that some lift or other control will probably be required.

4,222

Robinson, A.C., and C.R. Poli 1961 DEVELOPMENT OF NORMALIZED SIX-DEGREE-OF-FREEDOM EQUATIONS FOR ANALOG SIMULATION OF ATMOSPHERIC RE-ENTRY (Synthesis and Analysis Division, Directorate of Systems Dynamic Analysis, Aeronautical Systems Division, Wright-Patterson AFB, Ohio)Task No. 70958, ASD TR 61-448, November 1961, AD 270465

ABSTRACT: This report has developed the six-degree-of-freedom equations for a rigid body re-entering the earth's atmosphere and has normalized these equations to aid in their systematic study. Their solution by means of both analog and digital computers has been demonstrated. The results for specific re-entry conditions are shown together with an analysis of the errors in impact position due to re-entry perturbation sources. For the case of proper time scaling, the results of analog and digital computers compare quite favorably.

4,223

Robinson, F. R., R. L. Hamlin, W. M. Wolff, & R. R. Cermann 1962 RESPONSE OF THE RHESUS MONKEY TO LATERAL IMPACT. (Paper, 33rd Annual Meeting of the Aerospace Medical Assoc., 9-12 April 1962, Atlantic City, N. J.)

ABSTRACT: The physiological response of the Rhesus monkey to abrupt negative acceleration (deceleration) is reported. Eight animals received a series of progressively higher impact loss in the Y axis up to 75 g over a six-month period with use of the Vertical Deceleration Tower. Accelerations on the head, chest and hip of the animal were recorded simultaneously with the acceleration on the cart from which rise time, velocity and displacement were computed and recorded. Three orthogonal electrocardiograms and respiration rates were recorded. Radiographs were taken before and after the impacts. Routine hematological examinations were performed in addition to serum transaminase determinations. Changes in the EGG and respiration will be presented as well as changes of position of the heart as seen on radiographs. Hemograms and serum transaminase results will also be discussed. (Aerospace Medicine 33(3):350, March 1962)

4,224

Robinson, F. R., R. L. Hamlin, W. M. Wolff & R. R.Coermann 1963 RESPONSE OF THE RHESUS MONKEY TO LATERAL IMPACT.
Aerospace Med. 34(1):56-62, Jan. 1963.

SUMMARY: These experiments provide information regarding the physiological and mechanical response of well protected animate systems subjected to lateral impacts.

Rhesus monkeys were subjected to 11 laterally applied impacts over a 6 month period. The impacts ranged from 5 to 75 g with pulse durations of 70 to 27 milliseconds, respectively. Marked resonances of the head and hip occurred in the 30 millisecond pulse duration range. There appeared to be a resonance of the chest in the 60 millisecond range and either another resonance or the shifted resonance in the 30 millisecond range. The most important biological effect of the impacts was the response of the heart in the form of conduction abnormalities. The maximum response occurred immediately after the 55 g impacts. There were twice the number of abnormalities recorded from left lateral impacts as compared to right lateral impacts.

Radiographs showed no skeletal fractures. Movement and/or dilatation of the heart was evident on the side receiving the impact. Routine hemogram and serum

glutamic-oxalacetic transaminase values showed no change due to the impacts.

Protection provided by the individually fitted body molds is discussed, particularly with reference to the heart.

4,225

Robinson, J. E., et al. 1960 FLIGHT TESTS - TOO MANY VARIABLES?
(13th Annual International Air Safety Seminar, Chandler, Arizona) Nov. 1960

4,226

Roche, C.A. 1960 OF MEN, MEDICINE AND MILITARY PARACHUTING.
Milit. Med. 125:615-6, September 1960

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Roegner, H. F. & J. Carroll 1960 CRASH INJURY INVESTIGATION: U. S. ARMY HU-1A BELL IROQUOIS HELICOPTER ACCIDENT, FORT CARSON, COLORADO, 9 JUNE 1960. (Aviation Crash Injury Research, Phoenix, Arizona) AvCIR 12-PR-122, TREC Tech. Rept. 60-72, December 1960.

SUMMARY: This investigation revealed that the injuries experienced by the occupants resulted from vertical deceleration, failure of the troop seat, and failure of the transmission support, permitting displacement of the transmission into the cabin of the aircraft through the rear bulkhead. The side and the rear roof support members failed in this accident in a manner almost identical to failures of these parts experienced in other HU-1A helicopter accidents. The accident also revealed the excellent energy absorption characteristics of the skid landing gear and the crew seat cushion.

4,228

Roegner, H. F. 1960 CRASH INJURY EVALUATION: SUMMARY EVALUATION OF U. S. ARMY HU-1A BELL IROQUOIS HELICOPTER. (Aviation Crash Injury Research, Phoenix, Arizona) AvCIR 15-PR-126, TREC Tech. Rept. No. 60-73, December 30, 1960

ABSTRACT: This report reviews and discusses findings, conclusions, and recommendations forthcoming from the three evaluations and the five accident investigations. The purpose of the evaluations and investigations is to: (1) Evaluate the over-all crashworthiness of the basic aircraft structure; (2) Draw attention to all features which could either lead to or prevent unnecessary exposure of crew members and passengers to serious or fatal injury in accidents where crash forces are within survivable limits; (3) Make recommendations for remedial action in areas where deficiencies exist or are believed to exist in order to improve the crash safety aspects of the aircraft; and (4) Note the existence of effective crash safety features.

4,229

Roegner, H. F., G. J. Walhout & J. D. Davenport 1961 CRASH INJURY INVESTIGATION: U. S. ARMY G-91 RECONNAISSANCE JET FIGHTER ACCIDENT, FORT RUCKER, ALABAMA, 1 FEBRUARY 1961. (Aviation Crash Injury Research, Phoenix, Arizona) AvCIR 61-2, TREC Tech. Rept. 61-91, July 1961

ABSTRACT: Report is made of crash injury investigation involving a U.S. Army G-91 aircraft to determine cause of fatality. Wreckage was examined at crash

site, photographs obtained, and reconstruction of the approximate kinematics of the crash sequence made. It was concluded that the fatal injury was caused by a blow to the head and recommended that the ejection seat, since it is designed to provide safe escape at all altitudes and speeds, be utilized as an escape device in lieu of "riding the aircraft in" in a crash landing, with the exception, possibly, of crash landing on a well prepared surface or runway.

4,230

Roger, L. 1945 BLAST INJURY OF THE BRAIN Med. J. Australia 2:209-210

4,231

Rogers, T. A., & H. A. Smedal 1961 THE VENTILATORY ADVANTAGE OF BACKWARD TRANSVERSE ACCELERATION. (Paper, 32nd Annual Meeting of the Aerospace Medical Association, Palmer House, Chicago, Illinois, April 24-27, 1961) Aerospace Med. 32(3):245, March 1961.

ABSTRACT: Test pilots have reported less dyspnea when subjected to g-stress in the eyeballs out direction than in the eyeballs in direction. Six subjects were exposed to stresses of 4, 6 and 8 g in both positions for two minutes, during which measurements of tidal volume and vital capacity were made, using a wedgespirometer in a closed circuit. In the eyeballs in direction, there was virtually no expiratory reserve at only 4 g, and at higher g, the tidal volume was near the limit of the greatly diminished vital capacity. In contrast, each subject had a markedly greater tidal volume and vital capacity at each g level in the eyeballs out direction. The results strongly bear out the subjective reports of the greater ease of ventilation in the eyeballs out direction.

4,232

Rogers, T. A. and H. A. Smedal 1961 THE VENTILATORY ADVANTAGE OF BACKWARD TRANSVERSE ACCELERATION
Aerospace Medicine 32(8):737-740, Aug. 1961.

ABSTRACT: To compare the effects of acceleration applied transversely to the spinal axis in the "eyeballs-in" and the "eyeballs-out" directions on

respiratory function, five Ss were tested on the human centrifuge at four, six, and eight g. With the use of special respiratory equipment data were obtained on tidal volume, inspiratory capacity and expiratory reserve separately, and vital capacity. The ventilatory advantage of the eyeballs-out or backward position was discussed. (Tufts)

4,233

Rogers, T. A. 1962 THE PHYSIOLOGICAL EFFECTS OF ACCELERATION. The Scientific American 206(2):61-70, Feb. 1962

ABSTRACT: Emboldened by the resilience of their bodies, men now submit to the extreme stress of the acceleration sufficient to hurl them free of the earth's gravitational field. In the state of weightlessness thus achieved the body may come under stresses still more extreme. Within the past generation, therefore, the physiological effects of acceleration have become the focus of urgent and elaborate research programs. One program on acceleration studies is taking place at the Naval Air Development Center in Johnsville, Pa. At the center, volunteers are subjected to extreme acceleration in the largest centrifuge in the United States. Using this centrifuge, scientists study the physiological effects of various positions during acceleration. The centrifuge has also been used a great deal for experimenting with the effects of weightlessness. Investigators are concerned that the reflexes controlling the circulation might deteriorate under weightlessness. In the first place, long periods at zero G might be expected to depress the response of the pressure receptors in the circulatory system. The second factor to be considered is that of blood-volume changes. Finally, it is possible that prolonged exposure to zero G may affect the sensitivity of the pressure-receptor cells themselves. (CARI)

4,234

Roggeveen, L. J., & P. Nijhoff 1956 THE NORMAL AND PATHOLOGICAL THRESHOLD OF THE PERCEPTION OF ANGULAR ACCELERATIONS FOR THE OPTOGYRAL ILLUSION AND THE TURNING SENSATION. Acta oto-laryngologica (Stockholm) 46(6):533-541, Nov.-Dec. 1956

ABSTRACT: Threshold determinations on the vestibular organ were made in fifteen s subjects using a turning chair. Two criteria were used: (1) perception of a turning movement without further aids and (2) the optogyral illusion (caloric or rota-

tory stimulation applied with the visible surroundings reduced to a small luminous spot in a fixed position in relation to the subject and at a distance of 1 m. from his eyes). A reduction of the effect of fancied impressions was brought about by the administration of blank stimuli (no acceleration after the warning signal). A significant difference was found between sensitivity as expressed by the turning sensation and sensation expressed by the turning sensation and sensation expressed by the optogyral illusion, the latter being more sensitive. In most pathological cases a still larger difference was found. (AUTHOR)

4,235

Rohles, F. H., Jr., H. H. Reynolds, et al. 1961 A LABORATORY MODEL FOR A FOURTEEN DAY ORBITAL FLIGHT WITH A CHIMPANZEE. (AF Missile Development Center, Holloman AFB, New Mexico) Report No. AFMDC TR 61-33, October 1961. ASTIA Doc. No. AD-268 408.

ABSTRACT: A young male chimpanzee was restrained on a plastic couch and isolated from the usual laboratory distractions for 14 days. Assuming a 90 minute orbit, the subject performed a complex psychomotor task for approximately nine hours each day and received all of his food and water as rewards for his performance. Skin temperature, pulse, and respiration were monitored throughout the test and urine and feces were collected outside the isolation cubicle and measured. The subject lost no weight for the test period and recovery was rapid. (Author)

4,236

Rohles, F.H., Jr., H.H. Reynolds, & M.E. Grunzke 1962 A PERFORMANCE SCHEDULE FOR EXTENDED SPACE FLIGHT WITH THE CHIMPANZEE (Aeromedical Research Laboratory, Holloman AFB, New Mexico) ARL-TDR-62-14; Project 6893 July 1962. ASTIA AD 278 546

ABSTRACT: This report describes a schedule designed for measuring animal performance during space flight which is oriented toward sampling simple motor behavior and visual and auditory monitoring, as well as requiring performance for food and water. Employment of this schedule should facilitate the animal to human extrapolation.

4,237

Rohles, F.H., M.E. Grunzke & H.H. Reynolds 1962 A DETAILED ACCOUNT OF CHIMPANZEE PERFORMANCE DURING THE BALLISTIC AND ORBITAL PROJECT MERCURY FLIGHTS
(6571st Aeromedical Research Lab., Holloman AFB, N. Mex.) ARL TDR 62-15; Proj. 6893. ASTIA AD 282 687

ABSTRACT: The insults of prolonged periods without sleep, the suturing of the physiological sensors, and the long period of restraint before launch, did not affect performance during flight; this also appeared true of the prolonged breathing of 100 per cent oxygen under reduced atmospheric pressures for the time periods of these flights. The noise and vibration accompanying launch did not affect performance during flight. Accelerations accompanying launch and re-entry in excess of 7 G's had an immediate effect upon performance; however, recovery to a prelaunch level appeared to be rapid. Adaptation to weightlessness took place during the long exposures to the weightless state, and re-entry accelerations did not have as severe effect upon performance as during the shorter flight. Eating and drinking were accomplished during weightlessness without difficulty. The visual processes, as measured, were unaffected by the rigors of space flight; this was also true of temporal response processes as well as continuous and discrete motor behavior. The pellet and water dispensers functioned properly during weightlessness. The chimpanzee appears to be a highly reliable subject for future space flights. (Author)

4,238

Rolle, S.D. 1952 INTERPRETATION OF PRESSURE-TIME RECORDS IN TESTS OF CATAPULTIC DEVICES. (Pitman-Dunn Laboratories Department, Frankford Arsenal) Memorandum Report MR-516, ASTIA ATI-166379, 1 May 1952

ABSTRACT: Ballistic performance of catapultic devices is evaluated on the basis of separation velocity, thrust, maximum acceleration, maximum rate of change of acceleration, and ignition delay. The methods and techniques of evaluating these data from pressure-time records are described to promote uniform interpretation of such records and to insure compliance with specification requirements. Typical pressure-time traces are shown to illustrate the methods of interpretation.

4,239

Roman, A. 1959 LIST OF REFERENCES ON PACKAGES, WITH SPECIAL REFERENCE TO SHOCKS AND VIBRATIONS APPLIED TO PACKAGES WHILE IN TRANSIT
(Royal Aircraft Establishment (Gt. Brit.) Library bibliography no. 160, ASTIA AD-93761
Revised edition, June 1961, ASTIA AD 226 657L

4,240

Roman, J.A. and J.R. Prine 1958 THE SEMI-RIGID ENVELOPE AS A MEANS OF PROTECTION FROM IMPACT-PRELIMINARY TESTS ON RABBITS. (USAF Aero Med. Lab., Wright-Patterson AFB, Ohio) Techn. Report 58-123, April 1958

4,241

Roman, J., I.R. Coermann, & G. Ziengenruecker 1958 VIBRATION, BUFFETING AND IMPACT RESEARCH. (Paper, First Post-Satellite Meeting of the Aero-Medical Association, Statler Hotel, Washington, D.C. March 24-26, 1958)

ABSTRACT: A "vertical accelerator" which simulates the dynamic loads expected of future aircraft was developed in order to study the effectiveness of devices for protection against vibration, buffeting, and impact. Experimentation revealed several mechanisms productive of injury in severe vibration of buffeting, and indicated that vibration and impact protection are intimately related and possible by simple means. It was shown that by simplification of mathematical models of organ systems, present knowledge of vibration physics may be directly applied to the development of protective equipment.
(J. Aviation Med., 29(3):248, March 1958)

4,242

Roman, J.A., R. Coermann & G. Ziegenruecker 1959 VIBRATION, BUFFETING AND IMPACT RESEARCH. J. Aviation Med. 30(2):118-125
See also WADC TR 58107

SUMMARY: Prediction of the effects of mechanical forces upon the human body, and protection against these effects hinges largely upon our ability to describe body structures in terms which are susceptible to analysis. The chest-abdomen system simplified mechanical model. The behavior in vibration and impact of the chest-abdomen in some animals and humans has been found to follow closely that of the model.

Formulation of a successful model for certain conditions has proved helpful in determining the potential value for humans of protective equipment against vibration, buffeting and impact. It may permit many of the data derived from vibration study of humans under safe conditions to be extrapolated to impact situations with valid results. Testing of impact protective devices for humans may eventually be accomplished with minimal risk to the subject.

4,243

Roman, J. A. 1961 SCHOOL OF AVIATION MEDICINE PHYSIOLOGICAL STUDIES IN HIGH PERFORMANCE AIRCRAFT. (Paper, 32nd Annual Meeting of the Aerospace Medical Assoc., 24-27 April 1961, Chicago, Ill.)

ABSTRACT: Work at the School of Aviation Medicine with high performance aircraft in subgravity has yielded physiological data in statistical quantities. These show that cardiovascular reaction to subgravity may be quantitated and bears direct relation to cardiovascular behavior at positive and negative acceleration values. Representative EGG, respiration and heart rate data are presented for several conditions of flight in high performance aircraft, i. e., local VFR flights and cross-country flights, both VFR and actual HFR, with weather departures and terminal procedures. These data are discussed in the light of current air traffic control problems and pilot selection policies. Operational problems attendant to biomedical use of high performance aircraft are discussed. Figures are given for the number of flying hours per month to be expected from heavily instrumented high performance aircraft. Instrumentation problems are presented and some of the solutions utilized by the Aerospace Medical Center are discussed.
(Aerospace Medicine 32(3):244-245, March 1961)

4,244

Roman, James A. 1962 BIOMEDICAL MONITORING IN-FLIGHT
In: (School of Aerospace Medicine) Lectures in Aerospace Medicine, 1962 pp. 97-114

ABSTRACT: For the operational situation in space, biomedical monitoring implies the automatic gathering of quantitative information relative to physiological functioning in the intact human or animal in a form suitable for evaluation, recording, or storage. The justification for the use of biomedical monitoring on space missions is based on considerations of operational safety and on the need to gather data which will bear on the design of future space vehicles and mission profiles. Physiological parameters for use in biomedical monitoring must be chosen in such manners that information derived from them is unequivocally interpretable as well as being descriptive of the functioning of important organ systems. In addition, the choice of parameters must be governed by the knowledge as to whether or not reliable sensors exist with which to measure them or whether such sensors can be developed within the near future. The interpretation of data during a space flight will be affected by the environment, diet and fluid intake, and the level of alertness or stress during critical parts of the mission.

4,245

Roman, J.A. 1963 CARDIORESPIRATORY FUNCTIONING IN-FLIGHT. Aerospace Medicine, 34(4): 322-336, April 1963

ABSTRACT: Systolic and diastolic blood pressures on three pilots in-flight in high performance single engine jet aircraft in the course of cross-country flights were above clinical norms, in the absence of linear acceleration other than 1 G or Hypoxia.

The blood pressures obtained correlates with the pilot's estimate of the difficulty of the task at hand.

High blood pressures are frequently seen in the face of normal or near normal pulse and respiratory rates.

Heart rate, respiratory rate and blood pressure responses were highly reproducible in similar in-flight situations in the same individual.

Evaluation of in-flight heart rate response of a subject has meaning only when related to baseline heart rate values for that individual.

From the data available, it appears that sinus tachycardia is the most common and the only significant ECG finding seen regularly in the in-flight situation.

4,246

Roman, J. A., B. H. Warren et al. 1962 SOME OBSERVATIONS ON THE BEHAVIOR OF A VISUAL TARGET AND A VISUAL AFTER-IMAGE DURING PARABOLIC FLIGHT MANEUVERS (School of Aerospace Medicine, Brooks Air Force Base, Tex.) SAM TDR 62-66, June 1962, ASTIA AD-287 083. Same as ASTIA AD-290 353

ABSTRACT: The apparent displacement of a real target and a visual after-image were observed in the F-100F aircraft during periods of weightlessness averaging 45 seconds. A real target appears to be displaced upward from center for accelerations greater than 1 G positive, and appears to be displaced downward for accelerations less than 1 G positive. A visual after-image, when observed in the absence of a real target, appears to be displaced from center in a direction opposite to that observed for a real target. Fixating on a real target (RT) in RT and the VAi concurrently in the fashion described for a real target. Differences in interpretation of results, on the basis of the opposite direction of illusory movements using real targets and visual after-images, were resolved. (Author)

4,247

Roman, P. 1958 SEMI-RIGID ENVELOPE AS A MEANS OF PROTECTION FROM IMPACT (Wright Air Development Center, Wright-Patterson AFB, Ohio) WADC TR 58-123.

4,248

Roman, J.A., B.H. Warren and A. Graybiel 1963 THE SENSITIVITY TO STIMULATION OF THE SEMICIRCULAR CANALS DURING WEIGHTLESSNESS. (U.S. Naval School of Aviation Medicine, Pensacola, Fla.) SAM/B TDR62 148, Report No. 84, 20 May 1963. ASTIA AD 410 982.

ABSTRACT: The sensitivity to stimulation of the semicircular canals during periods of weightlessness averaging 46 seconds was estimated by timing the duration of apparent rotation of a visual target and of the subjects perception of rotation after stimulation. Stimulation was accomplished by rolling the aircraft during periods of subgravity as well as during 1-G control maneuvers. Time-intensity relationships of the stimulus were obtained by means of specialized instrumentation incorporated into the experimental subject's crash helmet. (Author).

4,249

Roman, J.A., B.H. Warren and A. Graybiel 1963 OBSERVATION OF THE ELEVATOR ILLUSION DURING SUBGRAVITY PRECEDED BY NEGATIVE ACCELERATIONS. (U.S. Naval School of Aviation Medicine, Pensacola, Fla.) Joint Report No. 83, SAM/B TDR62 141, 15 May 1963. ASTIA AD 410 734.

ABSTRACT: By observing apparent displacements of a real target, and visual afterimages, during weightlessness preceded by positive or negative acceleration, it was possible to identify these displacements as a special case of the elevator illusion, as opposed to the oculogravic illusion. Positive and negative linear acceleration, as well as weightlessness, was obtained for this purpose in jet aircraft. (Author)

4,250

Roman, J.A., B.H. Warren & A. Graybiel 1963 OBSERVATION OF THE ELEVATOR ILLUSION DURING SUBGRAVITY PRECEDED BY NEGATIVE ACCELERATIONS
USAF School of Aerospace Medicine, Brooks AFB, Texas SAM-TDR-62-141 February 1963

ABSTRACT: By observing apparent displacements of a real target, and visual afterimages during weightlessness preceded by positive or negative acceleration,

it was possible to identify these displacements as a special case of the "elevator illusion," as opposed to the oculogravic illusion. Positive and negative linear acceleration, as well as weightlessness, was obtained for this purpose in jet aircraft.

4,251

Romba, J. J. & P. Martin 1961 THE PROPAGATION OF AIR SHOCK WAVES ON A BIOPHYSICAL MODEL. (Human Engineering Lab., Aberdeen Proving Ground, Md.) Technical Memo No. 17-61, September 1961. ASTIA Doc. No. AD-264 932.

ABSTRACT: Shock wave characteristics were studied in the field about and within the Rhesus monkey body form. Measurements were obtained in free air, top of the animal's head, the mid-brain and the lower thorax; with distance and position of the explosive varied in relation to the animal's body. The study of shock wave transmission from one body level to another was accomplished and the problem complexity of shock wave energy distribution in the field of the organism was emphasized. Shock wave forms were observed to be uniquely characteristic of the medium through which shock wave transmission occurred. In addition, body tissue was found to greatly attenuate the shock wave. The study of shock wave characteristics in and about biophysical media is believed to be relatively unexplored. (Author)

4,252

Romberg, I. 1939 DAS ANATOMISCHE BILD DER BLUTVERTEILUNG BEI BESCHLEUNIGUNGSWIRKUNG (Anatomical Aspects of Blood Distribution During Acceleration) (Deutsche Versuchsanstalt fur Luftfahrt, E. V., Berlin - Adlershof). Forschungsbericht Nr. 1110, 6 Oct. 1939 ASTIA ATI 66 450.

4,253

Romberg, H.W. 1940 DAS ANATOMISCHE BILD DER BLUTVERTEILUNG BEI BESCHLEUNIGUNG-WIRKUNG (Anatomical Aspects of Blood Distribution During Acceleration) Luftfahrtmedizin 4: 192-203

4,254

Romberg, H.W. 1940 ON THE MODE OF ORIGIN OF SOME FATAL INJURIES IN AIRCRAFT ACCIDENTS. (Uber die Entstehungsweise einiger todlicher Verletzungen bei Flugunfallen) Luftfahrtmed., 5:24-31

ABSTRACT: Sturdy seats and belts are of utmost importance to the safety of fliers. An analysis of crashes has shown that 50% of all injuries, and 80% of fatalities involve the head. Usually the safety factor given for a seat is the ability to withstand 1000 kg.; actually in one crash, the force calculated from deceleration and weight of the flier) was about 1400 kg. The author cites two accidents in which three people were killed. Failure of the seat to withstand the crash threw the victims forward against portions of the cabin. Two died as a result of fractures of the cervical vertebrae; the third suffocated from a fractured larynx.

4,255

Romer, E. M. 1962 VELOCITY REQUIREMENTS FOR TRANSFER BETWEEN CO-PLANAR, CO-AXIAL ORBITS. (AF Inst. of Tech., Wright-Patterson AFB, Ohio) Tech. Rept. No. 62-1, Proj. AFIT 61-23, 5 January 1962. ASTIA Doc. No. AD-269 872.

ABSTRACT: The total velocity requirements for coplanar, cotangential transfer between orbits with a common major diameter are examined. The results are valid for ascending, descending, intersecting, and non-intersecting orbits. Computational results obtained using the AFIR IBM 1620 computer are presented for elliptic, parabolic, and hyperbolic outer orbits as a function of the transfer and outer orbit geometries. For the parabolic outer orbit, the maximum velocity requirement is 18% greater than the escape velocity at the periapsis of the transfer orbit when the transfer orbit has an accentricity of 0.73. For hyperbolic orbits, maximum velocity requirements occur at particular elliptical transfer orbits where the velocities at infinity (i.e., the hyperbolic excess), are less than one third the reference escape velocity. (Author)

4,256

Rona, T. P. 1959 THE ACCELERATION RATE OF ONSET PROBLEM IN SIMPLE LINEAR SYSTEMS. (Air Force Missile Development Ctr., Holloman AFB, N. Mex.) AFMDC TN-59-21; ASTIA AD-219 311; July 1959

ABSTRACT: The experimental evidence that the rate of acceleration onset is one of the critical factors in damage sustained by living organisms is discussed from the viewpoint of applied mechanics. Such evidence is shown to be insufficient

to form a rational basis of design. The effect of rate of acceleration onset is then computed for a few simple models. The strain within these models is easily shown to depend on the first derivation of the acceleration rather than just on acceleration alone. (AUTHOR)

4,257

Rook, A.F. and D.J. Dawson 1938 HYPOTENSION AND FLYING.
Lancet, 2:1503-10

ABSTRACT: In flying tests distant vision was found to be impaired in a number of cases, but occasionally distant vision remained clear, whereas close objects appeared blurred. The most common symptom in flying is known as "blacking out". This varies from a dimming or graying of the whole field of vision to complete blindness, often with no effect on any of the other systems of the body. In one case a central scotma was experienced, and one subject described the loss of only the peripheral field. In most cases the loss of vision was gradual and even throughout the field. One aviator described the effect as similar to the drawing of a blind over the field of vision or to the closing of a diaphragm of a camera.

4,258

Roos, Charles 1958 BIBLIOGRAPHY OF SPACE MEDICINE, PRELIMINARY EDITION (National Library of Medicine, Reference Division, Washington, D.C.)
43 p. March 3, 1958

ABSTRACT: This bibliography, which will be issued in definitive form in mid-summer 1958, covers material related to physiological aspects of space flight from 1950 through early 1958.

4,259

Roos, C. A. 1959 BIBLIOGRAPHY OF SPACE MEDICINE
U. S. Armed Forces Medical Journal 10(2):173-217, Jan.-July 1959
See also (U. S. Dept. of Health, Education, & Welfare, National Library of Medicine, Wash., D. C.) Public Health Service Publication 617, Series 21, June 1958

ABSTRACT: References for this bibliography on space medicine were selected from a number of indexes and catalogs of the National Library of Medicine, and from examination of the principal aviation, aviation medicine, and astronautical pub-

lications. Items are arranged in broad subject classes (general, sealed cabin problems, acceleration/deceleration, fractional and zero gravity, cosmic radiation, survival problems, psychological and social problems, ground crew problems, extraterrestrial aspects and bibliographies) in inverse chronological order alphabetically by author within the years 1928-1958. Brief annotations have occasionally been added.

4,260

Roos, C.A. 1959 BIBLIOGRAPHY OF SPACE MEDICINE
(U.S. Dept. of Health, Education & Welfare, National Library of Medicine, Washington, D.C.) Public Health Service Pub. 617, Series 21, June 1958. See also U.S. Armed Forces Medical Journal 10(2):173-217, Jan-July 1959.

4,261

Root, G. T., & B. H. Christensen 1957 EARLY SURGICAL TREATMENT OF ABDOMINAL INJURIES IN TRAFFIC VICTIM. Surgery, Gynecology & Obstetrics 105(3):264-267, Sept. 1957

SUMMARY: 1) A review of 1,988 records of traffic victims seen at Highland Alameda County Hospital in Oakland, California, in 1955, reveals the regularity in occurrence of accidents month after month predominantly involving the male younger than 30 yrs of age. The manner in which the accident occurred, the subsequent care of the patient, and the type of injury have been presented. 2) Only 2.2 per cent of all patients had any abdominal signs or symptoms. The medical records of these 44 patients with abdominal symptoms were reviewed, with emphasis on the 12 patients who underwent abdominal exploration, 7 of whom lived and 5 of whom died. 3) There were 45 deaths in the entire series and 20 of these, or 44 per cent, were associated with abdominal injuries. In order to combat this high mortality in traffic victims, early thorough abdominal exploration is indicated in patients who have abdominal symptoms which persist or increase in severity, irrespective of the development of signs and symptoms which involve other systems. (AUTHOR)

4,262

Root, D. M. 1958 SELECTION AND DESIGN OF ESCAPE CAPSULES
S.A.E. Journal 66(11):46-50, Part 2.

ABSTRACT: This paper is an analysis of the problems involved in selecting and designing an escape capsule for supersonic aircraft. Five capsules were studied, varying in size from the smallest capsule that could be put within the cockpit to the largest breakaway section of an aircraft that was considered feasible. The limiting dynamic pressures are given for each of the five capsules.

4,263

Rose, B. 1941 PROGRESS REPORT OF THE WORK DONE DURING THE PERIOD OCT. TO DEC. (National Research Council, Canada) C-2103

ABSTRACT: This is a report made on expenditures in the construction and operation of the accelerator.

4,264

Rose, B. 1942 INCIDENCE OF NAUSEA AND DIZZINESS IN 95 SUBJECTS FOLLOWING RUNS IN THE ACCELERATOR. (National Research Council, Canada) Report #C-2882, 27 August 1942

ABSTRACT: The incidence of nausea and vertigo in 95 subjects exposed to runs in the human accelerator is listed.

4,265

Rose, B. and W.R. Martin 1942 DETERMINATION OF BLACKOUT THRESHOLD IN AIRCREW TRAINEES, AND FACTORS CONCERNED IN ITS VARIATIONS. Proc. Assoc. Comm. Aviation Med. Research, NRCC, Appendix D, 22 October 1942

4,266

Rose, B., & W. R. Martin 1942 THE DETERMINATION OF THE BLACKOUT THRESHOLD IN AIRCREW TRAINEES, AND FACTORS CONCERNED IN ITS VARIATION. (Canada, National Research Council) Rept. C-2205, No. 4, 25 Sept. 1942

ABSTRACT: Eighty-eight subjects were given at least 10 runs each on the RCAF centrifuge at Toronto.
(a) Average blackout threshold was 4 to 6 "g". Range was 3.5 to 9 "g".
(b) Average grayout level was one "g" below the blackout level; the average level of unconsciousness was one "g" above it.
(c) The blackout threshold is inversely related to the time of exposure to "g".
(d) At the blackout threshold, increasing the time of exposure to "g" may prolong blackout without producing unconsciousness.
(e) In any one man, the blackout threshold may vary by plus or minus one "g" in any one day.
(f) Continued exposure to acceleration does not increase the tolerance to "g".
(g) Frequent daily exposure to threshold "g" may reduce the tolerance to "g".

4,267

Rose, B., W.K. Kerr & W.A. Kennedy 1942 THE EFFECTS OF ACCELERATION ON THE PULSE RATE, ELECTROCARDIOGRAM, ELECTROENCEPHALOGRAM, AND THE EAR OPACITY (National Research Council, Canada) 30 Nov. 1942, C-2390

ABSTRACT: Pulse Rate: Acceleration produced an immediate and rapid increase in pulse rate, the duration of which was directly dependent on the time of exposure to maximum G. The highest pulse rate observed was 195. It might take from ten to thirty seconds at maximum G for the pulse to attain its highest rate during lengthy exposures to G. In runs of short duration there was some correlation between the maximum pulse rate attained and the height of the G. A more definite correlation existed when the duration of the exposure to G was 30 seconds more. With the decline of the G during runs of short duration, there was usually a sudden bradycardia. This was almost always to a level which was below that of the original resting level. The bradycardia was usually followed by one or more secondary rises in the pulse rate. Following runs of longer duration (30 sec. or more), the decline in pulse rate was more gradual. There was no characteristic change in the pulse rate with the onset or disappearance of visual symptoms during runs of short duration. During runs of longer duration, symptoms such as greying and blackout might appear or disappear without any alterations in the pulse rate. The rate of increase in pulse rate was not influenced by the height of G. It consequently reached a higher level during these runs as compared to the level reached during runs of low G. The rate of increase of pulse rate during exposure to acceleration was more rapid in subjects with a high blackout threshold. There was no difference between the maximum pulse rate attained by subjects with a high blackout threshold as compared to those whose blackout threshold is low.

4,268

Rose, B., W. K. Kerr, & W. A. Kennedy 1942 THE EFFECTS OF ACCELERATION ON THE PULSE RATE, ELECTROCARDIOGRAM, ELECTROENCEPHALOGRAM, AND THE EAR OPACITY. (RCAF, Toronto) Rept. No. 6, File No. A. H. 100-5; 30 Nov. 1942

ABSTRACT: 72 subjects--690 centrifuge runs. EKGs taken by means of 2 chest electrodes, one to left of apex, one over base of heart 1 inch below sternal notch. EEGs taken by 2 electrodes 2 inches apart transverse to sagittal suture, 1 inch anterior to midpoint between occiput and nasion. Ground electrode on mastoid process. Ear photoelectric cell on upper ear below helix.
Pulse Rate Changes--Preceding run, pulse may be elevated to 90-130 beats per min. (average 95). With onset of acceleration, the rate increases for 4-10 sec. after maximum "g" is attained. If the run is short, it may increase even when "g" decreases. The maximum pulse attained was 195 to 220, followed by bradycarida. During recovery the pulse may rise slowly and evenly or fluctuate wildly.
There is no linear correlation between increases in pulse and the amount of "g" at values of "g" less than 3 on 5 second runs. On longer runs, G = K pulse. On reparted runs, pulse response is usually identical except for recovery period. There is no apparent relation between the pulse response and the severity of symptoms. There is no relation between the maximum pulse response and "g" tolerance. However, the average rate of increase of pulse correlates with a high "g" threshold.

EKG Responses--As the heart rate increases, the PR interval decreases from 0.07 to 0.06 sec. The P wave is frequently superimposed on the T wave, may be biphasic, notched or absent. The QRS complex diminishes in amplitude and the main deflection is down. QRS diminishes in duration with "g" and becomes normal as "g" is removed. Right axis deviation occurs, the electrical axis shifting from 90 degrees at the beginning of the run to a maximum of 150 degrees at the height of "g". It returns to normal suddenly.
The gradient of the ST segment disappears. It is isolectric at height of "g" and overcompensated on recovery. The T wave diminishes in amplitude or disappears altogether. It returns to normal very rapidly, often in a biphasic form. Following exposure, sinus arrhythmia is very common as is an increase in the amplitude of the T wave. Rare complications are ventricular extra systoles and lengthened PR interval with or without heart block. No permanent changes have been observed.
Ear Opacity--387 observations on 40 subjects. Opacity begins to decrease at 2 to 3 "g" and continues to decrease until just after "g" decreases. Following this, reactive hyperemia occurs for 5 to 15 seconds. Ear opacity decreases inversely with "g". It is not related to duration of "g". Reactive hyperemia lasts longer after long runs. On repeated runs to just below threshold, ear reactions are the same. Visual symptoms follow ear reactions approximately.
EEG Reactions--530 runs on 62 subjects. A muscle filter is used to take out frequencies of more than 30/sec. Readings are taken from motor areas. Most

Most frequent change in EEG is 16 to 26/sec. waves of 10 to 50 microvolts, probably muscular in origin. These waves last for the duration of the run. Sometimes high, slow (60 to 90 micro-volt, 2 to 6/sec.) waves appear during deep blackout. 5 to 14/sec., 30 to 90 micro-volt waves appear early in the run unaccompanied by symptoms in rare cases, and diminish before the maximum "g" is attained. The origin of these is unknown.
When consciousness is lost, 1.6 to 6/sec., 50 to 180 micro-volt waves usually appear at about the time consciousness is lost or 1 to 2 seconds before. In all probability they are due to cerebral anoxia. The EEG may remain normal for the entire run, even through consciousness is lost. Convulsive seizures occur in 69% of those who lose consciousness and are not accompanied by seizure discharges. Instead slow high waves of unconsciousness remain unchanged.
EEGs taken without muscle filters show the same pattern. In no case have grand mal or petit mal patterns been seen, nor have large random spikes been observed.
Discussion---It is concluded that no physiological measurements are of as much value as the simple signal system. Pulse increases compensate for the blood pressure drop. In those with rapid response, hydrostatic pressures determines the blackout threshold. In those with slow response, the pooling of blood is the limiting factor.

4,269

Rose, B. W., W. K. Kerr, & W. A. Kennedy 1942 THE AVERAGE BLACKOUT THRESHOLD IN AIRCREW TRAINEES AS DETERMINED BY MEANS OF THE CENTRIFUGE. (Canada, National Research Council) Rept. No. C-2393, 14 Dec. 1942

ABSTRACT: One hundred and twenty-four normal, physically fit aircrewmen were studied in upright position on 1568 centrifuge runs, usually of 25 seconds duration with 5 seconds exposure to maximum "g". Occasional runs were performed with up to 30 seconds exposure to maximum "g". Blackout threshold ranged from 2.5 to 9 "g".

Percent of Subjects	Vision Clear at
100	2 "g"
80	4 "g"
20	6 "g"
2 to 3	9 "g"

Slightly higher values of "g" can be withstood by all subjects with 2 seconds maximum exposure.

4,270

Rose, B. and A.J. Cipriani 1942 METHODS OF RECORDING AND APPARATUS USED IN THE CENTRIFUGE AT NO. 1 INITIAL TRAINING SCHOOL. Canadian Aviation Report #120, 4 November 1942

4,271

Rose, B. & A.J. Cipriani 1942 METHODS OF RECORDING AND APPARATUS USED IN THE CENTRIFUGE AT NO. 1 INITIAL TRAINING SCHOOL. (National Research Council, Canada) C2232, 4 Nov. 1942. NOTE: CARI P&S 2.15 r; 2.2rc.

ABSTRACT: The purpose of this report is to describe tha apparatus and methods of recording in use at present in the Accelerator. A three channel electro-encephalograph was installed by means of which records may be taken during rotation of the Accelerator. The records include: electroencephalograph, electrocardiograph and ear capacity. The original signal system has been adapted to record on the same chart as the electroencephalograph channels.

4,272

Rose, B. 1942 ACCELERATOR RESEARCH
(National Research Council, Canada) C-2104, Jan. 30, 1942.

ABSTRACT: This is a preliminary report on the progress made on accelerator research and is concerned with only the installation of equipment and preliminary tests. It is recommended that groups of twenty airmen be made available for investigation of "blackout threshold".

4,273

Rose, B. 1942 REPORT OF THE MEETING ON ACCELERATION HELD AT THE NATIONAL ACADEMY IN WASHINGTON, D.C. APRIL 20, 1942.
(National Research Council, Canada) C-2143

ABSTRACT: The reports given at this meeting included one by Dr. Rose describing the accelerator in Toronto, Dr. Jasper on centrifuge experiments with cats and monkeys describing the effects of "G" on the circulation and the electrical activity of the brain and the effects of protecting animals by immersing them in a water-bottle, Lieutenant Ferwerda of the U.S. Navy on an air suit tested on the accelerator in Toronto, Dr. Britton on animal experiments done on centrifuge at the University of Virginia and Dr. Ham on an apparatus for measuring circulatory changes during flight.

4,274

Rose, B. & W.R. Martin 1942 REPORT ON THE VISIT OF LIEUTENANT T. FERWERDA, U.S. NAVAL AIR STATION, ANACOSTIA, D.C., TO THE ACCELERATOR HUT, NO. 1 C.I.U. MARCH 25, TO APRIL 13, 1942 FOR THE PURPOSE OF TESTING ANTI-G SUIT.
(National Research Council, Canada) C-2172

ABSTRACT: This suit consists of an inextensible outer covering, and a series of air-sacs which are activated by air pressure. The air pressure is regulated by a sylphon valve which alters the flow according to the degree of acceleration or "G". Since a definite degree of protection is afforded by the Ferwerda suit in its present state, and since it is easily put on and does not hamper movement, it is felt that such a suit could be of very definite value.

4,275

Rose, B. & A.J. Cipriani 1942 METHODS OF RECORDING AND APPARATUS USED IN THE CENTRIFUGE AT NO. 1 INITIAL TRAINING SCHOOL. Proc. Exec. Assoc. Comm. Aviation Med. Research, NRCC, Appendix F, Dec 3, 1942.

4,276

Rose, B. 1942 REPORT OF THE SECOND MEETING OF THE SUB-COMMITTEE ON ACCELERATION HELD AT WASHINGTON ON DECEMBER 2, 1942 (National Research Council, Canada) C-2247

ABSTRACT: Reports presented at this meeting include: (1) Report by Lieutenant Commander Ferwerda on Service tests of anti-G equipment at Cecil Field, Jacksonville, Florida, U.S.A. (2) Production aspects: Mr. Berger of the Ellsworth Manufacturing Company; (3) Report by Dr. Ham supplementary to that of Lieutenant Ferwerda; (4) Reports of work in progress at the centrifuge in Toronto and Mayo Clinic and in New Haven.

4,277

Rose, B. 1942 REPORT OF THE MEETING ON ACCELERATION HELD AT THE ACADEMY OF SCIENCES IN WASHINGTON, D.C. ON SEPTEMBER 28, 1942. (National Research Council, Canada) C-2264.

ABSTRACT: Reports presented at this meeting include: (1) B.Rose on centrifuge work at Toronto; (2) George Ham on portable ear opacity apparatus; (3) H.H. Jasper on animal centrifuge work; (4) J. Reach on the progress in construction of centrifuge at Wright Field;(5) T. Ferwerda on the pulsating anti G-suit; (6) Dr. Baldes on the Mayo Clinic centrifuge.

4,278

Rose, B. 1942 REPORT ON ACCELEROMETERS USED TO COMPUTE VALUES OF "G" IN THE ACCELERATOR CAR. (National Research Council, Canada) C-2147, May 20, 1942.

ABSTRACT: Two accelerometers have been used to measure acceleration in the accelerator, namely, the Kolsman Accelerometer (model 312-01-194) and the Pioneer (type #3402-1A-A-174) the former is calibrated with and the latter without the acceleration of gravity.

4,279

Rose, B. 1942 DESCRIPTION OF THE HUMAN CENTRIFUGE AT NO. 1 INITIAL TRAINING SCHOOL, R.C.A.F., EGLINTON. (National Research Council, Canada) C-2145, April 16, 1942.

ABSTRACT: A detailed description of the human centrifuge, its control mechanism, the method of conducting runs and type of records obtained is given. The incidence of nausea and vertigo is discussed.

4,280

Rose, B. & W.R. Martin 1942 ON THE OCCURRENCE OF CONVULSIVE EPISODES FOLLOWING LOSS OF CONSCIOUSNESS AS A RESULT OF EXPOSURE TO ACCELERATION. (National Research Council, Canada) C-2144, 28 April 1942.

ABSTRACT: In a study on blackout threshold in a group of 29 airmen, all potential aircrew, convulsive seizures varying from minor episodal tremors to a complete seizure involving the whole body have been observed. These episodes have been noted in particular individuals only. They come on only if unconsciousness has been produced by the acceleration, and appear to be pattern-like for each individual.

There appears to be some correlation between the susceptibility of subject to these seizures and the presence of episodal activity in the resting electroencephalogram. The importance of this finding is discussed from a tactical point of view.

4,281

Rose, B., W.K. Kerr, & W.A. Kennedy 1943 AVERAGE BLACKOUT THRESHOLD IN AIRCREW TRAINEES AS DETERMINED BY MEANS OF THE CENTRIFUGE. Proc. Assoc. Comm. Aviation Med. Research, NRCC, Appendix L, p. 8, Feb. 1943

4,282

Rose, B., W.R. Kerr & W.A. Kennedy 1943 EFFECTS OF ACCELERATION ON THE PULSE RATE, ELECTROCARDIOGRAM, ELECTRO-ENCEPHALOGRAM, AND EAR OPACITY. Proc. Assoc. Comm. Aviation Med. Research, NRCC, Appendix J, 27 Feb. 1943

4,283

Rose, B., & Accelerator Section Staff 1943 THE PROTECTION AGAINST G AFFORDED BY THE CANADIAN PROTOTYPE FRANKS FLYING SUIT AS ESTIMATED BY TESTS MADE IN THE CENTRIFUGE. (Rept. to Associate Committee on Aviation Medical Research, Nat'l. Research Council of Canada) NRC Grant No. AM5 Rept. No. 9, File No. A.H. 100-5, 1 Sept. 1943.

4,284

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Rose, H. W., and P. H. Ripple 1951 VISUAL PROBLEMS OF PILOT IN PRONE POSITION
(USAF School Av. Med. Randolph Field, Texas) Proj. No. 21-24-011, Report No. 1, August 1951.

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Rose, D. C. 1960 SPACE SCIENCE ORGANIZATIONS AND THE SCOPE OF PLANNED PROGRAMMES. The J. of the Royal Astronomical Society of Canada 54(5):201-207, Oct. 1960

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Paper: American Astronautical Society Symposium on the Exploration of Mars, Denver, Colorado, June 6-7, 1963. Preprint (10)

ABSTRACT: A brief discussion of the entry problems peculiar to interplanetary travel is given. The desirability of high velocity entry into both the planetary atmospheres and back at Earth is pointed out. Aspects of entry contributing to the severity of the heating problem are discussed. Research in re-entry physics has always been paced by our ability to simulate the entry environment in the laboratory. Several new experimental techniques have been developed which are capable of producing the proper conditions for study. Recent investigations into the convective and radiative energy transport in ionized gases are discussed. Convective heating has been measured up to velocities of 55,000 ft/sec and the radiative properties of air are known up to about 10,000°K. The present uncertainties in this knowledge are discussed. A number of new problems which need to be faced in planetary entry are enumerated. Most of these problems are due to the coupling of the radiative energy transfer and the other aspects of the flow problem. The conditions under which these problems become significant are estimated.

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Journal Brit. Interplanetary Soc., 12: 26-32.

Abstract: Manned flight has been accomplished to an altitude of 15 miles in a Douglas Skyrocket. Feasibility of manned flight between 15 and 50 miles has been demonstrated by instruments on recovered WAC Corporal rockets and sections from Aerobees ejected by parachute from an altitude of 50 miles. Accelerations encountered in the powered ascent to this altitude are within the limits of human tolerance. Temperatures on the surface of the vehicle rising to 50 miles are within the scope of our technology. Problems encountered in long flights at this altitude, such as radiation, meteor collisions, and free fall in a vacuum, cannot be adequately explored at this time because of the short flying time of manned rockets utilizing our present capabilities. The space above 50 miles presents even greater difficulties. Attempts of parachute recovery have not been successful. Accelerations of rockets which reach the heights above 50 miles may be beyond human tolerance. Temperatures encountered under such acceleration could also be beyond our present methods of control for any occupant of the rocket. The effects of cosmic and solar radiation are very little understood above 50 miles.

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Rosenblat, V. V. and L. S. Dombrovskii 1961 REMOTE RECORDING BY RADIO OF THE RATE OF HEART CONTRACTIONS IN FREELY MOVING HUMAN SUBJECTS L. M. Sechenov Physiol. J. USSR, June, pp. 718-724. Translation (Space Technology Laboratories, Inc., Los Angeles, California) STL-TR-61-5110-43. ASTIA AD 264072.

ABSTRACT: A detailed report on the radiopulsophone - a device which will record remotely by radio the rate of heart contractions of a man moving freely and performing his usual functions.

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Rosenfeld, S. and C. F. Lombard 1949 THE COMPARATIVE PHYSIOLOGY OF THE CARDIOVASCULAR PRESSOR REFLEX MECHANISM UNDER HEAD-TO-TAIL ACCELERATION (Negative G). (University of Southern Calif., School of Medicine, Los Angeles) Contract N60ri77, Project NR 161-014, October 1949.

See also Fed. Proc., Vol. 9, 1950.

ABSTRACT: As a guide to choice of experimental animals useful in predicting the effects of negative G in man, studies were made of the comparative physiology of the cardiovascular pressor reflex mechanism in 4 species of animals. These animals were subjected to various degrees of head-to-tail acceleration on the human centrifuge. Studies of 28 experiments including 10 goats, 10 dogs, 5 monkeys, and 3 rabbits indicate that the monkey and the dog respond in a manner which most closely parallels the reflex cardiovascular response elicited by man during negative G. The goat does not simulate this response pattern.

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Rosenfeld, Sheldon and Charles F. Lombard 1950 CARDIOVASCULAR PRESSOR REFLEX MECHANISM AND CEREBRAL CIRCULATION UNDER NEGATIVE G HEAD-TO-TAIL ACCELERATION. J. Aviat. Med. 21(4):293-303,354.

SUMMARY: Studies of the effect of negative acceleration upon four species of animals indicate that certain species are not suitable for considerations relative to man.

Studies of 28 experiments including 10 goats, 10 dogs, 5 monkeys and 3 rabbits, and compared with data available for man, indicate that the monkey and the dog respond in a manner which most closely parallels the reflex cardiovascular response elicited by man during negative g. The

goat does not simulate this response pattern. The major changes to cephalic circulation during negative acceleration, as measured from the carotid artery and external jugular vein connected to Statham strain guages at the level of the brain, include the following:

At the onset of radial acceleration the arteriovenous pressure difference in man, monkey and goat is slightly increased, but in the dog slightly decreased. During radial acceleration of 15-second duration the arteriovenous pressure difference diminishes gradually in man (30 per cent), monkey (12 per cent), and dog (65 per cent), but increases in the goat (65 per cent), and is associated with a bradycardia of various degrees. At the termination of radial acceleration within 1 to 4 seconds the arteriovenous pressure difference drops markedly in man (65 per cent), monkey (40 per cent), dog (60 per cent), and drops to the normal pre-run level in the goat.

It is believed that at the termination of acceleration the animal or subject experiences the most harmful insult to cerebral circulation. Factors which tend to maintain minute cardiac output, as well as factors preventing generalized vasodilation should be investigated for possibilities of offering greater tolerance to negative acceleration.

Finally, it seems likely that the symptoms experienced by pilots exposed to negative g may be attributed to two phenomena: (1) the increase in intravascular and extravascular caphalic pressure, and (2) the stagnation of cerebral flow. The former produces the feeling of extreme fullness of the head, while the latter is probably responsible for factors of mental confusion, fainting and unconsciousness. However, the possibility of a central type of syncope from stimulation of the carotid sinus cannot be overlooked. Ferris, Capps, and Weiss have demonstrated the cerebral type of syncope in patients with hypersensitive carotid sinuses in which no detectable alteration of the cardiovascular system could be found.

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Astronautics 4(9):20-23, Sept. 1959

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Rosenfeld, S., and C.F. Lombard 1951 CARDIOVASCULAR PRESSOR REFLEX MECHANISM AND CEREBRAL CIRCULATION UNDER NEGATIVE G HEAD-TO-TAIL ACCELERATION. (University of Southern Calif., School of Medicine, Los Angeles) Contract N6ori77, Task 1, 31 March 1951
See also J. Avia. Med., 21:293, August 1950

ABSTRACT: Studies of the effect of negative acceleration upon four species of animals indicate that certain species are not suitable for considerations relative to man.

Studies of twenty-eight experiments including ten goats, ten dogs, five monkeys and three rabbits, and compared with data available for man, indicate that the monkey and the dog respond in a manner which most closely parrallels the reflex cardiovascular response elicited by man during negative g. The goat does not simulate this response pattern. The major changes to cephalic circulation during negative acceleration, as measured from the carotid artery and external jugular vein connected to Statham strain gauges at the level of the brain, are reported in this publication.

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