

report. Damage to the peripheral superficial veins can be prevented with adequate counterpressure with elastic bandages. By carefully choosing and monitoring subjects it should be possible to prevent cardiac emergencies. Observations suggest that aviators who experience unconsciousness in flight due to acceleration should not land immediately, but should stay aloft for some time if fuel aboard will permit it. A definitive study should be done to determine this. Serious damage to the labyrinth may be prevented by early recognition of danger signs. Further studies will undoubtedly reveal the best orientation of the human body in a G field to prevent chest pain. The intestinal bleeding and chest pain which occur in vibration studies indicate the need for extensive animal research in this relatively untouched area of investigation. (AUTHOR)

5,828

Webb, M.G. & R.F. Gray 1958 HUMAN TOLERANCE TO HIGH ACCELERATION STRESS  
U.S. Naval Air Development Center, Johnsville, Pa. NADC-MA-LR52 May 2, 1958

ABSTRACT: Three human subjects, submerged in water to eye level while in a sitting position in a tank, were exposed to positive G levels up to 16 G on the 50-foot centrifuge at AMAL. The acceleration followed a sinusoidal pattern as a function of time, increasing in amount for 12.5 seconds. The subjects held their breath during the runs which were carried out using the tank used by Code, Wood, and Baldes in 1942 at the Mayo Clinic. At that time they used submersion to the level of the third rib and obtained about 1.7 G protection. The present study sought to increase G tolerance by using water pressure to compress the air in the chest. It was expected that the air pressure in the chest would exert counter pressure against the hydrostatic pressures within the circulatory system of the chest and thus reduce expansion of the circulatory system during periods of increased acceleration. Peripheral light loss was used as the endpoint. Exposures of subjects to acceleration began at a level of 1.5 G and increased by 0.5 G units. The maximum acceleration to which subject MCW was exposed was 10.0 G, subject HE, 10.5 G, and subject FG, 16.0 G. For subject FG, whose normal G tolerance unprotected was 3.25 G, this amounted to an increase in G tolerance of 12.75 G, a record for positive acceleration in this degree at this time.

5,829

Webb, M.G., & R.F. Gray 1958 PRELIMINARY STUDY OF G TOLERANCE OF A  
SUBJECT IN THE G CAPSULE, PRONE POSITION. (Naval Air Development Ctr.,  
Johnsville, Pa.) Letter Rept. TED ADC AE-1411, Serial 0568, 8 July 1958.

5,830

Webb, M. G., & R. F. Gray 1959 PROTECTION AGAINST ACCELERATION BY WATER IMMERSION. (Paper, American Rocket Society Semi-annual Meeting, 8-11 June 1959, San Diego, Calif.) American Rocket Society Paper 805-59, June 1959

5,831

Webb, M. G., & R. F. Gray 1960 A NEW METHOD OF PROTECTION AGAINST THE EFFECTS OF ACCELERATION ON THE CARDIOVASCULAR SYSTEM. Amer. J. Cardiol. 6(6):1070-1077, Dec. 1960

ABSTRACT: A closed water-immersion system for the protection of the cardiovascular system of human centrifuge subjects against the effects of acceleration is described. One subject was exposed to accelerations as high as 31 g. The first subject had frontal sinus hemorrhage at 28 g, possibly due to high respiratory system pressure used to protect the chest but which was later found to be unnecessary. The second subject stopped at 26 g due to anxiety. The third subject successfully sustained a 31 g exposure for 5 seconds without injury. The only clearcut evidence of cardiovascular system dysfunction was frontal sinus hemorrhage. An additional advantage of the system was found to be that movement of the extremities during high accelerations was not hindered. (AUTHORS)

5,832

Webb, M. G. 1961 END POINTS FOR ACCELERATION TOLERANCES ON THE CENTRIFUGE. 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. 59-64.

ABSTRACT: The intent of this paper is to indicate that the ultimate goal for those working in the field of acceleration is to be able to test on the centrifuge the ability of man to perform his total task in the total environment. Not until this happens will centrifuge personnel be able to perform their dual function of providing accurate, adequate data for the engineers who will design future vehicles, while simultaneously working to increase man's tolerance to acceleration.

5,833

Webb, P. 1959 HUMAN TOLERANCE AND PROTECTIVE CLOTHING  
Annals New York Acad. Sc., 82 (3): 714-723 7 Oct 1959

5,834

Webber, D. A. 1956 ACCELERATION MEASUREMENTS DURING DROP TESTS.  
(Royal Air Establishment, Great Britian, Farnborough) TN STRUC. 198,  
July 1956

ABSTRACT: Test results of an extensive drop-testing program on a complete aircraft into which four types of accelerometers were fitted. The obtained acceleration readings and the relative merits of the four instruments designed for this special purpose are compared.

5,835

Webster, A.P. n.d. ACCELERATION in Human Engineering Bulletin 55-5 H  
(Flight Safety Foundation, New York, California)

ABSTRACT: The Human Engineering Bulletin is prepared to assist designers and engineers to incorporate physiological and psychological data in aircraft design as a means of advancing aviation safety.

5,836

Webster, A.P. 1947 FREE-FALLS AND PARACHUTE DESCENTS IN THE STANDARD  
ATMOSPHERE. (National Advisory Committee for Aeronautics, Wash., D.C.)  
NACA TN 1315, June 1947.

ABSTRACT: With the advent of high-altitude flying, hazards not previously encountered in the event of bail-out became of extreme importance. Without oxygen, consciousness is lost very quickly. The extreme cold necessitates the wearing of heavy flying suits which not only encumber the jumper but increase his weight. The duration of the descent subjects the jumper to anoxia and cold.

In order to have a background for answering some of the arising questions on free-falls, information was obtained on altitude, velocity and time relationships for free-falls and open parachute descent. Values were tabulated for the situation in which the weight of the jumper equals the drag in the standard atmosphere.

5,837

Webster, A.P. & H.A. Smedal 1949 SUGGESTED ALTITUDE VS. VELOCITY  
TOLERANCES FOR PARACHUTE OPENING SHOCK.  
U.S. Navy Medical News Letter, 10:1-6. March - April 1949.

5,838

Webster, A.P. and D.E. Reynolds 1950 TIME OF CONSCIOUSNESS DURING EXPOSURE TO VARIOUS PRESSURE ALTITUDES. J. Aviat. Med., 21:237

5,839

Webster, A. P. 1950 HIGH ALTITUDE-HIGH VELOCITY FLYING WITH SPECIAL REFERENCE TO THE HUMAN FACTORS. I. OUTLINE OF HUMAN PROBLEMS. J. Aviation Med. 21(2):82-84, 89.

5,840

Webster, A. P. & O. E. Reynolds 1950 HIGH ALTITUDE, HIGH VELOCITY FLYING WITH SPECIAL REFERENCE TO THE HUMAN FACTORS. II. TIME OF CONSCIOUSNESS DURING EXPOSURE TO VARIOUS PRESSURE ALTITUDES. J. Aviation Med. 21(3):237-245.

5,841

Webster, A.P., 1953 HIGH ALTITUDE-HIGH VELOCITY FLYING WITH REFERENCE TO THE HUMAN FACTORS. IV. OPENING SHOCK OF PARACHUTE DESCENTS. J. Aviation Med. 24(2):189-199

SUMMARY: The opening shock of standard American parachutes is shown to increase directly with the fourth power of the velocity (true air speed) of the jumper when the parachute opens; to increase directly with the weight of the jumper; and to increase directly with the mass density of the air, i.e., decrease with increase in altitude. The equation for the opening shock is of the form  $P = AW\rho V_o^4$

where P is the opening shock in pounds; W is the weight of the jumper in pounds;  $\rho$  is the mass density of the air in slugs per cubic foot;  $V_o$  is the opening velocity in feet per second; G is the opening shock in multiples of g, the acceleration due to gravity; and A is a constant depending on the type of parachute. This constant has been estimated to be  $3.964 \times 10^{-4}$ ,  $3.441 \times 10^{-4}$ , and  $5.386 \times 10^{-4}$  for 24-foot nylon, 28-foot nylon and 28-foot silk parachutes, respectively. If the jumper is falling at equilibrium free-fall velocity when the parachute opens, the opening shock may be obtained from the equation  $P = BWV_f^2$  or  $G = BV_f^2$  where  $V_f$  is the free-fall equilibrium velocity, and B is a constant depending on the type of parachute. This constant has been estimated to be 0.0488, 0.0575, and 0.0785 for 24-foot nylon, 28-foot nylon, and 28-foot silk parachutes, respectively. For a constant G-tolerance criterion, the relation between the velocity and mass density of the air (altitude) is of the form

$$V_o = \left( \frac{G}{\rho} \right)^{1/4}$$

where C is a constant depending on the type of parachute and the value of G selected.

For a 200-pound jumper with a 20 G criterion and a 28-foot nylon parachute, the constant C is estimated to be  $5.812 \times 10^6$ ; and for a 30G criterion,  $8.718 \times 10^6$ . Using this latter equation and constants a velocity-altitude tolerance table and chart were prepared showing a SAFE REGION production of 20 G or less, a DANGEROUS REGION PRODUCING 30 G or more, and BORDERLINE REGION producing between 20 and 30G

5,842

Webster, A. P., & H. N. Hunter 1954 ACCELERATION

J. Avia. Med. 25(4):378-379, Aug. 1954

See also (Naval Air Development Ctr., Johnsville, Pa.) NADC TR- ;  
March 1954

ABSTRACT: A table is presented containing the following data: (1) relationship between the different types of acceleration (positive, negative, transverse prone, fluctuating positive, and cyclic) and direction of body movement, type of aircraft maneuver, and tolerance limits under various degrees of experimental exposures in man; and (2) pathological effects on animals of varying degrees of various types of acceleration.

5,843

Webster, A.P. 1956 ACCELERATION LIMITS OF THE HUMAN BODY Aviation Age,  
March 1956

5,844

Wechsler, R. L. August 1952 EFFECTS OF ACCELERATION UPON CEREBRAL METABOLISM AND CEREBRAL BLOOD FLOW. PHASE I. DEVELOPMENT OF A NEW METHOD FOR CONTINUOUS MEASUREMENT OF CEREBRAL BLOOD FLOW IN HUMANS UNDER ACCELERATION. NADC-MA-5202 (Rept. NM 001 060.03.01)  
5 Aug 1952.

ABSTRACT: The radioactive krypton (KR) method was developed for the investigation of cerebral circulation during acceleration. This method is similar S. S. Kety's nitrous oxide method, substituting K79 for N<sub>2</sub>O.

It permits measurement of cerebral blood flow as often as 2-4 times in 30 seconds. The maximum amounts of KR<sup>79</sup> to which a normal subject would be exposed during the inhalation of Kr<sup>79</sup> (in concentrations of 100 microcurie per liter) for 20 minutes was calculated to be 300 and 250 uc. in the lungs and in the remainder of the body, respectively. A scintillation counter, with a thallium-activated NaI crystal, will be used to record the Kr<sup>79</sup>  $\gamma$  - rays. (TIP abstract, modified).

5,845

Weddell, F.J. Jr. 1945 REPORT ON TARGET 24/17e, GOTTINGEN, GERMANY.  
(INSTITUTE OF HYGIENE) (War Dept., Combined Intelligence Objectives  
Subcomm.) Report #28, 20 April 1945

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Weed, L. H. 1927 EXPERIMENTAL STUDIES OF INTRACRANIAL PRESSURE. AN  
INVESTIGATION OF THE MOST RECENT ADVANCES. Proceedings of Association  
for Research in Nervous and Mental Diseases, New York, Dec. 28,  
29, 1927, 8(3):53.

5,847

Weil, Joseph 1962 REVIEW OF THE X-15 PROGRAM  
Rept. No. NASA TN D-1278, Washington, June, 1962  
(NASA, FLIGHT RESEARCH CENTER, Edwards, Calif.)

5,848

Weick, Fred E. SAFETY AND CRASH SURVIVAL ASPECTS OF PAWNEE DESIGN.  
Flight Safety Foundation.

5,849

Weiner, J. & M.C. Leikind, ed. J.R. Gibson 1952 VISIBILITY - A BIBLIOGRAPHY  
(The Library of Congress Reference Department Technical Information  
Division) July 1952; ASTIA AD-105 57

ABSTRACT: The bibliography is intended to provide reference information and background material for the many research and development projects in the field of vision being sponsored by the Vision Committee. It provides a survey of much of the literature published from 1925 to 1950 inclusive on the subject of visibility as influenced by the various physical, psychological, and physiological factors inherent in the observer, target, background and atmosphere, and the engineering applications of visibility data. Such materials as optical physics, the anatomy and physiology of the eye, pathological effects on vision and routine optometrical theory has been excluded.

5,850

Weiner, M. 1955 EFFECTS OF TRAINING IN SPACE ORIENTATION ON PERCEPTION OF THE UPRIGHT J. Exp. Psychol 49:367-373

5,851

Weinstock, M. and W. Boaz 1958 INVESTIGATION OF THE PRINCIPLE OF CONTROLLED ACCELERATION OPERATION OF PERSONNEL ESCAPE CATAPULTS  
(Pitman-Dunn Laboratories Group, Frankford Arsenal, Philadelphia 37, Pa.)  
Memorandum Report No. MR-712, WADC TN 58-372, MIPR 33-600-8-1375A-178,  
FA Subproject No. C180, OCO Project No. TS1-15, DA Project No. 502-06-001,  
October 1958, ASTIA AD 207612

ABSTRACT: The Pitman-Dunn Laboratories Division of Frankford Arsenal designed a pressure-sensitive relief valve in compliance with a request by the Wright Air Development Center. The basic project (TS1-15-C180) was aimed at developing a propellant charge for use in the M5 catapult in order to obtain a safe personnel ejection from an aircraft at runway level; the relief valve was conceived as an alternate means of obtaining this capability. The relief valve maintains the gas at the pressure level required for optimum acceleration of the catapult by venting the excess gases formed during the catapult stroke. In this configuration, the catapult propellant charge must be great enough to produce above-normal operating pressures over the range of operating temperatures, thus insuring, throughout the stroke, an abundant supply of gas for regulation by the relief valve. The test firings demonstrated that the pressure relief valve functioned satisfactorily. The test results established the soundness of the principle of controlled-acceleration operation in personnel escape catapults.

5,852

Weinwurm, G. F. 1959 X-15 WINDBLAST TEST. Rept. no. AFFTC TN-58-42;  
ASTIA AD 221 123.

ABSTRACT: The X-15 windblast tests performed on the Air Force Flight Test Center High Speed Track are analyzed to supply aerodynamic load information for the seat, and point out a number of deficiencies in the system. These include malfunction of the fin locking mechanism, oscillation of the extended skip flow generator, weakness of the parachute package, tendency of several parts of the seat to puncture the pressure suit, and material failure of the survival garment at a number of points. (Author) (See also AD 201 282)

5,853

Weis, E. B., J. W. Brinkley, N. P. Clarke, & W. E. Temple 1963 HUMAN RESPONSE TO LATERAL IMPACT. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 29-May 2, 1963)

ABSTRACT: Thirty-two tests of human response to lateral impact were conducted (15 rightward and 17 leftward). This study was a joint effort between NASA (Manned Spacecraft Center) and this Laboratory, conducted in order to furnish previously undefined criteria for tolerance to impulsive loads applied through the Y axis for the purposes of attenuator design.

The acceleration impulses were applied on the Vertical Deceleration Tower at this Laboratory. The VDT water brake produces an approximately triangular acceleration pulse after a free fall. The series of graduated tests reached a maximum of 20 g peak acceleration, 22 fps impact velocity, 1,500 g per second onset rate, and pulse duration of 120 milliseconds (exclusive of free fall). Although human tolerance was not reached in these tests, a clinical evaluation of physiological response will be presented in consideration of potential tolerance limiting factors. The restraint system (integrated shoulder, chest, lap, thigh, and ankle straps) and the support system (microballoon couch) will be discussed and criticized on the basis of subjective response and force and acceleration measurements. The method and current status of mathematical analysis and mechanical modeling of human response to this stress will be presented.

5,854

Weiser, H.I. 1959 VERTIGO OF CERVICAL ORIGIN.  
Harefuah 57:61-2, 2 August 1959

5,855

Weisflog, G. 1957 UIVAGI NO TEMAT FIZJOMECHANIKI KREGOSLUPA (Remarks on the physiomechanics of the spine)  
Polski Przegląd Radiologiczny (Warszawa) 21(3):141-58 May-June 1958



5,856

Weiss, H. S., R. Edelberg, P. V. Charland & J. L. Rosenbaum 1954. THE PHYSIOLOGY OF SIMPLE TUMBLING. PT. II. HUMAN STUDIES.  
(Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TR 53-139, Pt. 2; Jan. 1954. ASTIA AD 36 305. (Supersedes WADC TR 53-139, Pt. 2; ASTIA AD 27 890.)

ABSTRACT: In order to assess the tolerance limits to head-over-heels rotations or flat spins, as likely to be encountered in escape from aircraft, human subjects were spun on the horizontal spin-table. The experiments were guided by previous animal investigations but runs on human subjects were limited to 125 rpm because of the onset of pressure pain in the head or feet. During the spin, the physiological behavior of the humans closely resembled that of the dogs and, on the basis of this, curves for the responses of humans at speeds up to 110 rpm were extrapolated to the level of circulatory failure. By this procedure, it was estimated that the border line of unconsciousness would be reached after three to ten seconds of rotation at 140 rpm and complete unconsciousness after three to ten seconds at 160 rpm with the center of rotation at the heart. The data, together with performance tests and the observation of conjunctival petechiae, were used to determine the time intensity areas of safe and dangerous rotations.  
(AML)

5,857

Weiss, H. S., 1955. THE HUMAN ELECTROCARDIOGRAM DURING TUMBLING. J. Aviat. Med. 26(3):206-213.

SUMMARY: Vector analyses were made of simultaneous limb and precordial electrocardiograms taken from normal males exposed to the stress of tumbling. For the range of tumbling exposures employed (limited by the appearance of conjunctival petechiae and/or pain), the ECG records do not indicate any impairment of cardiac function; the top speed attained was 188 r.p.m. (for three seconds), center of rotation (C/R) at the heart, and 93 r.p.m. (for three seconds), C/R at the iliac crest. With the C/R at the heart, the only consistent effects noted were a clockwise rotation of the mean QRS and T vectors in the frontal plane, an increase in heart rate, and a prolongation of the corrected Q-T intervals. The degree of clockwise rotation was related to the speed of tumbling and the starting position of the electrical axes. With the C/R at the iliac crest, counterclockwise rotation of the QRS vector in the frontal plane, a slight widening of the QRS-T angle in the frontal plane, a decrease in heart rate, and shortening of the corrected Q-t interval were noted.

The rotation of the QRS vector with either C/R is best interpreted on the basis of the anatomical movements of the heart. The widening of the QRS-T angle and the changes in the corrected Q-T intervals are discussed in terms of a possible effect of tumbling on myocardial function.

5,858

Weisler, A. C., & C. C. Haygood 1959 BIOLOGICAL EXPERIMENTAL ACCELERATION ENVIRONMENT JUPITER MISSILE AM-18 (Flight Evaluation Branch, Aeroballistics Lab., DOD, Army Ballistic Missile Agency, Redstone Arsenal, Alabama), Report No. DA-TM-87-59, 10 July 1959.

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Weissler, A. M., J. J. Leouard, and J. V. Warren 1957 EFFECTS OF POSTURE AND ATROPINE ON THE CARDIAC OUTPUT. J. Clin. Invest. 36:1656.

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Weiss, D. E. 1947 DESIGN AND APPLICATION OF ACCELEROMETERS. Proc. SESA IV(2)

5,861

Weiss, H. S., R. Edelberg, P. V. Charland, and J. I. Rosenbaum. 1954. ANIMAL AND HUMAN REACTIONS TO RAPID TUMBLING. J. Aviat. Med. 25(1):5-22.

SUMMARY: Rates of tumbling between 180 and 240 rpm following seat ejection or during free-fall have been reported and may be a source of danger to an escaping crewman. Anesthetized dogs spun about a center of rotation (C/R) through the heart exhibit signs of circulatory collapse and severe hypoxia at speeds higher than 140-150 rpm. While caudad displacement of the C/R does not interfere with the circulation to as great an extent, the animals in this situation display severe edema and hemorrhage in the head region. Human spins about the heart were limited to 125 rpm and about the iliac crest to 90 rpm because of pain and hemorrhage in the head region. The degree of circulatory impairment encountered at these speeds was not serious. Nevertheless, extrapolation to higher speeds on the basis of comparison with animal studies led to the prediction of conditions under which circulatory collapse would occur. Strength-duration curves for conjunctival petechiae in humans were established, ranging from three seconds at 90 rpm to two minutes at 50 rpm, C/R at iliac crest, and from 25-30 rpm higher with the C/R at the heart. Blood pressure, ECG and performance analysis indicate that these curves can be used to differentiate known safe from possibly unsafe exposures to tumbling. Only simple tumbling, that is, tumbling in the absence of a linear 'g' field, was considered in this study. The results therefore are strictly applicable only to the post ejection tumbling which persists after deceleration in the air stream ends, or to tumbling that occurs in free fall.

5,862

Welch, B.E. 1962 PHYSIOLOGIC NECESSITIES IN SIMULATED LUNAR FLIGHTS  
In USAF School of Aerospace Medicine Lectures in Aerospace Medicine,  
1962. Pp. 77-96

ABSTRACT: The primary purpose of including man in a space mission is to utilize man's full and unique capabilities toward successful mission completion. This means, therefore, that the man portion of the space mission must be at maximum effective performance consistent with the mission profile. To insure that man will be at maximum effectiveness, it is necessary to satisfy the various physiologic requirements that man places on the space vehicle system. These physiologic requirements are not necessarily unique to space operations and, for this discussion, will be classified somewhat arbitrarily into atmospheric and metabolic requirements. This paper will be divided into two parts; the first consisting of a brief discussion of the physiologic necessities and the second consisting of data collected during space cabin simulator experiments.

5,863

Welle, B. 1962 COSMONAUT TRAINING PROGRAM  
FBIS, USSR & East Europe, Nr. 70, April 10, 1962

ABSTRACT: Special efforts are surely being made to improve the training program of future cosmonauts. German Titov experienced several disturbances--slight vertigo and sickness. This was probably because of the influence of weightlessness on the middle ear, the organ of equilibrium. This effect disappeared almost completely when Titov assumed his normal resting position and made no strong movements with his head. Experts are now investigating whether this is a biological effect, or an individual peculiarity of Titov's. A scientist stated that better methods will strengthen the organ of equilibrium. In other words, cosmonauts must spend even more time than previously on rotating disks and swings, on apparatuses which move in three directions simultaneously. If, despite all training, the troublesome effects show up during future flights, if they interfere with the ability to work of the cosmonauts, then--the principle possibilities are already known--artificial gravity will be created in the space crafts which will amount to about one-fourth or even only one-tenth of the Earth's gravity. Currently, stress is laid on cosmonauts exercising under considerable weight. (CARI)

5,864

Wells, H. S., J. B. Youmans, & D. G. Miller 1938 TISSUE PRESSURE (INTRACUTANEOUS, SUBCUTANEOUS, AND INTRAMUSCULAR) AS RELATED TO VENOUS PRESSURE, CAPILLARY FILTRATION, AND OTHER FACTORS. J. clin. Invest. 17:489-499

5,865

Wells, J. Gordon and Laurence E. Morehouse 1950 ELECTROMYOGRAPHIC STUDY OF THE EFFECTS OF VARIOUS HEADWARD ACCELERATIVE FORCES UPON THE PILOT'S ABILITY TO PERFORM STANDARDIZED PULLS ON AN AIRCRAFT CONTROL STICK. J. Aviat. Med. 21(1):48-54.

SUMMARY: 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:

1. 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.

2. The effect of headward acceleration on stick pull is to increase the acceleration during the light pulls (10 to 20 pounds) and least during heavy pulls (40 to 50 pounds).

3. The effect of headward acceleration on muscular activity is least when the arm is held in a position intermediate between flexion and extension.

4. 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.

5. The linear relationship between calculated values of involuntary pull and experimental values of myographic activity indicates that the reduction in pulling effort as the arm is extended from a flexed position is a dynamic, not a physiological phenomenon.

6. 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 headward acceleration is minimal under these conditions.

5,866

Wells, R. 1961 ALIVE IN SPACE: THE SCIENCE OF BIO-ASTRONAUTICS (Boston, Mass., Little, Brown and Co., 1961)

ABSTRACT: This is an illustrated treatise on space flight dealing with the following topics: space instruments, space mechanics, space vehicle, weightlessness in space, living in space, safety in space, crewmen in space, man's mind in space, training for space, science in space, and the will to space.

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ABSTRACT: This is an illustrated treatise on space flight dealing with the following topics: space instruments, space mechanics, space vehicle, weightlessness in space, living in space, safety in space, crewmen in space, man's mind in space, training for space, science in space, and the will to space.

5,867

Wendt, G. R. 1944 STUDIES IN MOTION SICKNESS: I. A STUDY OF THE SUBJECTIVE EFFECTS OF SMALL DOSES OF BENZEDRINE SULPHATE ON INDIVIDUALS SUSCEPTIBLE AND THOSE NON-SUSCEPTIBLE TO MOTION SICKNESS, INCLUDING OBSERVATIONS ON PSYCHOGENIC SYMPTOMS. (Civil Aeronautics Administration, Washington, D.C.) Dec. 1944; Rept. No. 40

SUMMARY: In the following investigation the experimenters selected, by means of a motion-sickness history questionnaire and by interview, 19 college students who were susceptible to motion sickness and 20 who had never been motion sick to any degree, and who were free of illness or other physiological abnormality. Each subject served three days, taking a capsule with breakfast. One day each received 2.5 mgm. benzedrine sulphate. On days 2 and 3 each received either a placebo or benzedrine (1mgm. per 30 lbs. of body weight). The subjects were told that they were getting two different "drugs." Twice each day (before lunch and after dinner) each subject completed a 29-item questionnaire concerning subjective effects. Twenty of these items were of the kind, "have you drunk (a) more water than usual \_\_\_\_\_, (b) less water than usual \_\_\_\_\_, (c) same amount of water as usual \_\_\_\_\_?" Questionnaires were scored both in terms of total number of abnormal items and in terms of preponderance of items in the direction expected after benzedrine.

Under the conditions of the experiment the questionnaire method was of almost no value for the detection of drug effects. There were as many abnormal items checked on the placebo day as on the drug day, and for the total group the nature of the abnormalities reported on the benzedrine day was only slightly more in the direction of the expected benzedrine effect than on the placebo day. The group of subjects susceptible to motion sickness checked approximately three times as many symptoms as the group of non-susceptibles on each of the three experimental days. When asked to note their most prominent symptoms the susceptibles wrote in approximately twice as many as the non-susceptibles.

A comparison of the kinds of symptoms reported by susceptibles and non-susceptibles on benzedrine and placebo days showed: (1) that of the 19 susceptibles, 12 reported a greater excess of benzedrine symptoms on the benzedrine day, 3 on the placebo day, 1 reported no difference, and 3 reported no symptoms on either day; and (2) that of the 20 non-susceptibles, 2 reported a greater excess of benzedrine symptoms on the benzedrine day, 6 on the placebo day, 4 reported no difference; and 8 reported no symptoms on either day. (CAA)

5,868

Wendt, G. R. 1944 STUDIES IN MOTION SICKNESS: III. A NOTE ON AN UNSUCCESSFUL EFFORT TO INVESTIGATE THE EFFECTS OF TEMPERATURE ON VESTIBULARLY INDUCED NAUSEA. (Civil Aeronautics Administration, Washington, D. C.) Dec. 1944 Rept. No. 40

SUMMARY: The Note on an Unsuccessful Effort to Investigate the Effects of Temperature on Vestibularly Induced Nausea summarizes two limited investigations in which the effects of environmental temperature on motion-sickness rates were studied. Subjects selected on the basis of motion-sickness history inventory

scores were matched and divided into two groups of 16 subjects each. One group was subjected to a modified form of the Dorcus tilting procedure at a room temperature of 70 degrees F. and the other group was subjected to the same procedure at a room temperature of 90 degrees F. While the subject was lying supine and before being tilted upright, his ear canal was irrigated with ice water, however, only 2 cases of vomiting and 4 cases of subjective nausea were obtained. Since it was suspected that the low sickness rate might be a consequence of malfunction of the irrigator a check experiment at a room temperature of 80 degrees F. was run, using 9 of the men who had shown no symptoms of illness, employing an irrigator of different design. This device insured massive irrigation of the far end of the canal. Two of the subjects vomited, 4 were nauseated, and 3 were without symptoms of sickness. (CAA)

5,869

Wendt, G.R. 1946 AIRSICKNESS AMONG SEVENTY-ONE STUDENT PILOTS AND FIFTEEN INSTRUCTORS AND ITS RELATIONSHIP TO PREVIOUS HISTORY OF MOTION SICKNESS (CAA Div. Res.) Report No. 60, April 1946

5,870

wendt, G. R. 1946 STUDIES IN MOTION SICKNESS: III. AIRSICKNESS AMONG SEVENTY-ONE STUDENT PILOTS AND FIFTEEN INSTRUCTORS AND ITS RELATIONSHIP TO PREVIOUS HISTORY OF MOTION SICKNESS. (Civil Aeronautics Administration, Washington, D. C.) April 1946; Rept. No. 60

SUMMARY: A questionnaire was administered to seventy-one civilian student pilots in the Civilian Pilot Training program of the CAA and to fifteen instructors in the same program. This required them to report the frequency and degree to which they had been airsick, and the conditions under which it occurred. The questionnaire included an inventory of motion sickness on boats, trains, autos, and other devices. The percentage frequency of airsickness was: vomiting, students 16%; instructors 20%; lesser sickness, students 52%; instructors 67%; not sick, students 32%; instructors 13%. An a priori scoring key was applied to the inventory of motion sickness on devices other than planes, and the writer sorted the questionnaires into categories of comparable airsickness records. The correlation of motion sickness-inventory score and airsickness category was .73 in the case of student pilots and .34 in the case of instructors. The pilots attributed their airsickness in large part to training maneuvers, especially when long continued, and to a lesser extent to other causes. (CAA)



5,871

Wendt, G. R. 1946 STUDIES IN MOTION SICKNESS: STUDIES OF SOMATIC, PHYSIOLOGICAL, AND PSYCHOLOGICAL CORRELATES OF HISTORY OF MOTION SICKNESS. (Civil Aeronautical Administration, Washington, D. C.) Rept. No. 66; Aug. 1946

SUMMARY: This paper consists of brief reports of methods and results of early attempts to discover somatic, physiological, and psychological correlates of history of motion sickness. Results on more than 200 variables are presented, showing their frequency of occurrence as related to history of motion sickness. Some of the variables were obtained from personnel records, some from laboratory investigations, and some from questionnaires. In general, the purpose of this paper has been to give indications of what may be expected from further research. (CAA)

5,872

Wendt, G. R. 1946 STUDIES IN MOTION SICKNESS: I. FREQUENCY OF SUSCEPTIBILITY TO MOTION SICKNESS AMONG YOUNG ADULTS. (Civil Aeronautics Administration, Washington, D. C.) Apr. 1946; Rept. No. 60

ABSTRACT: A series of questionnaire surveys was made by means of which the frequency of susceptibility to motion sickness among young adults was estimated. The groups reported in this study included seven groups of college students and a group of airline stewardesses. The questionnaires included items on sea, train, auto, street car, and bus travel, and on elevators, lawn awnings, and amusement park devices. Four forms of questionnaires were used. Some groups were assembled for questionnaire; others completed it without supervision. The results have been presented for normative purposes. Such forms are useful both in the evaluation of the practical importance of the problem of motion sickness and for guidance in construction of motion sickness inventories or estimates of their possible usefulness as predictive devices.

According to the over-all data, taking no account of type of subject or form of question, among transportation devices boats were most frequently rated as nauseating, 42%; then buses, 25%; autos, 24%; street cars, 11%; and finally trains, 10%. The obtained percentages varied, however, depending upon the form of the question. For instance, the reported frequency of susceptibility on boats was 53% when the subjects were asked to report whether they had ever, at any age, been susceptible and were required to answer for each of three or four age periods; 46% when asked a similar question requiring less detail in the reply; 36% when asked "Have you ever been seasick?" and required to answer by "Yes," "No" or "Slightly"; and only 31% when the subjects were asked to state whether they would be affected by a future ride. Questions concerning susceptibility at various age levels showed the greatest frequency at the grade school ages. Comparison of women and men, on comparable questionnaire forms, showed that women reported more motion sickness than men and that accepted pilot applicants had less sickness in their histories than other college students. (CAA)

5,873

Wendt, G. R. 1948 OF WHAT IMPORTANCE ARE PSYCHOLOGICAL FACTORS IN MOTION SICKNESS. J. Avia. Med. 19:24-32

5,874

Wendt, G.R. and W. Berry 1950 REPORT OF CONFERENCE ON MOTION SICKNESS.  
( Symposium sponsored by the Naval Research Advisory Panel for Psychophysiology, Wash., D.C.) ASTIA AD-102213, 9 September 1950

ABSTRACT: The purpose of the Symposium on Motion Sickness was to review the present status of research, to discuss basic and applied research which should be expedited or initiated, and to plan ways and means of utilizing the results of research most effectively by the Armed Forces. This publication contains reports on the papers presented at the symposium. Those papers presented on recent and current research covered problems of the effects of drugs, the effects of physical forces, neurophysiological problems, effects of body and head movements and incidence of motion sickness. Other subjects of papers included the present military importance of the problems, present status of knowledge of preventive and therapeutic techniques, present and future research needs, and dissemination and utilization of research results.

5,875

Wendt, G.R. 1950 SOME CHARACTERISTICS OF VESTIBULAR EYE MOVEMENTS (Office of Naval Research, Washington, D.C., NAVEXOS P-966, October 1950

5,876

Wendt, G.R. 1950 SOME CHARACTERISTICS OF VESTIBULAR EYE MOVEMENTS  
( In: USONR Symposium, Psychophysiological factors in spatial orientation.)  
US NAS, Pensacola, Fla., 1950.

ABSTRACT: Laboratory research utilizing the Dodge mirror recorder revealed several unpublished facts. For example, when seated with head fixed, in the dark, or with eyes closed, normal subjects usually show some degree of spontaneous horizontal nystagmus. This has been called a "drift" or an "imbalance". After a single acceleratory stimulus, there is not only the primary nystagmus, but following this there is a weak but long-lasting secondary nystagmus in the opposite direction. The primary nystagmus shows certain lawful relations of its speed, duration, and time-course to the stimulus given to the ears. A visual field inhibits vestibular eye movements, So-called "habituation to rotation" can be prevented by control of orientation.

5,877

Wendt, G.R. 1951 VESTIBULAR FUNCTION  
(In: Stevens, S.S. (Ed.) Handbook of Experimental Psychology. N.Y.: Wiley, 1951)  
pp. 1191-1223.

5,878

Wen-Hwa Chu 1960 ON THE DEVELOPMENT OF A MORE ACCURATE METHOD FOR CALCULATING  
BODY-WATER IMPACT PRESSURES (Southwest Research Inst., San Antonio, Tex.)  
Technical rept. no. 2, Contract Nonr-272900, Proj. 23-834-2; 30 Sep. 1960;  
ASTIA AD-251 927

ABSTRACT: Details are presented of a theoretical investigation into the hydrodynamic forces and pressures developed during the early stages of water entry of a circular cylinder. The method employed is a numerical scheme developed from formulations of the governing equations and boundary conditions that are less restrictive than those usually employed, and is applicable to a wide class of body forms. Some comparisons with experimental data are made. It is concluded that the method is not yet suitable for general usage because of excessive requirements for computing machine time. (Author)

5,879

Wessler, S. 1953 EXPERIMENTAL INTRAVASCULAR THROMBOSIS INDUCED BY SERUM  
FRACTIONS CONTAINING SERUM PROTHROMBIN CONVERSION ACCELERATOR. (Yamins  
Research Lab., Beth Israel Hosp., and the Dept. of Medicine, Harvard Med.  
School, Boston, Mass.)

ABSTRACT: Previous studies (Federation Proceedings 11:309, 1952) suggested a technique whereby intravascular thrombosis may be produced in the dog under standard conditions. The method is based upon the ability of serum fractions containing SPCA to induce rapid clot formation in isolated bloodfilled jugular and femoral vein segments occluded while these serum fractions are infused into an antecubital vein. Upon releasing the occluding clamps, the clot is moved proximally by the flow of blood and can be arrested at a previously narrowed site at which the endothelium is normal. Intravascular thrombi were uniformly produced in the jugular veins of 20 dogs. Adherence to the vein wall was first noted on the fourth day, and was not always complete after 5 weeks. The sequential histopathology was that of a phlebothrombosis. In another series of experiments in 19 animals the right femoral vein was narrowed before, and the left fe-

moral vein after, infusion of SPCA into the antecubital vein. Thrombi developed in 15 of the right, and in only 5 of the left femoral veins. These findings are consistent with the concept that retarded venous flow combined with a temporary increase in SPCA activity may produce intravascular thrombosis in the absence both of endothelial damage and complete stasis. This investigation has provided a method for the study of intravascular thrombosis under conditions more nearly simulating those operative in man and has suggested a mechanism whereby spontaneous thrombosis may occur in vivo.

(Federation Proceedings 12(1):152-153, March 1953)

5,880

Westbrook, C.B. 1959 THE PILOT'S ROLE IN SPACE FLIGHT.  
(Wright Air Development Center, Air Research and Development Command,  
Wright-Patterson AFB, Ohio) WADC TN 59-31, Feb. 1959. ASTIA AD 210228.

ABSTRACT: Man's basic capabilities as a control element and his capabilities as an actuator, sensor, computer, and as a part of a complete control system are discussed and conclusions formed as strong and weak points. Several factors which contribute to a change in thinking regarding flight control in space missions are reviewed briefly. These are reliability, the changed dynamic characteristics of the vehicles, and the new control systems required. The phases of a lunar soft landing mission are then reviewed to determine what functions should or must be performed automatically and what should or could be performed by the man. It is concluded that man has a place in certain missions not merely on the basis of curiosity or even as a scientific observer but on sound engineering reasons as a flight control element.

5,881

Westbrook, C.B. 1959 PILOT'S ROLE IN SPACE FLIGHT.  
(Advisory Group for Aeronautical Research and Development, Palais De  
Chaillot, Paris) Report No. 252. Sept. 1959. ASTIA AD 243015

ABSTRACT: The capabilities of man as an actuator, sensor, computer, and as a part of a complete control system are discussed and conclusions formed as to man's strong and weak points. Several factors which contribute to a change in thinking regarding flight control in space missions are reviewed briefly. These are reliability, the changed dynamic characteristics of the vehicles and the new control systems required. The phases of a lunar soft landing mission are then reviewed to determine what functions should or must be performed automatically and what should or could be performed by the man. It is concluded that man has a place in certain missions not merely on the basis of curiosity or even as a scientific observer but on sound engineering reasons as a flight control element.

5,882

Weyl, A.R. 1958 TOWARDS SPACE FLIGHT Aeronautics 38:32-35.

ABSTRACT: Summaries of several published reports on astronautics appearing in British, US, and Soviet publications.

5,883

Whalen, W. J., & V. E. Hall 1953 ACCELERATION OF THERMAL POLYPNEA BY HYPOCAPNIA (Dept. of Physiology, School of Medicine, Univ. of California, Los Angeles, Calif.)

ABSTRACT: Urethanized cats were given artificial respiration during eupnea and thermal polypnea for 3 minutes at 4 different rates. The amount of hyperventilation sufficient to cause apnea at 'normal' body temperatures was found to be completely inadequate at higher temperatures. Often during thermal panting apnea could not be produced following the maximum available rate of artificial respiration. On the contrary the panting rate was accelerated by the hyperventilation although depth of respiration decreased. Since the carbon dioxide drive was presumably absent at the time, the acceleration might best be explained by a facilitating effect of hypocapnia on thermoregulatory centers. Several alterna-

5,884

Whateley, D.E., M.B. Riley 1960 TOLERANCE OF WHITE MICE TO THE COMBINED STRESSES OF ALTITUDE HYPOXIA AND TRANSVERSE ACCELERATION. (In Press, 1960).

5,885

Wheatley, George M. 1956 ACCIDENTS IN CHILDHOOD (Metropolitan Life Insurance Co., New York City, Feb. 1, 1956)

ABSTRACT: A recent development in pediatrics in this country has been the growing interest of physicians in the prevention of childhood accidents. Preventive efforts must be based on statistical information which indicates the nature of the problem and the best points of attack. The tables presented here are based on data from the Metropolitan Life Insurance Co., the Eastern Health District of Baltimore, and the Chicago poisoning Control Program.

5,886

Whedon, G.D., J.E. Deitrick & E. Shorr MODIFICATION OF THE EFFECTS OF IMMOBILIZATION UPON METABOLIC AND PHYSIOLOGIC FUNCTIONS OF NORMAL MAN BY THE USE OF AN OSCILLATING BED Amer. J. Med. 6:668

5,887

Wheeler, R.V. 1952 PARACHUTE OPENING AND GROUND IMPACT  
(Paper, presented at the 19th Symposium on Shock and Vibration  
Wright Air Development Center, Wright-Patterson AFB, 10-11 Sept. 1952)

5,888

Wheeler, W.L., Jr., J.M. Howland, W. Smith and J.E. Corso 1959 THE USE OF PROCHLORPERAZINE IN SEASICKNESS. Industr. Med. Surg. 28:405-6, Sept 1959

5,889

Wheelwright, C. D. 1962 PHYSIOLOGICAL SENSORS FOR USE IN PROJECT MERCURY  
National Aeronautical and Space Administration, Washington, D.C.  
Rept. no. NASA TN D-1082, Aug. 1962

ABSTRACT: Results of tests of biosensors for measuring body core temperature, respiration rate and depth, and electrocardiogram on animals and humans are presented. Comments are made on the bioconnector and biosensor assembly and the possible use of blood-pressure sensors in space flight.

5,890

Whillans, M.G. 1942 SPONGE RUBBER ABDOMINAL BELT FOR USE WITH CRASH  
BOAT CREW TO PREVENT EFFECTS OF JOLTING.  
(National Research Council, Canada) 4 February 1942, #C-2477

5,891

Whillans, M.G. 1960 BIOSCIENCES RESEARCH AND SPACE PROBLEMS (Defence Research Board (Canada). Reprint Jnl. of the Royal Astronomical Society of Canada 54:211-215; October 1960; ASTIA AD-244 464

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Whillans, M. G. 1960 BIOSCIENCES RESEARCH AND SPACE PROBLEMS  
The Journal of the Royal Astronomical Society of Canada 54(5):211-215, Oct.  
1960

ABSTRACT: Brief reviews and proposed solutions for various problems in manned space flight are presented. The problems include the following: (1) radiations from the Van Allen belts and solar flares, (2) isolation, (3) disorientation and weightlessness, and (4) methods for providing food and oxygen. Inquiries into these problems have brought research into the areas such as the possibility of life on other planets, the relationship of biological rhythms to the health and efficiency of the human organism, mechanisms of navigation in birds and other animals, and possibilities of traveling in space or hibernating state.

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5,893

White, A. S. 1958 X-15 TEST PILOTS.  
S.A.E. Journal 66(9):51, Part 2

ABSTRACT: North American's engineering department has developed an X-15 simulator in order to prepare pilots for the type of "space" mission expected in an X-15 aircraft. By using wind tunnel data and predicted aerodynamic data, the design engineer can predict the type of control system required for a mission of this type, build the control system into the simulator, and test the ability of theis control system to handle various problems of research flight without having actually flown the airplane. In addition, stability and control parameters may also be predicted. To meet the challenge of g forces, an almost exact replica of the X-15 cockpit has been mounted on a centrifuge where actual g loads of the flight are duplicated. In the centrifuge tests at the Naval Air Development Center, Johnsville, Pa., thepilots will again be trained in flying a complete mission profile, at the same time undergoing at least the positive g loads that will be experienced during actual flight conditions.

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5,894

White, C. S. and O. O. Benson, Jr., Ed. 1952 PHYSICS AND MEDICINE OF THE UPPER ATMOSPHERE (Proc. Sym. on the Phys. and Med. of the Upper Atmosphere, San Antonio, Tex., 6-9 Nov. 1951) (Albuquerque, New Mex.: Univ. New Mexico Press, 1952)

CONTENTS include:

- Mayo, A. M., "Basic Environmental Problems Relating Man and the Aeropause," pp. 6-22, 12 figs., 15 refs.
- Strughold, H., "Basic Environmental Problems Relating Man and the Highest Regions of the Atmosphere as Seen by the Biologist," pp. 23-34, 5 figs., 32 refs.
- Haber, H., "Gravity, Inertia, and Weight," pp. 123-136, 5 figs., 9 refs.
- Campbell, A., "Human Orientation During Travel in the Aeropause," pp. 488-493, tbl., 13 refs.
- Graybiel, A., "The Effect on Vision Produced by Stimulation of the Semicircular Canals by Angular Acceleration and Stimulation of the Otolith Organs by Linear Acceleration," pp. 494-508, 9 figs., 24 refs.

5,895

White, C. S. 1952 THE CHALLENGE OF SPACE MEDICINE  
J. Avia. Med. 23(5):527-529

ABSTRACT: The founding of the Space Medicine Association represents the recognition of new possibilities in aviation medicine. At the same time it imposes on its members the responsibility of studying the biological possibilities of human existence in the aeropause. The cooperation of affiliated disciplines must be secured for this purpose and a strong basic research program must be developed. The symposium on "Physics and Medicine of the Upper Atmosphere", held in San Antonio, Texas, in November 1951, may be considered a result of this much needed cooperation. (Literatuuroverzicht (Over Ruimtevaartgeneeskunde) (Space Medicine Bibliography) (Technisch Documentatie en Informatie Centrum voor de Krijgsmacht, den Haag, Netherlands) Rept. No. TDCK-16903; ASTIA AD-227 817; Feb. 1959)

5,896

White, C. S. 1954 BIOLOGICAL TOLERANCE TO ACCELERATIVE FORCES.  
(Paper, Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex., 10 June 1954) ASTIA AD-158 982

ABSTRACT: Information on human tolerance to accelerative forces was compiled from the literature and summarized in tabular and graphic form. Experimental data were discussed and deficiencies indicated; the most serious deficiency involves the lack of experimentation on combinations of g forces applied simultaneously and in a varied sequence. (ASTIA)



5,897

White, C. S. 1954 BIOLOGICAL TOLERANCE TO ACCELERATIVE FORCES. ADDENDUM I  
(Paper, Lovelace Foundation for Medical Education and Research, Albuquerque,  
N. Mex.) ASTIA AD-158 983; 17 June 1954

ABSTRACT: Data are presented graphically showing the relative g loads imposed by automobile accidents, catapults, parachute opening and landing shocks, ejection seats, and the tolerance of the human head protected with crash helmets to impact loads. The actuation of ejection seat controls, when subjects were exposed to radial g along with pitch and roll, was investigated. The effect of g loads on a man's ability to move is discussed. Forces of 3 to 4 g, when properly directed, were near the limit against which the body extremities could be moved, and which would allow progression from one point to another and prevented rising from an aircraft seat. Loads between 1 and 3 g significantly increase the time to perform a given task; e.g., donning a back-pack parachute took 17 sec at 1-g gravity load; time increased to 21, 41, and 75 sec at a radial load of 1, 2 and 3 g, respectively. The task was impossible for some subjects. Difficulties with orientation and vision occurred when subjects were exposed to jostle in a radial g field. Nausea was experienced and post-exposure effects were noted for 2 hr after a 10 min exposure to a 1.14 resultant g force, when head movements and up and down bouncing was carried out during the exposure on the centrifuge. (ASTIA)

5,898

White, C. S., et al. 1955 COLLECTED PAPERS ON AVIATION MEDICINE  
(AGARD, Paris, France)

5,899

White, C.S., T.L. Chiffelle and others 1956 BIOLOGICAL EFFECTS OF PRESSURE  
PHENOMENA OCCURRING INSIDE PROTECTIVE SHELTERS FOLLOWING A NUCLEAR DETONA-  
TION (Lovelace Foundation for Medical Education and Research, Albuquerque,  
N. Mex.) Oct. 1956; ASTIA AD-147 077

ABSTRACT: In two series of experiments 277 experimental animals, including 66 dogs 52 rabbits, 52 quinea pigs, 63 rats, and 44 mice, were exposed under selected conditions in six different general types of instrumented above- and below-ground shelters to blast produced by nuclear explosions. The distance of the several structures from Ground Zero ranged from 1050 to 5500 ft. The most severe alterations in the pressure environment occurring inside the structures followed the detonation of a nuclear device with a yeild approximately 50 per cent greater than nominal. The highest overpressure to which animals were exposed was 85.8 psi, the rise time of which was 4 msec. The overpressure endured for about 570 msec. Over-

pressures ranged from this maximum downward in 15 other exposure situations to a minimum of 1.3 psi enduring for nearly 1346 msec but rising to a maximum in about 420 msec. The latter pressure occurred inside a reinforced concrete bathroom at 4700 ft where the outside incident pressure was about 5 psi. Following the nuclear explosions, all animals were recovered, examined, sacrificed, and subjected to gross and microscopic pathological study. The most outstanding contribution of the field experiments and the related study of the literature was the unequivocal demonstration that the provision of adequate protective structures can indeed be an effective means of sharply reducing casualties which would otherwise be associated with the detonation of modern large-scale explosive devices. (Author) (See also AD-103 431)

5,900

White, C. S., T. L. Chiffelle, D. R. Richmond, W. H. Lockyear, I. G. Bowen, V. C. Goldizen, et al. 1957 THE BIOLOGICAL EFFECTS OF PRESSURE PHENOMENA OCCURRING INSIDE PROTECTIVE SHELTERS FOLLOWING A NUCLEAR DETONATION. (OPERATION TEAPOT) (Civil Effects Test Group, U. S. Atomic Energy Commission) Rept. WT-1179; Project 33.1; 28 Oct. 1957

ABSTRACT: In two series of experiments 277 experimental animals, including 66 dogs, 52 rabbits, 52 guinea pigs, 63 rats, and 44 mice, were exposed under selected conditions in six different general types of instrumented above- and below-ground shelters to blast produced by nuclear explosions. The distance of the several structures from Ground Zero ranged from 1050 to 5500 ft. The most severe alterations in the pressure environment occurring inside the structures followed the detonation of a nuclear device with a yield approximately 50 per cent greater than nominal. The highest overpressure endured for about 570 msec. Overpressures ranged from this maximum downward in 15 other exposure situations to a minimum of 1.3 psi enduring for nearly 1346 msec but rising to a maximum in about 420 msec. The latter pressure occurred inside a reinforced concrete bathroom shelter, which was the only surviving part of a house otherwise totally destroyed, at 4700 ft where the outside incident pressure was about 5 psi. Following the nuclear explosions, all animals were recovered, examined, sacrificed, and subjected to gross and microscopic pathological study. All lesions were tabulated and described. The results of pressure-time data, documenting the variations of the pressure environment, are presented and analyzed, and an exploratory attempt is made to relate the alterations in the pressure environment to the associated pathology observed. A critical review of selected material from the blast and related literature is presented. All data are discussed, and the several problems related to the design and construction of protective shelters are noted and briefly, but analytically, assessed. The most outstanding contribution of the field experiments and the related study of the literature was the unequivocal demonstration that the provision of adequate protective structures can indeed be an effective means of sharply reducing casualties which would otherwise be associated with the detonation of modern large-scale explosive devices. (AUTHOR)

5,901

White, C. S. 1958 BLAST BIOLOGY - A SUMMARY  
(Contribution to Holifield Subcommittee Hearings, May 1, 1958)  
In Report of Hearings before a Subcommittee on Government Operations,  
House of Representatives, Part I - Atomic Shelter Tests (Washington, D. C.:  
U. S. Government Printing Office, 1958) pp. 80-93

5,902

White, C.S. (ed.) 1958 AVIATION MEDICINE; SEL. REVIEWS  
(Pergamon Press, Alburquerque, N.M., 1958) Agardograph No. 25

5,903

White, C. S. 1958 THE AEROMEDICAL REALITIES OF SPACE TRAVEL  
J. Aviation Med. 29(10):707-715 Oct 1958.  
See also Air Force 41(12):76-79, Dec. 1958.

ABSTRACT: A brief review is presented of pioneering efforts in balloon ascensions which demonstrate the contribution of Europe to space flight. Telescopic observations of space are discussed in order to provide orientation for the choice of obtainable goals in space flight. The limited nature of space travel under present concepts is indicated by analysis of the distances and time involved in travel beyond the solar system. It is concluded that exploration of the moon, Venus, and Mars will provide a significant contribution to medicine and scientific knowledge.

5,904

White, C. S. 1959 BIOLOGICAL BLAST EFFECTS  
(U. S. Atomic Energy Commission) Report TID-5564; Sept. 1959

ABSTRACT: This presentation, though generally concerned with biological effects of airborne blast phenomena, is limited to deal briefly with three main topics. First, the scope and nature of the several blast hazards will be delineated. Secondly, tentative criteria for threshold damage to humans will be set forth. Thirdly, these criteria will be related to nuclear weapons in terms of ground ranges and areas involved for 1 MT and 10 MT surface detonations, and to allow appreciation of the relative importance of blast with other effects, appropriate values for ionizing and thermal radiation will be noted. (AUTHOR)

5,905

White, C.S. 1959 BIOLOGICAL EFFECTS OF NUCLEAR WAR (A report of Hearings before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy, U.S. Government Printing Office, Washington 25, D.C.) pp. 311-372

5,906

White, C. S., & D. R. Richmond 1959 BLAST BIOLOGY  
(U. S. Atomic Energy Commission & The Lovelace Foundation for Medical Education & Research, Albuquerque, N. Mex.) Report TID-5764; 18 Sept. 1959

ABSTRACT: Selected information from the literature and new experimental data regarding the biologic consequences of exposure to the several environmental variations associated with actual and simulated explosive detonations were reviewed. As background, brief and elementary remarks concerning blast physics and terminology were set forth. The scope of what now comprises the field of blast biology was noted to include primary, secondary, tertiary and miscellaneous blast effects as those attributable, respectively, to variations in environmental pressure, trauma from blast-produced missiles (both penetrating and nonpenetrating), the consequences of physical displacement of biological targets by blast-produced winds and hazards due to ground shock, dust and thermal phenomena not caused by thermal radiation per se. Primary blast effects were covered in detail noting physical-biophysical factors contributing to the observed pathophysiology. Also, a simple hydrostatic model was utilized diagrammatically in pointing out possible etiologic mechanisms. The gross biologic response to single, "fast"-rising overpressures were described as was the tolerance of mice, rats, guinea pigs and rabbits to "long"-duration pressure pulses rising "rapidly" in single and double steps. Further, a few data were noted regarding biological response to "slowly" rising overpressures of "long" duration. Attention was called to the similarities under certain circumstances between thoracic trauma from nonpenetrating missiles and that noted from air blast. The association between air emboli, increase in lung weight (hemorrhage and edema) and mortality was discussed. Information relevant to the clinical symptoms and therapy of blast injury was presented and the needs for additional investigations were emphasized. The relation of blast hazards to nuclear explosions was assessed and one approach to predicting the maximal, potential casualties from blast phenomena was presented making use of arbitrary and tentative criteria. Finally, the sound sense of practicing blast, radiation and thermal prophylaxis as a means of minimizing casualties was urged as an essential step to enhance individual and national survival in the event of a nuclear war. (AUTHOR)

5,907

White, C. S. and D. R. Richmond 1960 BLAST BIOLOGY In Clinical Cardio-pulmonary Physiology (New York; London: Grune and Stratton, 1960). Chapt. 63.

5,908

White, C. S. 1961 BIOLOGICAL EFFECTS OF BLAST

(Paper, Armed Forces Medical Symposium, Field Command, Defense Atomic Support Agency, Sandia Base, Albuquerque, N. Mex., Nov. 28, 1961)

(Defense Atomic Support Agency, U. S. Atomic Energy Commission) Contract No. DA-49-146-XZ-055, Dec. 1961 ASTIA AD-276 892

ABSTRACT: The current state of knowledge relevant to biological blast effects was summarized in a selective manner. Initially, five problems of concern to those who would relate the environmental variations produced by nuclear weapons with biological response and hazard assessment were pointed out. Primary, secondary, tertiary, and miscellaneous blast effects were defined and selected interspecies experimental data of a physical and pathophysiological nature useful in estimating human response were presented. Tentative biological criteria defining "safe" levels of exposure were set forth as were survival curves for different conditions of exposure in Hiroshima. These were discussed along with the comparative variations in range of the "free-field" effects as they vary with explosive yield. The fundamental requirement for surviving seconds, minutes, and hours to abet survival for days, weeks, months, and years was emphasized along with the necessity for planning protective measures against all hazardous weapons effects as one attractive alternative for minimizing casualties and maximizing survival in the event of a nuclear war.

5,910

White, C. S., I. G. Bowen, D. R. Richmond, & R. L. Corsbie 1961 COMPARATIVE NUCLEAR EFFECTS OF BIOMEDICAL INTEREST. (Civil Effects Test Operations, U. S. Atomic Energy Commission) Report CEX-58.8., 12 Jan. 1961

ABSTRACT: Selected physical and biological data bearing upon the environmental variations created by nuclear explosions are presented in simplified form. Emphasis is placed upon the "early" consequences of exposure to blast, thermal radiation, and ionizing radiation to elucidate the comparative ranges of the major effects as they vary with explosive yield and as they contribute to the total hazard to man. A section containing brief definitions of the terminology employed is followed by a section that utilizes text and tabular material to set forth events that follow nuclear explosions and the varied responses of exposed physical and biological materials. Finally, selected quantitative weapons--effects data in graphic and tabular form are presented over a wide range of explosive yields to show the relative distances from Ground Zero affected by significant levels of blast overpressures, thermal fluxes, and initial and residual penetrating ionizing radiations. However, only the "early" rather than the "late" effects of the latter are considered. (AUTHOR)

5,911

White, D.C. & M.M. Mozell 1957 WHOLE BODY OSCILLATION: PRELIMINARY REPORT  
(U.S. Naval Air Development Center, Johnsville, Pa.) NADC-MA-LR23,  
1 April 1957.

ABSTRACT: In a study to set the upper limit of endurance to sinusoidal whole body oscillation, two subjects were studied on a vibration table while strapped securely in an A4D seat at 0.34 inch double amplitude and frequency of 10 cps (2-3G). An intolerable precordial pain radiating to the left shoulder developed in both subjects. At frequency levels of 20-25 cps and the same double amplitude (6-10G), a lower bowel disturbance was observed which was characterized by discomfort, followed later by bloody, mucloid discharge.

5,912

White, M. P., ed. 1946 EFFECTS OF IMPACT AND EXPLOSION  
(Office of Scientific Research & Development, and National Defense Research Committee, Division 2, Washington, D. C.) Vol. I; ASTIA ATI-37 735  
See Schneider, W. G., E. B. Wilson, P. E. Cross, et al.

5,913

White, M. S. 1940 CORONARY THROMBOSIS OCCURRING IN A PILOT WHILE IN  
FLIGHT IN A SINGLE SEAT AIRCRAFT. J. Amer. Med. Ass'n. 115:447

5,914

White, Robert M. 1962 X-15 OPERATIONS IN PRE-LUNAR STUDIES  
In: (School of Aerospace Medicine) Lectures in Aerospace Medicine, 1962  
pp. 191-210

ABSTRACT: This paper is a discussion of the events and results of the X-15 project to the present time. The author discusses in detail structural problems, temperature problems, pilot preparation, and ground monitoring station function.

5,915

White, S. 1958 THE PROBLEMS OF MAINTAINING MAN AT EXTREME ALTITUDE  
In Alperin, M., M. Stern, & H. Wooster, eds., Vistas in Astronautics: Proceedings of the First Annual AFOSR Astronautics Symposium (New York: Pergamon Press, 1958) pp. 288-290

5,916

White, S.C. 1960 HUMAN FACTORS AND BIOASTRONAUTICS (Langley Research Center, NASA) Astronautics 5(11):35,98-99

5,917

White, Stanley C., Richard S. Johnston, & Gerard J. Pesman 1961 REVIEW OF BIOMEDICAL SYSTEMS FOR MR-3 FLIGHT

In: Results of the First U.S. Manned Suborbital Space Flight (NASA) pp. 19-27  
6 June 1961

ABSTRACT: The successful conclusion of the manned ballistic flight of MR-3 was the culmination of approximately 2 years of preparation of the life support systems for the spacecraft and of the selection and training of the astronauts for space flight. The major spacecraft systems which are essential for sustaining the astronaut during flight are the environmental control system and the astronaut acceleration protection system. This discussion will be limited to a summary of the status of these two systems at the time of the flight of MR-3, a review of the biomedical portions of the astronaut training, and a discussion of the animal program preceding the manned flight.

5,918

White, S. C. 1961 PROGRESS IN SPACE MEDICINE  
In; IL CONGRESSO MONDIALE E IV EUROPEO DI MEDICINA AERONAUTICA E SPAZIALE,  
Rome, 1:231-241, 1961

ABSTRACT: Both the X-15 and Mercury programs offer the opportunity to study men in space flight through the use of instrumentation placed upon the crewman. The biological areas considered in these programs include: acceleration, deceleration, and weightlessness; acoustic energies (sound and vibration); atmosphere, temperature and humidity; decompression; radiation; work capacity and physical fatigue; orientation; day-night cycles; hygiene, illness; and diet and waste handling. The gathering of data under both programs has required a completely new approach to biological instrumentation.

5,919

White, S. C., & C. A. Berry 1963 RESUME OF PRESENT KNOWLEDGE OF MAN'S ABILITY TO MEET THE SPACE ENVIRONMENT. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 29-May 2, 1963.)

ABSTRACT: The United States and Soviet Union Spaceflight programs continue to compile information on man's ability to operate in this

new environment. As more flight data becomes available, better insight into the performance of the body systems can be made while under weightlessness and other stresses of the environment. This information permits the reevaluation of the proposed problems associated with further extension of flight experience and the inclusion of multiple men into the crew. This paper will attempt to summarize the experience to date and present estimation of the problems being encountered or expected in the next phases of flight. (Aerospace Medicine 34(3):269, March 1963)

5,920

White, T. D. 1959 THE INEVITABLE CLIMB TO SPACE.  
Air University Quarterly Review, Winter 1958-1959

5,921

White, V.J. 1959 PERFORMANCE TESTS ON TWO SERVO ACCELEROMETERS  
National Bureau of Standards Report No. 6603

ABSTRACT: Two model 4310, Serial Nos. 166 and 167, servo accelerometers of  $\pm 2g$  range, manufactured by the Donner scientific Company were tested to determine static and dynamic characteristics. Static calibrations are made in the range  $\pm 1g$  by changing the orientation of the instrument in the earth's gravitational field. Frequency response of the instruments from 0 to about 25 c.p.s. was checked by rotating in the earth's field to provide a sinusoidally varying excitation.

5,922

White, W.J. 1954 THE EFFECTS OF GRAVITATIONAL STRESS UPON VISUAL ACUITY (Wright Patterson, AFB, Ohio) WADC Technical Report 53-464, 1954

5,923

White, W. J., & W. R. Jorve 1955 GRAVITATIONAL STRESS AND VISUAL ACUITY.  
WADC TR 53-469



5,924

White, W. J., and M. B. Riley 1956 THE EFFECTS OF POSITIVE ACCELERATION (G) ON THE RELATION BETWEEN ILLUMINATION AND DIAL READING. (In Finch, G., and F. Cameron, eds., Symposium on Air Force Human Engineering, Personnel and Training Research.) (Wash., D. C.: Nat. Acad. of Sci., Nat. Res. Council, 1956) Pub. 455, Pp. 306-310.

See also J. Avia. Med. 28:306-309, 1957.

ABSTRACT: Commencing at 3 to 4 G the subject experiences a dimming of vision which is most noticeable in the peripheral field. At 4 to 5 G the condition progresses to temporary blindness, and finally at slightly higher levels of G unconsciousness occurs.

A number of investigators have shown that acceleration induces visual symptoms by causing a decrease in arterial pressure at eye level.

Results: (a) At the highest brightness there are no differences in the percentage of errors among the various values of G. (b) At the three highest brightness levels for values up to 3 G there are no differences in the percentage of errors. (c) At the two lower brightness levels errors are inversely related to the value of G. (d) At the 4 G condition there is a systematic increase in errors with decreasing brightness. (DACO)

5,925

White, W. J., & W. Jorve 1956 THE EFFECTS OF GRAVITATIONAL STRESS UPON VISUAL ACUITY (Wright Air Development Center, Wright-Patterson AFB, Ohio) WADC TR 56-247; ASTIA AD-110 444; Nov. 1956

ABSTRACT: It was the purpose of this study to determine the relationship between increased gravitational force and visual acuity when the factor of reduced cerebral circulation is minimized by the use of protective measures known to ameliorate the gross visual symptoms associated with g stress. It was found that gravitational stress has a significant and progressive effect upon visual acuity. Hypotheses are advanced to account for the difference in visual performance, during gravitational stress.

5,926

White, W. J. and M. B. Riley 1957 THE EFFECT OF POSITIVE ACCELERATION (G) ON THE RELATION BETWEEN ILLUMINATION AND DIAL READING  
J. Avia. Med. 28:306-309

See also Finch, G., & F. Cameron, eds., Symposium on Air Force Human Engineering, Personnel and Training Research (Wash., D. C.: Nat'l. Acad. of Sci., Nat'l. Res. Council, 1956) Pub. 455, Pp. 306-310, 1956.

ABSTRACT: Commencing at 3 to 4 G the subject experiences a dimming of vision which is most noticeable in the peripheral field. At 4 to 5 G the condition

progresses to temporary blindness, and finally at slightly higher levels of G unconsciousness occurs.

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5,927

White, W.J. 1958 STUDIES PERTAINING TO THE EFFECTS OF ACCELERATION ON VISION(USAF WADC, Dayton, Ohio) May 1958.

5,928

White, W. J. and M. B. Riley 1958 THE EFFECTS OF POSITIVE ACCELERATION ON RELATION BETWEEN ILLUMINATION AND INSTRUMENT READING. (USAF, Wright-Pat. AFB, Ohio) WADC TR 58-332, Nov. 1958. ASTIA AD 206 663  
NOTE: CARI P&S 2.11

ABSTRACT: This study is concerned with the manner in which accuracy of quantitative scale reading varies as a function of illumination and acceleration. Six subjects were exposed to accelerative levels ranging from one to four g and reading errors and time were measured for various levels of illumination of the instrument panel. Thus it was possible to determine whether or not a pilot's ability to read aircraft instrument dials at various levels of illumination is impaired by positive g forces less than that required to produce blackout.

SECOND ABSTRACT: This study concerns the manner in which the accuracy of quantitative scale readings varies as a function of illumination and acceleration. The following basic findings resulted from an analysis of the data from this experiment: 1. At the higher levels of instrument illumination, increasing acceleration and decreasing luminance produce relatively small increases in reading errors. 2. At marginal levels of illumination, acceleration and luminance interact to produce a relatively large increase in error. 3. Intensity of illumination can compensate for the decline in visual performance at stress levels above 1 g.

5,929

White, W. J. 1958 ACCELERATION AND VISION.  
(Wright-Patterson AFB, Ohio) WADC TR 58-333; ASTIA AD 208 147, Nov. 1958  
NOTE: CARI P&S 2.11

Summary (a): This report is a review and evaluation of research pertaining to the effects of acceleration on human vision. Studies of gross qualitative changes in vision such as blackout and loss of peripheral in headward (positive) acceleration and the less dramatic effects in other body orientations to the acceleration vector are discussed first, together with the physiological basis of these symptoms. Then the quantitative and analytic studies of the influence of acceleration on vision are reviewed including the use of electrophysiological techniques and the application of the threshold method of psychophics [sic; psychophysics?]. Finally a number of areas are pointed out where there is a need for more investigation.

SECOND ABSTRACT: Research pertaining to the effects of acceleration on human vision is reviewed and evaluated. Studies of gross qualitative changes in vision such as blackout and loss of peripheral vision in headward (positive) acceleration and the less dramatic effects in other body orientations to the acceleration vector are discussed, together with the physiological basis of these symptoms. The quantitative and analytic studies of the influence of acceleration on vision are reviewed including the use of electrophysiological techniques and the application of the threshold method of psychophics. A number of areas are pointed out where there is a need for more investigation.  
(Author)

5,930

White, W. J. 1958 SOME EFFECTS OF MODERATE ACCELERATION (G) ON OPERATOR PERFORMANCE. (Cornell Aeronautical Lab., Inc., Buffalo, N. Y.)  
FDM 291, Nov. 1958

ABSTRACT: This report is an assessment of the empirical relations that have been found between reaction and response times and moderate accelerative force. Serious gaps in knowledge are pointed out. The application of the findings to future air traffic control simulators is presented. In addition, the possibilities of simulating the visual effects of acceleration are discussed.

5,931

White, W. J. 1958 EXPERIMENTAL STUDIES OF THE EFFECTS OF ACCELERATIVE STRESS ON VISUAL PERFORMANCE. (Dissertation, Ohio State University)

ABSTRACT: Two different aspects of visual behavior were examined during exposure to accelerative stress: absolute thresholds of foveal (cone) and peripheral

(rod) vision and the ability to read instrument dials. The threshold measurements were made on one seasoned observer at accelerative levels from one to four units (g) with and without protection from an anti-G suit. Six subjects, wearing an anti-G suit, read dials at five luminance levels and four acceleration levels (one to four G). The data from both were analyzed in detail for the effect of acceleration on visual performance. An extensive review of previous studies in this area is included.

5,932

White, W. J. 1959 EXPERIMENTAL STUDIES OF THE EFFECTS OF ACCELERATIVE STRESS ON VISUAL PERFORMANCE. 30th Annual Meeting, Aero Medical Association, April 27-29, 1959.

ABSTRACT: Two different aspects of visual behavior have been examined during exposure to a common stress, an increased G force on the body. The WADC human centrifuge was used to produce the increased G forces. Measurements were reported on the effects of accelerative stress upon the absolute threshold of foveal (cone) and peripheral (rod) vision. The ability to read instrument dials was recorded as a function of acceleration and illumination. These experiments show that acceleration has a consistent and progressive effect on visual performance, the size of the effect being proportional to the magnitude of the positive acceleration. The following basic findings resulted from an analysis of the data gathered from these experiments:

1. Absolute threshold--(a) Acceleration levels of 3 and 4 G approximately double and triple foveal thresholds (b) Threshold levels in peripheral vision triple at 3 G and quadruple at 4 G. (c) This effect of peripheral vision is compensated in part by anti-G suits. (d) A rise in threshold (decline in visual sensitivity) is found with repeated exposure to acceleration, the rise being smaller than that associated with acceleration.

2. Instrument reading--(a) At the higher levels of instrument illumination, increasing acceleration and decreasing luminance produce relatively small increase in reading errors. (b) At marginal levels of illumination, acceleration and luminance interact to produce a relatively large increase in errors. (c) Intensity of illumination can compensate for the decline in Visual performance at stress levels above 1 G.

J. of Aviation Medicine, Vol. 30, No. 1. January, 1959)

5,933

White, W. J. 1960 VARIATIONS IN ABSOLUTE VISUAL THRESHOLDS DURING ACCELERATION STRESS. (Wright Air Development Division, Wright-Patterson AFB, Ohio)  
WADD TR 60-34; ASTIA AD-243 612; April 1960

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ABSTRACT: Measurements are reported on the effects of moderate acceleration upon the absolute thresholds of foveal (cone) and peripheral (rod) vision. This experiment shows that accelerative stress has a consistent and progressive effect on visual performance, this effect being proportional to the magnitude of the positive acceleration. (AUTHOR)

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White, W. J. 1961 VISUAL PERFORMANCE UNDER GRAVITATIONAL STRESS.  
(In Gauer, O. H. and G. D. Zuidema, eds., Gravitational Stress  
in Aerospace Medicine. (Boston: Little, Brown, and Co., 1961)  
pp. 70 - 89

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5,935

White, W. J. 1961 THE EFFECT OF ACCELERATION ON THE RELATION BETWEEN VISUAL ACUITY AND LUMINANCE LEVEL. (Paper, 32nd Annual Meeting, Aerospace Medical Assoc., 24-27 April 1961, Chicago, Ill.)

ABSTRACT: Measurements made in the WADD centrifuge using an Ortho-Rater visual testing apparatus show the effects of positive acceleration on the relation between visual acuity and luminance level. Under conditions of 1 g the expected increase in resolving power of the eye with increasing luminance was found. In repeating these measurements at 3 g and again at 4 g the following relation appeared: acceleration has a significant and progressive effect on visual acuity at all luminance levels, but this effect is most profound at low brightness levels. Thus at the luminance of 0.01 millilamberts the minimum resolvable angle increased from 4.0 minutes at 1 g to 7.59 mins of arc under conditions of 4 g. At the highest brightness level, 150 millilamberts, the change in visual angle was 0.25 mins of arc between these two values of acceleration. The data have been interpreted both in terms of decreased blood flow to the head and in terms of distortion of the optical imagery of the eye. (J. Aerospace Medicine 32(3):252, Mar.1961)

5,936

White, W. J. 1962 A SURVEY OF BIOASTRONAUTICS 1961-1962 RESOURCES  
FOR RESEARCH AND DEVELOPMENT  
(Cornell Aeronautical Lab., Inc., Buffalo, N. Y.)  
Feb. 1962 ASTIA AD 274 053

ABSTRACT: Foremost among the questions to be answered by future exploration of space are those concerned with bioastronautics. A research and development program for manned space flight during the next two decades will serve both to establish human productivity in space-based systems and to stimulate the advancement of concepts of military action for exploiting human capabilities. Information and ideas which must be considered in the formulation of a long range program aimed at manned exploration and use of outer space are discussed. (Author)

5,937

White, W.J. 1962 QUANTITATIVE INSTRUMENT READING AS A FUNCTION OF  
ILLUMINATION AND GRAVITATIONAL STRESS.  
J. Engineering Psychol., 1(3):127-133, July 1952.

ABSTRACT: This study investigated whether or not a pilot's ability to read aircraft instrument dials at various brightness levels is impaired by accelerative force less than that required to produce temporary blindness. Six subjects with a visual acuity of 20/20 or better, clad in a CSU-3/P anti-G-suit, were exposed to positive acceleration levels ranging from 1 to 4 g (at least 1 g unit below that at which dimming of peripheral vision would occur). The results indicate the following: (a) at the highest luminance level there are no differences in the percentage of errors among the four acceleration conditions; (b) at the three highest luminance levels, for values up to 3 g, there are no significant differences in the percentage of reading errors; (c) at the two lower luminance levels errors are inversely related to luminance and directly related to acceleration; (d) at the 4-g conditions there is a systematic increase in errors with decreasing brightness; and (e) the 2-g level of acceleration cannot be distinguished from the 1 g or static condition.

5,938

White, W. J., & M. L. Braunstein 1963 ACCELERATION AND VISION: BRIGHTNESS  
DISCRIMINATION. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 28 - May 2, 1963)

ABSTRACT: Brightness discrimination thresholds were determined at positive acceleration levels of 1, 2, e, and 5 G and transverse acceleration levels of

1, 2, 3, 5, and 7 G. Four background luminance levels, ranging from .03 to 31 foot lamberts, were studied. Contrast required to detect an increment in illumination increased with acceleration. This increase was present for both directions of acceleration and for all background levels, but was most marked for positive acceleration, and for the dimmest background. At .03 ft. l., 16 per cent contrast was required to detect a target of 5 G positive, as compared to 9 per cent at 1 G. The differential effects of positive and transverse acceleration permit a comparison of the mechanical and haemodynamic effects of acceleration on brightness discrimination. These results will be related to previous research, and the role of these factors in other aspects of visual functioning will be discussed.

5,939

White, William J. 1962 A SURVEY OF BIOASTRONAUTICS 1961-1962 RESOURCES FOR RESEARCH AND DEVELOPMENT

Andrews Air Force Base, HQAFSC-TDR-62-1 Contract No. AF 18(600)-1916 by Cornell Aeronautical Laboratory, Inc. ASTIA AD-274 053

ABSTRACT: This report outlines information and ideas which must be considered in the formulation of a long range program aimed at manned exploration and use of outer space. This report attempts to achieve the following objectives: (1) An accounting of the men, money and skills invested in bioastronautics work by universities, not-for-profit and industrial concerns; (2) An evaluation of the usefulness of their effort to the National program; (3) An appraisal of the research and development now in progress, together with a prognosis of technical accomplishments, and recommendations for research that recognize the magnitudes of the country's scientific skills, facilities, and manpower.

5,940

Whiteside, T.C.D., and F.W. Campbell 1959 SIZE CONSTANCY EFFECT DURING ANGULAR AND RADIAL ACCELERATION Quart. J. Exp. Psychol 11:249, November 1959

5,941

Whiteside, T. C. D. 1960 MOTION SICKNESS (RAF, Institute of Aviation Medicine, Farnborough) FPRC Memo 156; ASTIA AD-264 112; Dec. 1960

ABSTRACT: Motion sickness is the syndrome characterised by nausea and malaise which is initiated by exposure to changing accelerations. It includes sea sick-

ness, air sickness, car sickness, etc. Although the mechanism has not yet been determined with certainty it is clear that changing acceleration acting on the labyrinths is a basic factor, although it is not known with certainty whether the syndrome is initiated by the labyrinthine stimulus per se or by a secondary mechanism. Therapeutic measures include: immobilization of the head insofar as possible; avoidance of rapid and repeated head movement; mental relaxation; avoidance of anxiety; and comfortable clothing. (AUTHOR)

5,942

Whiteside, T. C. D., & A. J. Benson 1961 THE EFFECT OF LINEAR ACCELERATION ON THE RESPONSE TO ANGULAR ACCELERATION IN MAN. J. Physiol.

5,943

Whiteside, T. C. D. 1962 PROBLEMS OF EMPTY VISUAL FIELDS IN AGARD, VISUAL PROBLEMS IN AVIATION MEDICINE (Oxford, N.Y.: Pergamon Press) p. 118-120; NASA N62-17156.

ABSTRACT: The problems associated with scanning totally empty fields and with perceiving a single object against a featureless background are reviewed. The search of an empty field for an undetected target poses physiological problems of accommodation and fixation, since these reflexes both depend on the stimulus of visual detail in the external scene. Another problem is man's dependence upon vision for confirmation of the positional stability of his body as a whole and of his eyes in particular. As a result of these factors, scanning a totally empty field is often reduced to random eye motions. Even when a target has been spotted on an otherwise empty background, perceptual problems remain. The threshold of relative motion perception is dependent upon the texture of the background and further complicated by turbulence and coriolis effects, so that the relative motion of the target cannot be determined with any certainty. The size and distance of the object also appear different when no other detail is present; the target is judged to be further away because it appears smaller, and a converging flight path results in approach speeds which appear greater than in reality. M.P.G.

5,944

Whiting, A. A. 1946 PRELIMINARY REPORT ON DECELERATIVE FORCES ON AIR CREWS. (Cornell Aeronautical Laboratory) Army Contract W 33-038 AC-14230, Phase I, 2 April 1946. Cornell Aeronautical Lab Report No. OG-410-D-1, 17 May 1946.



5,945

Whiting, A. A. 1946 DECELERATIVE FORCES ON AIR CREWS.  
(Cornell Aeronautical Laboratory, Buffalo, New York) Final Report  
No. 410-D-2, Army Contract W33-038 AC-14248, Phase I, 6 June 1946  
(Technical Proposal - Decelerator Apparatus) 16 August 1946.

5,946

Whiting, A.A. et al. 1951 HEAD IMPACT AND HELMET INVESTIGATION  
(Cornell Aero. Lab., Inc., Buffalo, N.Y.) Rept. No. OG-675-D-5,  
Contract No. N6ori-11917, 30 April 1951.

5,947

Whiting, A. A. 1951 DETERMINATION OF OPTIMUM CONSTRUCTION OF A BOXING PLAT-  
FORM TO REDUCE DANGER OF HEAD INJURY ON IMPACT. (Cornell Aeronautical Lab.,  
Inc., Buffalo, N. Y.) Contract SC-1, Rept. No. OG-742-D-1; 10 April 1951

5,948

Whitlock, C.M. n.d. MAN IN SPACE: METABOLIC DATA, STRESSES ENCOUNTERED,  
AND GROUND TEST FACILITIES (Convair Document 44059 (U)

ABSTRACT: The purpose of this paper is to present some of the problems  
posed in providing man with an operational environment in space vehicles  
and some of the answers.

5,949

Whittingham, H. E. 1939 MEDICAL RESEARCH AND AVIATION Int. Congr.  
J. R. Nav. Med. Serv. 26:15-24 Jan. 1940.  
See also Milit. Med 2:95-103, 1939.

5,950

Whittingham, H.E. 1939 PREVENTIVE MEDICINE IN RELATION TO AVIATION.  
J. Roy. Army M. Corps, 73:278-81

ABSTRACT: The author described "blacking out" resulting when the pilot makes  
sharp turns at high speed and centrifugal forces greater than 4 g. are develop-

ed. The first symptom is the feeling of being forcibly pressed into the seat of the plane. Then increasing dimness of the visual field, and sudden blindness ensue. The "blacking out" lasts from 2 to 5 seconds depending on the force and the duration of the "g". The phenomenon is considered due to the centrifugally induced splanchnic pooling of the blood. There is a reduction of blood pressure in the head, especially in the central retinal artery, with a temporary interference with the retinal circulation.

The preventive measures suggested are: (1) keeping flying personnel fit, (2) use of belts to support the abdominal wall, and (3) the adoption of a crouching posture by the aviator.

5,951

Whittingham, H.E. 1946 REPORT TO THE SECRETARY FOR AIR ON THE  
COMMITTEE'S ACTIVITIES FOR THE PERIOD JUNE 1940 TO DECEMBER 1945.  
F.P.R.C. Report #651, 5 March 1946

5,952

Whittingham, H. E. 1953 MEDICAL ASPECTS OF AIR TRAVEL. MEDICAL FITNESS.  
(RAF, Institute of Aviation Medicine, Farnborough) FPRC Rept. No. 828;  
ASTIA AD-142 597  
See also Reprint British Medical Journal, Pp. 556 and 610, 7 and 14 Mar. 1953  
London 1 (4810): 610-612.

ABSTRACT: The second part of the paper covers common medical conditions which should preclude travel by air. They are: anemia, cardiovascular diseases, gastrointestinal conditions, respiratory disorders, mental disorders, and infectious diseases. Some difficulties may be experienced by travelers because of age or because of pregnancy. Statistics show that only 0.3% of the total number of passengers traveling by air suffer from diseases. Medical emergencies arise during flight among diseased passengers as well as among persons whose medical conditions were heretofore unknown. In some cases, distress due to flight is delayed up to 48 hours after travel. (CARI)

5,953

Whittingham, H.E. 1954 MEDICAL SCIENCE AND PROBLEMS OF FLYING.  
(Flying Personnel Research Committee, Gt. Brit.) Report no. FPRC-915;  
ASTIA AD-65 152; May 1954

5,954

Whittingham, R. A. 1959 TRIALS WITH "SAFELAND" TYPES 4:3 AND 6:3 OVER-RUN  
EMERGENCY BARRIERS MANUFACTURED BY BORGS FABRIKS A. B. OF SWEDEN.  
Royal Aircraft Establishment August 1959 Tech Note No. Nval 38

These barriers are of the deep net type and are designed to arrest aircraft overshooting the ends of runways either on take-off or landing. They engage around the mainplanes of the aircraft and the arrest is by multi disc type brake units.

The Royal Air Force have given these barriers the nomenclature of the Mk.5 and Mk.6 airfield barrier installations respectively.

5,955

Wiant, H. W. 1956 THE EFFECTS OF SIMULTANEOUS DECELERATION, TUMBLING, AND WIND-BLAST ENCOUNTERED IN ESCAPE FROM SUPERSONIC AIRCRAFT. WADC TN 54-18, Mar. 1956  
ASTIA AD-99 656

ABSTRACT: The angular motion of the seat was quite different in the two drops. In general the magnitude of angular velocity about the three axes averaged higher shortly after seat ejection for the second test. The axes about which the highest angular velocities occurred were also different. In test No. 1 the highest value was about the Z axis and in test No. 2 about the X axis. A final steady rotation about the Z axis was widened in the first drop while in test Drop 2 a steady rotation about the Y axis developed. These rotations approached 2.9 rps and 1.5 rps, respectively.

The differences in accelerations are very evident in the two tests. The magnitudes of the accelerations in test Drop 2 exceed those of Drop 1 and sense at the maxima are reversed. For example in Drop 1 the maximum is along the positive X axis. Table 5 compares maximum values of the accelerations and angular velocities along the coordinate axes.

A comparison of chest and helmet pressure variations at seat ejection cannot be made because of damage to the chest and helmet instrumentation as a result of failure of the seat frame in Drop test 2. Chest pressure records of the first test show a pressure differential of 12.35 psi in 0.2 of a second elapsed time. This was after hatch ejection and through seat ejection. The maximum chest pressure that exists for drop 2 is 7 psi. After this point the record is meaningless.

Both tests failed in recovery of animal subject and seat. The first failure was the result of a malfunctioning mechanical timer. In the second test the seat recovery pilot parachute deployed but immediately fouled itself on the broken seat parts.

The missile recovery system in both tests failed. The failure of the first missile was due to premature deployment of the second stage brake parachute and unpredictable parachute damage due to afterburning of the JATO unit. The failure in the second test was a result of the pilot parachutes being unable to extract the brake parachutes from their respective storage pods. In both instances the final 88 ft diameter recovery parachute was destroyed because of excessive missile velocity at the time of deployment. The damage due to windblast in test No. 1 was negligible. Test No. 2 produced an indirect effect due to windblast; namely the damaging of the roller mounting frame on the ejection seat. This is the main structural component of the seat back.

(DACO)

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Wiant, H. W. 1956 THE EFFECTS OF SIMULTANEOUS DECELERATION, TUMBLING, AND WIND-BLAST ENCOUNTERED IN ESCAPE FROM SUPERSONIC AIRCRAFT. (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TN 54-18; ASTIA AD-99 656, Mar. 1956

ABSTRACT: Two chimpanzees were emitted by ejection seats from missiles traveling at Mach 1.1 and 1.5 respectively at 21,500 feet. Physiological data were obtained from accelerometers, rate gyros, electromanometers, and heart and respiratory rate recorders attached to the seat during ejection. Maxima of 180 r.p.m. and 25 g were observed for brief periods. In each case, the recovery parachute failed and the animal free fell to earth. Maximum pressure change occurred at ejection at which time the pressure at the chest rose from 3.05 psi to 15.4 psi in 0.2 seconds. Findings on postmortem examination were inconclusive. Microscopic examination of the lungs revealed no signs of explosive decompression, although signs of trauma due to impact were diffuse and severe. A large angular impulse arising from the airloads was applied to the seat during ejection, which was of sufficient magnitude to cause the seat to rotate from its initial horizontal position to a nearly head-down attitude shortly after separation from the missile. The results indicate that tumbling is somewhat higher than might be reasonably tolerated by a human subject.

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Wicke, Walter 1958 PROGRESS REPORT ON MANUFACTURE & EVALUATION OF  
50 INTEGRATING ACCELEROMETERS  
Contract No. DA-19-059-501-ORD-2757

5,958

Wielunski, Stefan 1961 THE INVESTIGATION OF LIVING ORGANISMS IN ROTATING SYSTEMS

(Paper 49, XIth International Astronautical Congress, Stockholm, 1960, pp. 483-488) Prepared by: Translation Services Branch, Foreign Technology Division, SP-AFB, Ohio FTD-TT-61-248/1+2 ASTIA AD 269153

ABSTRACT: An apparatus constructed at the physical laboratory of the Polytechnical Institute of Lublin, Poland permits the observation by a stationary observer of the phenomena occurring in a rotating system as seen by an observer resting in this system.

The author's apparatus enables a stationary observer to follow the behavior of a living animal in a rotating cage, in natural size and colors.

The apparatus consists of a horizontal disc on which a cage with the animal under observation is fastened. The disk rotates about the vertical axis and the behavior of the animal is observed in a mirror rotating at one-half the speed about the same axis. The mechanism may be driven either manually or electrically. Many experiments illustrating the centrifugal and Coriolis' forces may be made with it. The apparatus should prove useful in the investigation of the physiological effects of high accelerations in rapidly rotating cosmic vehicles of the future in which the Coriolis' forces on the subjects' blood will be 10,000 to 20,000 times greater than on the surface of the earth. The author hopes that his inexpensive apparatus will make such investigations possible even in laboratories of limited means.

5,959

Wiesehofer, H. 1939 FLIGHT TESTS ON THE INCREASES OF G TOLERANCE BY ACCOMMODATION OF THE CREW IN THE PRONE POSITION. (Edited by Deutsche Versuchsanstalt für Luftfahrt. E. V. Berlin-Adlershof, 12 June 1939) German Aviation Research Rept. 1075

5,960

Webb Associates 1962 FORCE FIELDS

In: NASA Life Sciences Data Book (National Aeronautics and Space Administration, Washington, D.C.) Contract NASr-89. June 1962

ABSTRACT: This handbook provides 28 pages of charts and summaries from the various force fields. Areas covered include: acceleration (experience, impact, transverse G limits, acceleration terminology, variations in G tolerance, G vector and consciousness, direction of force, maximum tolerable acceleration profiles, G protection by water immersion); tolerance to tumbling; deceleration (abrupt transverse, positive and negative G decelerations, tolerance to vertical impact, human impact sensitivity, impact tolerance); G fields in rotating space vehicles; vibration, (response, tolerances, physiological effects, psychophysical factors, performance functions, transmission, oxygen consumption, respiratory ventilation, and tracking performance); resonance of the abdominal wall; oscillations; high dynamic pressures; blast injury.

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Wiesehofer, H. 1940 UBER FLUGVERSUCHE ZUR FRAGE DER ERTRAGLICHKEIT HOHER  
BESCHLEUNIGUNGEN BEI LIEGENDER UNTERBRINGUNG DER FLUGZEUGINSASSEN  
(Question of Tolerance of High Rates of Acceleration by Pilot While  
Lying Down; Experimental Studies)  
Luftfahrtmedizin 4: 145-155

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Wiesehofer, H. 1943 FLUGMEDIZINISCHE GRUNDLAGEN ZUM BAN VON  
SCHLEUDERSITZEN. (Aero-Medical Basis for Construction of Catapult Seats)  
Oct. 1943. ASTIA ATI 52016

ABSTRACT: A detailed discussion is presented on the aero-medical principles for construction of catapult seats. The main topic of the discussion is the determination of how well the human body is able to withstand the strain connected with high acceleration, and how these stresses can be reduced, and other safety measures are outlined. Numerical tables are given showing the stress resistance of various vertebrae to various stresses. One proposed measure to reduce acceleration is to catapult the seat downward. Results of tests showed that accelerations of 18 to 20 g for a period of 1/10 to 2/10 sec are permissible causing no serious effects to the body.

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Wiesehofer, H. 1944 SCHLEUDERSITZABECHUESSE MIT MENSCHEN ZUR....  
FLUGZEUGMUSTER. (Tolerance of Human Subjects to Acceleration During  
Catapult Seat Ejection) Oct. 1944. ASTIA ATI 43761

ABSTRACT: Tests were performed with catapult ejection seats with human subjects to determine tolerance to high acceleration. Catapult seats intended for the Do 335 and He 219 fighters were used, at ejection pressures of 60 to 135 atmospheres corresponding to actual flight of both aircraft. Attention is directed to the difference in construction of both assemblies. On the basis of results obtained it is shown that these ejection seats may be used without causing injuries to pilots due to excessive acceleration. It is considered premature to regard accelerations up to 28 g, which have been well tolerated in the tests, as lying invariably below the breaking load of skeletal structures.

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Wiesehofer, H., tr. J.B. Bateman 1945 AVIATION MEDICAL PRINCIPLES FOR THE CONSTRUCTION OF EMERGENCY EJECTION SEATS. (Deutsche Versuchsanstalt fur Luftfahrt, E.V., Berlin-Aldershof) Rept. Rf 301/12, UM 1175(150)2402, 27 Oct. 1943. Translated as Appendix 2 to Lovelace, W.R., E.J. Baldes, & V.J. Wulff, The Ejection Seat for Emergency Escape from High-Speed Aircraft, Aug. 31, 1945. ASTIA ATI 7245

ABSTRACT: Following a review of the dynamic processes occurring in the ejection of the catapult seat, the effects on the human subject resulting from accelerations and air resistance are set forth. The limiting conditions are established under which the thresholds of tolerance of the human body, and particularly of the spinal column, are not exceeded. The procedures for reducing the forces involved and certain safety measures are discussed.

- I. Introduction
  - II. Technical Details of the Ejection Seat.
  - III. Tolerance Toward Impact-Like Accelerations.
  - IV. Experiments on Tolerance to Wind Blast.
  - V. Flight Tests with Catapult Seat in the Ju 87.
  - VI. Possible Methods of Reducing the Acceleration During Ejection.
- (Author)

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Wiesehofer, H., tr., J.B. Bateman 1945 CATAPULT SEAT EJECTION WITH HUMAN SUBJECTS: TOLERANCE TO ACCELERATION OF PERSONS EJECTED FROM THE Do 335 AND He 219. (Deutsche Versuchsanstalt Fur Luftfahrt, E.V., Berlin-Adler-shof) Deutsche Luftfahrtforschung: Investigation and Report No. 1393, 31 Oct. 1944. Translated as Appendix 14 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 report deals with the effects on human subjects of seat ejection from a stationary mounting using high driving forces. Using a catapult seat assembly intended for model Do 335, twenty-seven ejections have been performed with ten subjects, using pressures of 60 to 135 atmospheres. Using that intended for model He 219, fourteen ejections have been made with five subjects at pressures of 60 to 90 atmospheres. Attention is drawn to the differences between the two assemblies; the requirements for each are set forth, and the results of the experiments are discussed.

(Author)

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Wiesehofer, H. CATAPULT SEAT LAUNCHINGS OF MEN TO DETERMINE ACCELERATION  
TOLERANCES FOR APPARATUS USED IN THE DO. 335 AND HE.219 AIRCRAFT  
(ZWB-U & M 1393) (TIB Ref. GDC 10/5725)  
R.A.E. Translation No. 226

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Wiesinger, K. 1953 THE ROLE OF ANALYSIS OF FINDINGS IN THE RECONSTRUC-  
TION OF AVIATION ACCIDENTS(Le Role de l'analyse des traces dans la re-  
construction des accidents d'avion.  
Medecine aeronautique(Paris). 8(1):85-86, 1953

ABSTRACT: Serious military airplane accidents are evaluated by a special  
committee in Switzerland; the members of this committee are: a police off-  
icial, a flight surgeon, and a technical expert. The methods of evaluation  
of their findings are the same as those employed in forensic medicine. Mi-  
croscopic physical, chemical, and biological examination of the findings is  
done by experts. The role of the flight surgeon is to collect and preserve  
all available evidence.--This method seems to be of considerable value in the  
investigation of airplane accidents.

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Wiggers, C.J. 1944 AVIATION PHYSIOLOGY, Chapters 28-29 4th ed.  
Lea and Febiger Philadelphia,

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Wiggers, C.J. 1950 PHYSIOLOGY OF SHOCK.  
( New York: Commonwealth Fund, 1950)

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Wiggers, C. J. 1952 CIRCULATORY DYNAMICS  
(New York: Grune & Stratton, 1952) p. 8



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Wilber, C.G. THE USE OF ANIMALS, PLANTS, MICROORGANISMS AND TISSUE  
CULTURE IN SPACE RESEARCH. (US Atomic Energy Comm.) COM-7-T24.

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Wilbur, C.E. THE FLIGHT SURGEON AND AIRCRAFT ACCIDENTS. New York, Institute  
of Aeronautical Sciences, Inc.; ASTIA

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Wilbur, C. E. 1961 MEDICAL INVESTIGATION OF CIVIL AIRCRAFT ACCIDENTS  
(Paper, 32nd Annual Meeting of the Aerospace Medical Assoc., Palmer House,  
Chicago, Illinois, April 24-27, 1961)

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Wild, H. B. 1931 FLYING WITH THE PIONEERS. Pop. Sci. Mon. 118:40; 61.

5,975

Wildhack, W.A. & R.O. Smith 1955 A BASIC METHOD OF DETERMINING THE DYNAMIC  
CHARACTERISTICS OF ACCELEROMETERS IN ROTATION  
(National Bureau of Standards, Washington, D.C.) March 1955 Paper No. 54-40-3  
ASTIA AD 118 806

ABSTRACT: The earth's gravitational field furnishes a convenient sinusoidal forcing function for a vibrating system (e.g., an accelerometer) rotating in a vertical plane. The centrifugal field decreases the restoring force on the vibrating mass. Resonance occurs at lower frequencies and with greater amplitudes than in the case of excitation by linear vibration. The response ratio is greater than unity for all damping ratios up to unity. The resonant frequency for zero damping occurs at 0.707 times the natural undamped frequency. From measurements of the maximum response ratio, and of the frequency at which this ratio decreases to unity, one may determine both the damping ratio and the undamped natural frequency of any system whose damping ratio is less than unity. The response equation for the rotational excitation is given, and the solutions are presented in graphic form. Experimental test results obtained by this method are included. (Contractor's abstract)

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Wilhelm, Kaiser 1928 INJURIES DUE TO CHANGE OF AIR PRESSURE IN PARACHUTE  
DESCENT. Die Medizinische welt, (Berlin) 2:1192, Aug 11, 1928

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Wilkes, W.H. 1952 ESCAPE FROM MULTIPLACE SUPERSONIC AIRCRAFT  
(Paper, Symposium on Problems of Emergency Escape In High Speed Flight,  
Wright Field, Ohio, Sept 29-30, 1952)

ABSTRACT: The principal dangers involved in escape from an aircraft at super-sonic speeds and high altitudes are as follows: (1) explosive decompression; (2) immobility due to uncontrollable airplane or injury; (3) possibility of collision with the airplane structure such as wings, fin, wheels, etc.; (4) possible high temperatures due to aerodynamic heating of the crewman; (5) extreme horizontal deceleration after entering the airstream; (6) physical harm due to air blast on face and body; (7) lack of oxygen; (8) extreme cold; and (9) inability to open the parachute due to unconsciousness. The implications of these dangers are briefly discussed, in as much as they apply to multiplace bombers operating at altitudes up to 60,000 feet and speeds up to Mach 2.

5,978

Wilkins, R. W., C. K. Driedland, & S. E. Bradley 1943 ESTIMATIONS OF CARDIAC  
AND VASOMOTOR RESERVE ESPECIALLY IN RESPONSE TO STRAINS DESIGNED TO SIMULATE  
THOSE OF ACCELERATION. CAM No. 177; 1 Sept. 1943

ABSTRACT:

- (a) Release of occlusion of circulation in the limbs is followed by intense local hyperemia and fall of systemic arterial blood pressure, rise in pulse rate and cardiac output and fall in venous pressure. Reocclusion reverses this.
- (b) External compression of the abdomen raises intra-abdominal pressure slightly, but not enough to occlude circulation, although blood flow and kidney functions are retarded.
- (c) Abdominal muscular straining raises intra-abdominal pressure much higher than does external abdominal compression.
- (d) Valsalva maneuver causes initial sharp rise in arterial pressure followed by a fall in the arterial and pulse pressure plus a rise in pulse rate.
- (e) Release of Valsalva strain is followed by brief further fall in arterial pressure, then a rise into hypertensive levels for one half minute or more.

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Wilkins, R. W. 1944 BIMONTHLY PROGRESS REPORT NO. 17 TO THE CMR-OSRD ON  
CONTRACT OEMcmr-143; 2 Oct. 1944

ABSTRACT: An anti-"g" suit has been constructed out of cotton netting which works on the principle of the "Japanese finger trap". Tests at the Wright Field Centrifuge show that it gives a protection of  $\frac{1}{2}$  to 1 "g". The experimental model is now being strengthened and simplified.

5,980

Wilkins, R. W., S. Bradley, & C. K. Friedland 1946 CIRCULATORY EFFECTS  
OF THE HEAD-DOWN POSITION (NEGATIVE G) IN NORMAL MEN AND MEASURES  
DESIGNED TO COUNTERACT THEM. (Nat'l Research Council) C. A. M.  
Final Rept. OEMcmr-143 May 1946.

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Wilkins, R. W., S. E. Bradley, & C. K. Friedland 1946 CIRCULATORY  
ADJUSTMENTS TO THE HEADDOWN POSTURE. J. Clin. Invest. 25:937.

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Wilkins, R. W., S. E. Bradley, & C. K. Friedland 1950 THE ACUTE CIRCULATORY  
EFFECTS OF THE HEAD DOWN POSITION (NEGATIVE G) IN NORMAL MAN WITH A NOTE ON  
SOME MEASURES DESIGNED TO RELIEVE CRANIAL CONGESTION IN THIS POSITION.  
J. Clin. Invest. 29(7):940-949

SUMMARY: Studies of the circulatory effects of the head-down position have revealed venous, and to a lesser extent, arterial hypertension in the head to be among the more important changes. Because of moderating physiological mechanisms, the increase in cerebral venous pressure in the inverted position is less than might otherwise be expected, but is still formidable, and presumably the chief cause of the ill effects reported to follow exposure to higher negative G. In the inverted position there was a decreased and often irregular pulse rate and an increased cardiac output (ballistocardiographic). After the initial passive (hydrostatic) change in arterial pressure there was a further moderate decrease, indicating vasodilation. A study of renal clearance showed that the kidneys did not participate in this vasodepressor response. Several simple methods of lessening cranial venous hypertension in the head-down position were found to give considerable relief from the usual symptoms and signs of cranial congestion caused by this posture. (DACO)

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Williams, D. 1944 ANALYSIS OF FPRC/450  
(RAF, Institute of Aviation Medicine, Farnborough)  
FPRC 450a, November 1944

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Williams, D. C. 1959 T33 AIRCRAFT EJECTION SEAT TRIALS LOW LEVEL CASE  
USING D-RING LANYARD SYSTEM (Royal Canadian Air Force Central  
Experimental and Proving Establishment) Report No. CEPE-1363,  
March 1959.

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Williams, D.J. 1943 EPISODES OF UNCONSCIOUSNESS, CONFUSION, AND  
AMNESIA WHILE FLYING. (Flying Personnel Research Committee, Air Ministry)  
F.P.R.C. Report # 562, November 1943

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Williams, E.R.P. 1942 BLAST EFFECTS IN WARFARE (Hunterian lecture). Brit. J  
Sur., 30:38-49

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Williams, G.O. 1945 NATURE AND SITE OF INJURIES RECEIVED IN FLYING  
ACCIDENTS. (RAF, Institute of Aviation Medicine, Farnborough)  
FPRC 639, Sept. 1945.

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Williams, G.O. 1945 NATURE AND SITE OF INJURIES RECEIVED IN FLYING  
ACCIDENTS: SECOND REPORT. (RAF, Institute of Aviation Medicine,  
Farnborough) FPRC 639(a), Jan. 1946.

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Williams, G.O. 1946 NATURE AND SITE OF INJURIES RECEIVED IN  
FLYING ACCIDENTS: THIRD REPORT. (RAF, Institute of Aviation Medicine,  
Farnborough) FPRC 639(b), June 1946.

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Williams, G.O. 1946 NATURE AND SITE OF INJURIES RECEIVED IN FLYING  
ACCIDENTS: FOURTH REPORT. (RAF, Institute of Aviation Medicine,  
Farnborough) FPRC 639(c), Aug. 1945.

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Williams, G. O. 1946 NATURE AND SITE OF INJURIES RECEIVED IN FLYING  
ACCIDENTS. (Flying Personnel Research Committee) November 1946.

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Williams, M. M. D., E. J. Baldes, R. K. Ghormley, & C. F. Code 1944 ARE THE  
INTERVERTEBRAL DISKS COMPRESSED OR DISPLACED DURING POSITIVE ACCELERATION?  
(Mayo Clinic) CAM Rept. No. 255, 18 Feb. 1944

ABSTRACT: Anteroposterior and lateral X-ray pictures were taken of the lower  
spinal region in 4 subjects before and during exposure to 2 to 6 "g". No signifi-  
cant change was detected in the measurements of the lumbar intervertebral spaces  
and the total length of the lumbar spine. It is concluded that there is no com-  
pression or displacement of the lumbar spine under these values of "g".

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Williams, K. G. 1959 THE NEW FRONTIER: MAN'S SURVIVAL IN THE SKY  
(London: William Heinemann Medical Books, 1959)

ABSTRACT: Of special interest are chapters on the basic man-machine control  
system; the problem of input, man versus automatic control; fatigue, prevention  
of fatigue; selection of the man, teamwork in flying; problems and psychological  
dangers of weightlessness.

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Williams, P.C. LESIONS OF THE LUMBOSACRAL SPINE: PT I, II. Journ. Bone  
Joint Surg. 19(1937): 343, 690.

5,995

Williams, R.B. & R.J. Benjamin 1960 ANALYSIS OF WEBBING IMPACT DATA AND DETERMINATION OF OPTIMUM INSTRUMENTATION TO BE USED IN CONJUNCTION WITH THE IMPACTING OF WEBBING. (Cook Technological Center, Morton Grove, Ill.) Contract No. AF 33(616)-6440, Project No. 7320, WADC TR 59-694, March 1960. ASTIA AD 237 171.

ABSTRACT: Quantities of data have been obtained at Edwards Air Force Base, California, concerning the impact behavior of nylon webbing. The basic aims of this investigation are:

- (1) To evaluate and analyze the methods used to obtain data acquired during nylon webbing impact tests conducted at Edwards Air Force Base, California.
- (2) To interpret these data and to judge their reliability.
- (3) To recommend, if necessary, improved or modified testing methods and instrumentation techniques which would result in obtaining data of greater value in future tests.

Analysis and interpretation of the test data indicated that these data were of intermediate reliability. Certain trends were apparent, but relatively large experimental scatter existed. Possible causes of the scatter were investigated and recommendations were made for improvement of testing methods, equipment, data reduction technique, and data interpretation.

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Williamson, F., Jr. 1963 FEASIBILITY STUDY AND DEMONSTRATION OF VARIABLE-THRUST PROPULSION FOR A SOFT-LANDING VEHICLE. (Naval Ordnance Test Station, China Lake, Calif.) NAVWEPS-7900; NOTS-TP-2901; NASA N63-13759; Jan. 1963

ABSTRACT: The soft-landing vehicle was designed and tested to demonstrate the feasibility of using the NOTS Variable Area Injector to softly land a rocket vehicle without the aid of aerodynamic forces. The vehicle was tested in a vertical track which restricted freedom of movement to the direction of the vertical axis. Propellant tank capacity of the soft-landing vehicle was 200 lbs. of inhibited red fuming nitric acid and 100 lbs. of unsymmetrical-dimethylhydrazine. Total loaded weight of the vehicle was 700 lbs. and maximum thrust was 1,300 lbs. The vehicle successfully completed four captive flight tests. During these tests a maximum height of 155 ft. and landing velocities between 3.8 and 8.3 ft. per sec. were achieved. Thrust control was sufficient to allow the observer to hover the vehicle. (AUTHOR)

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Willis, J. M. 1962 THE ROLE OF MOTION INFORMATION AND ITS CONTRIBUTION TO SIMULATION VALIDITY: DESCRIPTION OF THE EXPERIMENTAL APPARATUS. (Bell Helicopter Co., Ft. Worth, Texas) TR D228-370-005, Apr. 1962

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Willis, M. P. & F. Siroky 1960 SIMULTANEOUS VS SUCCESSIVE PRESENTATION OF RELATIVE MOTION PROBLEMS (U. S. Naval Training Devices Center, Port Washington, New York) 26 August 1960 AD 248 419.

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Willmorth, N. E., & G. A. Green 1950 THE EFFECT OF INCREASED POSITIVE RADIAL ACCELERATION ON THE SPEED AND ACCURACY OF REACHING MOVEMENTS. (Paper, 30th Annual Meeting of the Western Psychological Assoc., 27-29 April 1950, Santa Barbara, Calif.)

ABSTRACT: The purpose of this study was to compare speed and accuracy of reaching movements for up, down, right, and left target positions at increased g-levels.

Results show that reaction and movement times increase, and accuracy decreases, significantly, with increased g. Errors of underestimation and negative-inertia determined the position of strikes on the targets. (Amer. Psychologist 5(9):465, Sept. 1950)

6,000

Willmorth, N.E., and G.A. Green 1950 THE EFFECT OF INCREASED POSITIVE RADIAL ACCELERATION ON THE SPEED AND ACCURACY OF REACHING MOVEMENTS.  
Abstract: Amer. Psychol., 5(9):466. 1950

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Wilson, A.G. 1958 THE SPACE ENVIRONMENT.  
(The Rand Corp., Santa Monica, Calif.) Report. No. P-1427, Feb 1958

6,002

Wilson, C. L. 1959 PROJECT MERCURY CANDIDATE EVALUATION PROGRAM.  
(Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TR 59-505;  
ASTIA AD-234 749; Dec. 1959

ABSTRACT: The National Aeronautics and Space Administration (NASA), a U. S. Government civilian agency, has been assigned the task of exploring the feasibility of space travel. As a result of thorough and exhaustive study, NASA has concluded that certain aspects of space travel are feasible and, furthermore, that some will be practicable in the very near future. One profile of space travel envision that a human pilot, transported in a life support system (capsule), could be

thrust into orbit by a liquid fuel rocket, maintained there for several revolutions around the earth, and successfully and safely recovered from orbit. Project Mercury intends to realize this vision.

Among the many strategic questions to be answered is: "Who will the pilot be?" This report describes how and why the Aerospace Medical Laboratory participated in the selection of the seven Mercury Astronauts. (CARI)

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Wilson, C.W.J. 1957 BIBLIOGRAPHY ON LOW DENSITY WIND TUNNELS (Royal Aircraft Establishment (Gt. Brit.) Library Bibliography no. 194, Nov. 1957, ASTIA AD-217 324

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Wilson, C.W.J. 1957 BIBLIOGRAPHY ON LOW DENSITY WIND TUNNELS (Royal Aircraft Establishment (Gt. Brit.) Library Bibliography no. 194, Nov. 1957, ASTIA AD-217 324

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Wilson, J.S., E.H. Estes, J.T. Doyle, W.L. Bloom, & J.V. Warren 1951 THE USE OF DEXTRAN IN THE TREATMENT OF BLOOD LOSS AND SHOCK.  
(U.S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla.)  
NM 001 050. 01.03, 1 Oct. 1951. ASTIA ATI 122250.

ABSTRACT: A solution of dextran, a glucose ploymer, has been fiven to five normal individuals previously subjected to experimental blood loss of from 450 to 900 cc., and to 52 patients suffering from clinical shock. The use of dextran following experimental blood loss resulted in hemodilution and an increase in the circulating plasma volume. In the treatment of shock due to blood loss, trauma and dehydration, dextran brought about satisfactory clinical improvement. Results were poor in those patients with cerebral trauma or infection, even though satisfactory hemodilution occurred. In general, the therapeutic results were essentially the same as might have been expected from plasma. Dextran appears to be a satisfactory plasma volume expander offering advantages of large scale production, storage stability, and convenient reaction-free use in clinical practice.



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Wilson, James V. 1946 THE PATHOLOGY OF TRAUMATIC INJURY. (Aberdeen, Great Britain: The Central Press, 1946)

6,007

Wilson, J.W. 1949 THE EFFECT OF PRONE POSITION UPON THE DURATION OF USEFUL CONSCIOUSNESS AT ALTITUDE (Aero Medical Laboratory, Air Materiel Command, Wright-Patterson AFB, Dayton, Ohio) MCREXD-696-1071, 4 January 1949

ABSTRACT: One may conclude therefore, from these studies, that the aviator will be neither better nor worse if he assumes a prone or sitting position if loss of oxygen at altitude occurs. His duration of useful consciousness will probably depend upon factors other than posture.

6,008

Wilson, R. C. 1950 THE EFFECT OF INCREASED POSITIVE RADIAL ACCELERATION ON PERCEPTUAL SPEED AND SPATIAL ORIENTATION ABILITIES. (Paper, 30th Annual Meeting of the Western Psychological Assoc., 27-29 April 1950, Santa Barbara, Calif.)

ABSTRACT: Perceptual Speed Ability and Spatial Orientation Ability were studied using test items adapted from the Guilford-Zimmerman Aptitude Survey and the AAF Discrimination Reaction Time Test. Test items were administered to subjects at 1 g and under conditions of increased g. Results indicate no significant change in these abilities attributable to increased g forces below the blackout threshold. (J. Amer. Psychologist 5(9):465-466, Sept. 1950)

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Wilson, R.B., et al. 1951 REPORT ON PILOT SAFETY AND FAILURE WARNING SYSTEM FOR ATLAS/CENTAUR/DYNA SOAR (Convair Astronautics, San Diego, Calif 13 April 1951) Report AZP-096

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Wilson, R.C. 1950 THE EFFECT OF INCREASED POSITIVE RADIAL ACCELERATION ON PERCEPTUAL SPEED AND SPATIAL ORIENTATION ABILITIES. (Abstract) Amer. Psychol., 5(9): 466

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Wilson, R.C., G.A. Green, G.L. Bryan, N.E. Willmorth and N.D. Warren 1950  
AN INVESTIGATION OF CERTAIN AFTER EFFECTS OF INTERMITTENT POSITIVE RADIAL  
ACCELERATION. ( University of Southern Calif., Psychological Lab.,  
Los Angeles) Contract no. N6ori77, Task order 3, 19 pp., October 1950

ABSTRACT: Healthy young male students were employed as subjects in an attempt to determine the aftereffects of prolonged exposure to moderate g intensities.

The subjects were divided into experimental and control groups. A battery of six tests was administered to each group before rotation on the human centrifuge and again at the conclusion of the rotation.

The following general conclusion was reached:

- a. In the main, the abilities tested were unaffected by the prolonged exposure to g. With the following exceptions:
  - (1) the improvement of the experimental group was significantly less than the improvement of the control group in the time required to name colors (significant at the 1% level); and
  - (2) the improvement of the experimental group was significantly less than the improvement of the control group in the number of contacts made in the Steadiness Test (significant at the 5% level)

6,012

Wilson, R.C., and A.A. Canfield 1951 THE EFFECTS OF INCREASED POSITIVE RADICAL ACCELERATION UPON PUPILLARY RESPONSE in PHYSIOLOGICAL RESEARCH ON THE HUMAN CENTRIFUGE: FINAL REPORT (Department of Psychology, University of Southern California, Los Angeles, California) Technical Report N6 or 177, 1951

6,013

Wilson, R. C., G. L. Bryan, G. A. Green, N. E. Willmorth, A. A. Canfield, and N. D. Warren. 1951 AFTER EFFECTS OF INTERMITTENT POSITIVE RADIAL ACCELERATION. J. Aviat. Med. 22(5):509-517.

CONCLUSIONS: In general, intermittent exposure to positive radial acceleration does not significantly affect the performance on the tests of this battery. However, two exceptions to this general statement occur: (1) the improvement of the experimental group was significantly less than the improvement of the control group in the time required to name colors; and (2) the improvement of the experimental group was significantly less than the improvement of the control group in the number of contacts made in the Steadiness Test. The evidence from this study does not support the hypothesis that exposure to g, per se, is a significant factor in producing the post-flight fatigue which pilots have reported. On the basis of these results, no changes or modifications in design of aircraft controls or flight procedures are recommended.

6,014

Wilson, R. C., & A. A. Canfield      AN EXPERIMENTAL INVESTIGATION OF  
THE EFFECTS OF INCREASED POSITIVE RADIAL ACCELERATION ON THE REPRODUCTION  
OF SHORT TEMPORAL INTERVALS (10 SECONDS). (Dept. of Psychol., Univ. of  
Southern Calif.) Contract No. N6 ori 77, Task Order 3

6,015

Wilson, R. C. and A. A. Canfield    1951    THE EFFECTS OF INCREASED POSITIVE  
RADIAL ACCELERATION UPON PUPILLARY RESPONSE. (In Warren, M. D., ed.,  
Psychological Research on the Human Centrifuge: Final Report) (Dept. of  
Psychology, Univ. of Southern Calif., Los Angeles, June 1951) Tech Rept.  
N6-ori-77, Task Order 3.

6,016

Wilson, W.S.    1960    HUMAN FACTORS IN SPACE FLIGHT: A BIBLIOGRAPHY COMPILED  
BY AIRCRAFT AND MISSILES  
(Chilton Research Services: Philadelphia) 1960 (Mimeo Report)

6,017

Wimperis, H. E.    1931    HIGH SPEED FLYING J. R. Aero. Soc. 35:1040-1046.

6,018

Windle, W. F., R. A. Groat, & H. W. Magoun    1944    FUNCTIONAL AND STRUCTURAL  
CHANGES IN CENTRAL NERVOUS SYSTEM, DURING AND AFTER EXPERIMENTAL  
CONCUSSION Trans. Amer. Neurol. Ass. 70:117-122.

6,019

Wimperis, H.E.    1939    NATURAL LIMITS TO HUMAN FLIGHT  
Smithsonian Inst. Annual Report 579-593.

6,020

Windes, S. L.    Feb. 1942    REPORT OF INVESTIGATIONS, DAMAGE FROM AIR  
BLAST, PROGRESS REPORT 1. (U. S. Dept. of Interior, Bureau of  
Mines) RI 3622, Feb. 1942.

6,021

Windle, W. F., R. A. Groat, & C. A. Fox 1944 EXPERIMENTAL STRUCTURAL ALTERATIONS IN THE MAIN DURING AND AFTER CONCUSSION. Surg., Gynecol. Obstet. 79:561

6,022

Windle, W. F. and R. A. Groat 1945 DISAPPEARANCE OF NERVE CELLS AFTER CONCUSSION. Anat. Rec. 93:201-209.

6,023

Winfield, B.J.O. 1948 SOME MEDICAL ASPECTS OF PARACHUTE TRAINING (Air Ministry, Flying Personnel Research Committee) Report No. FPRC/674

6,024

Winfield, B.J.O. & C. Crichton-Miller 1942 ABBREVIATED FORM OF A STATISTICAL REPORT ON PARACHUTING BASED ON 11,000 DESCENTS MADE AT RINGWAY DURING NOVEMBER, DECEMBER, AND JANUARY, 1941/2  
Flying Personnel Research Committee, Farnborough, England FPRC 445  
ASTIA ATI 206 834

ABSTRACT: The object of the investigation was to secure some information about parachute descents, based on a sufficiently large number of cases to be fairly definite and reliable. All injuries occurring within the period were analysed and the variation of the injury rate with the physical characteristics of the man, his experience, and the wind and weather conditions were examined. Wind speed measurements were recorded on the actual dropping ground for 4,165 descents, and the actual landings were noted and descriptions recorded in 2,792 cases. A note was also kept on the frequency of various other occurrences, e.g. thrown lines, twisted rigging lines, interference between men and containers or their parachutes, men landing in trees, on obstructions, etc. A general survey of the injuries sustained in 11,190 descents was also undertaken. Some deductions have been drawn from the information which may or may not be considered acceptable; but it is hoped that the raw information will prove useful to those desiring to draw their own conclusions and desiring statistical information on which to base their own theories.

6,025

Winfield, R.H. 1940 INCIDENCE AND CAUSATION OF AIRSICKNESS IN OPERATIONAL AIRCREWS. (RAF, Institute of Aviation Medicine, Farnborough) FPRC 220(a), Dec. 1940.

6 026

Winfield, R.H. 1941 AIRSICKNESS IN PARACHUTE TROOPS.  
(RAF, Institute of Aviation Medicine, Farnborough)  
FPRC 277, March 1941.

6,027

Winfield, R.H. 1942 DISCUSSION ON THE EFFECTS OF FLYING ON THE NOSE AND  
EAR. OBSERVATIONS ON AIR SICKNESS. Proc. R. Soc. Med., 35:257-258.  
Also: J. Laryng., 57:23-25

6,028

Winfield, R.H. 1946 FLYING PERSONNEL RESEARCH COMMITTEE REPORT ON THE PROBLEM OF  
AIRSICKNESS IN PARACHUTE TROOPS (RAF, Institute of Aviation Medicine, Farnborough  
Dec. 1946

ABSTRACT: The object of this investigation was twofold. First to determine the incidence of airsickness among parachute troops and secondly, to consider means by which it might be prevented. It was found that airsickness occurs in a very high proportion of casual troops flown in troop-carriers. This is in part due to lack of control of the accessory factors. No cases of airsickness have been recorded on the twenty minute flights made by parachute troops during training. Three cases of airsickness out of thirty-six troops were reported on the ten and a half hour flight made to the advanced base on the Colossus operation. This relatively low incidence of airsickness as compared with the condition in troop carriers is consistent with the care taken in dealing with the accessory factors in transporting parachute troops. Airsickness on long flights with parachute troops could be still further reduced by eliminating those liable to vomiting by giving all prospective troops a trial flight of three or four hours.

6,029

Winfield, R.H. 1947 MEDICAL PROBLEMS OF THE MERCHANT SHIP FIGHTER UNIT (M.S.F.U.)  
(RAF, Institute of Aviation Medicine, Farnborough) FPRC Report 469; Oct. 1947,  
ASTIA ATI-206 859

ABSTRACT: This paper gives an account of the Merchant Ship Fighter Unit and the medical problems which have arisen in connection with it. The question of selection and training of personnel is considered and the various ways of raising the morale of the unit on land and at sea are discussed.

6,030

Winfield, R.H. & Crichton-Miller, C. 1942 PARACHUTING: BASED ON  
11,000 DESCENTS MADE AT RAF RINGWAY. (RAF, Institute of Aviation  
Medicine, Farnborough) FPRC 445, March 1962.

6,031

Wing, C. W. and G. E. Passey 1950 THE PERCEPTION OF THE VERTICAL: XI.  
The Visual Vertical under Conflicting Visual and Acceleratory Factors.  
(USN. School of Aviat. Med., Naval Air Stat., Pensacola, Fla.) Rept. No.  
NM 001 063.01.20. 15 Nov. 1950. Research Project NM 001 110  
500.20, 11-15-50.

SUMMARY:

- 1) Four Ss made adjustments of the visual vertical in both presence and absence of a visual frame of reference under varying resultant acceleratory forces produced in a human centrifuge.
- 2) In the absence of a visual frame of reference the subjectively accepted vertical to which S adjusted a target was aligned with the resultant acceleratory force. The adjustment was made whether or not the resultant force was aligned with S's body axis or acted at some angle to it.
- 3) In the presence of a visual frame of reference which was alignment with the resultant forces S adjusted the visual vertical to a position which placed the target in alignment with the resultant force and the main lines of the visual framework.
- 4) In the presence of a visual frame of reference which is aligned with S's body axis and a resultant force which acts at some angle with S's body axis and the visual frame of reference S adjusts the visual vertical to a position of compromise. Neither visual or postural cues are accepted to the exclusion of the other. With increased intensity of the postural cues furnished by an acceleratory force the visual vertical is located relatively nearer to the vertical determined by the resultant force.
- 5) The results are related to the work of Asch and Witkin (1), (2), and Witkin and Asch (9) and to the work of Gibson and Mowrer (3). On the basis of the results of this experiment we find judgment of the visual vertical to be a function of both visual and postural factors.

6,032

Wing, M. E. 1962 THE RESPONSE OF THE OTOLITH ORGANS TO TILT.  
(School of Aerospace Medicine, Brooks AFB, Texas) SAM-TDR-62-132; Nov. 1962

ABSTRACT: Action potentials and their changes in response to tilt were recorded from 60 units in the vestibular ganglion, presumably supplying the otolith organs of 10 cats. The action potentials in all units were infrequent and irregular

after position was maintained for some time. The majority of the units showed no response to any change in position. In most cases, of those which exhibited a response, the responses were delayed an average of 40 seconds. The evidence presented supports the view that the utricle and saccule may be vestigial organs, or at least do not function meaningfully in the orientation of the cat with respect to the gravitational field. (AUTHOR)

6,033

Winget, C.M., and A.H. Smith 1962 QUANTITATIVE MEASUREMENT OF  
LABYRINTHINE FUNCTION IN THE FOWL BY NYSTAGMOGRAPHY.  
J. Appl. Physiol. 17: 712-18, July 1962.

ABSTRACT: It is commonly known that some of the most important mechanisms governing posture and equilibrium of vertebrates are located in the labyrinth of the inner ear. Stimulation of this region by rotation, heat, or electricity leads to a variety of compensatory motions, one of the most obvious being nystagmus, a spasmodic oscillation of the eyes. A detailed description of this process and discussion of its neurological origin is given. Anatomical and functional descriptions of the labyrinth also are available as well as a summary of experiments, usually involving surgical alteration of the organ.

Under some circumstances, birds suffer postural or equilibrium difficulties which appear to result from labyrinthine damage or malfunction. In birds with Newcastle disease, peculiar postural attitudes are assumed as well as abnormal movements. Chronic exposure of birds to a relatively low accelerative force, produced by centrifugation, also appears to affect labyrinthine function. An apparatus functionally similar to the Bárány chair for the determination of labyrinthine characteristics of birds, and the conditions for its use are described herein.

6 034

Winget, C.M., A.H. Smith & C.F. Kelly 1962 EFFECTS OF CHRONIC  
ACCELERATION ON INDUCED NYSTAGMUS IN THE FOWL.  
J. Appl. Physiol. 17(4):709-711, July 1962.

ABSTRACT: Domestic fowl exposed to chronic acceleration (prolonged centrifugation) do not appear to "habituate" to repeated rotatory stimulation, as do similarly treated birds maintained at normal gravity. Chronically accelerated birds frequently exhibit postural or locomotor abnormalities, and such individuals lack a nystagmus response to rotary stimulation.

6,035

Wingrove, R. C. & R. E. Coate 1961 PILOTED SIMULATOR TESTS OF A GUIDANCE SYSTEM WHICH CAN CONTINUOUSLY PREDICT LANDING POINT OF A LOW L/D VEHICLE DURING ATMOSPHERE RE-ENTRY.  
(National Aeronautics and Space Administration, Washington, D. C.)  
NASA TN D 787, March 1961.

ABSTRACT: The guidance system studied is based on the concept of fast continuous trajectory computation from conditions existing along the trajectory. A method of display compares desired touchdown points with the maximum range capability and heating or acceleration boundaries, so that a proper decision and choice of control inputs can be made. Results from piloted fixed-simulator tests for typical re-entries with lunar mission velocities and for recoveries from aborts are presented. (Tufts)

6,036

Wingrove, R. C. & R. E. Coate 1961 PILOTED STIMULATION STUDIES OR RE-ENTRY GUIDANCE AND CONTROL AT PARABOLIC VELOCITIES.  
(Institute of the Aerospace Sciences, New York, N. Y.)  
Paper 61 195 1889, June 1961.

ABSTRACT: The results of piloted simulation studies are presented and compared for two piloted re-entry guidance methods for controlling lifting vehicles through a planetary atmosphere to a desired touchdown point. One method continuously predicts from present conditions the remainder of the re-entry trajectory with trim conditions held constant, and the pilot judges what control inputs to apply from these predictions. The second method uses feedback control in combination with a predetermined fixed trajectory to guide the pilot in correcting trim conditions. Usable range, usable entry corridor, and pilot's time-tolerance to acceleration are compared for the two methods. (Tufts)

6,037

Winquist, P.G. & P.M. Stumm 1952 ABRUPT DECELERATION STUDIES OF SURVIVAL LIMITS IN HOGS WITH A MONORAIL DECELERATOR, 51 EXPERIMENTS.



6,038

Winqvist, P. G., P. W. Stumm, & Robin Hansen 1953 CRASH INJURY EXPERIMENTS  
WITH THE MONORAIL DECELERATOR. (Air Force Flight Test Ctr., Edwards, Calif.)  
AF Technical Rept. No. AFFTC 53-7; ASTIA AD-16 297; 27 Apr. 1953

ABSTRACT: Nineteen deceleration tests were conducted on anesthetized hogs in a carriage which was suspended from a monorail, propelled by an ejector seat, and decelerated by striking a lead cone. Thirteen hogs were allowed to leave the carriage and strike an impingement block and 6 hogs were restrained by harness straps. The range of survivable impingements was below velocities of 24 fps and kinetic energies of 1600 ft-lb. The lower abdominal region appeared more vulnerable than the thorax; one hog survived a chest impact against the impingement block, while another hog died from a comparable abdominal impact. One hog wearing an abdominal belt was killed, while another wearing the belt survived. Three hogs survived decelerations of 130, 148, and 176 g, respectively, when each was wearing a shoulder strap, abdominal belt, and a pelvis-restraining strap. The monorail decelerator was considered a useful and economical test instrument. (ASTIA)

6 039

Winter, K. 1961 DER ERSTE SCHRITT INS WETTAL (The First Step into  
the Universe) (Weltrumfahrt (Frankfurt), 12(4):101-103, July-August  
1961, in German)

ABSTRACT: This is a description of Yu. Gagarin's orbital flight as compiled from open Soviet literature and newspapers. Education, training and background of Soviet astronauts are similar to those in the United States. According to Gagarin's own notes, he ate and drank, wrote, and was not adversely affected by weightlessness. Gagarin wore a space suit throughout the flight. Preparation for the flight included parabolic flight, centrifuge rides, and parachute jumps.

6,040

Winters, W. D. 1961 NEUROPHYSIOLOGICAL ASPECTS OF SPACE FLIGHT.  
(Paper, AAS Lunar Flight Symposium, 29 Dec. 1961, Denver, Colo.)

6 041

Wisniewski, V. 1937 ETAT DU SYSTEME CIRCULATOIRE AVANT ET APRES LES VOLS DE CHASSE. (State of the circulatory system before and after pursuit flights.) Polski przeglad medycyny lotnicz., 6:15-23

ABSTRACT: Rapid speed flights will produce in young pilots after the flight an increase in systolic arterial pressure and of the pulse rate with a fall in the Schneider index of two to three points, demonstrating fatigue of the circulatory system caused by hyper-adrenalinemia and the emotional factors involved.  
ABSTRACT: (Limited) Journal of Aviation Medicine, 9(1):77, March 1938

6,042

Wit, G. de Seasickness 1953 MOTION SICKNESS, A LABYRINTHOLOGICAL STUDY. Acta oto-laryng. Stockh. Suppl., No. 108

6,043

Witkin, H.A. and S.E. Asch 1948 STUDIES IN SPACE ORIENTATION. IV. FURTHER EXPERIMENTS IN PERCEPTION OF THE UPRIGHT WITH DISPLACED VISUAL FIELDS. Journal of Experimental Psychology, 38(6):762-782, Dec 1948

ABSTRACT: To determine how perception of the upright is affected by position of a simple luminous visual frame (28 degrees right, 28 degrees left, erect) and body position (28 degrees left, erect), 53 adult subjects in a completely darkened room adjusted a luminous rod (set within the frame) to the horizontal and vertical for all above combinations. In supplementary experiments judgments were made for : 1) additional frame positions, 2) frame within a frame situations, 3) rod with and without a frame situations. All results are discussed in terms of amount and direction of errors as a function of articulation of the visual field.

6,044

Witkin, H. A., & S. E. Asch 1948 STUDIES IN SPACE ORIENTATION; PERCEPTION OF THE UPRIGHT IN ABSENCE OF VISUAL FIELD. J. Exper. Psychol. 38:603-614, Oct. 1948.

6 041

Wisniewski, V. 1937 ETAT DU SYSTEME CIRCULATOIRE AVANT ET APRES LES VOLS DE CHASSE. (State of the circulatory system before and after pursuit flights.) Polski przeglad medycyny lotnicz., 6:15-23

ABSTRACT: Rapid speed flights will produce in young pilots after the flight an increase in systolic arterial pressure and of the pulse rate with a fall in the Schneider index of two to three points, demonstrating fatigue of the circulatory system caused by hyper-adrenalinemia and the emotional factors involved.

ABSTRACT: (Limited) Journal of Aviation Medicine, 9(1):77, March 1938

6,042

Wit, G. de Seasickness 1953 MOTION SICKNESS, A LABYRINTHOLOGICAL STUDY. Acta oto-laryng. Stockh. Suppl., No. 108

6,043

Witkin, H.A. and S.E. Asch 1948 STUDIES IN SPACE ORIENTATION. IV. FURTHER EXPERIMENTS IN PERCEPTION OF THE UPRIGHT WITH DISPLACED VISUAL FIELDS. Journal of Experimental Psychology, 38(6):762-782, Dec 1948

ABSTRACT: To determine how perception of the upright is affected by position of a simple luminous visual frame (28 degrees right, 28 degrees left, erect) and body position (28 degrees left, erect), 53 adult subjects in a completely darkened room adjusted a luminous rod (set within the frame) to the horizontal and vertical for all above combinations. In supplementary experiments judgments were made for : 1) additional frame positions, 2) frame within a frame situations, 3) rod with and without a frame situations. All results are discussed in terms of amount and direction of errors as a function of articulation of the visual field.

6,044

Witkin, H. A., & S. E. Asch 1948 STUDIES IN SPACE ORIENTATION; PERCEPTION OF THE UPRIGHT IN ABSENCE OF VISUAL FIELD. J. Exper. Psychol. 38:603-614, Oct. 1948.

6,045

Witkin, H.A. 1949 PERCEPTION OF BODY POSITION AND OF THE POSITION OF THE VISUAL FIELD. Psychological Monographs, 63(7):1-46

ABSTRACTS: To investigate factors involved in perception of body and visual field position, several experiments were employed a tilting room-tilting chair apparatus were performed. These included: 1) judging body and room orientation during changing relations between body and field, 2) adjusting body or room position to true upright, 3) adjusting body position to upright with and without visual field, 4) judging body and room position and adjusting pointer to upright. Qualitative differences in performance including illness brought on by unstable visual field are discussed. Quantitative differences in performance are discussed as a function of the relative importance of visual and postural sensations.

6,046

Witkin, H. A. 1950 PERCEPTION OF THE UPRIGHT WHEN THE DIRECTION OF THE FORCE ACTING ON THE BODY IS CHANGED. J. exp. Psychol. 40:93-106

6,047

Witkin, H. A. 1950 FURTHER STUDIES OF PERCEPTION OF THE UPRIGHT WHEN THE DIRECTION OF THE FORCE ACTING ON THE BODY IS CHANGED (Brooklyn Coll., Brooklyn, N. Y.) 1950

6,048

Witkin, H. A. 1952 FURTHER STUDIES OF PERCEPTION J. OF THE UPRIGHT WHEN THE DIRECTION OF THE FORCE ACTING ON THE BODY IS CHANGED Exper. Psychol. 43(1):9-20, DLC (BF1.J6, v.43)

ABSTRACT: The effect of rotation upon perception of the position of the body and the immediate environment was measured with the following apparatus: a small fully enclosed room moving around a circular track contained a chair which could be tilted to the right or left. The subject was asked to "straighten" the room if it appeared tilted and, in other trials, to "straighten" his body. The latter experiment was carried out with the room lighted or darkened (i. e. with or without a visual field). During rotation the room had to be tilted from the true upright toward the center of rotation to be perceived as upright. However, the magnitude of the shift of the force on the body was not proportional to the amount by which the room

was tilted. The amount of body shift (usually directed toward the center of rotation) was less with than without the visual field. Marked individual differences were observed. Reliance on visual or postural standards in orientation variation with different subjects. The judging of body position on the degree to which the body aligned with the displaced force acting upon it. Women appeared to adhere more closely to visual standards than men.

6,049

Witkin, H. S. 1954 THE SPACE-ORIENTATION TESTS.  
In Personality Through Perception (New York: Harper & Brothers, 1954)  
Chapt. 3

6,050

Witt, M.C. & R.F. Gray May 1958 HUMAN TOLERANCE TO HIGH ACCELERATION  
STRESS. (Lett. Rept. FED ADC AE 1411, 2 May 1958)

6,051

Witts, L. J. 1941 FLYING PERSONNEL RESEARCH COMMITTEE REMEDIES FOR SEA-SICKNESS  
AND AIR-SICKNESS. (RAF, Institute of Aviation Medicine, Farnborough)  
FPRC Rept. No. 318, July 1941; ATI-206 430

CONCLUSION: The non-proprietary remedies for sea- and air-sickness with most reputation are the belladonna alkaloids, amphetamine (benzedrine) and cerebral sedatives particularly chlorbutol (chloretone). (AUTHOR)

6,052

Witwer, R. G. 1943 AIR SICKNESS.  
U.S. Nav. M. Bull., 43:34-6

6,053

Wodak, E. Mar. 1956 ROTARY AND MOTOR INDUCED ILLUSIONS OF OPTIC AND OTHER SENSORY IMPRESSIONS DUE TO VESTIBULAR REACTION.  
Pract. Otorhinolar, Basel. 18(2).

6 054

Woellner, R.C. 1957 THE PERCEPTION OF VERTICAL IN THE PRESENCE OF INCREASED ACCELERATIVE FORCES. (Naval School of Aviation Medicine, Pensacola, Fla.) Research Project No. NM 17 01 11, Report no. 45 October 31, 1957.

ABSTRACT: Nine normal subjects were tested for their estimations of vertical and body axis when tilted to the side in a tilting chair and when exposed to a change in direction and magnitude of resultant force on a human centrifuge. It was found that the estimation of vertical lay close to the true vertical on the tilt chair and close to the angle of resultant force on the centrifuge. The constant error in both cases lay toward the subject's body axis, consistently but not significantly, and was slightly greater under increased resultant force on the centrifuge. The estimation of body axis had considerable deviation in each subject and also varied considerably from subject to subject.

6,055

Wojcik, W. 1936 OBSERVATIONS DU MEDECIN D'AVIATION CONCERNANT LES SAUTS AVEC PARACHUTES DANS L'ECOLE DE PILOTAGE (AVIATION MEDICAL OBSERVATIONS CONCERNING THE TUMBLING WITH PARACHUTES IN PILOT TRAINING) (poln., franzosische Zusammenfassung) Polski Przegl. Med. Lotn. 5, Nr 1, 20-33. Ref. J. aviat. Med. 7, 218

6,056

Woellner, R. C., & A. Graybiel 1958 REFLEX OCULAR TORSION IN HEALTHY MALES. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. MR005.13-6001. 1.47., 30 July 1958

6,057

Woellner, R. C., & A. Graybiel 1959 THE LOSS OF COUNTER-ROLLING OF THE EYES IN THREE PERSONS PRESUMABLY WITHOUT FUNCTIONAL OTOLITH ORGANS. (Naval School of Aviation Medicine, Pensacola, Fla.) Research Proj. MR005.13-6001, Rept. No. 50; ASTIA AD-235 887; 15 Dec. 1959

ABSTRACT: In three subjects with bilateral defects of the inner ear, ocular torsion was determined using a method of subconjunctival sutures in an effort

to determine whether counter-rolling occurred in these persons when they were tilted or when exposed to a change in direction of centripetal force on a human centrifuge. No regular dependence was found between counter-rolling and gravitational or inertial force in the three subjects. The findings suggest that counter-rolling is a response to stimulation of the otolith organs but do not eliminate the possibility of other causes. (AUTHOR)

6,058

Woellner, R. C., & A. Graybiel 1959 COUNTERROLLING OF THE EYES AND ITS DEPENDENCE ON THE MAGNITUDE OF GRAVITATIONAL OR INERTIAL FORCE ACTING Laterally ON THE BODY. J. Appl. Physiol. 14(4):632-634, Jul 1959

ABSTRACT: Counterrolling of the eyes was measured in five healthy persons when inclined on a tilt-chair and when exposed to a change in direction of force on a human centrifuge. For equivalent changes in direction of force incident to the subject, the magnitude of the force was greater on the centrifuge. When the amount of roll was plotted as a function of the incident angle of force, divergent curves were obtained for tilt-chair and centrifuge data. When the amount of roll was plotted as a function of magnitude of laterally-acting force as the independent variable, a single curve resulted indicating a straight line relation within the range of 1 G. These findings not only constitute definite proof that the counterrolling reflex can be released by gravitational (and inertial) force, but also are consistent with the current theory of the functioning of the otolith organs. (AUTHORS)

6,059

Wolbers, H. L. 1961 RECENT DEVELOPMENTS IN BIO-MEDICAL INSTRUMENTATION. ARS J. 31(10):1422-1428, Oct. 1961.

ABSTRACT: New techniques of sensing and analyzing physiological changes in human Ss were considered. Bioelectronic recording techniques that were developed to record physiological and psychological changes with stress as supplementary to work output changes were described. "Minisensors" combining the sensing device, signal amplification stages, and an FM transmitter were developed and used to transmit physiological changes over a distance of 50 ft. or more. The possible uses of the system in other situations were discussed. Improvements possible in the data analytic methods were illustrated by applying the techniques used in detecting and classifying sonar returns to EKG recordings. (Tufts)

6,060

Wolf, Robert A., B. J. Campbell, M. I. Macht; M. A. Kraft; and J. W. Garrett 1961 THE INJURY-PRODUCING AUTOMOBILE ACCIDENT: A primer of facts and figures.  
(Automotive Crash Injury Research of Cornell University) August 1961

ABSTRACT: Since 1953 Automotive Crash Injury Research (ACIR) of Cornell University has collected, processed, and analyzed approximately 25,000 case reports on automobiles involved in injury-producing accidents, and 17,000 case reports on automobiles involved in property damage accidents.

The charts in this primer are based on data collected through random or administrative sampling plans designed to provide representative injury-producing accident data from a number of states. Although certain "special" study samples were also collected -- property damage, recent model cars, seat belt cases, etc. -- these have been excluded from this presentation in order to provide a cohesive accident picture. Tabulations are therefore based on a total of 11,892 cars involved in rural injury-producing accidents: 1,807 collected during the period 1953 to 1955, and 10,085 collected from 1956 to 1959. It is planned that other time periods will also be presented in the future.

6,061

Wolf, Robert 1961 AUTOMOBILE CRASH INJURY RESEARCH - CORNELL UNIVERSITY  
(Paper, Symposium On Impact Acceleration Stress, Brooks Air Force Base, San Antonio, Texas, November 27-29, 1961)

6,062

Wolf, R.A. 1962 CAUSES OF IMPACT INJURY IN AUTOMOBILE ACCIDENTS  
(In: Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography, National Academy of Sciences, National Research Council, Publication No. 977, pp. 45-60)

ABSTRACT: The Automotive Crash Injury Research project (ACIR) of Cornell University has collected and analyzed a sufficiently large number of automobile accidents to allow ranking some of the major causes of injury attributable to interior configuration of the American automobile. This paper deals with ranking ten of the major identifiable "causes" of injury to passengers (physical features of automobile interiors) according to the magnitude of their injury producing effects. Special emphasis is directed to the differences in ranked pattern of the "causes" as they vary with direction of external impact on the injury-producing car; the principal directions being considered are forward, side, rear and rollover.



6,063

Wood, E.H., C.F. Code, & E.J. Baldes 1943 THE PROTECTION AFFORDED THE HUMAN BY HYDROSTATIC AS COMPARED TO PNEUMATIC ANTI-G DEVICES.  
(National Research Council, Committee on Aviation Medicine) CAM # 207,  
12 Nov. 1943. ASTIA AD 212 870

ABSTRACT: Nine hundred centrifuge runs were made on 12 subjects to compare the "g" protection afforded by:

- a. Immersion in water to xiphoid process.....0.9 "g"
- b. FFS containing 4.7 liters water.....0.9 "g"
- c. FFS fully inflated with water.....1.5 "g"
- d. Water immersion to 3rd rib at sternum.....1.7 "g"
- e. Pneumatic gradient pressure suit.....1.9 "g"
- f. Arterial occlusion suit.....2.9 "g"

Arterial occlusion (Clark-Wood) suit has 4 pneumatic cuffs, one on each extremity close to the body and an abdominal bladder, which are inflated by "g" -activated valves. All blood vessels are occluded by it.

Conclusion of paper: Pneumatic pressure devices are definitely superior to hydraulic ones in affording "g" protection.

6,064

Wood, E. H., C. F. Code, & E. J. Baldes 1943 PROTECTION AGAINST THE EFFECTS OF ACCELERATION AFFORDED THE HUMAN BY ASSUMPTION OF THE PRONE POSITION.  
C. A. M. Rept. No. 158, 10 July 1943

ABSTRACT: Thirty centrifuge runs were made by 3 trained subjects. Vision dimmed at 3 "g" and blackout occurred at 4 to 5 "g" when subjects were sitting upright. In prone position vision was unaffected by 9 "g" for 10 seconds.

6,065

Wood, E. H., E. J. Baldes and C. F. Code 1944 CHANGES IN THE EXTERNAL APPEARANCE OF THE HUMAN BEING DURING POSITIVE ACCELERATION.  
(Mayo Clinic) CAM No. 391, 18 October 1944  
See Also Air Surgeon's Bull 2:117, April 1945.

ABSTRACT: Special equipment used for the testing of a human subject while undergoing different ranges of acceleration.

6,066

Wood, E.H., E.H. Lambert, & R.E. Strum 1944 SYSTOLIC BLOOD PRESSURE IN MAN DURING EXPOSURE TO HIGH ACCELERATIONS OF THE CENTRIFUGE  
National Research Council, Division of Medical Sciences, Committee on Aviation Medicine. Report No. CAM 338. August 4, 1944

ABSTRACT: (a) An instrument has been developed which records systolic pressure in humans using finger opacity pulse as an indicator. It has been used on three subjects in over 100 centrifuge runs in which the forearm was supported at brain level.

(b) In control runs for 15 seconds at maximum g with subjects unprotected, the maximum decrease in systolic pressure averaged 28 mm Hg per g above 1 g and occurred within the first 7 seconds after exposure.

(c) In centrifuge runs which did not produce unconsciousness, systolic pressure rose during exposure, the maximum recovery taking place 12 seconds after the onset of g. The average recovery was 35 mm Hg above the lowest blood pressure level.

(d) Blood pressure varied inversely as the maximum g attained. Clear vision persisted to 56 mm Hg; peripheral lights were lost at 39 mm Hg, and blackout occurred at 19 mm Hg.

(e) Blood pressure varied directly with ear opacity, (although ear opacity changes lagged behind blood pressure) and inversely as the changes in the heart rate.

6,067

Wood, E.H., E.H. Lambert, C.F. Code, & E.J. Baldes 1944 FACTORS INVOLVED IN THE PROTECTION AFFORDED BY PNEUMATIC ANTI-BLACKOUT SUITS.  
(Mayo Clinic) CAM No. 351, 24 Aug. 1944.

ABSTRACT: Field tests show that a suit giving 1.5 "g" protection on the centrifuge gives ample protection in aircraft.

(a) Three types of experiments were carried out on FFS, GPS, and AOS. Variation in blackout threshold was determined.

(1) With leg and abdominal bladders inflated to the same pressure.

(2) With abdominal bladder pressure only varied, with and without constant pressurization of leg bladders.

(3) With leg bladder pressure only varied, with and without constant pressurization of abdominal bladders.

(b) In general, as pressure increases, suit protection increases. The most important factor affecting the amount of protection afforded by the suit is the amount of pressure applied to the abdomen and trunk.

(c) Pressurizing leg bladders alone gives very little protection. (Average 0.2 "g"). However, pressurizing abdominal bladder alone gives 50 percent less protection than is afforded by abdominal plus leg bladders.

- (d) High pressures in suit, which uniformly give greatest protection, may also cause considerable discomfort. The most important factor is abdominal pressure. Hence the optimum suit pressure is the highest abdominal pressure the subject can stand comfortably. This varies with subject, type, and fit of suit. In general, the larger and more efficient the abdominal and trunk bladders, the lower is the optimum pressure.
- (e) Arm bladders are not necessary. When used alone they offer no protection at all although when used with a complete suit they increase protection 0.6 "g".
- (f) Recommended pressures for suits are as follows:
  - FFS..... 1/2 to 1 lb/g
  - GPS and Mark V AOS..... 1 to 2 lb/g

6 068

Wood, E. H., E. F. Code & E. J. Baldes 1945 THE SEQUENCE OF PHYSIOLOGIC EVENTS IN MAN DURING EXPOSURE TO POSITIVE ACCELERATION.  
Fed. Proc. 4(1):14-15.

ABSTRACT: There is a definite sequence to the physiologic events that occur in the comfortably seated human being during exposure to positive acceleration. This sequence is divided into two distinct periods: the period of progressive failure and the period of compensation.

During the period of progressive failure, the pulse rate progressively increases, the amount of blood in the ear is progressively reduced, the pulse in the ear may be gradually reduced or abruptly lost, the blood pressure at the level of the base of the brain declines and reductions of vision and consciousness, if they occur, become evident. As accelerations of greater intensity are experienced, the extent of these changes is increased.

The period of progressive failure is usually terminated by compensatory reactions, which become effective about six to eleven seconds after the onset of acceleration.

During the period of compensation, the blood pressure rises, the ear pulse may return or increase, the amount of blood in the ear increases, the pulse rate increase is checked and the pulse may slow and, if these compensatory changes are sufficiently effective recovery from symptoms (both loss of vision and consciousness) will occur.

This consistent pattern has been observed in a total of more than 250 subjects. Measurement of the magnitude of the changes has allowed the development of an accurate quantitative assay procedure for the determination of man's g tolerance and for the measurement of the efficacy of any device designed to prevent or offset these physiologic changes.

6,069

Wood, E.H., D.M. Clark and E H. Lambert 1945 AN ANALYSIS OF FACTORS INVOLVED IN THE PROTECTION AFFORDED MAN BY PNEUMATIC ANTI-BLACKOUT SUITS. Fed. Proc. 4:79

ABSTRACT: Establishment of the sequence of physiologic events that occur in man during positive acceleration has allowed a quantitative and orderly approach to the problem of protecting the aircraft pilot against blackout. The problem becomes: How may this physiologic sequence be altered so that the period of progressive failure is reduced or eliminated? Inflatable bladder system suits have proved a convenient and effective means of accomplishing this in man. By the use of suits that allowed application of pressure to the legs, thighs, abdomen and arms separately and in combination, a quantitative analysis of the factors involved in the protection afforded by such suits has been made.

In general, as the pressure within the suits was raised, the protection afforded increased. The most important single factor in the amount of protection obtained was the amount of pressure applied to the abdomen and trunk. In general, raising this pressure increased the protection afforded.

Application of pressure to the lower extremities alone afforded a barely perceptible amount of protection (average of 0.2g). Pressure to the lower extremities, while providing little protection alone, was found to increase by a factor of (approximately) two the protection afforded by application of pressure to the abdomen.

The findings revealed the simplicity of the essential requirements for a simple, effective anti-blackout suit. They led to the development and use of a simple, uniformly pressurized bladder system, which may be built into any type of garment—be it underwear, trousers, coveralls, cutaway and so forth.

6,070

Wood, E.H. & E.H. Lambert 1945 FACTORS INFLUENCING THE EFFICACY OF ANTI-G EQUIPMENT AT PRESENT IN USE. (National Research Council, Division of Medical Sciences) Report No. 442 CARI P & S 4.63.

ABSTRACT: This report reviews the different models of anti-blackout suits which have been developed and considers the major changes made during the process of development.

6,071

MOTION PICTURE

Wood, E. H. & G. A. Hallenbeck 1945 VOLUNTARY (SELF PROTECTIVE) MANEUVERS WHICH CAN BE USED TO INCREASE MAN'S TOLERANCE TO POSITIVE ACCELERATION. Fed. Proc. 4(1); 78-79.

ABSTRACT: Systolic blood pressure is a most important factor in determining man's tolerance to sudden exposure to high positive accelerations in the sitting position. Exposure to 5 g's for a duration greater than the symptom latent period of the retina or cerebrum to acute ischemic anoxia (2-10 seconds) usually produces blackout or unconsciousness. At this acceleration due to the height of the brain above the heart a systolic pressure of 120 mm. of mercury at heart level affords a systolic pressure of only 5 mm. of mercury at brain level and symptoms therefore result.

It has been found that voluntary maneuvers producing a temporary hypertension and aiding venous return will enable many individuals to maintain vision at 9 g. These maneuvers utilize either the pressor effect attained by coordinating muscular straining with a type of forced respiration or self-induced pressor reflexes such as occur immediately after a Valsalva maneuver of ten seconds' duration. Blackout prevention of 8 g's by one such maneuver (M-1) is illustrated. This maneuver is described to pilots as follows: "Just before the g comes on with all your strength pull your chin in and your shoulders up. Simultaneously push your belly against a tightly drawn safety belt as if straining at stool. As you do this, yell the word "Hey" as continuously as possible. Use up nearly all your breath on each "Hey", then grab a very fast breath and immediately start yelling again. Keep this up as long as you hold the g."

6,072

Wood, E. H., E. H. Lambert, E. J. Baldes, & C. F. Code 1946 EFFECTS OF ACCELERATION IN RELATION TO AVIATION. Federation Proceedings 3(5):327-344

ABSTRACT: Although this report is entitled, in part, "Effects of acceleration," actually the discussion is chiefly concerned with the effects of force on man.

Anti-blackout suits, especially simplified suits used by our air forces, are not the answer to the problem of prevention of blackout among aviators. Since in any given turn centrifugal force is proportional to the square of the velocity, it can be predicted that, with the advent of super-speed planes, the present anti-blackout suits soon will be as obsolete as the planes in which they were used. Additional physiologic investigations will be necessary before methods can be developed which will enable pilots to utilize the full potentialities of the new aircraft.

6,073

MOTION PICTURE

Wood, E. H., & G. A. Hallenbeck 1946 VOLUNTARY (SELF-PROTECTIVE) MANEUVERS  
WHICH CAN BE USED TO INCREASE MAN'S TOLERANCE TO POSITIVE ACCELERATION.  
(Acceleration Lab., Mayo Aero Medical Unit, Rochester, Minn.)

ABSTRACT: Systolic blood pressure is a most important factor in determining man's tolerance to sudden exposure to high positive accelerations in the sitting position. Exposure to 5 g for a duration greater than the symptom latent period of the retina or cerebrum to acute ischemic anoxia (3-10 seconds) usually produces blackout or unconsciousness. At this acceleration due to the height of the brain above the heart a systolic pressure of 120 mm. of mercury at heart level affords a systolic pressure of only 5 mm. of mercury at brain level and symptoms therefore result.

It has been found that voluntary maneuvers producing a temporary hypertension and aiding venous return will enable many individuals to maintain vision at 9 g. These maneuvers utilize either the pressor effect attained by coordinating muscular straining with a type of forced respiration or self-induced pressor reflexes such as occur immediately after a Valsalva maneuver of ten seconds' duration. Blackout prevention to 8 g by one such maneuver (M-1) is illustrated. This maneuver is described to pilots as follows: "Just before the g comes on with all your strength pull your chin in and your shoulders up. Simultaneously push your belly against a tightly drawn safety belt as if straining at stool. As you do this, yell the word "Hey" as continuously as possible. Use up nearly all your breath on each "Hey" then take a breath as quickly as possible and immediately start yelling again. Keep this up as long as you hold the g." (Federal Proceedings 5(1):115, 1946)

6 074

Wood, E.H., & E.H. Lambert 1946 THE EFFECT OF ANTI-BLACKOUT SUITS ON  
BLOOD PRESSURE CHANGES PRODUCED ON THE HUMAN CENTRIFUGE.  
(Acceleration Lab., Mayo Aero Medical Unit, Rochester, Minn.)

ABSTRACT: Direct arterial pressure (radial artery) was recorded in thirteen men during exposure to positive acceleration with and without anti-blackout suit protection. The procedures used are described in another abstract (see Lambert and Wood).

At the level of the eyes the decrease in blood pressure per g increase in acceleration averaged 32 mm. Hg. systolic and 19 mm. Hg. diastolic without the suit and 20 and 14 mm. Hg. respectively with the suit. At heart level with onset of acceleration, the pressures decreased on the average without the suit 3.0 mm. Hg. systolic and 0.0 mm. Hg. diastolic per delta g, while with the suit these pressures increased 5.0 mm. Hg. per delta g. The anti-blackout suit increased g tolerance by 1.4 g, 1.5 g, 1.7 g and 1.7 g as determined by visual symptoms, blood content of the ear, ear pulse and blood pressure at eye level, respectively. The protection afforded blood pressure was significantly greater than that afforded vision (P 0.001). This was associated with a tendency for visual symptoms to occur at higher levels of

blood pressure with the suit than without it.  
Inflation of anti-blackout suits produces an increase in blood pressure at heart level which is most marked during exposure to positive acceleration. This effect is responsible for the increased g tolerance produced.  
Federal Proceedings 5(1):116, 1946)

6,075

Wood, E. H., E. H. Lambert, & C. F. Code 1947 DO PERMANENT EFFECTS RESULT FROM REPEATED BLACKOUTS CAUSED BY POSITIVE ACCELERATION? J. Avia. Med. 18(5):471-482, Oct. 1947

ABSTRACT: The purpose of this project was to determine if the average pilot would develop residual or permanent effects as a result of blackouts or episodes of unconsciousness experienced in flight.

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Data collected on four of the members of the personnel of the Mayo centrifuge laboratories who have undergone the greatest number of exposures to acceleration. The majority of these exposures were experienced on the Mayo centrifuge. This group of subjects also experienced a relatively large number of exposures to high accelerations in a specially instrumented Douglas Dauntless Divebomber. It was concluded that the average pilot has little to fear in regard to the development of residual or permanent effects as a result of the blackouts or episodes of unconsciousness he may experience in flight. The greatest danger to the flyer is reduction in, or loss of control of, his aircraft at the time of loss of vision or consciousness.

6,076

Wood, E.H., C.F. Code & E.J. Baldes 1947 THE PHYSIOLOGICAL BASIS OF VOLUNTARY (SELF-PROTECTIVE) MANEUVERS CAPABLE OF INCREASING MAN'S TOLERANCE TO POSITIVE ACCELERATION. (Proceedings of the 17th International Physiological Congress, Oxford, 1947. pp. 2.)

6,077

Wood, E.H. 1947 USE OF THE VALSALVA MANEUVER TO INCREASE MAN'S TOLERANCE TO POSITIVE ACCELERATION. Fed. Proc. 6:229

6,078

Wood, E. H. 1950 SPECIAL INSTRUMENTATION PROBLEMS ENCOUNTERED IN PHYSIOLOGICAL RESEARCH CONCERNING THE HEART AND CIRCULATION IN MAN. Science. n. s. 112:707.

6,079

Wood, E.H. & E.H. Lambert 1952 SOME FACTORS WHICH INFLUENCE THE PROTECTION AFFORDED BY PNEUMATIC ANTI-G SUITS.  
J. Aviation Med. 23:218-228

ABSTRACT: Various factors which affect the protection against positive acceleration afforded by pneumatic anti-blackout suits, were studied on the human centrifuge. Inflation of the suit at 1 g produced a rapid increase in arterial blood pressure, which was followed by a slowing of the heart rate (carotid sinus and aortic depressor reflexes). This slowing could be prevented by administration of tetraethylammonium chloride. The effects of inflation of the component parts of the anti-blackout suit were compared with those of the whole suit: protection afforded by the leg bladders alone was 0.2 g; by the abdominal bladder alone, 0.6 g; and by both combined, 1.2 g. -Straining or pulling on a stick with 19 lb. of force per g afforded a protection of 0.7 g which was added to that of the pressure suit. Performing the Valsalva maneuver (voluntary maintenance of intrathoracic pressure) increased acceleration tolerance when a pressure suit was worn, but decreased it when it was done without a suit. The M-1 maneuver (a series of brief Valsalva maneuvers) alone afforded a protection of 0.4 to 5.2 g; when combined with the wearing of a pressure suit, the effect was less than the sum of the individual protective effects. Pressure breathing as well as a crouching position enhanced the protection afforded by the suit.

6,080

Wood, E.H. 1960 COMPENSATORY REACTIONS OF THE CARDIOVASCULAR SYSTEM TO ACCELERATION STRESS  
(Mayo Aero Medical Unit, Rochester, Minn.) Contract AF 33(616)-5938; Project 7220(805); WADD, MD

ABSTRACT: The aim of this research is the continuous measurement by dye dilution method, or methods to be developed, of cardiac output in man exposed to acceleration stress acting in various vectors in relation to the long axis of the body. Work will include studies of the relationship between the blood pressure at head level and the changes in blood control of the ear produced by headward acceleration.



6,081

Wood, Earl H., Evan F. Lindberg et al. 1960 MAN'S CARDIOVASCULAR RESPONSE TO HEADWARD ACCELERATION WHILE IMMERSED IN WATER  
Paper: 31st Annual Meeting of the Aerospace Medical Association, Americana Hotel, Bal Harbour, Miami Beach, Fla., May 9-11, 1960

ABSTRACT: Variations in ear opacity, ear opacity pulse, heart rate, respiration and reaction times to auditory and visual stimuli were recorded continuously in a series of 15 subjects during 15-second exposures to acceleration while seated in a steel tub mounted in the cockpit of the Mayo centrifuge. The level of acceleration was increased by increments of 0.5 to 1.0 G until complete loss of vision (blackout) was produced when the tub was empty (control) and when filled with water to the level of the xyphoid and also to the third rib at the sternum. A total of 200 centrifuge exposures to accelerations ranging from 2.0 to 9.0 G was carried out. It is believed that at head level a higher blood pressure is required to maintain vision during immersion in water than when no external pressure is applied to the lower part of the body; and that the protection afforded to blood pressure at head level and to maintenance of consciousness is greater than the protection afforded to vision.

6,082

Wood, E. H. et. al. 1961 EFFECT OF HEADWARD AND FORWARD ACCELERATIONS ON THE CARDIOVASCULAR SYSTEM  
(USAF Biomedical Lab., Wright-Patterson AFB, Ohio) (AF 33(616)5938, Proj. 7220, Task 71742) WADD TR 60 634, Jan. 1961.

ABSTRACT: To measure cardiac output and related physiological variables in human Ss exposed to acceleration stress in various body orientations, seven Ss were studied under three conditions: 1) headward (positive) acceleration of one-min. duration, 2) of ten-min. duration, and 3) forward (transverse) acceleration for ten-min. duration. In all cases the Ss were in a seated position on a human centrifuge. The indicator-dilution technique with sudden single injections of dye into the right atrium and continuous recording of the resulting curves from arterial blood was used to evaluate changes caused by acceleration. (Tufts)

6,083

Wood, E.H., P.F. Scholander & S.L. Allen PILOT G-TOLERANCE AND ACCELERATION-TIME CURVES IN FIGHTER AIRCRAFT  
A CAM Report in preparation

6,084

Wood, Earl H., William F. Sutterer, Hiram W. Marshall, Evan F. Lindberg & Robert N. Headley 1961 EFFECT OF HEADWARD AND FORWARD ACCELERATIONS ON THE CARDIOVASCULAR SYSTEM  
(The Mayo Foundation, Mayo Clinic, Rochester, Minnesota)  
(Wright Air Development Division, Aerospace Medical Laboratory, Wright-Patterson Air Force Base, Ohio) Proj. 7220; Task 71742; Contract AF33(6160-5938)  
WADD Technical Report 60-634 ASTIA AD 255298

ABSTRACT: The purpose of this research was to measure cardiac output and related physiological variables in human subjects exposed to acceleration stress in various body orientations. Results of these experiments indicate that an average decrease in cardiac output of 22% of control values occurs in subjects exposed to headward accelerations of 4 g. No systematic change in cardiac output could be demonstrated when these same subjects were exposed to forward accelerations of up to 5 g. As the duration of these exposures to acceleration were increased to 10 minutes, no further alterations in output were demonstrable.

Exposure to headward acceleration caused decreases in right atrial and esophageal (intrathoracic) pressure and in the oxygen saturation of arterial blood which were proportional to the magnitude of the acceleration. Forward acceleration, however, caused relatively large increases in right atrial and esophageal pressure but a decrease in arterial oxygen saturation. The decrease in arterial oxygen saturation was prevented by breathing 99.6% oxygen.

6,085

Wood, E. H., A. C. Nolan, & D. E. Donald 1963 EFFECT OF FORWARD ACCELERATION ON CIRCULATORY, PLEURAL AND RELATED PRESSURES. (Paper, 34th Annual Meeting of the Aerospace Medical Association, Statler-Hilton Hotel, Los Angeles, Calif., April 29 - May 2, 1963)

ABSTRACT: Pleural pressures were recorded simultaneously from the ventral and dorsal regions of the thorax using fluid-filled catheters inserted through the chest wall via No. 17 needles using an air-tight technique. Pressures were referenced to the catheter tip levels determined by A-P and lateral roentgenograms taken prior to and after a series of 1 to 3 minute exposures of 8 anesthetized dogs to accelerations of 2, 4 and 6 G in the supine horizontal and 15° head-up and head-down positions.

The negativity of intrapleural pressure in the ventral thorax was uniformly increased during exposures while intrapleural pressure in the dorsal thorax became positive. These changes are believed to result from the increase in weight of the lungs and other intrathoracic elements during acceleration and would be compatible with an average specific gravity of the thoracic contents of about 0.5 since the increase in gradient between the dorsal and ventral recording sites averaged about 0.5 cm. H<sub>2</sub>O per cm. of vertical distance between the sites per G to which the animal was exposed. Esophageal and pericardial pressures were similar or somewhat less negative than the intrapleural pressures at the same horizontal plane in the thorax. All dogs showed decreases in arterial oxygen saturation during exposures to 6 G when breathing air or 99.6 per cent oxygen similar to those previously observed in normal human subjects. Collapse of alveoli and consequent arterial-venous pulmonary shunting of blood appears to be the most likely mechanism for the arterial desaturation observed.

6,086

Wood, J., C.C. Cain & D. Mahoney n.d. PHYSIOLOGICAL EVALUATION OF THE PARTIAL PRESSURE SUIT. Memo Rept. MCREXD-696-104P. (unpublished)

6,087

Wood, P. W. 1961 LIGHT WEIGHT HIGH ACCELERATION CREW SEAT.  
(Vought Astronautics, Dallas, Texas) Progress Rept. No. 2, AST/EIR-13502,  
June 1961

6,088

Wood, P.W. 1961 INVESTIGATION OF A NET CREW SEAT CONCEPT FOR ADVANCED FLIGHT VEHICLES, PART I. (Aeronautical Systems Division, Wright-Patterson AFB, Ohio) Report 61-546. Oct. 1961.

6,089

Wood, P.W., Jr. 1962 INVESTIGATION OF A NET CREW SEAT CONCEPT FOR ADVANCED FLIGHT VEHICLES: INVESTIGATION AND DESIGN.  
(Aeronautical Systems Division, Dir/Aeromechanics, Flight Dynamics Lab., Wright-Patterson AFB, Ohio) Report No. ASD-TR-61-546, Final Rept.  
June 1962.

ABSTRACT: This report describes the investigation and design of a Net Crew Seat Support-Restraint System, for use in laboratory experiments to demonstrate the feasibility of using this concept in advanced flight vehicles. An investigation was conducted to determine seating and restraint requirements, and define solutions to certain support-restraint problems. Several design concepts for the solution of these problems were developed. Trade studies were conducted and the optimum solution to each problem determined. Experiments were conducted to determine some of the physical characteristics of Nylon and Dacron Raschel Knit cloth. Load-deflection curves and load-time curves were developed. A Net Crew Seat Support Restraint System was designed and analyzed structurally for the loads anticipated in vehicles which are recovered vertically or horizontally.

6,090

Woodbridge, D.D. 1962 VISUAL PHENOMENA POSSIBLE TO BE ENCOUNTERED BY ASTRONAUTS (Vought Astronautics. Div. of Chance Vought Aircraft, Inc., Dallas) CVA-Q-1, 24 May 1962

6,091

Woodham, R.M. & J. Lederer 1955 SAFETY THROUGH STEEP GRADIENT AIRCRAFT.  
(Daniel & Florence Guggenheim Aviation Safety Center).

6,092

Woodling, C. H., J. B. Whitten, R. A. Champine, & R. E. Andrews 1958  
SIMULATION STUDY OF A HIGH-PERFORMANCE AIRCRAFT INCLUDING THE EFFECT  
ON PILOT CONTROL OF LARGE ACCELERATIONS DURING EXIT AND REENTRY  
FLIGHT (Langley Research Center, Langley Station, Virginia) NACA  
RM L58E08a, July 1958, NASA N62-64798 AD (NACA, Wash. D. C.)  
ASTIA AD 221849.

ABSTRACT: A discussion is given of a simulation study of a high-performance aircraft conducted on the human-centrifuge at the U. S. Naval Air Development Center, Johnsville, Pa. The centrifuge, in combination with an analog computer, provided a pilot-controlled simulator which subjected the pilot to linear accelerations similar to those he would encounter in exit and reentry flight. This simulator was found to be useful in the evaluation of pilot restraint, controls, instrument display, and pilot and airplane response.

6,093

Woodling, C. H. & C. C. Clark 1959 STUDIES OF PILOT CONTROL DURING  
A LAUNCHING AND REENTRY OF SPACE VEHICLES UTILIZING THE HUMAN  
CENTRIFUGE. Institute of Aeronautical Sciences Report 59-39.  
(Paper, Institute of Aeronautical Sciences 27 th Annual Meeting,  
26-29 Jan. 1959, New York)

ABSTRACT: Description of the design and operation of the centrifuge, and discussing of its potentialities and use as flight simulator.

6,094

Woodward, C. et al. 1957 INVESTIGATION, DESIGN AND DEVELOPMENT OF AN  
F7U-3 EJECTION SEAT ENERGY-ABSORPTION SYSTEM FOR REDUCTION OF CRASH  
FORCE-LOADS.  
(Air Crew Equipment Laboratory, Naval Air Material Center, Philadelphia,  
Pa.) NAMC-ACEL-335, 24 June 1957.

ABSTRACT: Spinal injuries resulting from failure of the nose landing gear during carrier landings caused an investigation of the forces involved and research into a method of reducing these forces.

A simulated crash test determined that forces along the vertical plane of the seat, corresponding to forces in the vertical plane of the spinal column, were far in excess of the tolerable limits of the human body. An energy-absorption system, consisting of a stainless steel strap with attaching devices, coupled with an energy-absorbing seat cushion, was devised and tested. etc.

6,095

Woodward, Fletcher D. 1957 GENERAL MEDICAL ASPECTS OF AUTOMOBILE CRASH INJURIES AND DEATHS  
(The Journal of the American Medical Association, Vol. 163, No. 4, Jan. 26, 1957)

ABSTRACT: The increase in the absolute number of fatal automobile accidents per year in the United States is offset somewhat by a decrease in number of deaths per million miles of travel. This encourages hopes of further success in a program of prevention. Public apathy must be overcome by education, traffic laws need continued revision; and safer automobiles must be provided. The requisite basis of facts for this program should be obtained by research. A foundation for this purpose should be financed by contributions from the many agencies who would benefit by its findings.

6,096

Woodward, F. D. 1959 PROGRAM ON MEDICAL ASPECTS OF AUTOMOBILE INJURIES AND DEATHS J. American Medical Assoc. 169(14):117/1577-119/1579, Apr. 1959  
NOTE: Reel 7, Flash 7, Item 24

ABSTRACT: The Board of Trustees of the American Medical Association appointed a committee to study and report on the medical aspects of automobile crash injuries and deaths in 1955. This committee was to determine the magnitude of the problem, study the epidemiology and methods of prevention and cure primarily from a purely medical standpoint, and determine the role of the physician in obtaining these objectives. In 1956, the committee presented a symposium to the board. The symposium was accompanied by a scientific exhibit and film. The committee decided that its first duty was to prepare three pamphlets. The first one is intended for the general public and is entitled "Are you fit to drive?" The second pamphlet is designed to serve as a guide to the physician in determining a patient's fitness to drive.

Worchel, P., & K. M. Dallenbach 1948 MINOR STUDIES FROM THE PSYCHOLOGICAL  
LABORATORY OF CORNELL UNIVERSITY. XCVI. THE VESTIBULAR SENSITIVITY OF  
DEAF-BLIND SUBJECTS. American J. Psychology 61(1):94-99, Jan. 1948  
NOTE: Reel 7, Flash 6, Item 33

DISCUSSION AND CONCLUSIONS: The result of Tests A and B show that the non-acous-  
tical organs of the inner ears were functional and normal for DB, and that they  
were completely lacking for the other 9 Ss. Whether these tests are concerned with  
the same or different functions, or whether our results are due to errors of samp-  
ling, cannot be determined from this study. Our Ss were too few in number and  
their deficiencies were not diversified; with them it was a case of all or none.  
From the results at hand, however, it appears that the "standing test" (Test A)  
may serve as a rapid means of differentiating normal Ss from those with vestibular  
deficiencies. Further work is needed, particularly with deficient Ss, to deter-  
mine the relationship of the standing and rotation-tests.

Few studies have been made of the vestibular sensitivity of the deaf, and none,  
insofar as we are aware, has before been made of the deaf-blind. The first to use  
deaf subjects was James. In 1882, he tested 519 deaf mutes on a rotating swing  
and found that 186 (36%) did not become dizzy. Of the 333 who did, 134 (26% of the  
total number of cases) reported it in a mild degree and 199(38% of the total) re-  
ported it in a marked degree. From these results, James concluded that in deaf  
mutes the semi-circular canals or entire auditory nerves must often be disorganized.  
This conclusion was soon afterwards confirmed by Myding. From the study of histo-  
logical sections of the inner ears of 118 deaf mutes, he discovered that patholog-  
ical changes occurred in the labyrinths of 67% of the cases and in the semi-circu-  
lar canals in 56% of them.

Myding's percentage of pathological changes in the semi-circular canals was found  
by Kreidl, in 1891 to approximate closely the percentage of deaf mutes who made no  
eye-movements when rotated. Of 109 Ss (51 girls and 58 boys) eye-movements were  
not made either during or after rotation by 63 of them -- 58% which is in close  
agreement with Myding's 56%.

After the completion of the rotation-test, Kreidl studied the posture and locomotion  
of 17 of his Ss whose semi-circular canals were presumed to be defective as they  
had made no eye-movements either during or after rotation. One of the tests used,  
was standing on one foot with eyes closed. In this test, 11 (65%) of the Ss failed  
utterly, 2 (12%) tottered and oscillated, and 5 (24%) experienced no difficulty in  
standing. Though Kreidl did not use time as a criterion of performance, and does  
not state what his criteria were, these results stand apparently in opposition to  
ours, as all of our Ss, who lacked post-rotation nystagmus, were unable to stand  
on one foot for longer than a few seconds at a time.

Standing and rotation-tests, among others, were also used with deaf mutes by Bruck  
and Beck. Their results regarding the point in question confirm Kreidl's: they  
found little correlation between an S's ability to stand on one foot with closed  
eyes and his experience and eye-movements during rotation.

Our results may be due, as we suggested above, to a sampling error, or to the age  
of our Ss (which varied from 34-55 yr. and averaged 45.9 yr.), or to the possibility

6,098

Woyczechowski, A. 1944 TAKE-OFF ASSISTS FOR ME 264 LONG-RANGE BOMBER  
(STARTVERGLEICH ME 264)  
ASTIA ATI 43232

ABSTRACT: The possibilities were investigated of smoothly starting the Me 264 long-range bomber with excessive loads in take-off. The development of the landing gears had not advanced to the extent of building up a reserve with respect to shock power, consumption of energy, and the ability to roll. The take-off of aircraft with excessive loads could be accomplished by jettisonable landing gear, a type of gear to be used on the runway only, or by catapult. Each of these possibilities is discussed and the advantages and disadvantages occurring with the various types of take-off are outlined.

6,099

Wright, W. L. 1950 EFFECTIVENESS OF NEWER DRUGS IN SEASICKNESS  
U.S. Armed Forces M. J., 1:570

6,100

Wright, Samson 1952 APPLIED PHYSIOLOGY. (Oxford University Press, 1952)

6,101

Wu, William L.S. and Ferber, D. 1961 APOLLO MEDICAL INSTRUMENTATION.  
(Convair Astronautics) AM-2 Oct. 27, 1961

ABSTRACT: The primary function of this subsystem is to ensure crew safety and its secondary function is to provide physiological details from each of the three Apollo astronauts. A third but very necessary feature is the capability for full duplex voice communications between the astronauts and between spacecraft occupants and the ground monitors.

6,102

Wulfeck, J.W., Weisz, A., and Raben, M.W. 1958 VISION IN MILITARY AVIATION.  
(Wright Air Development Center, Wright-Patterson AFB, Ohio)  
WADC Technical Report 58-399, ASTIA AD- 207780, November 1958

ABSTRACT: The requirements of vision in military aviation are analyzed in the

light of the human observer. Practical problems of perception encountered in many phases of flying are analyzed and discussed. A comprehensive bibliography is included in each section of the report for those who are interested in a more detailed approach to a particular subject.

6,103

Wulfeck, J.W., Weisz, A., and Raben, M.W. 1958 VISUAL PROBLEMS DUE TO SPEED.  
In: Wulfeck, J.W., Weisz, A., & Raben, M.W., editors, Vision In Military Aviation. (Wright Air Development Center, Wright-Patterson AFB, Ohio)  
WADC Technical Rept. 58-399, ASTIA AD-207780, November 1958

ABSTRACT: High speeds, altitudes, and accelerations, work load, airport density, complicated instrument panels, and the structure of the aircraft itself all create serious visual problems for the pilot and crew of high-performance aircraft. The most critical of these is high speed. At the speeds flown by today's jet aircraft, a perfectly ordinary situation, such as sighting an object a mile away, can turn into a calamity before the pilot can do anything about it. As speeds get higher, the problem will become worse in proportion. The trouble is simply that a man cannot see, identify, or act on an object the instant it comes into his field of view. Each of these things takes an interval of time..... usually an exceedingly short interval, but worth hundreds or thousands of feet in a high-speed aircraft.

6,104

Wunder, C. C. Feb. 1958 GROWTH OF MICE DURING EXPOSURE TO INCREASED GRAVITY. (Paper, 1958 Meeting, The Biophysical Society, M. I. T. Cambridge, Mass., Feb. 5-7, 1958)

6,105

Wunder, C. C. et al 1960 DECREASED OXYGEN REQUIREMENT FOR GROWTH OF FRUIT FLY LARVAE AFTER CONTINUAL CENTRIFUGATION.  
In Proc. Soc. Exp. Biol. Med. 104:749-751, Aug.-Sept. 1960.

6,106

Wunder, C. C., & S. R. Briney 1960 INFLUENCE OF HIGH GRAVITY UPON THE DIFFERENTIAL GROWTH OF MICE. (Paper, Meeting of the Biophysics Society, 25 Feb., 1960, Philadelphia, Pa.)



6,107

Wunder, C.C.; L. O. Lutherer; and C. H. Dodge 1962 SURVIVAL AND GROWTH  
OF ORGANISMS DURING LIFE-LONG EXPOSURE TO HIGH GRAVITY  
(Dept of Physiology, State Univ. of Iowa, Iowa City, Iowa.) 10 Apr. 1962

6,108

Wunder, C. C. 1962 SURVIVAL AND GROWTH OF ORGANISMS DURING LIFE-LONG  
EXPOSURE TO HIGH GRAVITY. (Paper presented at Aerospace Medical  
Association, Atlantic City, New Jersey, 10 April 1962.)

6,109

Wunder, Charles C. Lorenz O. Lutherer & C.H. Dodge 1963 SURVIVAL AND GROWTH  
OF ORGANISMS DURING LIFE-LONG EXPOSURE TO HIGH GRAVITY  
Aerospace Medicine 34(1): 5-11 Jan. 1963

ABSTRACT: Nine different forms have been subjected by various laboratories to a chronic centrifugation. Alterations in life span and development result. These forms are the bean and wheat seedlings, fruit fly larvae, turtles, chickens turkeys, rats, mice, and hamsters. In some cases, life span decreases and growth decelerates; in other cases, growth is enhanced. The nature of the response is a function of the field intensity, the age, size, and biological and physical characteristics of the organism, as well as other environmental factors. These experiments indicate that terrestrial forms of life could live and multiply at gravitational intensities differing from that of the Earth's. However, there would undoubtedly be developmental alterations of a type which are at this time too complex to accurately predict.

6,110

Wunder, C. C., D. Wombolt and E. N. Oberg 1962 GROWTH ANALYSIS OF MICE  
SUBJECTED TO HIGH GRAVITY.  
In Nature (London) 195:50-51, July 7, 1962.

6,111

Wurdemann, H. V. 1935 PROBLEMS ARISING FROM THE EFFECT OF HIGH SPEED ON LIVING TISSUE. J. Avia. Med. 6-27-29

ABSTRACT: It has been estimated that the extreme speed which can be reached by airplanes is 660 miles an hour. This is based upon the reached by airplanes is 660 miles an hour. This is based upon the fact that air, moving at this rate, disintegrates the association of its molecules. The high droning sound of an airplane is said to be due to this effect upon the air by the ends of the propellers traveling at the rate of 1,250 to 1,500 miles an hour, which cause the molecules to bump against each other.

Living tissue cannot stand the strain of extreme speed, and it is doubted that turns can be made with safety at a speed of 660 miles an hour. Many pilots have made dives at the rate of 400 miles an hour; however, in rapid turns, descents, etc., some pilots have been incapacitated from brain and abdominal hemorrhages and lost sight through hemorrhages into the retina and cornea.

6,112

Würdemann, H.V. 1938 INFLUENCE OF FLYING ON THE CIRCULATION. J. Amer. Med. Ass. 110:2092-2093.

6,113

Wurdemann, H. V. 1939 ANOTHER KIND OF BLACKOUT Lancet 2:1125-1126.

6,114

Wurzel, E.M., L.J. Polansky & E.E. Metcalfe 1948 MEASUREMENT OF THE LOADS REQUIRED TO BREAK COMMERCIAL AVIATION SAFETY BELTS AS AN INDICATION OF THE ABILITY OF THE HUMAN BODY TO WITHSTAND HIGH IMPACT FORCES. (Naval Medical Research Institute, Bethesda, Md.) Research Proj. X-630 Rept. No. 12, Mar. 1948.

ABSTRACT: The force required to break aviation safety belts used in private aircraft was determined in order to correlate this force with the trauma recorded in the reports of private aircraft crashes. The force was determined by using a new method of testing which closely simulates the conditions believed to exist in actual aircraft crashes.

The results indicate that in private aircraft crashes man has frequently survived impact loads of 2500 pounds with no sign or symptoms of injury.

6,115

Wycis, H. T., & E. A. Spiegel 1946 FURTHER STUDIES OF CORTICAL AND RETINAL INFLUENCES UPON VESTIBULO-OCULAR REFLEXES. (Dept. of Exp. Neurology, Temple Univ. Medical School, Philadelphia, Pa.)

ABSTRACT: Continuing our previous experiments on the effect of cerebral lobectomies upon postrotatory nystagmus (Wycis and Spiegel, Fed. Proc. 4:79, 1945), we compared the effect of partial lesions of the frontal and the occipital lobes with that of complete lobectomies upon the excitability of the vestibulo-ocular reflex arc in dogs and cats. Furthermore retinal impulses were eliminated by transection of both optic nerves, and this operation was combined with lobectomies. Following the bilateral optic nerve section, the duration of the postrotatory nystagmus was increased to 2-3 times and the number of jerks to 1.4-7 times the preoperative values. In this stage of increased reactivity of the vestibulo-ocular reflex arc, some dogs displayed a pronounced "after-after" discharge following labyrinthine stimulation by turning, the rotation being followed first by a nystagmus in the opposite direction and then one beating in the direction of rotation. Occipital lobectomy in these dogs with cut optic nerves failed to produce the directional preponderance to the side of the lobectomy usually appearing in normal dogs after this operation. It is inferred that the increased reactivity of the vestibulo-ocular reflex arc following occipital lobectomy is due to a release of this system from an inhibitory mechanism originating in the retinas.

(Federation Proceedings 5(1):116, 1946 )

ACCELERATION

X

6,116

Xhignesse, Louis V. 1958 SELECTIVE SURVEY OF FRENCH DEVELOPMENTS IN FLIGHT  
SIMULATORS AND FLIGHT INSTRUMENTS: I. FLIGHT SIMULATORS. WADD TR 57-378;  
ASTIA AD 142 130:

ABSTRACT: A selective survey of French developments in aircraft and missile simulation was conducted. The survey covered the characteristics of a flight simulator for a primary trainer of the conventional engine type, three types of helicopter simulators, and a simulator for an air-to-ground or ground-to-ground missile.

ACCELERATION

Y

6,117

Yamasaki, S. & R.F. Karis 1962 AN ACCURATE METHOD OF AUTOMATICALLY  
PLOTTING "g" LEVELS OF VIBRATION SIGNALS. (Institute of Environmental  
Sciences, Mt Prospect, Ill.) Reprint 62-620

ABSTRACT: This is a report on the development of the vibration Data Reduction  
System. This new process provides the same quality of reduced data as the  
previous system. However, UDRS requires a much shorter time period.

6,118

Yanquell, C.C. 1932 NAVAL PROBLEMS IN AVIATION MEDICINE J. Aviation Med.  
3(4):191-193

ABSTRACT: Briefly discusses effects of acceleration during dive bombing, problems  
of carrier operations, and carbon monoxide problems of naval aircraft. Suggests  
need for research in the following areas: Inquiry into the mechanism of the  
physical collapse of the flyer following sudden changes of direction in the  
recovery from high speed dive bombing, with tests to eliminate those who are  
peculiarly susceptible to such syncope; The design of an all-purpose airplane  
goggles, which will successfully eliminate injurious sunglare without changing the  
natural color of the terrain, further work on carbon monoxide poisoning from the  
exhaust of airplane engines, with the development of a routing field test,  
possibly, to indicate the flyer who has an idiosyncrasy to this gas.

6,119

Yanquell, C.C. 1939 AIRSICKNESS. Nav. Med. Bull., Wash., 37:486-489

6,120

Yarcho, W.B. 1957 ENVIRONMENT TEST FACILITIES OF WRIGHT AIR DEVELOPMENT  
CENTER. WADC TN 57-27, Jan. 1957. ASTIA AD 110 740

ABSTRACT: The purpose of this report is to provide a compilation of the

major environmental test facilities available at Wright Air Development Center for effective utilization. It is concluded that test facilities to meet most environmental conditions are available within Wright Air Development Center and their utilization is limited only by the size or weight of the test specimen.

6,121

Yaslovskiy, Y. J. 1958 BIOLOGICAL EXPERIMENTS ON ROCKETS AND ARTIFICIAL EARTH SATELLITES. (Paper presented at the Rocket and Satellite Symposium during the Fifth Reunion of the Committee Special Annee Geophysique Internationale, Moscow, July 30 - August 9, 1958)

ABSTRACT: The safety of living organisms during rocket flights can be guaranteed only under conditions which protect the organism from the action of a whole complex of unfavorable external factors: high degrees of rarefaction of the air, the absence of molecular oxygen, cosmic rays, ultraviolet radiation, meteors, weightlessness, etc. This paper discusses the programs conducted by the Russians to (1) select the most suitable biological specimen for conducting the experiments (2) develop methods of investigating the physiological functions of an animal suitable for use under the conditions of flight on a rocket, (3) determine the possibility of guaranteeing the conditions necessary for the animal to live with the aid of a small, regenerating, hermetically sealed cabin during rocket flights to an altitude of 100 km, and (4) determine the possibility of utilizing an ejectible cabin to recover animals and apparatus from high altitudes. A good description is given of the Laika experiment.

6,122

Yaslovskiy, V.I., & R.M. Baevskii 1962 MEDICO-BIOLOGICAL CONTROL IN COSMIC FLIGHT. (Joint Publications Research Service, Washington, D.C.) JPRS 16205, 15 Nov. 1962. ASTIA AD 299 170  
Translation from Akademiya Nauk SSR. Vestnik 32(9):9-15, 1962

ABSTRACT: The task of this article is to give a general idea of the character of radiotelemetric systems of medicobiological control in their current state i.e. the state in which they were utilized partim in the vehicles "Vostok-3" and "Vostok-4" and to indicate the ways of their improvement in view, of the guarantee of bio-medical control in subsequent cosmic flights covering greater distances and having longer duration. (Author)

6,123

Yaslovskii, V. I. 1962 NEWS OF SOVIET BIOLOGY: ACHIEVEMENTS OF COSMIC BIOLOGY (Uspekhi Kosmicheskoi Biologii).  
Trans. of Akademiya Nauk SSSR. Izvestiya. (Seriya Biologicheskaya) 27(2):308-311, 1962.  
(Joint Publications Research Service, San Francisco, Calif.)  
July 23, 1962 JPRS: 14553

6,124

Yazdovskii, V. I. 1962 ACHIEVEMENTS AND PRINCIPAL GOALS IN SPACE BIOLOGY.  
Trans. of Akademiya Nauk SSSR. Vestnik, 32(4):15-20, 1962.  
(Joint Publications Research Service, Washington, D.C.)  
July 26, 1962 JPRS: 14618

6,125

Young, C.A. 1941 HYPOTENSION IN AVIATION, WITH A REVIEW OF 159 FATAL  
CRASHES. U.S. Naval Med. Bull. 39:222-235.

ABSTRACT: Upper limits of hypotension taken as 110 mm Hg systolic blood pressure, 70 mm diastolic. Believes that 10% of cadets 18 to 25 years old are hypotensive. However, in 159 fatal crashes, 45.9% of the pilots were hypotensive. Of the pilots involved in crashes clearly due to pilot error, 85.6% were hypotensive.

Individuals with low blood pressure also tend to have higher than average standing pulse rate. It is suggested that they are more susceptible to blackout and fatigue and have less emotional stability.

6,126

Young, J. G. & I. Gray 1956 BIOCHEMICAL RESPONSE TO TRAUMA. III.  
EPINEPHRINE AND NOREPINEPHRINE LEVELS IN PLASMA OF RATS SUBJECTED TO  
TUMBLING TRAUMA.  
Am. J. Physiology 186:67-70.

ABSTRACT: The effect of tumbling trauma on the concentration of epinephrine and norepinephrine in the plasma of rats has been followed using the fluorimetric method of Weil-Malherbe and Bone for the analysis of the catechol amines. Sprague-Dawley rats weighing 250 gm were used. The animals were tumbled for 300, 400, 500, 600, 700 turns giving a 24-hour mortality ranging from 0-100%. The epinephrine levels immediately after the tumbling were increased 2-5 times while the norepinephrine concentrations increased 5-10 times. When followed in time after tumbling, the epinephrine remained elevated for 1-2 hours and returned to normal within 4-8 hours, while the norepinephrine began to fall within 1 hour and had returned to normal within 4-8 hours. Although changed excretion is ruled out, the actual role of secretion and biotransformation cannot be ascertained.

6,127

Young, J. G., & I. Gray 1956 BIOCHEMICAL RESPONSE TO TRAUMA. III. EPINEPHRINE  
AND NOREPINEPHRINE LEVELS IN PLASMA OF RATS SUBJECTED TO TUMBLING TRAUMA.  
(Walter Reed Army Institute of Research, Washington, D. C.) WRAIR-87-56;  
ASTIA AD-112 802; Apr. 1956

ABSTRACT: Plasma levels of epinephrine and norepinephrine were determined in normal and traumatized rats using the fluorimetric method of Weil-Malherbe and

Bone. Trauma was produced by tumbling in a Noble Collip drum. Epinephrine levels increased 2 to 5 times with tumbling and norepinephrine 5 to 10 times. Epinephrine and norepinephrine were determined periodically from 0 to 24 hours after tumbling. In general, norepinephrine levels began to fall within 1 hour after tumbling and returned approximately to normal in 4 to 8 hours. The epinephrine levels remained elevated for 1 to 2 hours and returned to normal within 4 to 8 hours.  
(AUTHOR)

6,128

Young, J.W., and L.E. Barker, Jr. 1963 MOVING-COCKPIT-SIMULATOR STUDY OF PILOTED ENTRIES INTO THE EARTH'S ATMOSPHERE FOR A CAPSULE-TYPE VEHICLE AT PARABOLIC VELOCITY. (National Aeronautics and Space Administration, Wash.) Technical note D-1797, May 1963

ABSTRACT: The primary goal of this study was to determine the effect of angular motions on the ability of the pilot to perform the maneuvers required during supercircular entry and to compare the pilot's performance on the moving simulator with that obtained from similar entries on a fixed-base simulator. Consideration was also given to the development of a minimum instrument display for which the pilot used motion cues to aid him in performing the entry maneuvers.

6,129

Young, M.W. 1945 MECHANICS OF BLAST INJURIES War Med., Chicago 8:73-81

6,130

Young, M. W. 1946 ANATOMICAL FACTORS INVOLVED IN THE "BLACKING-OUT" PHENOMENON. Anat. Rec. 94:531.

6,131

Young, R. 1961 PACKAGING OF A HYPERVELOCITY RADIO TELEMETER TO WITHSTAND HIGH IMPULSE ACCELERATIONS. (Arnold Engineering Development Center, Arnold AF Station, Tenn.) Rept. no AEDC TN 61-119, ASTIA AD 265 688, October 1961

ABSTRACT: Telemeter transmitters, consisting of simple r-f oscillators incorporating variable-capacitance pressure transducers, operated successfully in aeroballistic ranges after gun launchings at peak accelerations of 100,000 g. Telemetered pressure data obtained from these telemeters after launchings at 200,000 g. however, were very inaccurate, partly as a result of



the frequency shifts of the oscillators. Tests, devised to determine the cause of these shifts, showed that a single, most favorable, mounting orientation for each of the components exists. If the components are oriented properly, frequency shifts can be minimized. It was also found that launching a complete oscillator without the transducer does not necessarily allow a prediction of the behavior of the individual circuit components. It was proven possible for each of the oscillator circuit components to change its electrical value with no resulting change in oscillator center frequency. (Author)

6,132

Young, R.D. 1945 NOTE ON THE FLIGHT PATH OF A MAN EJECTED NORMALLY FROM AN AEROPLANE MOVING AT A HIGH SPEED.  
(Royal Aircraft Establishment, Farnborough) Technical Note Aero. 1484, Aug. 1944. Appendix 7 to Lovelace, W.R., E.J. Baldes, & V.J. Wulff, The Ejection Seat from High Speed Aircraft, ASTIA ATI 7245

SUMMARY: Calculations have been made of the flight path of a man ejected normally from an aeroplane moving at speeds (U degrees) of 400 f.p.s., and 800 f.p.s. Ejection velocities ( ) of 20 f.p.s., 50 f.p.s. and 100 f.p.s. in both up and down directions have been considered for each case, and the calculations are sufficiently valid for practical requirements. It is concluded that an upward ejection velocity of about 40 f.p.s. should be sufficient in most cases for the man to clear the aeroplane structure. The initial acceleration on the man required to give him this ejection velocity is estimated to be about 12 1/2 g acting for 1/10th sec.; this is not considered serious. The power required can be readily provided by a few ounces of cordite. (Author)

6,133

Young, R. S. 1959 SECURING THE DATA: PRACTICAL EXPERIMENTS IN SPACE BIOLOGY  
In: Proceedings of the Pilot Clinic on the Instrumentation Requirements for Human Comfort and Survival in Space Flight. Ohio State University, Columbus, Ohio. October 26-27, 1959.  
(Foundation for Instrumentation Education and Research, New York, N. Y., April 1960.) Pp. 27-35.

ABSTRACT: Some of the instrumentation problems that have been encountered by biologists in their experiments in space-type vehicles are presented and discussed. Such problems center around the vehicle itself and its environment. Two basic types of biological studies are being conducted: 1) effects of space flight on a living system and evaluation of the system as far as man is concerned, and 2) study of these effects simply as a scientific research effort. Illustrative examples of present research are given. (Tufts)

6,134

Young, R. S., & J. L. Johnson 1960 BASIC RESEARCH EFFORTS IN ASTROBIOLOGY  
Institute of Radio Engineers Transactions on Military Electronics MIL-4(2-3):  
284-287, April-July 1960

ABSTRACT: The need is cited for the development of instrumentation capable of accurately measuring and telemetering various physiologic responses of a wide variety of cellular systems subjected to accelerative forces, to conditions of vacuum, and to zero-gravity.

6,135

Young, W. R. 1959 WHAT IT'S LIKE TO FLY INTO SPACE 46(15):132-149.  
13 April

ABSTRACT: A very clear description, accompanied by full-page photographs, is provided of various physiological research for space flight in the U. S., including weightlessness, vibration, and acceleration. Subjective data on his rides on the Wright-Patterson Air Force (20 ft. arm) centrifuge, and the Navy's Johnsville (50 ft arm) centrifuge is given.  
(CARI)

6,136

Yudkofsky, P.L. n.d. PRIMATE RESPONSES TO PROLONGED LOW MAGNITUDE  
ACCELERATIONS AND TO SUDDEN WITHDRAWAL OF THESE ACCELERATIONS.  
(Wright Air Development Ctr., Wright-Patterson AFB, Ohio)  
Technical Report in preparation.

6,137

Yudkofsky, P. L. 1960 A MODIFIED SMALL ANIMAL CENTRIFUGE.  
(Wright Air Development Division, Wright-Patterson AFB, Ohio) WADD TN 60-245;  
ASTIA AD-247 181; Sept. 1960

ABSTRACT: A spin-table formerly used in tumbling studies has been modified to best compromise centrifuge radius with maximum speed, optimum electrical connections, ease of control, and maximum safety. The modified apparatus possesses a heavy-duty platform 8 ft. in diameter which may be rotated to a peak speed of 225 rpm while carrying a 500 pound load. The maximum acceleration produced at this speed is just under 70 g with a maximum rate of onset or braking of 11 g per sec at the full arm radius of 4 ft. Detailed operating instructions are included. (AUTHOR)

6,138

Yudkofsky, P.L. Sept. 1960 GROSS AND MICROCIRCULATORY EFFECTS OF TILTING AND ACCELERATION ON THE GOLDEN HAMSTER. ASTIA AD 249 260; WADD Tech Rept 60-373, Sept. 1960

ABSTRACT: The heart rate, respiratory rate, blood pressure, electrocardiogram, organ displacements, and microcirculation of the golden hamster were recorded and correlated during a wide range of gravitational stress, i.e., from 1 to 60 positive g. The effects of various anesthetics and hemorrhage on the observed responses were determined. Lastly, the cardiovascular responses of the hamster to occlusion of the carotid arteries were interpreting and necropsy examinations were performed to aid in interpreting the recorded physiologic data. It was found that tilting from the horizontal to head-up position elicited no pronounced physiologic responses in the test animal. The increased forces encountered during centrifugation elicit pronounced effects which appear to be primarily compensated for by increased heart rate. The microcirculation of the hamster cheek pouch did not appear to actively enter into the reactions to positive acceleration. Also, the cause of death at various magnitudes of acceleration is discussed. (AUTHOR)

6,139

Yugov, Ye and Serov, A. E. 1958 MAN BEFORE TAKING OFF TO SPACE  
(Chelovek pered startom v Kosmos  
Trans of Izvestiya (USSR) Oct. 4, 1958.  
(Office of Technical Services, Washington, D.C.)  
Feb. 12, 1959 59-16413

ABSTRACT: Physiological problems involved in space flight and during acceleration are described in laymen's terms.

6,140

Yurow, V. R. 1961 NOL WATER-ENTRY TEST FACILITY (Naval Ordnance Lab., White Oak, Md.) NAVORD rept. no. 6815; 15 March 1961; ASTIA AD-244 721

ABSTRACT: A high velocity, variable angle launcher has been placed in operation at the test pond of the Naval Ordnance Laboratory. Internally instrumented models and high speed motion picture photography are used to provide water-entry shock signatures and trajectory information. Scale and full size test vehicles up to 500 pounds in weight and 14' 25 inches in diameter can be launched at velocities that range from 350 fps for a 500 pound model to 1100 fps for a 5 pound model. The report describes the facility and its operation, discusses its advantages and limitations, and summarizes the test programs conducted in the facility since its completion. (Author)

6,141

Yustein, S.E. & R.R. Winans      1951      REPORT OF INVESTIGATION FOR DEVELOP-  
MENT OF AN IMPACT TEST FOR PROTECTIVE HATS. (Material Lab., Naval Shipyard,  
Brooklyn, N.Y.) Report NS 181-013, 7 Aug. 1951. ASTIA AD 205 655

ABSTRACT: The object of this investigation is to develop the Brinell  
impression method as described in reference (f), with a view to its use  
in drop ball impact tests on protective hats for brand approval and inspec-  
tion test purposes.

ACCELERATION

Z

6,142

Zahm, A. F. 1911 STRESS IN AEROPLANES IN CURVILINEAR AND FANCY FLIGHT.  
Sci. Amer. 105:189; 196.

6,143

Zahm, A. F. 1913 STRESS CONSIDERATIONS IN AEROPLANE DESIGN. J. Franklin  
Instit. 175:601.

6,144

Zahm, A.F. 1919 DEVELOPMENT OF AN AIRPLANE SHOCK RECORDER  
J. Franklin Inst. 188:237

6,145

Zarriello, J. J., M. E. Norsworthy, & H. R. Bower 1958 A STUDY OF  
EARLY GREYOUT THRESHOLD AS AN INDICATOR OF HUMAN TOLERANCE TO  
POSITIVE RADIAL ACCELERATORY FORCE. (Naval School of Aviation  
Medicine, Pensacola, Fla.) Research Proj. NM 110211, 1.1,  
Subtask 1, Rept. 11 8 May 1958 July 1958, ASTIA AD 201 873.

ABSTRACT: To determine the relationship between several prerun clinical  
measures of cardiovascular response and criteria of visual impairment  
occurring during centrifuge, 52 subjects, ranging from 18 to 35 years  
of age, were studied. Five cardiovascular measures were taken for  
each subject and related to: (1) g level of greyout, (2) time, from  
onset of peak g to onset of greyout, (3) g level of blackout, and (4)  
time from onset of peak g to onset of blackout. The task was to respond  
(press a button) to both central and peripheral lights, presented  
randomly, while undergoing acceleration. The results are discussed in  
terms of prediction of man's g tolerance.

6,146

Zarriello, J.J., E. Norsworthy & H.R. Bower 1959 STUDY OF EARLY GREY-  
OUT THRESHOLD AS AN INDICATOR OF HUMAN TOLERANCE TO POSITIVE RADIAL  
ACCELERATORY FORCE. (Paper, Meeting of Aero Medical Association,  
Statler Hilton Hotel, Los Angeles, 27-29 April 1959.)

ABSTRACT: The purpose of this study was to investigate the relationship under increased positive radial acceleratory force between peripheral light loss and blackout or unconsciousness when the light stimulus is located at 80° in the peripheral field; and to determine whether an 80° peripheral light stimulus was an earlier indicator than the 23° light for an endpoint of greyout in regards to magnitude of the G force. The time spread between onset of greyout (80° light loss) and onset of blackout or unconsciousness was determined, and this time spread was found to be slightly increased when compared to the use of a 23° light as an endpoint of greyout. The peripheral light loss has limited usefulness as an early indicator for the onset of critical symptoms of blackout or unconsciousness.  
( J. Aviation Med. 30(3):210-211, March 1959.)

6,147

Zarriello, J. J., L. M. Seale, & M. E. Norsworthy 1958 THE RELATIONSHIP BETWEEN CARDIOVASCULAR RESPONSE AND POSITIVE G TOLERANCE. (N. Sch. Av. Med., Pensacola, Fla., Res. Proj. NM 11 01 11 Subtask 1, Report No. 11. ASTIA AD 201 873.  
See Also: J. of Aviation Med. 29(11):815-820.

ABSTRACT: Relationships between pre - run clinical cardiovascular measures and criteria of positive G tolerance were determined in 52 inexperienced centrifuge subjects. Subjects were presented two peripheral lights and a central light. G levels and time at peak G at which greyout and blackout occurred were determined for each subject. The results indicated that diastolic blood pressure was significantly related to time during peak G and no cardiovascular measures were significantly related to G level at which blackout occurred. The G level at which greyout occurred was significantly related to the G level at which blackout occurred. (Author)

6,148

Zarriello, J. J. and L. M. Seale and Mary E. Norsworthy 1958 THE RELATIONSHIP BETWEEN CARDIOVASCULAR RESPONSE AND POSITIVE G TOLERANCE  
J. of Aviation Medicine 29(11):815-820, November 1958

SUMMARY: The relationships between pre-run clinical cardiovascular measures and criteria of G tolerance were determined in fifty-two inexperienced centrifuge subjects. The subjects were presented two peripheral lights, 80° right and left of the center of the visual field, and a central light. The G levels at which greyout and blackout occurred and the time at peak G at which they occurred were determined for each subject. The results indicated that the diastolic blood pressure was significantly related to both the time at which greyout appeared and the G level at which it appeared. Pre-run measures of pulse rate were negatively related to the time during peak G at which blackout occurred. No cardiovascular measures were significantly related to the G level at which blackout occurred.

6,149

Zarriello, J. J. 1958 SERUM GLUTAMIC OXALACETIC TRANSAMINASE ACTIVITY IN HUMANS SUBJECTED TO POSITIVE RADIAL ACCELERATORY FORCE. (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. No. NM 11 01 11; Research Rept. No. MR005.15-0001.1.12., 1/17/58; ASTIA AD-203 322  
See also J. Avia. Med. 30(2):97-99, Feb. 1959

ABSTRACT: In young normal subjects, the serum glutamic-oxalacetic transaminase activity was not elevated within seventy-two hours following human centrifugation in which subjects are exposed to positive radial acceleratory stress leading to blackout.

SECOND ABSTRACT: The purpose of the study was to determine if any variation of activity of Serum glutamic oxalacetic transaminase (SGO-T) occurs following human centrifugation when relaxed subjects experience the physiological state of blackout. It was found that the SGO-T activity is not elevated within seventy-two hours following human centrifugation leading to the physiological state of blackout. (AUTHOR)

6,150

Zarriello, J.J., M.E. Norsworthy & H.R. Bower 1959 STUDY OF EARLY GREYOUT THRESHOLD AS AN INDICATOR OF HUMAN TOLERANCE TO POSITIVE RADIAL ACCELERATORY FORCE  
Paper: Meeting of Aero Medical Association, Statler Hilton Hotel, Los Angeles, April 27-29, 1959

ABSTRACT: The purpose of this study was to investigate the relationship under increased positive radial acceleratory force between peripheral light loss and blackout or unconsciousness when the light stimulus is located at 80° in the peripheral field; and to determine whether an 80° peripheral light stimulus was an earlier indicator than lights located at 23° in the peripheral field. Under conditions of our experiment, it was found that an 80° light stimulus was an earlier indicator than the 23° light for an endpoint of greyout in regards to magnitude of the G force. The time spread between onset of greyout (80° light loss) and onset of blackout or unconsciousness was determined, and this time spread was found to be slightly increased when compared to the use of a 23° light as an endpoint of greyout. The peripheral light loss has limited usefulness as an early indicator for the onset of critical symptoms of blackout or unconsciousness.

6,151

Zarriello, J. J. 1959 SERUM GLUTAMIC OXALACETIC TRANSAMINASE ACTIVITY IN HUMANS SUBJECTED TO POSITIVE RADIAL ACCELERATORY FORCE. J. Avia. Med. 30(2): 97-99, Feb. 1959  
See also (Naval School of Aviation Medicine, Pensacola, Fla.) Proj. No. NM 11 01 11; Research Rept. No. MR005.15-0001.1.12., 1/17/58; ASTIA AD-203 322

ABSTRACT: In young normal subjects, the serum glutamic-oxalacetic transaminase activity was not elevated within seventy-two hours following human centrifugation in which subjects are exposed to positive radial acceleratory stress leading to blackout.

SECOND ABSTRACT: The purpose of the study was to determine if any variation of activity of Serum glutamic oxalacetic transaminase (SGO-T) occurs following human centrifugation when relaxed subjects experience the physiological state of blackout. It was found that the SGO-T activity is not elevated within seventy-two hours following human centrifugation leading to the physiological state of blackout. (AUTHOR)

6,152

Zarriello, J. J., & P. B Phillips Jan. 1959 EPILEPTIFORM SEIZURE AND LOW G TOLERANCE; A CASE REPORT. J Avia. Med. 30(1):35-37

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Zarriello, J.J. 1959 IDIOPATHIC ORTHOSTATIC HYPOTENSION AND ITS RELATIONSHIP TO POSITIVE G TOLERANCE  
(U.S. Naval School of Aviation Medicine, U.S. Naval Air Station, Pensacola, Florida) Bureau of Medicine and Surgery Research Project NM 11 01 11, Subtask 1 Report No. 13, May 21, 1959 ASTIA AD 225 719

ABSTRACT: Symptoms of unconsciousness developed in two student pilots during aerobatic maneuvers. These student pilots were normal in all respects having no past history of classical symptoms of orthostatic hypotension but demonstrating a definite fall in blood pressure on assuming the upright position. They were subjected to human centrifugation and their respective greyout, blackout, and unconscious threshold levels were determined and compared to 115 normal cases subjected to centrifugation in a similar manner.

When subjected to centrifugation these individuals demonstrated a markedly reduced greyout, blackout, and unconscious tolerance to positive G as compared to 115 normal individuals.

Human centrifugation may be used as an adjunct to assist in the diagnosis of early cases of postural or orthostatic hypotension prior to the development of classical symptoms of this syndrome.

Candidates entering the naval flight program demonstrating a significant fall in blood pressure on assuming the upright position should be screened carefully, and their complete evaluation should include determination of their basic tolerance to positive G as determined by human centrifugation.

6,154

Zarriello, J. J. 1959 THE CORRELATION OF SCOTOPIC AND PHOTOPIC VISION IN RELATIONSHIP TO BLACKOUT TOLERANCE ON THE HUMAN CENTRIFUGE. (Naval School of Aviation Medicine, Pensacola, Fla.) Research Proj. No. NM 11 02 11, Rept. No. 2; ASTIA AD-225 720; 30 Apr. 1959



ABSTRACT: Blackout thresholds obtained under two levels of stimulus intensity on the human centrifuge were compared. One level of intensity employed was in the scotopic range and the other in the photopic. Under conditions of this experiment, the results indicate significantly that lower blackout thresholds are obtained when low intensity lights are used and the subject is dark adapted than when standard lights are used in the same subject after he has been light adapted. This result pertains when the subject is unprotected or protected by an anti-blackout suit. Other significant correlations were found. (AUTHOR)

6,155

Zasosov, R. & A. Popov 1959 VESTIBULTARNAYA TRENIROVKA (Vestibular Training)  
(Trans. from Bol'shaya Meditsinskaya Entsiklopediya, (USSR) v. 5, cols. 275-279, 1958)  
(SLA Translations Center, Chicago, Ill.) 59-18445

6,156

Zborowzski, 1944 REVIEW OF ROCKET DEVELOPMENTS AT THE BMW UP TO NOVEMBER 1944  
(B.I.O.S. GROUP 2, Halstead Exploitation Centre H.E.C. 10610)  
R.A.E. Translation No. 146

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Zdanis, B.R. 1956 NAVAL ORDNANCE LABORATORY NAVORD REPORTS PUBLISHED BY THE AEROBALLISTIC RESEARCH DEPARTMENT, 1 JANUARY 1955 - 31 DECEMBER 1955  
(Naval Ordnance Lab., White Oak, Md.) 25 July 1956, Aeroballistic research report no. 350; NAVORD Rpt. no. 4312, ASTIA AD115 337  
See Also ASTIA AD-77 437

6,158

Zechman, F. W., N. S. Cherniack, & A. S. Hyde 1959 VENTILATORY RESPONSE TO FORWARD ACCELERATION. (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TR 59-584; ASTIA AD-231 286; Sept. 1959  
See also Fed. Proc. 19:376, 1960

ABSTRACT: The findings of two series of experiments dealing with the effect of forward acceleration on respiration in man are presented. In the first, the effect of 5, 8, and 12 g on respiratory frequency, tidal volume, minute volume, and nitrogen elimination were determined. Frequency increased reaching an average of 39.2 cycles per minute and tidal volumes decreased to an average of 318 cc at 12 g. The volume of nitrogen eliminated during a 30 second period, breathing oxygen at 12 g, was essentially unchanged suggesting that gross alveolar ventilation did not decrease. In the second series,  $O_2$  consumptions were measured before, during, and after accelerations of 5, 8, 10, and 12 g. Oxygen consumptions increased with

acceleration and it is presumed that the extra work of breathing may be an important contributing factor. In both series of studies the trunk was inclined 12 degrees in the direction of acceleration and a rate of onset of 1 g per second was used. (AUTHOR)

6,159

Zechman, F. W., N. S. Cherniack, & A. S. Hyde 1960 VENTILATORY RESPONSE TO FORWARD ACCELERATION. Fed. Proc. 19:376

See also (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TR 59-584, Sept. 1959; ASTIA AD-231 286

ABSTRACT: The findings of two series of experiments dealing with the effect of forward acceleration on respiration in man are presented. In the first, the effect of 5, 8, and 12 g on respiratory frequency, tidal volume, minute volume, and nitrogen elimination were determined. Frequency increased reaching an average of 39.2 cycles per minute and tidal volumes decreased to an average of 318 cc at 12 g. The volume of nitrogen eliminated during a 30 second period, breathing oxygen at 12 g, was essentially unchanged suggesting that gross alveolar ventilation did not decrease. In the second series,  $O_2$  consumptions were measured before, during, and after accelerations of 5, 8, 10, and 12 g. Oxygen consumptions increased with acceleration and it is presumed that the extra work of breathing may be an important contributing factor. In both series of studies the trunk was inclined 12 degrees in the direction of acceleration and a rate of onset of 1 g per second was used. (AUTHOR)

6,160

Zechman, F. W. 1958 THE EFFECT OF FORWARD ACCELERATION ON VITAL CAPACITY (Wright Air Development Division, Wright-Patterson AFB, Ohio) WADC TN 58-376; ASTIA AD-209 411; December 1958  
NOTE: CARI P&S 2.14

ABSTRACT: The effect of forward acceleration on vital capacity has been measured on six human subjects. Vital capacities were reduced in a fairly uniform manner with increasing g. Values reached on average of 1.5 liters at 8 g when the trunk was inclined 25 degrees forward. This degree of reduction was reached at 6 g when the trunk was not inclined.

6,161

Zechman, F. W., N. S. Cherniack, & A. S. Hyde 1960 RESPIRATORY EFFECTS OF FORWARD ACCELERATION. (Paper, 31st Annual Meeting of the Aerospace Medical Association, Americana Hotel, Bal Harbour, Miami Beach, Florida, May 9-11, 1960)

ABSTRACT: Since it is likely that pilots of rocket propelled vehicles will experience forward acceleration and since respiratory difficulties limit tolerance in this position, further studies have been conducted to determine the effect of forward acceleration on respiration. Two series of experiments were conducted.

In the first the influence of forward accelerations of 5, 8, and 12 G on respiratory frequency, tidal volume and nitrogen elimination have been studied. In the second series, the effect of forward accelerations of 5, 8, 10 and 12 G on oxygen consumption has been measured. Respiratory frequency increased and tidal volume decreased with increasing acceleration. Frequencies reached 39.2 cycles per minute at 12 G while tidal volume fell to 318 cc. The nitrogen eliminated during a 30-second period of oxygen breathing did not decrease suggesting that gross alveolar ventilation probably did not decrease. Oxygen consumption increased with increasing forward acceleration. Several factors presumably are responsible including the extra work in breathing and an increase in muscle tone.

6,162

Zechman, F. W., N. S. Cherniack and A. S. Hyde      1960    VENTILATORY  
RESPONSE TO FORWARD ACCELERATION.  
In J. Appl. Physiol 15:907-910, Sept. 1960.

ABSTRACT: Two series of experiments dealing with the effect of forward acceleration on respiration in man were performed. In both series of studies the trunk was inclined 12 degrees in the direction of acceleration and a rate of onset of 1 g/sec. was used. In the first series, the effect of 5, 8 and 12 g on respiratory frequency, tidal volume, minute volume and nitrogen elimination was determined. Frequency increased, reaching an average of 39.2 cpm and tidal volumes decreased to an average of 318 cc at 12 g. The volume of nitrogen eliminated during a 30-second period, breathing O<sub>2</sub> at 12 g, was essentially unchanged, suggesting that alveolar ventilation did not decrease. In the second series, O<sub>2</sub> consumptions were measured before, during and after accelerations of 5, 8, 10, and 12 g. O<sub>2</sub> consumptions increased with acceleration and it is presumed that the extra work of breathing may be an important contributing factor.

6,163

Zechman, F. & G. Mueller    1962    EFFECT OF FORWARD ACCELERATION AND NEGATIVE  
PRESSURE BREATHING ON PULMONARY DIFFUSION.  
J. Appl. Physiol. 17:909-912, Nov. 1962.

6,164

Zechman, F. W., & J. Taylor    1962    RESPIRATORY RESPONSE TO FORWARD ACCELERATION  
COMPARED WITH CHEST COMPRESSION IN DOGS. J. Applied Physiol. 17(3):410-412,  
May 1962

ABSTRACT: Six mongrel dogs were studied to determine if the increases in frequency of breathing characteristic of both chest compression and forward acceleration are initiated by the same vagal reflex. Since vagal section only abolished the response to chest compression, it is assumed that some other mechanism is primarily responsible for the rate increase characteristic of forward acceleration. Experiments are also described which suggest that the increased respiratory frequency may be attributed to a hypoxic drive. (AUTHOR)

6,165

Zechman, F. W., & G. Mueller 1962 EFFECT OF FORWARD ACCELERATION AND NEGATIVE PRESSURE BREATHING ON PULMONARY DIFFUSION. J. Applied Physiol. 17(6):909-912, Nov. 1962

ABSTRACT: Forward acceleration decreases lung volumes, resembling negative pressure breathing (NPB). At 4 g the relaxation pressure curve is shifted downward and to the right 15 mm. Hg. Pulmonary gas exchange and diffusion capacity were measured in nine human subjects during NPB (-15 mm. Hg) and forward acceleration (4 g). Pulmonary ventilation increased approximately 40% in each condition. The oxygen uptake increased with NPB (from 261 to 293 ml./min.) and was slightly decreased or unchanged at 4 g. Carbon dioxide elimination increased in both experimental conditions. The apparent steady-state carbon monoxide diffusion was unchanged by NPB but decreased from an average control value of 21 to 12 ml./min. mm. Hg at 4 g. Since lung volumes are decreased by comparable amounts in both conditions, it is believed that the deleterious effects observed with forward acceleration are associated with the increased hydrostatic gradient from chest to back. (AUTHOR) (Aerospace Medicine 34(3):276, March 1963)

6,166

Zeckwer, I. T. 1952 ACCELERATING EFFECT OF ADRENALECTOMY ON REGROWTH OF HAIR IN THE RAT CONSIDERED IN RELATION TO PITUITARY HISTOLOGY. (Dept. of Pathology, Univ. of Pennsylvania Medical School, Philadelphia)

ABSTRACT: Four groups of rats were studied: 1) thyroidectomized, 2) thyroidectomized and adrenalectomized, 3) adrenalectomized, 4) intact. Adrenalectomy was performed 5 to 17 weeks after thyroidectomy. Adrenalectomized rats received 1% NaCl drinking fluid. Hair was shaved by electric clippers from the back and sides of all rats, and the regrowth of hair photographed. Thyroidectomized rats showed large bald areas; rats with combined thyroidectomy and adrenalectomy showed rapid diffuse regrowth, nearly as marked as in adrenalectomized with thyroids intact, whose growth was much more rapid than in the intact rats. This proved that thyroidectomy, which caused loss of acidophils from the pituitary and stunting of somatic growth, did not prevent the accelerating effect of adrenalectomy on hair growth. A number of parabiotic rats were studied in which one partner was adrenalectomized. The adrenalectomized partner showed as rapid diffuse regrowth of hair as did single adrenalectomized rats. The intact partner in parabiosis with the adrenalectomized showed the slower patterns of regrowth characteristic of a single intact rat. The adrenalectomized partner, therefore, did not transfer to the intact parabiont any substance that stimulated hair growth. This suggests that adrenalectomy does not cause any increase in an accelerating substance, but occasions the removal of an inhibitory substance, and this removal is not modified by loss of pituitary acidophils consequent upon thyroidectomy. Regrowth of hair does not parallel somatic growth and does not depend on the presence of pituitary acidophils. (Federation Proceedings 11(1):177, 1952)

6,167

Zeigen, R. S. 1961 MUSCLE STRENGTH UNDER FORWARD ACCELERATION  
(Paper, 32nd Annual Meeting, Aerospace Medical Assoc., 24-27 April 1961,  
Chicago, Ill.)

ABSTRACT: Man's ability to utilize his mechanical characteristics under various degrees of forward acceleration is being studied. Maximum hand and arm strengths in six movements with the elbow flexed at a 90-degree angle have been tested thru 8 g using an isometric strain gage dynamometer. A nylon net supine seat with a 12-degree back angle served as the body support. Among the parameters studied were intra- and inter-subject variability under both rested and fatigued conditions. Selected anthropometric dimensions were measured on the twenty-two subjects used and possible correlations between these dimensions and the six arm strength movements investigated. (J. Aerospace Medicine 32(3):253, Mar. 1961)

6,168

Zeiner, E.A. 1962 XI. ENGINEERING RESEARCH.  
(Jet Propulsion Laboratory, California Institute of Technology,  
Pasadena, Calif.) Research Summary No. 36-13 for the period Dec. 1, 1961 to  
Feb. 1, 1962. ASTIA AD 274 011.

ABSTRACT: A drop capsule is being developed to provide an experimental chamber in which to perform free-fall (zero-g) liquid behavior experiments. It is hoped that 10 sec. of free-fall with satisfactory initial conditions can be achieved. Toward this objective, a prototype capsule was built. It was decided to drop two identically designed capsules from the Glen Canyon Bridge at Page, Arizona, where 672 ft. of fall and a soft dirt impact area were available. By using the measured drop time and the total distance of fall, the drag coefficient of the first capsule was determined to be  $0.082 \pm 0.052$ . The design value had been assumed at 0.070. The capsule fell along a true vertical path impacting the desired ground point within the accuracy of the film analysis of  $\pm 1.5$  ft. The first scan of the films indicated that the capsule fell without rolling, pitching, or yawing. The general results are that the capsule is aerodynamically satisfactory within the accuracy of the external camera setup. The impact dispersion from the helicopter drops was estimated at  $\pm 3.00$  ft. but excessive oscillations were visually observed. No evaluation has yet been made on the second capsule dropped from the bridge.

6,169

Zeitlin, L. R. 1960 THE INFLUENCE OF HEART ACTION AND THE CIRCULATION OF THE BLOOD ON MANNED SATELLITE ATTITUDE CONTROL. J. of the Astronautical Sciences 7(3):70-72, Fall 1960

ABSTRACT: The internal disturbing forces, particularly those produced by the heart action and blood circulation, are taken into consideration in the design of an attitude control system for a manned satellite.

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Zeller, A. F., & H. G. Moseley 1957 AIRCRAFT ACCIDENTS AS RELATED TO PILOT AGE AND EXPERIENCE. J. Avia. Med. 28:171-184

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Zeller, A. F., H. G. Moseley, & J. M. Burke 1957 FIGHTER ACCIDENTS. CENTURY SERIES. (F100, F101, F102, AND F104) (Aero Med Safety Div., Directorate of Flight Safety Research, The Inspector General, U. S. Air Force) Summary No. 20-57; 1 Oct. 1957

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Zeller, Anchar F. Mar. 1958 HUMAN ABILITY AND HIGH PERFORMANCE FLIGHT. AF Directorate of Flight Safety Research Rept. M-5-58, 26 Mar. 1958.

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Zeller, A. F., Ph. D. 1959 HUMAN ABILITY AND HIGH PERFORMANCE FLIGHT: AN ANALYSIS OF ACCIDENTS IN "CENTRUY SERIES" AIRCRAFT. The Journal of Aviation Medicine, 30(2):126-135. Feb. 1959.

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Zeller, Anchar F. 1959 AGE, EXPERIENCE AND AIRCRAFT ACCIDENTS Aerospace Medicine, 30(10):736-750

6,175

Zeller, A. F., G. H. Mormand, & J. M. Burke 1961 AIRCRAFT ACCIDENTS AND AIRCRAFT INSTRUMENTS Aerospace Medicine 32:(1)42-51.

ABSTRACT: Unfortunately aircraft accidents under instrument conditions are not rare. During the period of July 1, 1957 through June 30, 1958 the Air Force experienced 116 such major accidents. In those considered, 111 aircraft were destroyed and sixty-five pilot operators were fatally injured. Accidents of this kind emphasize the dependence of pilots on aids external to themselves, particularly when visual contact is lost. By far the greatest portion of the accidents under instrument reference occurred in flight under normal conditions. The most frequent accident type was collision with ground or water and the second most frequent was the abandonment of the aircraft while it was still in operating condition because of such emergencies as impending fuel depletion or because the pilot was lost. The collisions with the ground or water, in most instances, were completely unanticipated and gave the pilot no opportunity for escape. An accident under instrument conditions involves a breakdown of the equipment, the auxiliary aids, the man, or of the interaction between them. This article contains graphs, tables and information concerning tests conducted to improve instrument flying.

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Zeller, A. F. 1962 CURRENT FLYING AND ACCIDENT POTENTIAL.  
J. Aerospace Medicine 33(8):920-929, Aug. 1962

ABSTRACT: There is a direct relationship in the anticipated direction between current flying and accident experience. This is affected by such variables as the age and experience level of the pilot. It is particularly related to the specific type of equipment, being much more emphasized where higher performance aircraft are involved. The combination of limited background experience and limited current flying in the high performance fighters particularly, result in a situation of extreme accident potential. The most immediate way of reducing this appears to be by substantial increases in the amount of current flying made available to the individual pilot. The operation of jet trainers and jet bombers is less related to current flying than is the jet fighter. The demonstrated relationship between the variables involved have a number of implications directly applicable to decisions regarding the apportionment of hours; the decision to transition pilots of various age and background and the type of equipment which is most desirable for maintaining flying proficiency where a direct operational assignment is not involved.

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Zeller, W. 1932 DEM MENSCHLICHEN KÖRPER AUFGEZWUNGEN BEWEGUNGSVORGÄNGE  
UND DEREN WAHRNEHMUNG. (Influence of motion on the body and its perception)  
Psychotechn. Ztschr. 7:139-147

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Zellmer, R. W., G. J. Womack, R. C. McNee, & R. G. Allen, Jr. 1962 SIGNIFI-  
CANCE OF COMBINED STRESSES OF G-FORCES AND IRRADIATION. (Paper, 33rd Annual  
Meeting of the Aerospace Medical Assoc., 9-12 April 1962, Atlantic City, N.  
J.)

ABSTRACT: The occupant of a space vehicle will be exposed to varying amounts of accelerative force upon injection into orbit, escape from Earth's gravitational field and reentry into the atmosphere. Effects of G-forces ideally will be minimized by proper positioning of the astronaut within the capsule, but mal-orientation of the capsule could well occur due to system dysfunction. In addition, to this stress, the crewman will be required to accept minimum radiation exposure in certain regions of the flight profile or possibly, additionally, larger doses due to unexpected solar flare activity. The additivity of these combined stresses, within time, is the subject of this paper. Groups of rats were exposed in an experimental array designed to explore the interaction of various amounts of positive, negative, and transverse G-forces with grades doses of CO<sup>60</sup> gamma irradiation before and at various time intervals following the acceleration exposure. The end point investigated was the LD<sub>50</sub> of the exposed animals. Data will be presented and the significance of these data discussed.  
(J. Aerospace Medicine 33(3):356, Mar. 1962)

6,179

Zhukov-Verezhnikov, N. N., V. I. Yakovlev & I. N. Mayskii 1961 0  
TERETICHESKIKH PROBLEMAKH KOSMICHESKOY BIOLOGII (Theoretical Problems  
of Cosmic Biology)  
(Trans. of Voprosy Filosofii (USSR) 14(9):111-119, 1960)  
(Office of Technical Services, Washington, D.C.) 61-21125

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Ziegenruecker, G. H., & E. B. Magid 1959 SHORT TIME HUMAN TOLERANCE TO  
SINUSOIDAL VIBRATIONS. (Wright Air Development Ctr., Wright-Patterson  
AFB, Ohio) WADC TR 59-391; ASTIA AD-227 341; July 1959

ABSTRACT: Short time human tolerance criteria for sinusoidal vibration from 1 to 15 cps were determined using 10 healthy male subjects ranging in age from 23 to 34 years. At each frequency, the amplitude was increased at a constant rate from zero to the point where the subject stopped the run because he thought that further increase might cause actual bodily harm. The lower levels of tolerance were found to be between 1 and 2 g at 3 - 4 cps and at 7 - 8 cps. The highest tolerance level of 7 - 8 g was found at 15 cps. Subjective tolerance limits were found to be caused by one or more of seven specific sensations or symptoms. Physiological observations during vibration exposure were also made. (AUTHOR)

6,181

Ziegenrucker, G.H. & E.B. Magid 1960 SHORT TIME HUMAN TOLERANCE TO  
SINUSOIDAL VIBRATIONS. (Paper, 31st Annual Meeting of the Aerospace  
Medical Association, Americana Hotel, Bal Harbour, Miami Beach, Fla.,  
May 9-11, 1960)

ABSTRACT: Short time human tolerance criteria for sinusoidal vibration from 1 to 15 cps were determined using ten healthy male subjects ranging in age from twenty-three to thirty-four years. At each frequency, the amplitude was increased at a constant rate from zero to the point where the subject stopped the run because he thought that further increase might cause actual bodily harm. The lower levels of tolerance were found to be between 1 and 2 G at 3-4 cps and at 7-8 cps. The highest tolerance level of 7-8 G was found at 15 cps. Subjective tolerance limits were found to be caused by one or more of seven specific sensations or symptoms. Physiological observations during vibration exposure were also made.

6,182

Ziegler, R. B. and J. Lazo 1961 SUBJECT SELECTION: PERTINENT CRITERIA  
FOR SUBJECTS IN AEROSPACE HUMAN FACTORS RESEARCH.  
Aerospace Medicine 32(3):253, March 1961.

ABSTRACT: Selection of subjects for aerospace human factors research becomes



increasingly critical when the results are to be applied to a single human being, such as the operator of an X-15 aircraft or Mercury capsule. Longitudinal analysis of data from subjects in several Air Crew Equipment Laboratory studies has indicated that one carefully chosen subject can often provide more pertinent information than can large groups of randomly selected men. There was a tendency for introverted types of men to deal with anxiety differently than extroverted types do, and to have different psychophysiological patterns. Examples are given of differences in perceptual thresholds, time estimation ability, performance, personality test results, and in physiological measures, found in experimental subjects and which appeared to be related to the manner in which they reacted to stress situations. These meaningful differences are frequently cancelled out by statistical averaging techniques. A thorough mission profile analysis can provide criteria for determining which subjects are appropriate for studies of a particular aerospace problem.

6,183

Ziengenruecker, G.H. & E.B. Magid. 1960 SHORT TIME HUMAN TOLERANCE TO SINUSOIDAL VIBRATIONS. Aerospace Med. 31(4):325-326

ABSTRACT: Short time human tolerance criteria for sinusoidal vibration from 1-15 cps were determined using ten healthy male subjects ranging in age from 23 to 34 years. At each frequency the amplitude was increased at a constant rate from 0 to the point where the subject stopped the run because the thought that further increase might actually cause bodily harm. The lower levels of tolerance were found to be between 1 and 2 G at 3-4 cps and at 7-8 cps. The highest tolerance level of 7-8 was found at 15 cps. Subjective tolerance limits were found to be caused by one or more of 7 specific symptoms. Physiological observations during vibration exposure were also made.

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Zim, H. S. 1943 MAN IN THE AIR: The Effects of Flying on the Human Body. (New York: Harcourt Brace & Co., 1943)

ABSTRACT: "Man in the Air" considers flying from the point where it affects man's body and mind. The chapters include; man in the ocean of air; the air in which we live; our bodies; adjustment to temperature; respiration and breathing; oxygen and oxygen masks; present day oxygen masks; aeroembolism; pressure suits and pressure cabins; high up on the ground; changes in speed and direction; positive and negative acceleration; eyes to see; ears to hear; ears are for more than hearing; air sickness; flying fatigue; smart enough to fly; tests and more tests; safety in flight fatigue; smart enough to fly; tests and more tests; safety in flight and flying and public health.

6,185

Zimkin, N. V. 1961 KONFERENTSIIA PO PROBLEME ADAPTATSII, TRENIROVKI I DRUGIM SPOSOBAM POVYSHENIIA USTOICHIVOSTI ORGANIZMA, 25-28 IANVARIA 1961 G. (CONFERENCE ON PROBLEMS OF ADAPTATION, TRAINING, AND OTHER METHODS OF INCREASING BODY RESISTANCE, 25-28 JANUARY 1961) Fiziologicheskii zhurnal SSSR (Moskva) 47(7):934-937, July 1961  
English Translation: Sechenov Physiol. J. USSR (New York: Pergamon Press, 1962) 47(7):1020-1023, Jan. 1962

ABSTRACT: The majority of papers were concerned with the discovery of adaptation mechanisms and measures for enhancing the organism's resistance to unfavorable agents (physical training, drugs, etc.). Non-specific increase in resistance via non-specific adaptation mechanisms were obtained after administration of Dibazol, "Zhen'shen", Eleutherococcus, vitamin B<sub>12</sub>, ascorbic acid, Proserine, eserine, or cortisone. Various experiments were reported where these agents alone or in combination raised the tolerance to hypoxia, hypothermia, hyperthermia, and acceleration in the animal organism. A number of reports dealt with increased resistance resulting from regular exposure to hypoxia. Preliminary adaptation of rats to hypoxia increased their resistance to hypothermia, burn sequelae, and hyperthermia. Hemispherectomy affected hypoxia tolerance differentially in rats and dogs. Other reports described research on the organism's adaptation to ambient heat or cold, the importance of muscular work in increasing non-specific resistance, research on fatigue, development of resistance to drugs by cancer cells, and neural adaptation. (Aerospace Medicine 33(11):1396, Nov. 1962)

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Zimkin, N. V. 1961 CONFERENCE ON THE PROBLEM OF ADAPTATION, TRAINING AND OTHER METHODS OF RAISING BODILY RESISTANCE, STALINO, JAN. 61. (Trans. of Fiziologicheskii Zhurnal (USSR) 47(7):934-937, 1961.) (Office of Technical Services, Washington, D.C.) 62-15380

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Zimmer, H. 1960 TECHNICAL REVIEW OF BIOSCIENCES RESEARCH (Georgetown U. Hospital, Washington, D.C.) Project 9778(805), Contract AF 49(638)-187; AFOSR, DLS

ABSTRACT: The purpose of this research is to assemble and administer review committees consisting of distinguished scientists in the biosciences area for the purpose of providing critical reviews and guidance for the biosciences research program. Special teams will be provided for the preparation of reports and materials on special subjects of importance to the biosciences research program specifically, and to the Air Force at large as required. A vehicle and personnel for the review of research proposals submitted to the biosciences program will be provided to insure the ablest evaluation of such proposals.

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Zimmerman, and Putnam 1947 RELATION BETWEEN ELECTROENCEPHALOGRAPHIC AND HISTOLOGIC CHANGES FOLLOWING APPLICATIONS OF GRADED FORCE TO CORTEX Arch. Neurol. Psychiat. 57:521-546

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Zimmerman, W. S., A. A. Canfield, & R. C. Wilson 1948 THE EFFECT OF INCREASED POSITIVE RADIAL ACCELERATION OR G, UPON HUMAN ABILITIES. PART I: SPATIAL ORIENTATION ABILITY. (University of Southern California, Los Angeles, Calif.) Contract N6ori77, Task Order III; ASTIA ATI-52525; 15 June 1948

ABSTRACT: The effects were investigated of various levels of radial acceleration or positive G on human spatial orientation ability. Subjects wearing anti-G suits were tested at G levels of one, two, three, four, and five G by means of the human centrifuge and analyses were made of the difficulty of the six possible response movements. No observable effect of increased G was found in the performance of the task, either on speed, accuracy, or total performance, and no individual variations were observed. It was concluded that a pilot, equipped with a type Z-2 G suit has no impairment of his spatial orientation ability when exposed to as much as 5 G for a period of 15 seconds. (CADO)

SUMMARY: 1) This study is devoted to appraisal of the effects of various levels of radial acceleration or positive G on spatial orientation ability. It is one of a series of psychological experiments designed to investigate the effects of variation of G upon independent measurable human abilities, called factors. 2) The factorial viewpoint was adopted, on the assumption that such an approach should yield the most economical and meaningful results. 3) The abilities under investigation are those which were found to be most valid for predicting success in pilot training during World War II. 4) A study of the effects of positive G on spatial orientation ability was undertaken first. The results of this investigation are presented in this report. 5) A test to measure this spatial orientation ability was devised and apparatus suitable for presenting the test on the human centrifuge was constructed. 6) The test was administered to subjects at one, two, three, four and five G. Subjects wore anti-G suits, type Z-2, during all the test periods. At 15 sec. run at each of the G levels was given at each day's testing session for each individual. This procedure was repeated on five different days with counter-balanced G order and rearrangement of test items. Twenty-one subjects completed the series of trials. 7) Analysis of the data obtained reveals no evidence that spatial orientation ability, as measured, was affected by increased G produced by radial acceleration on the human centrifuge. No significant differences were found between scores made at the five different G levels. 8) It is recommended that the outlined series of psychological studies be continued, to map as completely as possible the effects of increased G forces upon human abilities. (AUTHOR)

6,190

Zimmerman, R.H. & C.D. Jones 1962 FLIGHT ENVIRONMENT DESIGN PARAMETERS FOR MARS AND VENUS (Ohio State U. Research Foundation, Columbus, Ohio)  
Contract AF 33(616)5914; Proj. 6146; ASD TDR 62-805, ASTIA AD-288 538

ABSTRACT: The physical characteristics of the planets Mars and Venus are assessed and probable quantitative limits are defined as minimum, representative and maximum probable values for application to environmental studies and equipment design. These data are applied to Chapman's generalized analysis for bodies entering planetary atmospheres to proflight environment design parameters. These planetary parameters are applied with body and trajectory parameters, using Chapman's analysis, to selected direct, multipass and graze entries. (AUTHOR)

6,191

Ziskind, M.M. & O. Creech Mar. 1961 STUDIES OF RESPIRATORY FUNCTION FOLLOWING THORACIC AND THORACO-ABDOMINAL INJURIES: 1) Pulmonary compliance, 2) Alveolar ventilation, 3) Inspired gas distribution.  
ASTIA AD 253 498. (Cont. no. DA-49-007-MD-796)

Summary(a): A large mobile equipment cart especially designed for bedside studies has been assembled. The cart carries a spirometer integrated with apparatus for the determination of residual volume, inspired air distribution, pulmonary compliance and airway resistance. The cart and the apparatus are described in detail in the report.

With the modified apparatus 29 subjects including normals, medical patients and traumatic chest and thoracic surgical patients have been studied; the results are tabulated in the report. The value of the individual tests for the investigation of acute chest injuries has been considered. Minute ventilation, tidal volume, nitrogen washout (single breath) curves, airway resistance measurements, and arterial oxygen saturation and carbon dioxide tension determinations are the most reliable and instructive procedures for the patient who is acutely ill and whose cooperation is limited. The complicated methods which measure pulmonary diffusing capacity and compliance require a steady-state and full cooperation and are suitable only after the clinical situation has been stabilized. They are then valuable aids for studying recovery of function and response to treatment.

6,192

Zjurin, I. 1940 AERIAL SICKNESS AND THE INSULIN TEST AFTER LONDON (Russisch)  
(Arch. biol. Nauk 60, Nr1, 41-45 u. engl. Zusammenfassung 45 Ref.  
Luftfahrtmed. 5, 301)

6,193

Zjuzin, I 1940 THE EFFECT OF ADRENALIN, PILOCARPINE AND INSULIN ON THE  
SYMPTOM-COMPLEX OF AERIAL SICKNESS (Russisch)  
(Arch. biol. Nauk 60: 37-40 Ref. Luftfahrtmed. 5, 205)

6,194

Zuckerman, S. 1939 EFFECTS OF DIRECT CONCUSSION ON MONKEYS IN  
UNDERGROUND SHELTERS. (Research and Ex. Branch, Min. Home Security)  
RC 65, December 1939

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Zuckerman, S. 1940 EXPERIMENTAL STUDY OF BLAST INJURIES TO LUNGS.  
Lancet 2:219, 238 Aug. 1940.

6,196

Zuckerman, S. 1940 FIRST REPORT OF INVESTIGATION OF EFFECT OF BLAST  
ON ANIMALS. (Report, Research and Exp. Branch, Min. of Home Security)  
June 1940

6,197

Zuckerman, S. and A.N. Black 1940 THE EFFECT OF IMPACTS ON THE HEAD AND  
BACK OF MONKEYS  
(Ministry of Home Security, Research and Experiments Dept.) August 1940  
R.C. 124

ABSTRACT: Signs of concussion do not develop in monkeys which are tied  
(either with their heads free or with their heads fixed) to a freely swinging  
plate that is set into motion with an initial velocity of up to 10 ft./ sec.

6,198

Zuckerman, S. 1940 EXPERIMENTAL STUDY OF BLAST INJURIES TO LUNGS  
Lancet 2:219, 238 24 Aug. 1940.

6,199

Zuckerman, S. 1940 BRIEF REPORT BY PROFESSOR S. ZUCKERMAN OF  
EXPERIMENTAL WORK ON THE PHYSIOLOGICAL EFFECTS OF BLAST, CARRIED OUT  
BY THE RESEARCH AND EXPERIMENTS BRANCH, MINISTRY OF HOME SECURITY.  
(Ministry Home Security, Research & Exper. Dept.) RC 108, June 1940

6,200

Zuckerman, S. 1941 THE PROBLEM OF BLAST INJURIES Proc. Roy. Soc. Med., XXXIV: 171-188.

6,201

Zuckerman, S. 1941 OBSERVATIONS ON SO-CALLED BLAST CEREBRAL-CONCUSSION. (Report, Comm. Weapons) MPRC-BPC 147/WS 12, 20 Nov. 1941

6,202

Zuidema, G.D., S.I. Cohen, A.J. Silverman & M.B. Riley 1956 HUMAN TOLERANCE TO PROLONGED ACCELERATION (Aero Med. Lab., WADC, Wright-Patterson AFB, Ohio) Tech. Rept. No. WADC TR-56-406, Oct. 56  
Also J. Aviat. Me. 27:469-481, Dec. 1956

ABSTRACT: Subjects whose blackout level had been determined while wearing the standard USAF anti-g suit were subjected to a series of nine runs distributed in random order, but consisting of three runs at 2.5 g for 115 secs. each, three 4 g. runs for 80 secs. each, and three runs at a g level 0.5 below individual blackout levels. Physiological and psychological determinations indicated: (1) dimming of vision occurred late in the higher g runs of all subjects despite the fact that they were protected by anti-g suits and running at 0.4 g below their pre-determined blackout level. (2) Blood pressures at the heart level showed graded increases both insystolic and diastolic components under increasing g; pulse pressure remained relatively constant, (3) Four of five subjects showed cardiac arrhythmias at high g levels. (4) High g loads produced excessive central nervous system excitability as reflected in skin resistance measures. And (5) the higher levels of sustained g in this experiment approach man's physiological and psychological limits of tolerance (AUTHOR).

6,203

Zuidema, G. D., S. I. Cohen, A. J. Silverman and M. B. Riley 1956 HUMAN TOLERANCE TO PROLONGED ACCELERATION. J. Aviat. Med. 27:(6)469-481 Dec 1956  
See also (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TR 56-406; ASTIA AD-97 156, Oct. 1956

ABSTRACT: Human tolerance to prolonged positive acceleration has been evaluated on the human centrifuge. Central nervous system and cardiovascular decompensation were found to occur almost simultaneously at high g levels. A high incidence of cardiac arrhythmias was seen, and this may well be the limiting factor of the future use of high g levels sustained for approximately 60 seconds.

6,204

Zuidema, G. D., & R. Edelberg 1956 A DEVICE FOR THE INDIRECT RECORDING OF BLOOD PRESSURE. PART II. RESEARCH USES. (Wright Air Development Ctr., Wright-Patterson AFB, Ohio) WADC TN 55 427, Pt. 2; ASTIA AD-110 576; Dec.1956

ABSTRACT: Four modifications of a previously reported indirect blood pressure recorder are presented. These consist of four variations in the pulse-sensing unit and include: a strain gauge mounted over the brachial artery; a one-piece unit consisting of a fluid-filled rubber balloon and tubing connecting it to a pressure transducer; use of the Gauer miniature manometer; or application of a very simple carbon microphone. Their use in the high altitude-low pressure chambers, the human centrifuge, and psychophysiological test situations is described. (AML)

6,205

Zuidema, G. D., S. I. Cohen, & A. J. Silverman July 1958 CLINICAL EVALUATION OF LOW G TOLERANCE. WADC TN 57-268 ASTIA AD 130 918  
NOTE: CARI P&S 2.14

ABSTRACT: Twelve student pilots were referred to this laboratory for evaluation of their g tolerance, following inflight blackout episodes. The patients were studied by a team using cardiovascular, neurohormonal, bioelectric, psychologic, and psychiatric techniques. Results showed that the patients could be divided into 4 groups: (1) 6 patients had no demonstrable physiological or psychological difficulties; (2) 2 subjects had been incorrectly performing protective maneuvers; (3) 2 patients had inadequate vasomotor reflexes; and (4) 2 subjects had psychologic characteristics thought to be important determinants of lowered acceleration tolerance. The relationship of cardiovascular and psychophysiological factors in tolerance to g forces is illustrated. (AUTHOR)

6,206

Zuidema, G. D. 1961 SOME PHYSIOLOGICAL CONSIDERATIONS OF SPACE FLIGHT. (In Gauer, O. H. and G. D. Zuidema, Gravitation Stress in Aerospace Medicine) (Boston: Little, Brown, and Co., 1961). pp. 202-210.

6,207

Zuidema, G. D. 1961 CLINICAL EVALUATION OF LOW G TOLERANCE. (In Gauer, O.H. and G. D. Zuidema, Gravitational Stress in Aerospace Medicine) (Boston: Little, Brown, and Co., 1961). pp. 224-237.

6,208

Zweifach, B. W., & L. Thomas 1957 THE RELATIONSHIP BETWEEN THE VASCULAR MANIFESTATIONS OF SHOCK PRODUCED BY ENDOTOXIN, TRAUMA, AND HEMORRHAGE. I. Certain Similarities between the Reactions in Normal and Endotoxin-Tolerant Rats. J. Exptl. Med. 106:385-402

6,209

Zweifach, B. W., B. Benacerraf, & T. Lewis 1957 THE RELATIONSHIP BETWEEN THE VASCULAR MANIFESTATIONS OF SHOCK PRODUCED BY ENDOTOXIN, TRAUMA, AND HEMORRHAGE. II. The Possible Role of the Reticulo-endothelial System in Resistance to each Type of Shock. J. Exptl. Med. 106:403-414

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Zweifach, B. W. 1960 THE CONTRIBUTION OF THE RETICULO-ENDOTHELIAL SYSTEM TO THE DEVELOPMENT OF TOLERANCES TO EXPERIMENTAL SHOCK. Ann. N.Y. Acad. Sciences 88:203-212

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Zwerling, I., 1949. A NOTE ON WENDT'S VIEWS OF THE IMPORTANCE OF PSYCHOLOGICAL FACTORS IN MOTION SICKNESS. J. Aviat. Med. 20(1):68-72.

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Zybulski, N. 1878 UEBER DEN EINFLUSS DER KÖRPERSTELLUNG AUF DEN BLUTDRUCK UND DEN PULS (Concerning the Influence of the Posture Upon the Blood Pressure and the Pulse.) Medizinische Wochenschrift (St. Petersburg) #11; 1878.



ACCELERATION

ANONYMOUS

6,213

Anon. n.d. ABSTRACTS OF PAPERS PRESENTED AT THE SYMPOSIUM ON THE UNEXPLAINED AIRCRAFT ACCIDENT (Tenth Meeting of the AGARD Aeromedical Panel, Paris, France)

6,214

Anon. n.d. ACCELERATION PROBLEMS IN SPACE FLIGHT.  
(U.S. Naval Air Development Center, Johnsville, Pa.) NADC-MA 5909.

6,215

Anon. n.d. STATIC AND DYNAMIC TESTS OF A TYPICAL TRANSPORT PILOT'S SEAT INSTALLATION FOR A 40 G CONDITION. (Naval Air Material Center, Philadelphia, Pa.) Rept. No. ASL NAM 24102, Part II and Part I.

6,216

Anon. n.d. THEORETICAL COURSE FOR THE USE OF CANDIDATES FOR THE PRELIMINARY PROFICIENCY CERTIFICATE IN PARACHUTING  
(French Ministry of Public Works and Transport) R.A.E. Transl. No. 416

6,217

Anon. n.d. VTOROY SOVETSKIY KOSMICHESKIY KORABL' (The Second Soviet Cosmic Ship)  
Izvestiya, No. 212, 6 Sept. 1960.

6,218

Anon. 1910 AEROPLANE ACCIDENTS: Record Breaking and Its Consequences.  
Sci. Amer. Suppl. 70:355

6,219

Anon. 1910 AEROPLANE ACCIDENTS: What they teach the designer  
Sci. Amer. Suppl. 70:212

6,220

Anon. 1911 AIR SICKNESS AND AVIATION ACCIDENTS.  
Sci. Amer., 104:570-571

6,221

Anon. 1911 RECENT FATAL ACCIDENTS WITH MONOPLANE.  
Sci. Amer. 104:108

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Anon. 1911 THE TRAGIC END OF MOISANT AND HOXSEY.  
Sci. Amer. 104:43

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Anon. 1912 PARACHUTE JUMP FROM AEROPLANE IS SUCCESSFUL  
Aero. J. 3:453.

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Anon. 1913 TURNING SOMERSAULTS WITH AN AEROPLANE: The Remarkable Exploit  
of Adolphe Pegoud. Sci. Amer. 109:240

6,225

Anon. 1928 PHYSIOLOGY OF FLYING. Literary Dig., 99 (2):84-85

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Anon. 1929 THE PROBLEM OF AIR SICKNESS. Air Commerce Bull. 1(10):6

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Anon. 1930 THE PROBLEM OF AIR SICKNESS. Sci. Amer., 142:70

6,228

Anon. 1931 ACCELERATION OF THE HUMAN BODY.  
Astronautics (2):5 Mar. - Apr. 1931

6,229

Anon. 1934 A NOTE ON BLIND FLYING ISSUED BY THE AERONAUTICS BRANCH,  
DEPARTMENT OF COMMERCE. J. Aviation Med. 5(1):26-27

ABSTRACT: It has been determined that if a pilot sits in a normal manner with head erect and facing forward he is subject to slight, if any, false impressions of position or orientation. It has also been found that if his head is twisted or inclined sidewise he is immediately subjected to strong and entirely false impressions of position and orientation. This is commonly referred to as vertigo. Vertigo is the sensation of movement after the body has stopped moving. It involves subjective sensations of disturbed relations with environment to some definite plane, vertical, horizontal or oblique. Vertigo occurs when the membranes in the semi-circular canal are strongly stimulated by rapid action of the fluid. (CARI)

6,230

Anon. 1937 BIBLIOGRAPHY OF AERONAUTICS, PART XI -MEDICINE  
(U.S. Works Progress Administration)

CONTENTS:

This bibliography was compiled from the index of aeronautics of the Institute of Aeronautical Sciences.

It is an extensive bibliography covering accidents, airsickness, airplane ambulances, carbon monoxide poisoning, cardiovascular system, ear, nose and throat, effects of altitude, effects of wind, cold and speed, eye fatigue and staleness, hygiene, nervous system, pathology, physical qualifications; psychological aspects, psycho-physiological aspects, sanitary aviation and general references.

6,231

anon. 1938 INFLUENCE OF FLYING ON THE CIRCULATION.  
J. Amer. Med. Ass. 110:2092-2093

ABSTRACT: Both the peripheral and the central circulation are greatly influenced by flying. The special demands made by flying are based on two factors, speed and altitude, which differ fundamentally in one respect: altitude influences the circulation directly through diminished oxygenation of the blood, whereas the effect of speed is vastly more indirect. The speed factor is based on centrifugal force, always present whenever the course of the aircraft is altered. The entire organism of the flier is exposed to the same centrifugal forces as the ship.

Since the blood volume is diminished, during exposure to centrifugal forces, blood in more or less considerable quantities is transported peripherad. Owing to the great capacity of the abdominal circulation and the centrifugal speed, which in flying usually exerts its influence distad, large quantities of blood will descend into the lower half of the body, with more or less complete emptying of the vessels of the upper half. Some vasomotor collapse will occur. It is generally assumed that the altitude influences the circulation indirectly through the lowering of the pressure of the oxygen in the atmosphere and by the inhibition of oxygenation in the pulmonary blood supply.

6,232

Anon. 1939 ANOTHER KIND OF BLACKOUT.  
Lancet, 2:1125-1126

ABSTRACT: High speed flying often results in transient blindness (blacking out or amaurosis fugax), brought about by sudden change of direction or when power diving.

Forces meeting the pilot in a straight anteroposterior or lateral direction while in flight do not have the same results as when accelerating in a curved path. Here the body may be subjected to a centrifugal force with the head inward, or less frequently outward. A force of more than 5 g. causes diminution, or loss of vision, rapidly followed by loss of consciousness. The changes are due to centrifugal removal of the blood from the brain.

The ability to withstand such stress depends on the power of the cardiovascular system to adjust itself to the forces encountered.

Whether blindness is due to retinal ischemia or vascular alterations in the visual pathway has not yet been determined; however, Livingston brought forward evidence against the theory the ischemia results from occlusion of the retinal arteries by positive intra-ocular pressure, since this is unchanged by centrifugal action. He believed that alterations take place in the neighborhood of the external geniculate bodies and the area striata.

6,233

Anon. 1939 GERMAN NOMENCLATURE FOR AERODYNAMICS  
(D.I.N.L. 100 German Standards, German Air Ministry, Sept., 1939)  
R.A.E. Translation No. 116

6,234

Anon. 1940-42 PHYSIOLOGY OF FLIGHT - HUMAN FACTORS IN THE OPERATION OF  
MILITARY AIRCRAFT, A COMPENDIUM OF LECTURES AND DEMONSTRATIONS GIVEN TO  
ARMY AIR FORCE PERSONNEL, 1940-42. (Aero-Medical Research Laboratory,  
Experimental Engineering Section, Materiel Center, Wright Field, Ohio)

6,235

Anon: 1941 PHENOMENON OF "BLACK-OUT,"  
Canad. M.A.J., 43:271-273

ABSTRACT: In amaurosis fugax (blackout) the defect of vision varies from slight transient haze to complete temporary blindness.

Gravity (G) is produced, the period during which it is operating to its full extent, and the degree of susceptibility of the flier enter into production of

"blackout," which is attributed to intra-ocular compression of the central retinal artery and its branches. The status of the eye is only one part of the factors affecting the lower visual centers and the corticovisual areas. The retinal vessels are believed to collapse because the systolic pressure in the ophthalmic artery is markedly reduced under centrifugal action and the intra-ocular pressure of 20 mm. offers a resistance which cannot be overcome.

6,236

Anon. 1941 SOLVING RIDDLES OF AVIATION MEDICINE.  
Canad. Aviation 14(8):21-23; 28, 53

6,237

Anon. 1942 BLAST INJURIES  
J. A. M. A. 118(11):898-899, March 14, 1942.

ABSTRACT: In 1918 and 1919 D. R. Hooker made a study of blast injuries at the Sandy Hook Proving Ground. These studies led him to emphasize four points: The fatal effects of primary blasts occur in animals only relatively near the explosion, a difference of 2 or 3 feet often determining the question of life or death; there is a syndrome of primary shock characterized by collapse of the blood pressure in animals affected but not killed; there is an absence of petechial hemorrhages or other intracranial lesions in the brains of animals exhibiting primary shock; hemorrhagic lesions of the lungs and occasionally of other visceral organs are prevalent in animals subject to blast. The extent of the lung lesion bore little if any relation to the gravity of the symptoms of concussion.

In his report on experimental investigation carried out for the Research and Experiments Department of the Ministry of Home Security, S. Zuckerman detailed his studies on mice, rats, guinea pigs, rabbits, cats, monkeys and pigeons. Zuckerman concluded from these experiments that it is the pressure component of the blast wave which bruises the lungs by its impact on the body wall.

6,238

Anon. 1942 BLAST INJURIES  
J. American Med. Assn. 120:1398-1399, Dec. 26, 1942.

ABSTRACT: Experiments conducted by E. R. P. Williams showed that the maximum blast pressure that can be withstood without loss of efficiency is 2 1/2 pounds per square inch. Effects on the body of explosions, both in air and in water, are primarily due to the externally applied pressure wave, but in air both the windage factor and the after-suction waves play their part. Internal blast injuries without external marks are rare in William's experience, since he has seen only 4 such cases among 1,500 casualties. Authors agree that most blast injuries are multiple. They include concussion of the brain and spinal cord, injury to the lungs or the abdominal contents, rupture of the ear membrane and injury to the eye. Williams believes that the most important single measure in the treatment of patients with blast injuries of the lungs is continuous administration of oxygen.

6,239

Anon. 1943 COOPERATION IN DESIGN.  
Sc. News Letter 43:92-93

ABSTRACT: Engineer and biologist must work together if men are to be successful in handling the formidable airplanes now possible.

Professor Bronk cites the "blackout" experienced by dive bombers in pulling out of steep, fast dives. The centrifugal effect of such sudden upswerves drains the blood away from the brain. The basic reason for this momentary unconsciousness is oxygen starvation on the part of the brain cells which never have more than a few seconds supply on hand.

6,240

Anon. 1943 YOUR BODY IN FLIGHT, AN ILLUSTRATED "BOOK OF KNOWLEDGE" FOR THE FLYER. (Aero Medical Lab. Engineering Division, Materiel Command, Wright field, Ohio)

6,241

Anon. 1945 ANTI-G SUIT FOR FIGHTER PILOTS  
Flight 47(1881):37. Jan. 1945.

ABSTRACT: To protect pilots against effects of excessive "positive g" during violent maneuvers. A short note about experiments and some particulars added.

6,242

Anon. 1945 ANTI-G SUIT FOR FIGHTER PILOTS.  
Flight and Aircraft Engineer, 47(1881):37, Jan. 1945

ABSTRACT: As early as 1945, Americans at Wright Field developed the Berger G 2 suit, consisting of 5 air cushions for the stomach, thigh and calves.

6,243

Anon. 1945 EFFECTS OF ACCELERATION ON MAN.  
(Conference on Human Factors in the Design and Operation of Aircraft, Aero Medical Laboratory, Engineering Division, ATSC, 19, 20 Jan. 1945)

ABSTRACT: The pilot, sitting in the conventional position in an aircraft, is

subjected to increased positive "g" in pull-outs and banking turns and to negative "g" in outside turns and push-downs. Forces developed in both types of maneuvers can produce important effects on the flyer. This article discusses the symptoms and results of increased positive "g" on the pilot. It also surveys the results obtained from experiments on the centrifuge at Wright-Patterson Field.

6,244

Anon. 1945 THE G-SUIT: NOTES FROM THE AIR SURGEONS OFFICE.  
J. Aviation Med. 16:45-46

ABSTRACT: The earliest workable G suits were developed by the Canadian and the Australian air forces, followed closely by the U.S. Navy. The AAF, experimenting with the Navy suit, modified and adapted it after extensive tests on the centrifuge at the Aero Medical Lab., Wright Field, and evolved the present suit now standard for the AAF.

The G-3 suit consists of a series of 5 air bladders positioned over the soft tissue areas of the calves, thighs, belly. When inflated, the air bladders tense the inelastic cloth of the suit, exerting pressure upon the body to keep the blood from flowing downward rapidly and to force it back toward the heart.

The suit makes use of the "exhaust" compressed air from the aircraft's vacuum instrument pump connecting to the pump through a light-weight valve which also supplies air pressure to the jettisonable gas tanks. This valve automatically inflates the suit in two seconds when the G force exceeds 2 G and empties it when the G force returns below two, giving the suit a pressure of 1 pound per square inch per G above 2 G. The flier needs only to plug the suit into the air line when he gets into the cockpit. The rest is automatic.

Although theoretically, the suit offers an extra tolerance of 1.9 G, fighter pilots wearing the suit have never reported a complete blackout, regardless of the violence of any combat maneuver experienced.

6,245

Anon. 1945 "RADIAL ACCELERATIVE FORCES IN THE GAF" MEDICAL  
INTELLIGENCE. The Air Surgeon's Bulletin. 2(11):411

ABSTRACT: " In an interview with a German University professor it was learned that work involving radial accelerative forces had been carried on in Berlin. Experiments were performed, first with animals and then with humans, in which forces up to 18g were recorded, presumably with the subjects in the prone position. The German Air Force apparently had no satisfactory method of coping with the effects of great accelerative forces on flyers. An anti-g suit obtained from a captured P-51 pilot was said to have been considered "inferior", but in the absence of any German device it was copied and put into production! "  
(CARI)

6,246

Anon. 1946 DECELERATOR FORCES PRINTS-DRAWINGS. (Cornell Aeronautical Lab, Buffalo, N.Y.) DA-R-223-001, DA-R-223-008, DA-G-223-015, DA-R-223-009, DA-R-223-013.

6,247

Anon. 1946 DESIGN DATA FOR PILOT EJECTION SEAT AND CATAPULT- APPENDIX 3 (Wright-Patterson Air Force Base, Ohio) M.R. TSEAC11-4534-7-2, Add. 1. 1 May 1946. ASTIA ATI 12725

ABSTRACT: This publication lists the specifications that must be met by the designer of the pilot ejection seat and catapult.

6,248

Anon. 1946 FOREIGN AIR TECHNICAL DOCUMENTS  
Mechanical Engineering 68(7):651-652, July 1946

6,249

Anon. 1946 PHYSIOLOGICAL EFFECTS OF INTERMITTENT BLASTS, PERIODIC BLASTS, AND SUPERSONIC VIBRATIONS OF GREAT ENERGY (War Dept. Air Forces. Interrogation Rept.) TSEAA-660-99, February 28, 1946

6,250

Anon. 1947 AEROMEDICAL RESEARCH  
Abstract: Bulletin of U.S. Army Medical Dept. 7(3):256-257, Mar. 1957.  
NOTE: Reel 7, Flash 7, Item 7

ABSTRACT: Reviews future projects for aeromedical research necessary to solve the physiological problems caused by acceleration, deceleration, high speed escape, and intense temperatures. (CARI)

6,251

Anon. 1947 AVIATION MEDICINE  
Abstract; Bulletin of U.S. Army Medical Dept. 7(7):627, July 1947.  
NOTE: Reel 7, Flash 7, Item 8

ABSTRACT: Throughout the war, the Air Force, with Army Air Forces funds, conducted an extensive program of research in the field of aviation medicine. In 1944, they developed an oxygen mask which fitted the flyer and eliminated the



danger of freezing up. In that same year, they developed an electrically heated suit to prevent frostbite. Soon afterwards, a pneumatic anti-g suit was developed to protect the crews of planes from accelerative forces in the air. To protect crew members from long-range flak and 20-mm. shell fragments, a flak suit made of overlapping plates of manganese steel secured in pockets and worn as an apron or vest was developed. In 1943 an improved type of helmet was developed for flying personnel. (CARI)

6,252

Anon. 1947 THE BELL XS-1

Abstract: Bulletin of U.S. Army Medical Dept. 7(1):41-42, Jan. 1947.

NOTE: Reel 7, Flash 7, Item 6

ABSTRACT: The Army Air Forces' first rocket-propelled airplane, the Bell XS-1 made its first powered flight at Muroc Flight Test Base, Calif., in Dec. Designed to fly at a top speed of 1,700 mph at an altitude of 80,000 ft., the XS-1 was never intended to be a military airplane. It is actually a piloted flying research laboratory, the sole function of which will be the recording of data on the effect of transonic and supersonic speeds on an aircraft. These data will be used in the development of faster and safer planes. The XS-1 has already flown--but not at supersonic speeds and not under its own power. It has been carried to altitude by a B-29 again as a towcraft. Released at altitude, the XS-1 will then be subjected to its rocket power. It has an extremely rugged airframe driven by a powerful rocket engine. Since it is not a combat plane, it has no armament or armor protection for the pilot. Power for the XS-1 is supplied by an engine which consists of 4 units, burning alcohol and liquid oxygen, each of which produces a static thrust of 1,500 lbs., or a total thrust output of 6,000 lbs. Power output is controlled by selection of the number of cylinders to be fired at one time. Thus, the pilot can use 1,500, 3,000, 4,500 or full 6,000 lbs. thrust at his choice. Its range will be extremely short, being little more than 100 miles. While the XS-1 has been designed and constructed as the most rugged airframe ever built it is believed to be thoroughly capable of withstanding the stresses and strains to be imposed. The manufacturer's contract calls for demonstration of the following minimum performance requirements: First, an 8 'g' pullout, at an indicated air speed not exceeding 500 mph; an 8 'g' pullout at minimum speed; a proof of the specified endurance at rated thrust, and take-off and climb to 35,000 ft. under its own power. Finally it must respond satisfactorily to controls at a speed of 0.8 the speed of sound. When transonic speeds are reached, the pilot will have more than the conventional controls to assist him in flight, inasmuch as he can change the horizontal stabilizer setting in flight by means of a powerful actuator. Since this might be hazardous at high speeds, because of the vibrations set up, flutter dampeners have been designed to minimize the danger from this source. Heat caused by friction, sufficient to melt glass, is expected if the Army Air Forces' Bell XS-1 supersonic plane flies at a speed near its designed ultimate of 1,700 mph. Before an attempt is made to push the plane thru and beyond the supersonic barrier, a new windshield will be installed. The present one will suffice in the initial powered experiments at Muroc, since plans for the first test series call for speeds only up to about 600 mph. Beyond that, the temperature, due to friction caused by the on-rush of air against the fuselage of the speeding plane, is expected to rise to such a degree that the present windshield will melt. A new one is being designed for replacement with glass having a much higher melting point.

6,253

Anon. 1948 CRASH DECELERATION, CRASH ENERGY, AND THEIR RELATIONSHIP TO CRASH INJURY.  
(Crash Injury Research, Cornell University Medical College)

6,254

Anon. 1948 EXIT IN EXTREMIS  
Flight 56:199-201, Aug. 1948.

6,255

Anon. 1948 LANDING IMPACT VIBRATION STUDIED  
Aviation Week, 48:26-27

ABSTRACT: An extensive investigation of vibration of airplane structure as a result of landing impact is in progress at the National Bureau of Standards under the direction of Dr. Walter Ramberg. Craft of earlier and more rigid types were designed for landing condition by treating the airplane as a rigid body subjected to an impact force. Large transport planes designed on this assumption showed a tendency to develop failures in the wing or tail, which could be ascribed only to transient vibration of the structure excited by landing impact. A comparison showed that the values obtained from the theory were 15 to 140 per cent greater than the measured values. It was concluded from the tests that the theory would give a fair estimate for the transient vibration in an airplane subjected to symmetrical landing impact leading to flexural vibration of the wing. Measurements on actual landings of large transport airplanes have failed to substantiate this conclusion.

6,256

Anon. 1948 MAN GIRDS FOR SUPERSONIC ROLE  
Aviation Week 49:21-4, Sept. 27, 1948.

6,257

Anon. 1948 MEASUREMENT OF THE LOADS REQUIRED TO BREAK COMMERCIAL AVIATION SAFETY BELTS AS AN INDICATION OF THE ABILITY OF THE HUMAN BODY TO WITHSTAND HIGH IMPACT FORCES. (Naval Medical Research Institute) Rept. No. 12.

6,258

Anon. 1948 PILOT SEAT AFFORDS QUICK 15G EJECTION  
AVIATION WEEK, Oct. 18, 1948. P. 9

6,259

Anon. . . 1949. . . DESIGN CRASH PROTECTION INTO LIGHTPLANES  
Aviation Week May 2, 1949

6,260

Anon. 1949 SYNOPSIS OF THE AERO MEDICAL ASPECTS OF JET PROPELLED AIRCRAFT  
(Aero Medical Lab., Air Materiel Command) January 1949. ASTIA ATI 56134

ABSTRACT: Brief reviews of recent developments and current practices are presented on the following subjects: requirements and equipment, decompression sickness, cabin pressurization, explosive decompression, long term positive and negative acceleration, pilot's pneumatic suit for positive acceleration, cockpit design and temperatures, flight instruments, psychological limitations, sound problems, the ejection seat, protective helmets, wind-blast protection, and vision. Future research will be concerned with protection under emergency conditions in a vacuum, etc.

6,261

Anon. 1950 TESTS SHOW BODY'S CRASH RESISTANCE  
National Safety News 61(2):62-63.

ABSTRACT: Six Air Force volunteers riding in a rocket-propelled sled developed by the Air Force by Northrop Aircraft, Inc., are now duplicating airplane crashes in an effort to provide greater flying safety. The experiments are being conducted at Edwards Air Force Base, Muroc, Calif.

Tests were made in gradual increases up to 35 g, facing forward and backward on the sled. A 35-g deceleration is achieved by slowing the carriage and rider from 150 mph to 75 mph in 1/5 of a second.

Seated backward, with the seat back for support, the body can easily withstand 35 g. Seated forward, the volunteers must have a special seat harness consisting of web straps fastened across the lap, around each thigh, and over each sholder.

6,262

Anon. 1951 DRAWING - GERMAN DECELERATOR.  
In Ruff, S., "Brief Acceleration: Less than 1 Second." In  
German Aviation Medicine WW II, I; 584-597, April 1950.  
11 August 1951.

6,263

Anon. 1951 ENFANTS TERRIBLES  
Shell Aviation News 159:3, Sept. 1951

6,264

Anon. 1951 "8,000 LB. LOAD NO BOTHER TO HIM"  
Aviation Week 55(22):41, 26 Nov. 1951.

(Ref. to Col. J.P. Stapp)

6,265

Anon. 1951 FITNESS FOR DUTY.  
Flight, 59(2192):104-107 ; 25 Jan. 1951

ABSTRACT: Survey of the work of the R.A.F. Institute of Aviation Medicine at Farnborough from 1939 till now. On the improvements of ejector-seats, pressure cabins and air-conditioning, g-suits, pressure waistcoats, ventilated suits and other items of specialized clothing.

6,266

Anon. 1951 580 MPH IN AN OPEN COCKPIT  
Am. Aviation 15(14):55, 1951.

ABSTRACT: At the Air Force Flight Test Center at Edwards, Calif., Northrop, Aircraft recently made test flights without a cockpit canopy on the F-89. The tests were made to determine: (1) Is there any effect on airplane handling characteristics? (2) Is the pilot subjected to enough discomfort to impair his control of the airplane? (3) Will the equipment in the cockpit withstand the limiting test speed? (4) What is the limiting speed at which the radar observer can eject himself? (5) How useful is the special Air Materiel Command Type Pl-A helmet in extending the tolerable speed range?

The first test, 400 mph and under 6,000 feet, was made with a life-size dummy seated in the radar operator's seat. The only damage was tearing of the right shoulder of the dummy's flying suit.

Two flights were made by E.P. Hetzel, asst. chief of Northrop's experimental flight department. In the first he wore standard goggles and experienced bad visibility at 250 mph caused by air leakage around the goggles. Wearing the Type Pl-A helmet with two-position visor for eye protection, he experienced no obstructions to vision at 335 mph at 6,000 feet. The fourth flight was made with the dummy at 580 mph. The helmet, oxygen mask and the left shoulder of the flight suit were pulled off at 540 mph.

The fifth flight, at 520 mph, was made by Maj. John Stapp, wearing a Pl-A helmet. He suffered no injury and could maintain all faculties during flight.

Northrop's report said the tests proved that crew members can operate ejection seat systems to escape in emergencies at speeds above 500 mph. The plane's handling characteristics were not markedly affected by absence of the canopy and the pilot was not subject to appreciable discomfort. Cockpit equipment was structurally sound to 575 mph. (J. Aviation Med. 23(1): 87-88, Feb. 1952)

6,267

Anon. 1951 46.6 G'S---FROM 120 MILES AN HOUR TO ZERO IN 19 FEET  
Tech. Data Digest 16:2-3, Oct. 1951

6,268

Anon. 1951 IMPROVED PILOT SHOULDER HARNESSSES WITHSTAND 38, 6 G CRASHES.  
Techn. Data Digest, 16:8 Jan. 1951

ABSTRACT: Designed to provide better protection in case of a crash, the new Air Force shoulder harness features increased strength of webbing and better distribution of forces to the strongest parts of the human body. The latter is accomplished by an inverted "V" crossing the pilot's thighs, which thus absorbs some of the pressure across the upper abdomen encountered with the old harness.

6,269

Anon. 1951 MEDICAL OFFICER SUBJECTS SELF TO EXTREME GRAVITY PULL  
Martin Star 10:7, Nov. 1951

6,270

Anon. 1951 PROBLEMS OF PILOT EJECTION  
The Aeroplane, 80(2071):378-379. March 30, 1951.

ABSTRACT: Summary of lecture before Roy. Aero. Soc. on physiological aspects, trajectory and control problems of ejection-seats, which requirements are to be fulfilled.

6,271

Anon. 1951 PRONE PILOT LAB.  
Aviation Week 55(23):9, 3 Dec. 1951.

ABSTRACT: Picture of the Reid and Sigrist R. S. 4 being used by the Royal Aircraft Establishment, Farnborough, for testing prone pilot cockpit layouts. For safety, another pilot is carried in the normal cockpit.

6,272

Anon. 1951 RECENT STUDIES ON THE TREATMENT OF MOTION SICKNESS.  
Ann. Int. Med. 35:1383-1389, Dec. 1951.

ABSTRACT: This editorial describes the satisfactory results obtained by the drug Dramamine in the treatment of motion sickness. Dramamine is a combination of two well known compounds, Benadryl and a simple derivative of theophylline. In one experiment, it was found that the best combination of drugs in the prevention of motion sickness was Benadryl and hyoscine. The use of Dramamine is not limited to the control and prevention of motion sickness alone. A number of reports give promise that Dramamine may prove a merciful salvation in many conditions characterized by nausea and vomiting. The drug has also been claimed to relieve the distressful syndrome of radiation sickness, to reduce the incidence of vomiting following the fenestration operation, and following anesthesia for other surgical purposes. It has been demonstrated that Dramamine raises the threshold of effective vestibular stimulation to the microcaloric test and to the galvanic stimulation.

6,273

Anon. 1951 REPORT AND SERVICING MEMORANDUM FOR SAAB EJECTION SEAT  
(Svenska Aeroplan Aktiebolaget, Linköping) Reference UM-29-9.04: R1. (1951)  
R.A.E. Translation No. 370 ASTIA AD 26 614

6,274

Anon. 1951 TESTS SHOW AIRSICKNESS CAN BE STOPPED  
American Aviation 15:26, 6 Aug. 1951

6,275

Anon. 1951 TESTS SHOW BAILOUTS FEASIBLE AT HIGH SPEEDS  
Tech. Data Digest 16:3, Oct. 1951

6,276

Anon. 1952 AIRCRAFT TYPE 29. EJECTIONS BY CATAPULT SEAT.  
(Air Technical Intelligence Center, Wright-Patterson AFB, Ohio)  
ATIC-235370. Translation no. F-TS-8748/III. ASTIA AD 153 353

ABSTRACT: The author describes the circumstances leading up to an ejection and the procedures used during several ejections. He also describes the injuries to personnel as a result of ejection.

6,277

Anon. 1952 THE G VERSUS YOU AND YOUR AIRPLANE  
Flying Safety 8(3):18-20

ABSTRACT: The physiological and psychological effects of ultrasonic speeds and high g forces on the pilot are briefly reviewed. The study is primarily concerned with structural and resistance factors of the airplane.

6,278

Anon. 1952 THE HUMAN CENTRIFUGE  
Mil. Surgeon 110:375, May 1952.

ABSTRACT: The Human Centrifuge at the Acceleration Laboratory, Naval School of Aviation Medicine, Pensacola, Florida recently completed its 10,000 th run since records were begun in August 1948.

The ten thousand runs have involved studies on and training of 613 men and 4 women, ranging in age from 2 to 56 years. The highest "G" level obtained has been 13.0, that is, thirteen times the force of gravity, and the longest run, ten minutes. The greatest number of runs by any one person has been 386, this extremely high number being accumulated by one of the research workers.

6,279

Anon. 1952 INVESTIGATION OF ACCIDENTS  
Interavia, Geneva, 7:197-200, April 1952

6,280

Anon. 1952 MOTION SICKNESS PREVENTION  
J. A. M. A. 148:1524, April 26, 1952

ABSTRACT: Further data suggesting that scopolamine (hyoscine) hydrobromide is the most effective motion-sickness remedy are presented by Glaser and Hervey (Lancet, 1:490 [March 8] 1952). The experiments were carried out in a large swimming bath with artificial waves; the subjects were 150 soldiers. The preparations used were: 1-scopolamine hydrobromide, 1 mg.; promethazine (N-[2-dimethylamino-n-propyl] phenothiazine hydrochloride) hydrochloride, 35 mg.; scopolamine hydrobromide, 1 mg., with promethazine hydrochloride, 25 mg.; scopolamine hydrobromide 0.65 mg., with promethazine hydrochloride, 15 mg., and mannitol hexanitrate, 50 mg.; and lactose (control). All the preparations containing scopolamine were more effective than promethazine, 35 mg., and 35 mg. of promethazine was no more effective than 25 mg., which was the dose that

had been used in a previous experiment. The straight comparison between scopolamine hydrobromide, 1 mg. and promethazine, 35 mg., showed that the former protected 92% of 98 men against vomiting and 81% against vomiting and nausea, compared with 64% and 53%, respectively, of 99 men given promethazine. The authors conclude "Except for pethidine, all the likely remedies have been investigated during the last eight years in this country and in North America. No further improvements can be expected except by accident or by a systematic study of basic principles."

6,281

Anon. 1952 NEW CAPSULE FOR HIGHSPEED BAILOUT  
Aviation Week 57(4):36. July 28, 1952.

ABSTRACT: A new escape capsule developed by Douglas Aircraft Co. is discussed. The capsule is expelled clear of the speeding plane by a rocket charge and is stabilized in flight by three rear fins. Forward speed is first slowed by a small auxiliary chute decelerating from 1,100 to 300 feet per second in about 5 seconds, then, at a safe speed, the main chute opens. The capsule is sealed and pressurized for use in atmospheric conditions above 50,000 ft. Fresh air is fed in "by wave motion". Survival gear similar to that carried in Navy life rafts is supplied. A test run under simulated conditions was tolerated well and without discomfort by the test subject.

6,282

Anon. 1952 ROCKET SENDS MAMMALS UP 200,000 FEET  
J. Amer. Med. Assoc. 150(9):948, Nov. 1, 1952

ABSTRACT: Monkeys and mice fired in a rocket to an altitude of about 200,000 feet returned unharmed to the ground. They withstood an initial acceleration of about 15 g lasting less than one second and a subsequent acceleration of 3-4 g, lasting 45 seconds. One mouse, placed in an empty container, appeared to have lost its sense of direction and orientation while floating in a gravity-free state. Another mouse, however, whose drum was provided with a shelf, was able to cling to it and command its body at will. The application to man of the findings from these animal experiments should be made with caution. Reports on pilot performance under subgravity conditions have indicated no adverse effects on the subjects' sense of orientation. (Literatuuroverzicht (Over Ruimtevaartge- neeskunke) (Space Medicine Bibliography) (Technisch Documentatie en Informatie Centrum voor de Krijgsmacht, den Haag, Netherlands) Rept. No. TDCK-16903; ASTIA AD-227 817; Feb. 1959)



6,283

Anon. 1952 A SELF-RELEASING SEAT-BELT.  
Flight, London 61:767, June 27, 1952

ABSTRACT: A coupling device for seat belts so designed as to open up automatically under excess g-loads (under crash conditions) is described. The inventor, Mr. J.R. Stuge Whiting of Great Britain, has applied for patent protection.

6,284

Anon. 1952 THEY'RE OFF. - THE MONKEYS AND THE MICE: PHYSIOLOGICAL RESEARCH ON ANIMALS LEADING TO HUMAN SPACE FLIGHT. Western Aviation 32(11):12

ABSTRACT: Two monkeys and two mice have survived a ride to an altitude of 200,000 feet in Aerobee and V-2 type rockets fired from Holloman Air Force Base at Alamogordo, New Mexico. The experiment was carried out by the U. S. Air Force Air Research and Development Command. The monkeys had been anesthetized to prevent them from interfering with the recording instruments. The mice were placed in two separate drums, one smooth on the inside, the other provided with a small shelf. An initial acceleration of 15 g for less than one second was followed by 3 to 4 g for about 45 seconds. At the peak of the trajectory the animals were weightless. Films taken during the flight showed the 'floating' mouse in a state of complete disorientation and unable to coordinate its movements. The mouse in the drum provided with a shelf was able to hold on to it and command its body at will. A statement by Major Charles Yaeger on his reactions during near-zero-conditions (while following a ballistic trajectory) confirmed the fact that proper performance of the pilot is not impaired under such conditions. (Literatuuroverzicht (Over Ruimtevaartgeneeskunde) (Space Medicine Bibliography) (Technisch Documentatie en Informatie Centrum voor de Krijgsmacht, den Haag, Netherlands) Rept. No. TDCK-16903; ASTIA AD-227 817; Feb. 1959)

6,285

Anon. 1952 WORLD'S LARGEST CENTRIFUGE TESTS MEN AND EQUIPMENT Tele-Tech,  
11 July, 1952 p. 42-43

ABSTRACT: The Naval Air Development Center at Johnsville, Pa., constructed the largest centrifuge for the purpose of testing how humans and communications and electronic equipment react to accelerations encountered in supersonic flight. The test subject is enclosed in a gimbal-mounted gondola and may be accelerated to 40 g (to speed of 180 m.p.h. at 48.6 r.p.m.) in 6.8 seconds. A television camera, equipment for taking X-ray motion pictures, and for registering respiration, heart rate, blood pressure, and heart and brain waves are incorporated in the gondola.

6,286

Anon. 1953 ANTI-G SUITS.

In Physiology of Flight (Department of the Air Force, Washington, D.C.)  
AF Manual 160-30, 1953.

6,287

Anon. 1953 COMPARISON OF ACCIDENTS IN U.S. SCHEDULED AIR CARRIER PASSENGER OPERATIONS, CALENDAR YEARS 1952-1951. (Civil Aeronautics Board, August 1953)

6,288

Anon. 1953 COMPARISON OF ACCIDENTS IN U.S. SCHEDULED AIR CARRIER PASSENGER OPERATIONS, 1st 3 Quarters 1952-1951. (Civil Aeronautics Board, June 1953)

6,289

Anon. 1953 COMPARISON OF ACCIDENTS IN U.S. SCHEDULED AIR CARRIER PASSENGER OPERATIONS, 1st 6 Months 1953-1952. (Civil Aeronautics Board, November 1953)

6,290

Anon. 1953 DONT BE A SORE-HEAD  
Naval Aviation News, p. 1-5, April 1953.

ABSTRACT: Several aircraft accidents are described in which the helmet worn by the pilot saved him from death. The development of the helmet, worn by the U.S. marine pilots since 1948, is traced. Types of shocks the helmet must withstand are described, and the technique of lessening the destructive force of impact by allowing damage to the helmet is explained.

6,291

Anon. 1953 EJECTION SEAT DEVELOPMENT IN SWEDEN.  
The Aeroplane, 85(2209):692-694, Nov. 20, 1953

ABSTRACT: Some information is given about the ejector seats developed by S.A.A.B. in Sweden.  
The first dummy ejection was made by S.A.A.B. as early as January 1942 to test their model I ejection seat. A description of this seat is given in the article

The Mark II is a special light weight seat (installed weight 70 LB) which is intended for installation in the Folland Gnat.

The ejection velocities are considerably lower than the British equivalents. A drawing with installation dimensions is given.

6,292

Anon. 1953 N.A.C.A. REPORT OF CRASH DATA TO INDUSTRY.  
Aviation Week 59(21):26-28, 30, 23 Nov. 1953.

6,293

Anon. 1953 RIDING THE RAILS  
Flying Safety 9(7):8-9

ABSTRACT: A brief illustrated description is presented of an ejection seat designed for training purposes and tested at Frankfort Arsenal. The portable testing unit was developed to acquaint air personnel with the knowledge of the procedures required to free oneself from the cockpit and to simulate the sensations experienced during ejection from an operational aircraft at high altitudes and speeds.

6,294

Anon. 1953 ROCKET FLIGHTS OF MAMMALS TO 200,000 FT.  
J. British Interplanet. Soc. 12:6-9  
NOTE: Reel 7, Flash 7, Item 1

ABSTRACT: An account of the V-2 and Aerobee missile flights from White Sands Proving Grounds under the senior project officer, Dr. J. P. Henry.

6,295

Anon. 1953 SAVE PILOTS IN CRASHES.  
Sci. News Letter, 63(13):206

ABSTRACT: A description of a shoulder harness, seat belt, and gravity reel combination for low-level crashes is given. The safety device was developed by F.E. Weick, director of the Personal Aircraft Research Center at Texas A. and M. College, College Station, Texas.

6,296

Anon. 1953 TUMBLING TOO FAST DANGEROUS IN PLANE ESCAPE  
Science News Letter 63(21):328

6,297

Anon. 1954 AVIATION MEDICAL LABORATORY OPENS  
Canad. Aviation Toronto) 7 (3): 32, 34. March 1954.

ABSTRACT: The new Defense Research Medical Laboratories, which opened recently, has developed from a merger of the Medical Research Laboratories with the Royal Canadian Air Force Institute of Aviation Medicine. Its current location is at Downsview. Included are: the Personnel Research Section, the Aerophysiology team, the Applied Physiology Section, the Physiology-of-Cold Section, the Motion Sickness and Disorientation team, the Sonics Section, the Toxicology Section, and the Biostatics Section. Acceleration studies are particularly concerned with cardiovascular research on human and animal subjects. Gravity tolerance studies are being conducted with and without various types of g-suits. An electronic human centrifuge capable of producing forces up to 20 g is used. Recording equipment is incorporated in the machine for continuous recording. Clarification of decompression sickness symptoms is attempted with the aid of a Bell-type decompression chamber, simulating atmospheric conditions up to altitudes of 80,000 ft. The role of ascorbic acid in increasing cold tolerance is investigated. The Motion Sickness and Disorientation team has discovered a relation between the degree of head motion and individual susceptibility to nausea and is investigating further the precise direction and speed of head movements. The staff is assisted by a selected group of consultants in diverse fields.

6,298

Anon. 1954 FILM OF MONKEY AND MICE IN FREE FALL.  
J. Brit. Interpl. Soc. 13:223-224

6,299

Anon. 1954 INJURIES IN AIR CARRIER ACCIDENTS IN TURBULENT AIR  
Air Carrier Safety Bulletin, No. 39, 16 March 1954

6,300

Anon. (USAF) 1954  
OPERATIONAL EXPERIENCE WITH EJECTION ESCAPE SYSTEMS FROM 1 JANUARY 1949  
THROUGH 31 DECEMBER, 1954  
(Directorate of Flight Safety Research, Norton Air Force Base, Calif.)  
ASTIA AD 72 809

ABSTRACT: Current ejection escape systems provided a means for successful

escape from aircraft in a wide range and combination of airspeeds (up to 560 knots), altitudes sign and maintenance and greater familiarity with the operation of ejection escape equipment reduced fatalities from 27% in 1951 to 21% in 1954. Further reduction was believed obtainable by (1) better training of aircrew, maintenance, and inspection personnel; (2) better design, maintenance, and inspection of ejection escape systems; (3) providing all personnel using ejection seats with both automatic opening lap belts and automatic opening parachutes; and (4) expeditious retrofit of in-service aircraft with improvements which have been approved for ejection escape systems. (ASTIA)

6,301

Anon. 1954 SAFE TEST EJECTIONS MADE FROM 50 FEET.  
Aviation Week 61(20):64.

6,302

Anon. 1954 SPACE FLIGHT PROBLEMS. IVth International Astronautical Congress, Zurich, 1953 (Biel-Bienne: Laubscher and Co., 1954)

6,303

Anon. 1955 AIR FORCE FLIGHT SURGEON ATTAINS SPEED OF 632 M.P.H. IN DECELERATION TESTS.  
U. S. Armed Forces Medical J. 6(1):292.

ABSTRACT: Lieutenant Colonel John P. Stapp, USAF (MC), Chief of the Aeromedical Field Laboratory, Holloman Air Force Base, N. Mex., on 10 December reached a speed of 632 miles per hour while riding a rocket-propelled sled to reproduce exposure to windblast and slowdown effects experienced by air crewmen when escaping from aircraft at supersonic speeds. In previous experiments he had attained a speed of 421 miles per hour in the "abrupt deceleration vehicle," the technical designation of the sled.

Exerting a total force of 40,000 pounds thrust, the nine rockets propelled the sled to its top speed in five seconds. After the rockets burned out, it coasted for less than half a second before the brakes were applied and it was abruptly halted. During the test, Colonel Stapp withstood a deceleration force of 35 g and a wind pressure of more than two tons. With the exception of a plastic helmet and visor, he wore no special clothing during the test.

6,304

Anon. 1955 AIRCRAFT CRASH ACCELEROMETER  
Engineer (London)200:305, 26 Aug. 1955

ABSTRACT: A description is given of an instrument designed by the N. P. L. for recording impact decelerations.

6,305

Anon. 1955 ANNUAL REPORT 4/1/54-3/31/55. (Automotive Crash Injury Research) Ann. Rept. 32.

6,306

Anon 1955 BRITON EJECTED Time 19 Sept. 1955

ABSTRACT: This article describes the first live test of the Martin-Boker Aircraft Company's low altitude ejection seat by test pilot, John Stuart Fifield on a little used air strip at Chalgrove, Oxfordshire. Fifield rode in the rear seat of a Meteor Jet with another pilot at the controls. At 157 mph, just before the wheels left the ground, Fifield ejected. "Fifty feet up, he separated from the seat and kept rising, when he reached 80 ft., two small parachutes pulled a big parachute out of its pack. The whole sequence, from ejection to landing, took six seconds." (CARI)  
Includes photo of ejection (See also Time, 21 March 1955)

6,307

Anon 1955 COLONEL STAPP HITS 632 M.P.H IN DECELERATION EXPERIMENTS.  
J. Aviation. Med. 26(1):17.

ABSTRACT: Lieutenant Colonel John P. Stapp, USAF (MC), chief of the Aeromedical Field Laboratory, Holloman Air Force Base, New Mexico, established a new speed record of 632 miles per hour on December 10, 1954, in a rocket-propelled test sled in which he has been conducting experiments as his own subject for several years. A fellow of the Aero Medical Association, he received the 1952 John Jeffries Award of the Institute of the Aeronautical Sciences and numerous other citations for his contributions to increased safety in flight.

The test vehicle was a 2,000 pound sled mounted on rails and pushed by nine rockets which exerted a total force of 40,000 pounds thrust. The enormous force generated by the rockets accelerated the sled from a standing start to its top speed of 632 miles per hour in five seconds time and 2,800 feet distance. After

the rockets burned out the sled coasted for less than a half second and the actual braking to a stop took a fraction more than a second. During the test Colonel Stapp withstood a deceleration of 35 times gravity and a wind pressure of more than two tons. With the exception of a plastic helmet and a clear plastic visor to protect his face no special clothing was worn for the test.

In June, 1954, the Air Force announced that Colonel Stapp had attained a speed of 421 miles per hour during an earlier test run which was a part of a series of tests that led to his latest speed record.

6,308

Anon. 1955 DOUGLAS DESIGNS COMPACT LIGHTWEIGHT EJECTION SEAT.  
Aviation Age, 23(3):50-53 March 1955.

ABSTRACT: A new ejection seat has been designed for the A4D-1, which possesses a carrying skin. During ejection, the chair is automatically loosened from the pilot. He possesses no adjustable head or foot rest. The chair and the equipment of the pilot weighs over 50 lbs less than the comparable installation of the Douglas A2D-1 and F4D1 manufactured for 25 g force and a 40 G crash force. It withstood a delay of 60 g.

6,309

Anon. 1955 GEORGE SMITH'S PHENOMENAL ESCAPE.  
See also: Coughlin, W.J. 1955

A manuscript, author unknown

6,310

Anon. 1955 MILITARY SPECIFICATION, SEAT EJECTION, AIRPLANE, DESIGN AND  
INSTALLATION OF. MIL-S-18471 (Aer), Feb. 1955.

6,311

Anon. 1955 NORTHROP DEMONSTRATION DECELERATOR. (Northrop Aircraft Inc.)  
Rept. No. NAI 55-831.

6,312

Anon. 1955 PROCEEDINGS OF THE VTH INTERNATIONAL ASTRONAUTICAL CONGRESS,  
INNSBRUCK, 1954 (Wien: Springer-Verlag, 1955)

6,313

Anon. 1955 PROJECT DETAILS OF TED ADC AE-1407, HUMAN PERFORMANCE  
LIMITATIONS IN AIRCRAFT CATAPULTING AND ARRESTING.  
(Bureau of Aeronautics letter, AE-14/36 of 17 Oct. 1955)

6,314

Anon. 1955 RESEARCH PROGRESS REPORT (Aviation Medical Acceleration Lab., Naval  
Air Development Center, Johnsville, Pa.) 31 Dec. 1955, ASTIA AD-83 499

6,315

Anon. 1955 ROCKING, NOT TUMBLING, IS BAILOUT HAZARD.  
Av. Week 63(26):21-23 26 Dec. 1955

ABSTRACT: Dummy tests on sled mockup of Convair's F-102A give researchers new  
design data for advanced supersonic ejection system.

6,316

Anon. 1955 A STUDY OF CRASH INJURY PATTERNS AS RELATED TO TWO PERIODS OF  
VEHICULAR DESIGN. (Automotive Crash Injury Research)

6,317

Anon. 1956 ACCOMPLISHMENT SUMMARY OF AVIATION MEDICAL ACCELERATION LABORATORY.  
(Naval Air Development Ctr., Johnsville, Pa.) ASTIA AD-52476

6,318

Anon. 1956 AEROMEDICAL ASPECTS OF HIGH ALTITUDE HIGH SPEED FLIGHT  
Information Bulletin (Office of the Surgeon, Headquarters AMC) 1 Feb.  
1956.

ABSTRACT: Aviation has made tremendous advances during the past few years.  
What the future holds in store remains to be seen but it does not seem too  
speculative to assume that within the next decade we can expect to witness  
military operations to altitudes of 100,000 feet, cabin altitude 37,000 feet,  
at speeds to 2000 miles per hour. It is upon such a premise that this paper  
which proposes to present a condensation of the available material relating  
to the aeromedical aspects of such flights is being prepared.



6,319

Anon. 1956 AIRCRAFT PASSENGER SEATS: SAFETY WITH ACCELERATION OF 9 G.  
Engineering (London) 181(4693):19- , Jan. 6, 1956

ABSTRACT: A new type of aircraft passenger seat is described designed to withstand an acceleration of 9 g, facing forward or aft. When forward facing, in an emergency landing, the back of seat, which is padded, will fold forward when struck behind.

6,320

Anon. 1956 ANNUAL REPORT (1955-56). (Automotive Crash Injury Research)  
Annual Rept. 20.

6,321

Anon. 1956 ARDC SLED TESTS EJECTION IMPACT FORCE.  
Aviation Week 65(24):81, 83.

6,322

Anon. 1956 EARTH SATELLITES AS RESEARCH VEHICLES (Proceedings of  
symposium at Franklin Institute, Philadelphia, 18 April 1956) J. of  
Franklin Inst. No. 2, June 1956

6,323

A non. 1956 EJECTION SEAT DEVELOPED FOR MACH 3 AFTER ARDC DECIDES ON CAPSULES.  
Aviation Week, 65 (15):72 , Oct. 1956

ABSTRACT: A supersonic escape ejection seat has been developed which is designed to permit safe escape limits exceeding 800 kts. at sea level and Mach 3 at altitude. The development comes in the face of a decision by Air Research and Development Command to require escape capsules incorporating protective and survival devices for all new aircraft with performance exceeding 600 knots IAS and 50,000 altitude.

6,324

Anon. 1956 EJECTION SEAT STUDY, 1949 - 1956.  
(Naval Aviation Safety Center, Norfolk, Va.)  
ASTIA AD 125 052

ABSTRACT: The increasing ejection rate per unit hours flown and an increasing number of these units flown indicated a steady mounting of the frequency of

ejections. There is a pronounced relationship between successful ejections and altitude. The relationship between altitude and successful ejection becomes apparent at 5000 feet and ejections become increasingly hazardous as the altitude decreases below this height. The mean altitude at which ejection occurs did not increase during the period. M + 0.70 is the beginning of the critically dangerous zone for ejections. In terms of indicated airspeed only, 400 kn is the beginning of the critically dangerous zone for ejections. Ejecting from the F9F, F7U and TV model aircraft is significantly more dangerous than ejecting from the F2H and FJ models. Ejections from the swept-wing F9F are no more dangerous than those from the straight wing F9F. Ejections are more dangerous than bailouts with present equipment. No relationship existed between altitude and injury in bailouts (as long as irreducible minimum is observed.) Successful bailouts may be made at lower altitudes than ejections with present equipment. No relationship existed between speed and injuries resulting from bailouts within the speed range in which bailouts are made. The mean speed in which bailouts are made is substantially slower than the mean speed at which ejections are made. Bailing out from the F4U model aircraft is significantly more dangerous than bailing out of AD and SNJ models. (ASTIA)

6,325

Anon. 1956 MEN IN SPACE.  
Ryan Reporter 17:18-21, 32-34

ABSTRACT: A discussion of the problems to be solved if man is to survive in space flight.

6,326

Anon. 1956 PROCEEDINGS OF THE VII INTERNATIONAL ASTRONAUTICAL CONGRESS,  
ROME, 1956

6,327

Anon. 1956 PRONE-COCKPIT LAY OUT PROMOTES FATIGUE.  
Aviation Week, 64(14):47-49

ABSTRACT: This article discusses a prone-cockpit layout developed by the Institute of Aviation, RAE, Farnborough, England which was recently used in a Gloster Meteor 8 test. vehicle. Information is presented on load factor tolerance of the prone pilot, effectiveness of control, pilot fatigue, visibility, and pilot escape. Detailed descriptions of the pilot bed and escape mechanisms are also given.

6,328

Anon. 1956 SIMULTANEOUS MONORAIL AND PERSONNEL DELIVERY FROM C-119 AIRCRAFT  
(Continental Army Command Board No. 5, Fort Bragg, N.C.) 29 Aug. 1956  
Proj. No. AB 355, ASTIA AD 108-128

ABSTRACT: Tests were conducted to determine the maximum speed at which standard type aerial delivery containers rigged with G-13 cargo parachutes on the monorail and personnel wearing T-10 parachutes may be safely delivered simultaneously from the C-119 airplane. Twenty-three drops were conducted with dummies delivered simultaneously with standard cargo containers of varying weights and dimensions at indicated air speeds (IAS) from 115 to 130 kn. Motion pictures and rapid sequence still photographs were taken and studied. As a result of these studies, simultaneous delivery of personnel and cargo was considered safe at IAS up to 130 kn provided the containers weighed 375 lb. or greater and the dimensions were 40 by 25 in. or smaller. Sixteen drops from the paratroop doors of combat-equipped personnel wearing T-10 parachute assemblies were conducted simultaneously with monorail delivery of standard type aerial delivery containers rigged with G-13 parachutes. This procedure was considered safe from C-119 airplanes flying at IAS up to 130 kn only when: the G-13 cargo parachute is utilized, container dimensions are 40 to 25 by 25 in. or smaller, container weights are 375 lb or greater, and containers are not dropped over personnel in the air or on the ground.

6,329

Anon. 1956 A STUDY OF THE CRASHES DURING LANDING OF TWO INSTRUMENTED F6F DRONE AIRCRAFT. (Human Factors Research, Inc., Los Angeles, Calif.)  
Technical Rept. No. 2 on "Measurement of Forces Affecting Human Bodies in Aircraft Accidents", Feb. 1956. ASTIA AD 93-352.

ABSTRACT: Research was undertaken for developing a method of recording deceleration forces in airplane crashes. Self-actuating accelerometers were mounted in the seats of two F6F drone aircraft prior to take off. Upon stimulation with a force of 8 g or more, the accelerometer starts and records the force patterns for 8 sec. Two airplanes which were crashed during landing struck the runway nose down at approximately the same angle. Results indicated that the method was feasible. Records showed that the application of g force varied with respect to time; successive peak g's occurred at a frequency of 35 to 45 c. Although both crashes were survivable crashes (cockpit area remained intact), the g forces were of such magnitude that a pilot would have been injured. The g forces which were recorded in the vertical and horizontal body axes were approximately equal (55.5 and 52g and 32.1 and 48 g, respectively). Seats and protective devices should be designed for absorbing repeated shocks and for withstanding high, short duration peak loads rather than only static loads.

6,330

Anon. 1956 A STUDY OF THE CRASHES OF FOUR INSTRUMENTED F6F DRONE AIRCRAFT  
(Human Factors Research, Inc., Los Angeles, Calif.) Technical Rept No. 3  
on "Measurement of Forces Affecting Human Bodies in Aircraft Accidents,"  
April 1956, ASTIA AD 93 351.

ABSTRACT: Accelerometer recordings were analyzed for 4 crashes. In 2 cases, the aircraft ran out of fuel and were crash landed on the desert, one with wheels up (no. 3) and the other with wheels down (no. 4). Of the other 2 crashes, one nonsurvivable crash into a mountain ridge (no. 5) occurred when aircraft control was lost, and one (no 6) occurred on takeoff. Results of crashes 3,4 and 6 showed that the forces in the vertical body axes exceeded those in the longitudinal axes; in crash 6, these forces approached human tolerance limits. The records of crash 3 indicated some evidence of an oscillatory application of crash forces. The records of crashes 3 and 4 showed that both the g forces which were developed and the damage to the aircraft were greater in the wheels-down crash.

6,331

Anon. 1956 TEXT-BOOK DITCHING.  
Flight 69(2454):142-143. Feb. 1956.

ABSTRACT: The story of a night ditching in the Atlantic Ocean by an American Military Air Transport Service C-54 with two of four engines inoperative, a 42 kt cross-wind and a 12-15 ft swell.

6,332

Anon. 1957 ABSTRACTS OF SCIENTIFIC PAPERS TO BE PRESENTED AT THE SECOND  
EUROPEAN CONGRESS OF AVIATION MEDICINE IN STOCKHOLM.  
Meddelanden fran flyg-och navalmedicinska namnden (Stockholm)  
Congress Number 5-19

ABSTRACT: Abstracts are presented of reports dealing with acceleration, decompression, recompression, psycho-physiology, psychology, medical examination, and pilot selection contributed by a group of authors.

6,333

Anon. 1957 AIRCRAFT ACCIDENTS AS RELATED TO AIR FORCE HIAD REQUIREMENTS.  
(Eng. Branch, Directorate of Flight Safety Research. Norton AFB.)  
AFR 190-16

6,334

Anon. 1957 ANNUAL REPORT 4/1/56-3/31/57. (Automotive Crash Injury Research) Annual Rept. 31.

6,335

AFOSR and Convair 1957 ASTRONAUTICS SYMPOSIUM (San Diego: AFOSR and Convair, 1957)

ABSTRACT: The tape transcription of the summary session of 19 Feb 1957 in the astronautics symposium held at San Diego, 18-20 Feb 1957, under the joint sponsorship of AFOSR and the Convair Division of the General Dynamics Corp. Panel subjects and leaders were: "Re-entry," W.H. Dorrance; "Tracking and Communications," C.A. Potter; "Environment and Measurements," F.L. Whipple; "Propulsion," W. Bollay; "Orbits," P. Herget; "Human Factors," H. Strughold. The 43 papers read at this symposium were published under the title Vistas in Astronautics; First Annual Air Force Office of Scientific Research Astronautics Symposium, M. Alperin, M. Stern, and H. Wooster (eds), (London: Pergamon, 1958)

6,336

Anon. 1957 "Crash Safety" (Reprinted from Canadian Flight). MATS Flyer 4: 24-25.

6,337

Anon. 1957 EINE SCHLEUDER FUR BESCHLEUNIGUNGSUNTERSUCHUNGEN (A Centrifuge For Acceleration Investigation) Luftfahrttech. (Germany) pp. 38-39, Feb. 1957.

ABSTRACT: Centrifuges for high g experiments which have been built and put into operation in the D.V.L. Aviation Medicine Institute, Bonn. are discussed and described.

Translated in ONR Tech Memo 2-58, ASTIA AD 206 888L.

6,338

Anon. 1957 THE EJECTABLE SEAT OF THE MARTIN-BAKER MK4. Aviation Magazine, (238):24,25, 1 Nov. 1957.

ABSTRACT: A detailed description of the ejection seat of the Martin-Baker MK4 type is given in this article. The discharge mechanism and the ignition is described. Furthermore, the parachute and the opening of the head parachute are discussed. Several ties are fastened to the chair to prevent the legs from moving around during firing. The ignition is 83 ft/sec, the maximum acceleration 20 g. The chair is 40 kilo.

6,339

Anon. (U. S. Army) 1957-1959  
FATAL ARMY HELICOPTER ACCIDENTS  
(Army Board for Aviation Accident Research, Fort Rucker, Ala.)  
Rept. no. HF 3-60 July, 1957- December, 1959  
ASTIA AD 246 719

ABSTRACT: Twenty-seven Army helicopter accidents involving fatalities were studied. Forty-four deaths occurred in these accidents during the period of July 1957-December 1959. The findings further indicate: (a) more than one-third of the fatalities occurred in survivable-type accidents; (b) head injuries and burns accounted for most of the deaths in survivable accidents; (c) approximately three-fourths (77%) of survivable accidents involved reconnaissance helicopters; and (d) more than one-half (59%) of reconnaissance helicopter accidents were survivable. These accounted for 75% of the fatalities in survivable accidents. It was concluded that: (a) utilization of protective helmet, safety belt, and shoulder harness will provide increased protection in survivable helicopter accidents once the crash-fire problem is overcome; and (b) helicopter accident fatalities can be reduced by insuring maximum indoctrination of personnel in the value of injury-preventing equipment, that all Army aircraft are equipped with proper restraint devices, and appropriate regulations governing use of injury-preventing equipment. (AUTHOR)

6,340

Anon. 1957 HEEDLESS HORSEPOWER.  
In The Traveler's 1957 Book of Street and Highway Accident Data.

6,341

Anon. 1957 HOLLOMAN TRACK (Air Force Missile Development Center, Holloman Air Force Base, N. Mex.) Rept. no. AFMDC TR-57-1, Sep 1957, ASTIA AD-150 248

6,342

Anon. 1957 HUMAN TOLERANCE TO LINEAR DECELERATIONS. (La tolerance humaine aux decelerations lineaires) Force Aerienne, Service de Sante, Bulletin technique d' information (Bruxelles) 1957 Dec. :1

ABSTRACT: Four subjects attached by different types of harnesses to an ejectible sled fixed to a vehicle on a rail propelled by rockets were subjected to deceleration tests of 0.2-0.4 seconds. Using a conventional harness with two outer straps, V-inverted, and attached to the center of the abdomen and base of the foot, the body was able to tolerate 17 g. By adding an apparatus for stabilizing the legs to the harness, 20 g was tolerated. If, instead of the conventional harness, a special retention vest with an apparatus for holding the legs, arms, and head was used, 25 g was tolerated.

6,343

Anon. 1957 MAN IN SPACE.  
Brit. Med. J. (London), 2(5052):1041-1042, 2 Nov. 1957.

ABSTRACT: The possibility of human space travel is discussed in general. The hazards and problems of space travel (confinement, acceleration, barometric pressure, radiations, meteorites, food, re-entry problems) and possible means of overcoming them are briefly considered.

6,344

Anon. 1957 PRELIMINARY REPORT ON NUMBER OF PERSONS INJURED, U.S., JULY-DECEMBER 1957 (Health Statistics, U.S. National Health Survey) Series B-3.

ABSTRACT: About 25 million persons (24,953,000) were injured during the last 6 months of 1957, according to data obtained by the U. S. National Health Survey in household interviews. This includes only persons who sustained injuries that caused them to restrict their usual activities for at least a day or injuries that were medically attended. Males accounted for 14.1 million of those injured and females for 10.8 million. Among those persons 60 percent had injuries that involved activity restriction, 80 percent had injuries that received medical attention, and 40 percent had injuries that involved both activity restriction and medical attendance.

6,345

Anon. 1957 PROCEEDINGS OF THE VITH INTERNATIONAL ASTRONAUTICAL CONGRESS, COPENHAGEN, 1955 (Copenhagen: Danish Astronautical Society, 1957)

6,346

Anon. 1957 QUARTERLY SUMMARY OF AIRCRAFT ACCIDENTS, OCTOBER-DECEMBER 1957.  
Royal Canadian Air Force (Toronto), 15 Feb. 1958. ASTIA AD 304 014

6,347

Anon. 1957. TWO GROUND EJECTION SEATS TESTED IN LIVE AND DUMMY RUNS.  
Aviation Week, 67(11):88,89 16 Sept. 1957.

ABSTRACT: A series of 6 pictures illustrating the use of the Martin Baker Mark V ground level ejection seat, demonstrated by a pilot of the R.A.F. who ejected himself out of a Grumman F9F-8T with a speed of 120 kt on the runway.

5,348

Anon. 1957 VERTEBRAL INJURIES FROM EJECTION FORCES,  
(North American Aviation) Engineering Rept., Dec. 1957

6,349

Anon. 1958 AIR FORCE PLANS MANNED ORBIT FOR 1959.  
Aviation Week 68:26-27, April 7, 1958.

ABSTRACT: Gen. LeMay seeks funds to support ARDC program that would put primary emphasis on human factors.

6,350

Anon. 1958 AIRCRAFT DAMAGE STUDIES  
(New Mexico Inst. of Mining and Tech., Socorro.) 10 Dec 1958. AD 304 -  
074.

6,351

Anon. 1958 ARMY AVIATION. (Army Aviation School, Fort Rucker, Ala.)  
6 June 1958. AD-144 962

5,352

Anon. 1958 BANG! YOU'RE ALIVE!  
Air Clues, 13(3):66-73 Dec. 1958

ABSTRACT: This article traces the development of ejection seats. The name of the British firm of Martin-Baker is synonymous with ejection seat history and much help has been received from them in writing the article. The many changes in the design of the seats are not detailed and an outline only of the main events is given. The article contains many new facts, and a number of the photographs have not previously been published.

6,353

Anon. 1958 CHIMPANZEES PASS SPACE SPEED TEST.  
New York Times, 31 Jan. 1958.



6,354

Anon. 1958 MILITARY AIRCRAFT ACCIDENTS. U.S. News and World Report 45:28

6,355

Anon. 1958 MOUSE IN LIQUID SUIT SHOWS HOW MAN MAY SURVIVE STRESS OF GRAVITY  
IN SPACE TRIPS  
Wall Street J. 8 Feb. 1958

6,356

Anon. 1958 NEKTERE SOUCASNE PROBLEMY LETECKEHO LEKARSTVI (SOME CONTEMPORARY  
PROBLEMS OF AVIATION MEDICINE)  
(Praha: MNO, 1958). 40pp.

6,357

Anon. 1958 OUTWARD BOUND  
Time 71(21):68-78, 26 May 1958.

ABSTRACT: A brief pictorial review of the psychophysiological factors that man must face during space flight.

6,358

Anon. 1958 PILOT PERFORMANCE AND TOLERANCE STUDIES OF ORBITAL RE-ENTRY  
ACCELERATION.  
(U.S. Naval Air Develop. Ctr., Johnsville, Pa.) NADC AE-1412, Sept. 1958.

ABSTRACT: This report concerns a preliminary study of human tolerances to the reentry accelerations expected in most lift vehicles. The study was undertaken to ascertain whether a human subject could tolerate orbital reentry acceleration patterns associated with the National Advisory Committee for Aeronautics (NACA) manned Space capsule. The first phase of this study involved the expected reentry G time histories which NACA supplied to the Aviation Medical Acceleration Laboratory (AMAL). These were carried up to 12 G peak. The second phase of the study probed the area up to 20 G.

6,359

Anon. 1958

The New York Times, Feb. 10, p. 14

ABSTRACT: Description of a manned sphere, 10 ft. in diameter, which could be lifted to 100,000 feet altitude by balloon, then released, whereupon a rocket motor would boost it to 3400 mph, raising the sphere to 600,000 feet altitude. It would then begin a free-fall that would produce 2.5 minutes of weightlessness. It is primarily designed to give training in weightlessness but could give some experience in acceleration, deceleration and isolation as in space flight.  
(CARI)

6,360

Anon. 1958 PROCEEDINGS OF THE VIIIth INTERNATIONAL ASTRONAUTICAL CONGRESS, BARCELONA, 1957 (Wien: Springer-Verlag, 1958)

6,361

Anon. 1959 REENTRY FORCES G-FORCE 150 to 170 G'S IN TACTICAL MISSILES.  
Aviation Week, p.63 20 July 1959

6,362

Anon. 1959 ROCKET TECHNOLOGY AND SPACE RESEARCH  
Raketentech. u. Raumfahrtforsch. 3(2): , Apr.-June 1959  
(Picatinny Arsenal, Feltman Research & Engineering Labs., Dover, N. J.)  
Translation No. PA-61, ASTIA AD-228 967, Nov. 1959

6,363

Anon. 1958 SATELLITES PAVE WAY FOR SPACE TRAVEL.  
FBIS, USSR/East Europe No. 186, Sept. 24, 1958

ABSTRACT: The problems during the third stage of rocket investigations included the checking of all the results obtained during the flight of animals up to a height of 212 kilometers. During the so-called "active" stage of the flight, with the intense noise and G-force, the rate of pulse and breathing and the blood pressure of nonanesthetized animals increased as a rule. When the state of weightlessness set in, these physiological indices remained at a high level for the first two to three minutes, but by the fifth or sixth minute they returned to the initial level. Animals which were anesthetized showed no changes in the rate of pulse and breathing and in blood pressure during the state of weightlessness. Telemetric data obtained during the ascent of the rocket showed that the heartbeat was almost trebled. But subsequently, while acceleration rose, the rate of the heartbeat fell. The rate of breathing also rose three to four times under the influence of maximal acceleration; this is apparently due to the considerable increase in the weight of the dog. (CARI)

6,364

Anon. 1958 SOVIETS RECOVER RESEARCH ROCKET DOGS  
Aviation Week 69:61-63, Nov. 3, 1958

ABSTRACT: Izvestia reports two dogs, Belyanka and Pestraya, were recovered from 280 miles altitude in a single-stage research rocket launched from the "the middle latitudes of Soviet European territory" on Aug. 27, 1958, with a 3,726-lb. payload. This is reported as being the second launching of such a rocket. The felt-lined cabin, which landed "in a selected area," contained "a generation system, a self-contained system for recording the biological functions of the animals, and a special motion picture camera." The rocket was stabilized "during the entire flight, including the inertial part of its flight," to ensure the necessary conditions for the experiment. The rocket also carried instruments for measuring concentration of free electrons, ion composition of the atmosphere, concentration of positive ions, electron temperature, air pressure, micrometeorite impingement, ultraviolet region of the solar spectrum, infrared radiation of the earth, and the earth's atmosphere.

6,365

Anon. 1958 "SPACE FLIGHT" Aviation Age 29:14-101

ABSTRACT: Among the articles and sections in this special report are the following: "Development of Manned Space Flight," "Who'll Run Our Space Program," "What Does It Take to Get into the Space Flight Business," "Blueprint for Space Research," "Getting Man into Space," "Balloon-launched Vehicle May Be First on the Moon," "Propulsion" "Thermodynamics," "Structures and Materials," "Guidance and Control," "Orbits," "Human Factors," "Accessories," and "Ground Support."

6,366

Anon. 1958 SPUTNIK II THROUGH RUSSIAN EYES.  
Astronautics 3:48-49, 62

ABSTRACT: Although silent on launching vehicle and means of propulsion, these translations from the Soviet press offer hitherto unreleased data on structure of the satellite and the biological experiments performed.

6,367

Anon. 1958 SPUTNIKS AND SPACE SHIPS BREAKING THROUGH THE BIOLOGICAL CARRIER  
(USSR no. 4:17-19, 1958)

ABSTRACT: A general article which covers the physiology of cosmic flight; overcoming hazards of space; how much speed can the body endure; weightlessness and acceleration; altitude and survival; and the space age.

6,368

Anon. 1958 TEN STEPS INTO SPACE.  
J. of the Franklin Inst. (6): Dec. 1958

6,369

Anon. 1959 ACCIDENT SUMMARY.  
Aviation Week, August 31, 1959, p. 25.

ABSTRACT: Civil Aeronautics Board last week, in its annual resume of aircraft accidents, reported a total of 90 air carrier accidents occurred during 1958, 15 of them fatal. Fatal accidents involving domestic airlines during the year totaled eight, with 20 crew fatalities and 119 passenger fatalities. Foreign and overseas operators were involved in two fatal accidents, with no crew and 10 passenger fatalities. Non-certified carriers were involved in one fatal accident which resulted in the loss of two crew members. There were no passengers lost in the latter accident. General aviation accidents involving helicopters and fixed wing aircraft in excess of 12,500 lb. gross weight totaled 122 during the year, 21 of them fatal.

6,370

Anon. 1959 AEROMED FACILITY STUDIES SHOCK ABSORBER SEATS FOR JET PASSENGERS  
Aviation Week 70(21):136- , May 1959

ABSTRACT: This brief article describes a hydraulic shock absorber system whereby passengers in jet transports would be able to survive fairly high impact accelerations. The data from which the proposed system was designed were obtained by Cornell Automotive Crash Injury Research. Two methods of applying the shock absorbers for deceleration are described and seat fitting are indicated.

6,371

Anon. 1959 ANNOTATED BIBLIOGRAPHY OF SOVIET AIR AND SPACE PROJECTS  
(AEROMEDICAL ASPECTS) Trans. from Soviet open sources, 1951-1959.  
LC or SLA 59-16479 (SLA Translation Center, Chicago, Ill.)

6,372

Anon. 1959 DRAG PARACHUTE RETRACTING SYSTEM (Van Zelm Associates, Inc., Baltimore, Md.) Rept. nos. 151 and 156; WADC Technical rept. no. 57-57, Contract AF 33(600)30389, Jan 1959, ASTIA AD-155 709

ABSTRACT: The general problem of a retractable deceleration parachute system has been examined and possible solutions have been studied. These solutions

have been evaluated, and the final system configuration has been selected and designed. The design incorporates a basic concept of winding a parachute around a revolving drum after retraction through a duct which collapses the parachute and compresses it to a size which the drum can accommodate. The rewind motor is hydraulically or pneumatically actuated and the control system is largely mechanical with some components being hydraulic or pneumatic. A prototype unit was manufactured for test which weighed 94 pounds, and was installed on a truck. The vehicle was used to conduct a comprehensive testing program, to study the action of the parachute during deployment and retraction, and to evaluate the retraction system. Tests of the retraction system demonstrated that the design meets the requirements of such a device. (Author)

6,373

Anon. 1959 MARTIN-BAKER EJECTION SYSTEM HIGH SPEED-HIGH ALTITUDE TEST AND EVALUATION (Joint Parachute Test Facility, El Centro, Calif.) Technical rept. no. 2-59, Proj. TED no. ELC AE-5242.2; ASTIA AD-244 200

ABSTRACT: Of the total of twelve test flights conducted, ejection was successful and satisfactory in all firings. Seat-dummy separation was accomplished ten times the two malfunctions resulting from interference between seat system components and auxiliary test equipment items. The dummy was recovered on nine (of the ten) tests, a hardware malfunction causing the one failure. As a result of the test program, ejection seat function was adjudged satisfactory. As stated by Appendix A, evaluation of the general parachute performance was to be made on the basis of data gathered on the free bailout facility, the maximum performance capability required, and the effect of drogue or other component failure. In addition, the possible use of a 28-foot parachute and/or the integrated torso harness was to be investigated. In this connection, a Bureau of Aeronautics instruction of 9 December 1958 required the employment of the integrated harness on all tests made subsequent to that date. The twelve tests were conducted in three basic phases such that six were made with the standard Martin-Baker 24-foot parachute and harness system, two with the MBA parachute and Naval Parachute Unit integrated harness, and four with Pioneer-NPU integrated harness. Minor malfunctions were frequently encountered, but generally satisfactory results were obtained with all three parachute-harness assemblies. The over-all results of the test program conducted demonstrate the serviceability of the subject ejection system. (Author)

6,374

Anon. 1959 PHOTO, BOEING, FULL-BODY RESTRAINT  
Astronautics P. 34, Nov. 1959.

CONTENTS: Photo of Boeing full-body restraint for spacecraft.

6,375

Anon. 1959 PILOTS BEYOND THE STRATOSPHERE.  
Interavia. 14: 390-392, April 1959

6,376

Anon. 1959 PROCEEDINGS OF THE IXth INTERNATIONAL ASTRONAUTICAL CONGRESS,  
AMSTERDAM, 1958, VOL. I (Wien: Springer-Verlag, 1959)

6,377

Anon. 1959 PROCEEDINGS OF THE IXth INTERNATIONAL ASTRONAUTICAL CONGRESS,  
AMSTERDAM, 1958, VOL. 2 (Wien: Springer-Verlag, 1959)

6,378

Anon. 1959 PUTESHESTVENNIKI V KOSMOS (Space Travelers)  
(Trans. from Gudok (USSR), p. 4, Sept. 38, 1958)  
(SLA Translations Center, Chicago, Ill.) 59-16430

6,379

Anon. 1959 RABBIT AND TWO DOGS RECOVERED FROM SPACE.  
Science 130:258.

ABSTRACT: From Soviet announcements, two dogs and a rabbit on a 4000-lb payload were launched into space on July 2, 1959, and successfully recovered. According to the Soviet press, instruments aboard the missile sent back information on the animal's reaction to weightlessness, and information on the ultraviolet part of the solar spectrum, the structure of the ionosphere, and the direction and speed of air streams at various altitudes. Among commentator's reports: "This has proved we can bring animals back alive," and "It means much in the preparation for space flights by human beings."

6,380

Anon. 1959 RAZVEDCHIKI BOL'SHIKH VYSOT (AND) ISSLEDOVANIYA PERVOSTEPEN-  
NOGO ZNACHENIYA (High Altitude Scouts (and) Research of Paramount  
Importance)  
(Trans. from Pravda Moscow, (189):6, 1959: a partial trans. from no.  
189, p. 1 and a summary trans. of 3 articles on the same subject from  
Izvestiya (USSR) (160):3, 1959)  
(SLA Translations Center, Chicago, Ill.) 59-19716

6,380

Anon. 1959 ROCKET TECHNOLOGY AND SPACE RESEARCH

(Picatinny Arsenal, Feltman Research and Engineering Labs., Dover, N.J.)

Translation no. PA-61, Nov. 1959, ASTIA AD 228 967

Also in: Raketentech. u. Raumfahrtforsch., v. 3, no. 2, Apr.-June 1959

ABSTRACT: Included in this report are observations on the physiology of the senses during the transition from acceleration to weightlessness.

6,381

Anon. 1959 SMART DRIVERS USE SEAT BELTS.

Rocky Mountain Medical Journal 56(7):44-46.

ABSTRACT: Seat belts help decrease the severity of accidental injury or prevent injury when accidents occur. When a car crashes, the motorist without a seat belt to stop him flies forward at unreduced speed—for a split second still uninjured—until he hits something solid. This is the impact that kills and maims. It is the violence of the reduction in speed, not the speed itself, which kills. Thus, even low speed collisions can produce high deceleration rates. Careful analysis of auto accidents by crash injury research experts shows that in a traffic accident: (1) a belt helps prevent being thrown forward; (2) you are much safer inside the car; and (3) everyone is safer when the driver is kept behind the wheel.

6,382

Anon. 1959 SPACE MEDICINE.

Scot. Med. J., 4:462-465, Sept. 1959.

ABSTRACT: Medical problems of spaceflight are in general, extensions of those faced by the aviation medicine specialist in the last decade. They can be usefully considered under the general classification of mechanical stresses and environmental factors.

6,383

Anon. 1959 STUDIES ON DYNAMICS AND INSTRUMENTATION OF THE HOLLOMAN TRACK

(Air Force Missile Development Center, Holloman Air Force Base, N. Mex)

Rept. No. AFMDC TR 59-8; April 1959. ASTIA AD 236 096.

ABSTRACT: This technical report is a consolidation of twenty-three papers prepared at AFMDC over a period of about two years, 1956 through 1958. Track structure, vibration, instrumentation, friction and slipper wear, and aerodynamics and propulsion are treated. (Author)

6,384

Anon. 1959 TYPICAL ACCELERATION LOADS IMPOSED ON PILOTS DURING CATAPULTING AND ARRESTING (N.A. Test Center, Patuxent River, Maryland) Proj. TED No. PIR SI-43108, 3 April 1959.

6,385

Anon. 1959 USAF PLANE CRASHES DECLINE SINCE 1955. Av. Wk. 29 June 1959, p.83.

ABSTRACT: Los Angeles, USAF aircraft accident rate has declined steadily since 1955, despite the increasing number of hours flown in high performance aircraft.

Maj. General Joseph D. Caldera, departing here for a new assignment as USAF deputy inspector general for Safety (AW June 15, p. 23), said the number of fatalities totaled 389 in 1955, but was down to 302 in 1958. If the trend continues as indicated in the first quarter 1959, the number of fatalities could decrease to less than 200, he added.

The accident rate per 100,000 flying hours is similarly reduced from 4.0 to 2.8 in the first quarter of this year.

Most significant cause in the reduction in the rate is pilot education; although the number of ejections in first quarter 1959 is 65% greater than in 1958, pilot fatalities have dropped, he said. Each year sees a greater number of flying hours in Century-series fighters with newly graduated pilots manning the aircraft, making the record more remarkable, Caldera added.

Fuel contamination is still a major headache in flying safety, he continued, and the Air Force suspects fuel contamination could be a cause factor in some of the undetermined crash causes which make up 18% of Air Force flying accidents. One manner in which the contamination problem is being tackled is through continued emphasis to fuel handlers of the importance of their jobs. Gen. Caldera said a large procurement of fuel filtration equipment is in the offing pending the outcome of service tests on such equipment now. Major emphasis will be removing water in solution from JP-4 and JP-5.

Brig. Gen. Walter E. Arnold will assume Caldera's former post as director of flight safety research, Norton AFB, Calif.

6,386

Anon. 1960 ANNUAL REPORT, 1 APRIL 1959 to 31 MARCH 1960. (Automotive Crash Injury Research).

6,387

Anon. 1960 ASCENT INTO THE HIGHEST STRATA OF THE ATMOSPHERE  
Deutsche Flugtechnik 1960(3):76-77

ABSTRACT: This is the narrative account of the unknown author's visit to an unidentified laboratory for high-altitude flying, obviously in the USSR. The



guide was the Candidate of Medicine, Modest Vakar. In the pressure chamber a test was made with a dog. The author could see on the X-ray screen the dog's skin lift several centimeters under the effect of the reduced barometric pressure. Upon completion of the test the visitor was shown the unharmed dog. The next test in the pressure chamber was carried out with Aleksey Grachev. A decompression was simulated with Aleksey Belokonev in the decompression pressure chamber. This chamber was a model of a cockpit built of armor-glass. The next stop of the visitor was at the acceleration lab. A test was made with Ivan Kachur. The author noticed on Kachur's pressure suit the special rubber pockets over the abdomen, on the thighs and the lower legs, filled with pressurized air to protect the vital organs, to facilitate the blood circulation and the heart functions on the centrifuge, simulating the acceleration. The guide told the author about K. Ye. Tsiolkovskiy's idea of placing the pilot into a liquid as a protective means against the acceleration forces. Test animals did thus stand a thousandfold pressure over short periods. (CARI)

6,388

Anon. 1960 BIBLIOGRAPHY OF RESEARCH REPORTS AND PUBLICATIONS ISSUED BY THE BIO-ACOUSTICS BRANCH.  
(Aerospace Medical Lab., Wright Air Development Div., Wright-Patterson Air Force Base, Ohio) Dec. 1960.

CONTENTS:

- Sound sources and noise fields
- Sound propagation
- Acoustic instrumentation
- Noise control -- general
- Noise control structures
- Hearing and physiology of the ear
- Speech
- Biological and psychological effects of noise
- Ear protection
- Mechanical characteristics of the human body:
  - Effects of vibrations and shocks
- General noise guides and criteria
- Bionics

6,389

Anon. 1960 CRASH INJURY; CRASH WORTHINESS. (Flight Safety Foundation, Inc.)  
Army Aviation Safety Final Report TREC TR-60-77, Av-CIR-70-0-128.

6,390

Anon. 1960 DESCRIPTION OF THE EXPERIMENTS PERFORMED DURING THE FLIGHT OF THE SECOND RUSSIAN SPACE-SHIP SATELLITE.  
Pravda, 4-6 Sept. 1960.  
R.A.E. Translation No. 921

6,391

Anon. 1960 DETERMINATION OF TEST INSTRUMENTATION REQUIREMENTS FOR BIOLOGICAL AIRBORNE AND ASTRONAUTICAL TESTS: REQUEST FOR (Air Crew Equipment Lab., Naval Air Material Center, Philadelphia, Pa.) Proj. TED no. NAM AE-1403.1 rept. no. 2137, 28 March 1960, ASTIA AD-234 091

ABSTRACT: A description of electrodes suitable for obtaining ECG records when worn under protective clothing during prolonged exposures in adverse environmental conditions has been given. The manner in which these electrodes were applied to the surface of the body was also indicated. The electrodes were found to give clinically acceptable ECG recordings during tests lasting over 12 hr. During this time, subjects dressed as shown in enclosure (5) were exposed to very warm and humid environmental conditions. After wearing these electrodes for 46 hr, a subject having fair, thin skin showed no skin changes other than a moderate reddening at the areas of contact. After removing the electrodes, these reddened areas disappeared within 6 hr. In no case, when these electrodes were used, did any of the subjects report discomfort arising from the electrodes or the lead wires. (Author)

6,392

Anon. 1960 DOGS ADJUST QUICKLY TO FLIGHT.  
TASS, Radioteletype in Russian to Europe (Moscow), 22 Aug. 1960.  
0110 GMT. (translation. Excerpts)

ABSTRACT: P. Fedorov reports that television observations were conducted from the moment the spaceship was launched and practically to the beginning of its descent. The dogs were reported to have pricked up their ears and looked with perplexity into the inside of the cabin. During the first seconds the dogs felt uneasy and agitated. As the speed of the ship increased they were gradually pressed to the floor by the increasing force of gravity. Strelka pressed down with her paws, tried to resist, and looked from side to side with alarm. Then the animal stood stock still. The ship was in orbit. After great changes in the load the condition of weightlessness was reached. The dogs "hung" in the cabin. Their paws and heads hung down weakly and at first sight the animals appeared lifeless. Having accustomed themselves to weightlessness, the animals began to eat. During the day they got worried from time to time, but they gradually settled down.

6,393

Anon. 1960 IN THE EARTH'S ATMOSPHERE  
Vozdushnogo flota 11: 95

6,394

Anon. 1960 EJECTION SEAT STUDY.  
(Naval Aviation Safety Center, Norfolk, Va.)  
June 1960. ASTIA AD-238 492

ABSTRACT: A statistical analysis is presented showing the degree of personnel injuries sustained during ejection from disabled aircraft. Factors analyzed include altitude, speed, seat systems, attitude, and types of emergency. Ejection frequency and fatality rates per 10,000 hours flying time are also presented. A comparison is made between injuries resulting from ejections and bailouts.

6,395

Anon. 1960 FLIGHT CONTROL STUDY OF A MANNED RE-ENTRY VEHICLE  
(General Electric Co., Philadelphia, Pa.) WADD TR 60-695, Contract  
AF 33(616) 6204, Proj. 8225, July 1960. ASTIA AD 249 400.

ABSTRACT: Appendix V shows how a variable drag device can be used to limit the maximum deceleration. The results presented herein should be helpful in evaluating the utility of variable drag devices in terms of human tolerance to deceleration and the thermodynamic and mechanical feasibilities of specific types of devices. (Author)

6,396

Anon. 1960 INDEX ON ENVIRONMENTAL TEST EQUIPMENT IN GOVERNMENT ESTABLISHMENTS  
(Director of Defense Research and Engineering, Washington, D.C.) Dec. 1960.  
ASTIA AD 252 715.

ABSTRACT: The index, compiled by the centralizing activity for shocks, vibration and associated environments, includes a list of the test facilities and equipment available at Army, Navy, Air Force, and non-military establishments. It is intended to acquaint scientists and engineers with the existence of these facilities and prevent unnecessary expenditures for environmental test equipment. Part I lists the items of test equipment at the several establishments and some information on performance capabilities. Part II lists the performance details of certain commercial ranges of test equipment.

6,397

Anon. 1960 PROBLEMS OF SPACE FLIGHT.  
Komsomol'skaya pravda, 2 Dec. 1960, p. 2, cols. 1-4.

ABSTRACT: Experiments with dogs have proved that the future space pilot must be placed in a position where the force of overload will be felt in the direction of chest to back ... The cabin, acting like a gyroscope in space, will maintain the same position for the pilot... The problem of overload has also been studied by

observing other animals such as the giraffe, in which special heart muscles pumping blood to the animal's head were found to overcome the "natural overload" created by the distance between the heart and the brain. Bears and pigs were also tested since their bone structure in terms of "biological resistance" resembles that of man... Tests have also been conducted with plants and organisms which immersed in a fluid were found to survive the effects of acceleration ... Weightlessness does not present a serious danger to life. Having experienced a state of weightlessness, man will, however, be faced with serious problems of readjustment after return to earth. Thus the necessity for creating artificial gravity in the space cabin by centrifugal force... A number of tests have been made in space with mice, hamsters, fruit flies, pieces of skin, and grains, to determine the effect of radiation. Chemist are working on a protective agent containing sulfur, albumens, vitamins, and hormones which, introduced into the organism, will increase resistance against radiation in space ....

6,398

Anon. 1960 PROSPECTORS OF GREAT HEIGHTS.  
Pravda, (Moscow) 189(14948):6 LC or SLA Trans. 60-19078

6,399

Anon. 1960 SATELLITE RETURNS SAFELY  
FBIS, USSR & East Europe, Nr. 163, August 22, 1960.

6,400

Anon. 1960 SECOND SOVIET SPACESHIP (Official Report)  
Pravda 4: 3-4; Sept. 1960

6,401

Anon. 1960 SERVICE TEST OF PARACHUTE JUMPING FROM ARMY AIRCRAFT (H-37).  
(Arctic Test Board, Fort Greely, Alaska) Proj. No. ATB 3-430, 20 May  
1960. ASTIA AD 237 940.

ABSTRACT: The H-37 helicopter, when modified by the installation of the anchor cable assembly described in Sikorsky Drawing S1507-5120-C less the starboard cable, will be suitable for parachute delivery of a maximum of 16 combat equipped parachutists under arctic winter conditions. When so modified, the H-37 helicopter will be suitable for consecutive delivery of standard type aerial delivery containers from the door or from the external cargo hook followed by parachutists from the door under arctic winter conditions. No requirement exists for the starboard anchor cable under arctic winter conditions. The requirement for use of the static line protective shield will be limited and infrequent and therefore the shield should be locally fabricated by using units as required.  
(Author)

6,402

Anon. 1960 SOVIET SPACE SCIENCE  
Trans of mono. Stantsii v Kosmos: Sbornik Statei (Stations in Space;  
Collected Articles) Moscow, 1960, p. 214-229.  
(Joint Publications Research Service, San Francisco, Calif.)  
Nov. 16, 1961 JPRS: 11154

CONTENTS:

Life in a Sputnik, by P. Isakov  
Man Prior to Starting into Space, by E. Yugov and A. Serov

6,403

Anon. 1960 SPACE COCOONS FOR ORBITING ASTRONAUTS  
I/EC 52(11):36A-39A, Nov. 1960

ABSTRACT: A plastic foam cocoon designed to protect an astronaut during re-entry, should it become necessary to abandon a disabled satellite vehicle, is contemplated by research engineers at General Electric.

6,404

Anon. 1960 VTOROIY SOVETSKIY KOSMICHESKIY KORABL' (The Second  
Soviet Cosmic Ship)  
Izvestiya no. 212, p. 3, 6 Sep. 1960

6,405

Anon. 1961 AT SUPERSONIC VELOCITY  
Sovetskaya Litva, July 28, 1961, p. 3. Prepared by: Translation Services  
Branch, Foreign Technology Division, WP-AFB, Ohio. FTD-TT-61-203/1  
ASTIA AD 268 072

ABSTRACT: This is an article from the Russian Newspaper Sovetskaya Litva. It discusses the characteristics of ejection seats and how they operate.

6,406

Anon. 1961 AUTOMOTIVE CRASH INJURY RESEARCH SUMMARY REPORT. Annual  
Report 21.

6,407

Anon. 1961 AVIATION CRASH INJURY SYMPOSIUM, U.S. ARMY CHIEF OF TRANSP.  
(Cornell-Guggenheim Aviation Safety Center)

6,408

Anon. 1961 BIOLOGY AND THE COSMOS  
Trans. of Nauka i Zhizn' (USSR) 28(6):6-9, 1961.  
(Joint Publications Research Service, New York, N. Y.)  
Oct. 17, 1961 JPRS: 10553; OTS 61-28924.

CONTENTS:

The First Voyage to the Stars and the Problems of Space Biology, by  
N. N. Zhukov-Verezhnikov.  
Microorganisms in the Cosmos, by N. I. Rybakov.

6,409

Anon. 1961 BIOMEDICAL ASPECTS OF SOVIET SPACE RESEARCH  
Trans. from Ekonomicheskaya Gazeta (USSR) 1961, no. 167, p. 3;  
Sovetskaya Rossiya (USSR) 1961, 19 Sept. p. 4; Izvestiya (USSR)  
1961, no. 184(13730)p. 6; Pravda, Moscow (USSR) 1961, no. 222(15712)  
p. 6; Pravda Vostoka (USSR) 1961, 13 Aug.  
(Joint Publications Research Service, New York, N. Y.)  
March 27, 1962 JPRS: 13244

6,410

Anon. 1961 COMPENDIUM OF ABSTRACTS OF PAPERS PRESENTED AT THE SYMPOSIUM  
ON BIOMECHANICS OF BODY RESTRAINT AND HEAD PROTECTION.  
(U.S. Naval Air Materiel Center, Philadelphia, Pa.)

6,411

Anon. 1961 DECELERATION OF SPACE VEHICLES.  
In Tekhnika-Molodezhi (Meteor-Rocket)  
(Science and Tech. Section, Air Information Division, Washington, D.C.)  
AID Rept. 61-51; 18 Apr. 1961. ASTIA AD 255 793

ABSTRACT: The electric charge on the nose of a rapidly flying body changes the intensity of the body's deceleration. The use of this effect in the development of a deceleration engine for space vehicles is discussed. In explaining the possibility of using the kinetic energy of a space body for deceleration, the reentry processes for both electrically conductive meteors and dielectric meteors are described.

6,412

Anon. 1961 DETAILS OF THE LEGENDARY FLIGHT  
(Komsomol'skaya Pravda, v. 91 (11031), April 16, 1961, pp. 1-3)  
(Aerospace Technical Intelligence Center, Wright-Patterson AFB, Ohio)  
Trans. No. MCL-1035, July 27, 1961, ASTIA AD 261 805

6,413

Anon. 1961 DYNA-SOAR EJECTION SEAT AND SURVIVAL SYSTEM  
(Boeing Co., Seattle, Washington) Rept. No. 10-81000, Rev. B to Rept. No  
10-81000, 15 Sept. 1961. ASTIA AD 269 506L

ABSTRACT: The design, fabrication, performance, and testing requirements for a type of equipment designated Ejection Seat and Survival System is reported. It is designed for pilot escape and survival from the Dyna-Soar glider in instances when a satisfactory landing site cannot be reached or when other conditions make an attempted glider landing impractical. (Author)

6,414

Anon. 1961 EL HOMBRE EN EL ESPACIO EXTERIOR (MAN IN OUTER SPACE)  
Revista de Aeronautica (Spain) 21(245):275-282, April 1961

ABSTRACT: A resume of the man-in-space projects being conducted by the U. S. and USSR is presented. (JPL)

6,415

Anon. 1961 EVALUATION OF HUMAN SUBJECT REACTION IN THE FORWARD AND AFT FACING SEATED POSITIONS.  
(Naval Air Materiel Center, Philadelphia, Pa.) NAMC-ACEL-424

6,416

Anon. 1961 THE FIRST FLIGHT OF MAN IN COSMIC SPACE  
Trans. from Izvestiya (USSR) 1961, 25 April.  
(Joint Publications Research Service, New York, N. Y.)  
May 8, 1961 JPRS: 8238

ABSTRACT: Newspaper account of Gagarin's flight of 12 April 1961 containing general nontechnical discussions on the design of the spaceship, medico-biological problems of spaceflight, and on the training of Soviet cosmonauts.

6,417

Anon. 1961 FIRST MAN IN SPACE  
Tudomány és technika (Hungarian Popular Science J.) (9)  
See also, Anon. "Manned Space Capsule," ibid.

ABSTRACT: This article concerns Major Gagarin's space flight on April 12, 1961. It describes the equipment in the cabin, food supplies and water, instruments and rockets and brakes for descent.

6,418

Anon. 1961 FLIGHT OF THE SECOND COSMIC SHIP  
Vestnik Akademii Nauk SSSR, 10:10-17

ABSTRACT: A report of a press conference by the Presidium of the USSR Academy of Sciences on Aug 24, 1960, two days after the flight of the second Soviet cosmic ship. A.V. Topchiyev related how the planned program on the ship was carried out, described the passengers, and cited preliminary results. N.M. Sisayakan described the biological program and V.V. Parin discussed the medico-biological part of the program. O.G. Gazenko exhibited rats, mice, and the dogs Belka and Strelka. S.N. Vernov and L.V. Kurnosova discussed radiation experiments on the flight. (CARI)

6,419

Anon. 1961 FROM SPUTNIK TO ASTRONAUT  
Wojskowy przeglad lotniczy 1961(5):1-8

ABSTRACT: This feature article commemorates Major Y. Gagarin's successful orbital flight of April 12, 1961 and briefly describes all Soviet space vehicles launched during the last 3½ years preceding the manned orbital flight. Gagarin's flight was preceded by two Vostok-type space ships launched for a test of the capsule's landing equipment. Gagarin's task during the flight was to observe the earth, the sky, and the lower layers of the atmosphere, as well as his own physical reactions to acceleration, weightlessness, etc. Sensors attached to his body recorded cardiac currents, respiration and pulse rate. The data showed that acceleration and deceleration caused little changes in his pulse rate and respiration. During weightlessness, his pulse and respiration rates returned to nearly normal. It can be assumed that manned space flights to the moon and other planets will come true in the near future. (CARI)

6,420

Anon. 1961 A GREAT EVENT IN THE SCIENCE AND HISTORY OF MANKIND -- THE FIRST FLIGHT OF MAN INTO THE COSMOS (CERTAIN CLINICO-PHYSIOLOGICAL PROBLEMS CONCERNING COSMIC FLIGHT OF MAN) Klinicheskaya Meditsina (Moscow) 39(7):3-5 July 1961

ABSTRACT: This article discusses Major Yuriy Alekseyevich Gagarin's flight into space, an event which the combined efforts of scientists, engineers, designers, medical men, biologists, psychologists, and other workers in the Soviet Union made possible. It also includes some comments made by Gagarin after his flight. The human descent, re-entry, and safe landing of Gagarin prove that a human is able to tolerate this complex stage of flight. This article is concluded with an appeal to all therapists, neuropathologists, surgeons, and specialists in other fields to cooperate actively with physiologists in their attempt to solve the problems of aerospace medicine. (CARI)



6,421

Anon. 1961 GRISSOM REPORTS ON SECOND MR FLIGHT  
Aviation Week and Space Technology 75(6):60-64, Aug. 7, 1961

ABSTRACT: Excerpts from the official NASA transcript of Captain V. I. Grissom's report of his flight and reactions are contained in this article. (JPL)

6,422

Anon. 1961 INSTRUMENTATION BIBLIOGRAPHY  
(Ministry of Aviation, Gt. Brit.) Rept. No. TIL/BIB/50; Jan. 1961.  
ASTIA AD 253 346

ABSTRACT: This bibliography contains material on the following subjects: general instrumentation; calibration; combustion; electrical and electronic devices; test facilities; accelerometers; computers; displacement measurements; flow measurement and control; pressure and thrust measurement; recording; shock and vibration; strain gauge measurements; temperature measurement; and time measurement.

6,423

Anon. 1961 LA PREMIERE EXPERIENCE BIOLOGIQUE SPATIALE FRANCAISE (THE FIRST FRENCH BIOLOGICAL SPACE EXPERIENCE) Homme et l'espace (Lausanne) No. 8-9-53-55. Nov.-Dec. 1961

ABSTRACT: A rat (Hector) hermetically sealed into a compartment of the Veronique rocket was launched to an altitude of 110 kilometers. Throughout the flight, the physiological parameters (brain, heart, and muscular activities) of the animal subjected to accelerations were telemetered and registered on the ground. Physiological surveillance of the rat permits the study of the eventual repercussion of the flight on the animal body. (J. Aerospace Medicine 33(11):1391, Nov. 1962)

6,424

Anon. 1961 LA RELAZIONE UFFICIALE SUL VOLO SPAZIALE DI TITOV (Official Account of Titov's Space Flight)  
Oltre il cielo (Rome), 5(90):292-296, 1-15 Oct. 1961, (in Italian)

ABSTRACT: The successful launching into space of the spaceship-sputnik "Vostok 2" on August 6, 1961, was manned by the Soviet astronaut, Gherman Stefanovic Titov. The flight lasted 25 hours and 18 minutes. Discussion is presented on the spaceship's structure and equipment; means of radio- and telecommunication; direct television and motion picture recording of the astronaut's

behavior during the flight, monitored simultaneously with registrations of physiological functions back to earth; environmental conditions on board (temperature, barometric pressure, etc.); the weightlessness encountered during the flight and its effects on blood circulation, respiration, work capacity, and vestibular apparatus; radiation protection; and the astronaut's impressions of the flight.

6,425

Anon. 1961 LIFE SUPPORT SYSTEMS: SOVIET LITERATURE  
(Monthly rept. no. 7 for Oct/Nov 61 on AID Work Assignment no. 22  
Dec. 1961) AID rept. 61-168; ASTIA AD 271 514  
(Office of Technical Services, Washington, D.C.) 62-19110

6,426

Anon. 1960 LUNAR JOURNEY  
Lancet (London) 1(7134): 1117-1118. 21 May 1960.

ABSTRACT: The physiological problems of orbital and space flight are briefly reviewed, including: (1) the typical aviation stresses of acceleration, low barometric pressure, and temperature and humidity extremes, for which adequate measure of protection are available; (2) prolonged weightlessness, the "breakoff phenomenon," and primary cosmic radiation, about which little is known; and (3) problems of lunar flight which will require further development of existing techniques, such as increased acceleration stress, the mental strain of extended flight, the additional radiation hazard of the Van Allen belts, and the necessity of the provision of large quantities of food and oxygen

6,427

Anon. 1961 MANNED SPACE CAPSULES (USSR, HUNGARY)  
Tudomány es technika (Hungarian Popular Science J.) (9), 8 May 1961

ABSTRACT: This article contains two sketches of Gagarin and his space capsule. The parts of the space capsule and interior of the cabin are pointed out in the picture and described in the article. (CARI)

6,428

Anon. 1961 MEDICINE AND SPACE FLIGHTS  
Trans. of Vsesoyuznoe Obshchestvo po Rasprostranentyu Politicheskikh i Nauchnykh Znanii. Seriya 8: Biologiya i Meditsina (USSR) (9):3-32, 1961.  
(Joint Publications Research Service, New York, N.Y.)  
Aug. 14, 1961 JPRS: 9939

CONTENTS:

In Place of a Foreword, by N. N. Blokhin  
The Role of Space Medicine in Providing for the Flight of the First Cosmonaut, By V. V. Parin  
Fundamental Medical-Biological Problems of Space Flights, by O. G. Gizenko  
Radiation in Cosmic Space, by S. N. Vernov.

6,429

Anon. 1961 MICE-BEARING ROCKET LAUNCHED IN KRAKOW.  
Warsaw Polish Home Service. 11:05 GMT. 11 April 1961. (translation).

ABSTRACT: (Text) Two successive rockets of the meteorological type were launched in the Bledowska Desert near Olkusz. One of them carried two white mice in a special container. The first rocket, weighing 10 kilograms and measuring one and a half meters in length, reached the planned altitude of 1,700 meters. The rocket traveled at a speed of 550 kilometers and hour. At a certain time the first stage with the container separated from the rocket and landed with its passengers by a special parachute. The animals felt well after the experiment. The next experiments are to take place in May. The experiments, organized by the experimental aviation and rocket technology circle of the Krakow Aero Club, take place under the auspices of the Polish Astronautical Society and Krakow scientists.

6,430

Anon. 1961 MISSILE "DRAG" BALLOON  
Spaceflight 3(3):112, May 1961

ABSTRACT: Coated fabric balloons which inflate in one-tenth of a second have been developed for a high-altitude recovery system designed to control deceleration of re-entry vehicles. (JPL)

6,431

Anon. 1961 NEW INDICATIONS IN SOVIET SPACE TECHNOLOGY (Science and Tech. Section, Air Information Div., Washington, D.C.) AID rept. 61-40; 28 March 1961;  
ASTIA AD-254 409

6,432

Anon. 1961 OT MECHTY K DRISTVITEL 'NOSTI (MEDIKO-BIOLOGICHESKIE PROBLEMY KOSMICHESKOGO POLETA) (From Thought to Reality (Bio-Medical Problems of Cosmic Flight) ) Voyenno-Med. Zhur. (Moscow), 1961, no. 5 pp. 3-12  
Also in U.S. Joint Publication Research Service, Washington, D.C.  
Trans. No. 10052 (1374-N/42), Aug., 1961.

ABSTRACT: This is a scientific review of preparations for the man-in-orbit satellite flight on April 12, 1961. Rocket and satellite flights carrying biological materials were used to solve problems concerning flight dynamics, physical characteristics of outer space, meteors, temperature changes, lack of atmosphere, and internal cabin environment. After being subject to cosmic radiation during the flight, accelerated growth and germination were shown for onion and Nigella seeds after flight. Also, there was an increase in the frequency of chromosomal aberrations in root cells, bone marrow cells of mice, and growth points of plants. Furthermore, the frequency of dominant and recessive lethal factors in Drosophila was increased after a 24-hour satellite flight. A complete ecological cycle is discussed for space flight with a larger crew.

6,433

Anon. 1961 PARIN ON COSMONAUTS, SPACE DOGS  
(FBIS, USSR & East Europe, Nr. 81, April 27, 1961)

ABSTRACT: Moscow -- The dogs which have taken part in space flights are still in excellent health and their journey into space has had no harmful aftereffects on them, said Soviet medical scientist Vasil Parin today, appearing on Moscow television program devoted to the conquest of space. Parin stressed that Soviet technology had created vehicles capable of placing living creatures into orbital flight and that both the stages of acceleration and deceleration had caused no harmful aftereffects. Academician Parin said that apparently for some time to come cosmonauts would be selected from among pilots. Outlining the requirements to be met by a cosmonaut, the scientists said that he must possess the same qualities as those possessed by Yuriy Gagarin. Speaking about Yuriy Gagarin's preparation for the flight, Academician Parin said that it had been carried out according to a big program, and all the tests were carried out with "large endurance margins" exceeding in severity those conditions which Gagarin was likely to encounter during the flight. Parin said that Gagarin's space suit incorporated special transmitters with the help of which all the data on the condition of his body during the flight were transmitted to earth. Academician Parin said that in future flights into unexplored cosmic regions the first explorers would apparently again be man's four-legged friends - dogs.

6,434

Anon. 1961 PERIODICAL REPORT ON AEROMEDICINE IN THE USSR: 61-24  
(1126th USAF FAG, Arlington Hall Station, Arlington 12, Va.) Rept. 1452577

ABSTRACT: This is a report dealing with: a) Contents of a book on the psychology of the flying profession, b) Comparative physiological study of tolerance to radial acceleration, 3) The Sixth Congress of the Ukr. Society of Physiologists, and d) Astronaut training and manned space flights. (CARI)

6,435

Anon. 1961 QUARTERLY REVIEW OF APL ACTIVITIES JULY-SEPTEMBER 1961. II. SPACE EXPLORATION AND RESEARCH AND DEVELOPMENT (Applied Physics Labs., Johns Hopkins U., Silver Spring, Md.) Contract NOrd-7386, ASTIA AD-327 457

6,436

Anon. 1961 RAT FLIGHT PROVIDES DATA ENCOURAGING FOR MAN  
Missile & Rockets 8(21):42-43, 22 May 1961

6,437

Anonymous (U. S. Army) 1961  
RELATIONSHIP BETWEEN IMPACT VARIABLES AND INJURIES SUSTAINED IN  
LIGHTPLANE ACCIDENTS.  
(Cornell-Guggenheim Aviation Safety Center, New York)  
AvCIR 61-5 August ASTIA AD 263 676L

ABSTRACT: Impact conditions are related to injuries sustained by 248 occupants involved in lightplane crashes. Seat tie-down and belt restraint were considered effective and structural collapse was generally not extensive, yet one of every four occupants was killed. Injury severity fatality rate, and incidence of injury to all areas of the body-except the lower torso and thoracic-lumbar spine-were directly related to impact velocity and to angle of impact but inversely related to stopping distance. Lumbar and thoracic spine injuries occurred more frequently in low-angle long deceleration crashes. It was concluded that crucial injuries largely stem from flailing of the body against injury-producing structures within the occupant's environment. Belt restraint is thus seen to play only a moderate role in reducing injury severity. The need for additional safety measures is emphasized. (AUTHOR)

6,438

Anon. 1961 REVIEW OF AERONAUTICAL AND SPACE MEDICINE (SELECTED ARTICLES)  
Riv. Med. Aeronaut. (Rome) 23:347-436, Sept. 1960  
(Aerospace Technical Intelligence Ctr., Wright-Patterson AFB, Ohio,  
Trans. No. MCL-787; ASTIA AD-259 594; April 25, 1961)

CONTENTS:

Vacca, C. & L. Vacca, "Modification of the Electrocardiogram of Albino Rats Subjected to Tangential (Transversal) Acceleration Before and After Splenectomy."

6,439

Anon. 1961 SOVIET LITERATURE ON LIFE SUPPORT SYSTEMS (Science and Tech. Branch, Aerospace Information Div., Washington, D.C.) AID rept. 61-156, 30 Nov. 61, ASTIA AD-269 794

6,440

Anon. 1961 SOVIET SPACE SCIENCE  
Trans. of Priroda (USSR) 50(9):9-10, 54-60, and 75-77, 1961.  
(Joint Publications Research Service, San Francisco, Calif.)  
Dec. 21, 1961 JPRS: 11706

CONTENTS:

Another Victory of Soviet Science and Technology Laboratory Animals, by  
A. I. Metelkin  
In the Name of Science, the Homeland, and the Progress of Mankind (Press  
Conference).

6,441

Anon. 1961 SOVIETS INDICATE BIG PROBLEMS IN SPACEMAN'S WAY.  
Columbus Dispatch, March 10, 1961

ABSTRACT: Two Russian scientists indicated that despite Soviet recovery of another space ship with a dog inside, major problems remain to be solved before a Soviet man is shot into space. Ivan Maisky, director for the Experimental Biology Institute, and Vasil Parin of the Soviet Academy of Medical Sciences agreed that weightlessness is a major problem of manned space flight. Parin said Russian scientists have been getting "interesting data" on how living organisms are affected by such unusual irritants as vibration, stress, and the extreme noise of rocket engines. (CARI)

6,442

Anon. 1961 SPACE MEDICAL SYMPOSIUM HELD IN CONJUNCTION WITH THE XIth INTERNATIONAL ASTRONAUTICAL CONGRESS, STOCKHOLM, SWEDEN, AUGUST 15-20, 1960  
Astronautik (Stockholm) 2(4):213-324

ABSTRACT: This issue of the journal contains 13 papers or abstracts on aerospace medicine. Some of the entries are abstracted separately. (J. Aerospace Medicine 33(8):1030, Aug. 1962)

6,443

Anon. 1961 SPACESHIP CAPSULE  
Vestnik Vozdushnogo Flota, no. 1, 1961, 95. TL504.V45

ABSTRACT: The best solution for protecting man from the effect of over-loading and appreciable angular acceleration is an anti-g force detachable capsule. The capsule should be provided with a special device for automatic regulation of the position of the astronaut so that the accelerations originating during the flight will always be in a direction perpendicular to the axis of the human body.

6,444

Anon. 1961 SURVIVAL IN SPACE  
Interavia (Geneva), 16 (12): 1651-1653. Dec. 1961

ABSTRACT: In a space vehicle, the following problems are met with which do not arise with either a jet aircraft or a submarine: (1) the absence of any medium which can be used for propulsion or in the life support system cycle; (2) new environmental influences, e.g., cosmic radiation, reduced magnetic fields, meteoritic storms; (3) re-entry into the Earth's atmosphere; and (4) weightlessness. Despite extreme stresses, such as high accelerations, noise, vibration, heat, reduced external pressures, and emotional stress, astronauts can undertake an impressive work program of making decisions, carrying out observations, and executing repairs. Included are a tabulation of the present state of knowledge in the life sciences, a picture of the Mercury capsule, and a record of astronaut Shepard's pulse and respiration rate during Mercury flight.

6,445

Anon. 1961 A TABLE OF EQUIVALENTS OF ACCELERATION TERMINOLOGIES (Acceleration Committee, Aerospace Medical Panel, AGARD, 1961)

6,446

Anon. 1961 A TABLE OF EQUIVALENTS OF ACCELERATION TERMINOLOGIES.  
Rivista di medicina aeronautica e spaziale (Roma) 24(4):644-651, Oct.-Dec. 1961

ABSTRACT: A Table of Equivalents of Acceleration Terminologies is presented which has been prepared by the Committee on Acceleration of the Advisory Group for Aeronautical Research and Development, Aero Space Medical Panel. In this table the terms are grouped as to the type of acceleration, the body axis concerned, and the physiological consequences of acceleration. The Committee recommends the following: (1) that writers and researchers in the field of acceleration related to mammalian subjects restrict their descriptive terminologies and symbols

to those contained in the table; (2) that the table be used as a ready reference for equivalent translation of acceleration terminologies; (3) that large G be used as the unit of physiological acceleration at all times; and (4) that the metric system be used in applying these acceleration terminologies and symbols. ( Aerospace Medicine 33(8):1036, Aug. 1962)

6,447

Anon. 1961 TIMETABLE FOR ASTRONAUTS IN 1961  
Tudomány es technika 1961(1):16

ABSTRACT: The article deals with astronautical events to be expected in 1961. The author predicts the possible achievements of space navigation. The most eagerly expected event is the first manned space flight. Further experiments will be conducted on the psychological aspects of manned space flight to determine to what extent the spaceman can maintain his composure and deliberation, and what can be done to influence his state by drugs. The author discusses research on nutrition, sleep during weightlessness. He also discusses the problems involved in landing on the Moon or Venus or Mars. (CARI)

6,448

Anon. 1961 VOSTOK DETAILS  
Flight 79(2721): 586, 4 May 1961

ABSTRACT: The Soviet satellite Vostok and Major Gagarin's flight of April 12, 1961, are described. (JPL)

6,449

Anon. 1961 VOSTOK II STEERING EXPLAINED  
FBIS USSR & East Europe, Nr. 155, August 11, 1961

ABSTRACT: Berlin--The Society for the Dissemination of Scientific Knowledge and the GDR Astronautical Society this afternoon arranged a discussion with journalists about Major Titov's space flight. The scientists and technologists made clear that the reports concerning steering of the spaceship by the pilot have been misunderstood. In the view of the German experts, these steering operations could hardly have been concerned with changing the orbit. For various reasons it would be inexpedient to change the direction of the flight of a spaceship which has been on a precalculated orbit. On the other hand, there was a need for later corrections in the position of the spaceship axis in the light of changes brought about by physical conditions in space. This can be done automatically, as with all the unmanned artificial earth satellites which have been brought back, or by hand



steering. The pilot takes his orientation from an instrument which, irrespective of the position of the spaceship at the time, indicates an "artificial horizon." These corrections of the position in space are, however, without influence on the course along which the spaceship moves. The scientists expressed the view that Titov was exposed to a maximum pressure of 5 G's at the short and of 10 G's maximum at the landing.

6,450

Anon. 1961 UNITED STATES ARMY AVIATION CRASH INJURY RESEARCH  
(Aviation Crash Injury Research, Phoenix, Ariz.)  
AvCIR 61-20, 44-177-tc-707, Sept. 1961. ASTIA AD 275 184-L

ABSTRACT: During this year of the program of Army Aviation Flight Safety, added emphasis was given to fullscale dynamic crash testing of aircraft and intensive activities were carried on in statistical analysis, while at the same time continuing the work in the training of crash injury investigators and field investigation of Army aircraft accidents. (Author)

6,451

Anon. 1961 UNPRECEDENTED CONQUEST OF THE FORCES OF NATURE (SELECTED ARTICLES).  
Trans. of 5 selected articles from Priroda (USSR) 50(5), 1961.  
(Joint Publications Research Service, New York, N. Y.)  
Sept. 14, 1961 JPRS: 10166

6,452

Anon. 1962 BIOLOGISCHE GEFAHREN DER RAUMFAHRT (BIOLOGICAL DANGERS OF SPACE FLIGHT) Weltraumfahrt (Frankfurt) 13(2):50, March 1962

ABSTRACT: A brief editorial describes the dangers that may arise for life on earth upon return of a space ship contaminated with extraterrestrial organisms. Effective decontamination procedures should be developed before space travel and carried out before launching the space vehicle to prevent passage of terrestrial organisms into space and before reentry. A model of such a sterilization plant has been built and tested, employing as the chemical agent a mixture of ethylene oxide and freon-12 gases. Other methods include ultrasound, irradiation, dry heat, chemical disinfection, extreme cold, dehydration, and mechanical abrasives. (Aerospace Medicine 33(11):1391, Nov. 1962)

6,453

Anon. 1962 EARTH-SPACE-EARTH (SELECTED ARTICLES)

(Foreign Technology Division, Wright-Patterson AFB, Ohio) FTD-TT-62-1416/1+2  
11 Oct. 1962 ASTIA AD 292 224

Trans. from: Zemlya-Kosmos-Zemlya, (Sbornik Materialov, Opublikovannykh  
V Gazete "Pravda" Izdatel'stvo "Pravda", Moskva, Issue Nr. 24, 16 Aug. 1962,  
96 pages), pp. 10, 13-14, 27, 30-31, 45-46, 47, 51-52, 56-57 and 51.

ABSTRACT: This publication contains detailed accounts of the launch and flight of Vostok-3 and Vostok-4. Telemetric data of the health of the astronauts are included along with reports on the effects of weightlessness and activity and eating reports.

6,454

Anon. 1962 ENVIRONMENTAL EFFECTS ON MATERIALS AND EQUIPMENT. ABSTRACTS.  
SECTION B. VOLUME 2B, NUMBER 1.

(Prevention of Deterioration Center, National Research Council,  
Washington, D.C.) Jan. 1962. ASTIA AD 283 811.

ABSTRACT: Section A: Reports information on environmental factors, their effects on materials and equipment, materials resistance, corrective or preventive measures, and test methods. Section A is the successor to the Prevention of Deterioration Abstracts, a service covering the identical area of interest since 1946. Section B: Similar in treatment to Section A but presents information dealing predominately with physical and engineering considerations--mechanical shock and vibration, thermal extremes, vacuum, magnetic and gravitational fields, natural radiations found in space, dissociated and ionized gases, meteoroids and meteoric dust. Section B is a continuation of Environmental Effects on Materials and Equipment, Volume I which commenced in January 1961. (Author).

6,455

Anon. 1962 FROM GROUP SPACE FLIGHT TO A MOON-FLIGHT  
Repules, No. 10, pp. 8-9, 1962

ABSTRACT: The significance of Vostock 3 and 4 spacecraft is discussed. Two main lessons were learned: (1) The human body can function satisfactorily under conditions of weightlessness for several days; (2) It is possible to put two spacecraft into almost identical orbits. The specially prepared food, liquid containers, oxygen supply, the removal of carbon dioxide and water vapor from the air, the possibility of high-energy radiations and the need for television transmitters in spacecraft are considered. In connection with future space flights the following points are briefly mentioned: (1) In flights of several months duration, the regeneration of water must be considered. (2) The food

supply problem can be mitigated by cultivating chlorella algae aboard the spacecraft. (3) The problems arising in connection with earth-moon-earth spacecraft. (4) Assembly of stations in space and the possibility of constructing these stations from the Vostock rockets themselves. The latter solution would greatly reduce the problems of payload.

6,456

Anon. 1962 LECTURES IN AEROSPACE MEDICINE 8-12 JANUARY 1962.  
(School of Aerospace Medicine, Brooks AFB, Texas) ASTIA AD 281 775

CONTENTS:

- History and background of astronautics
- Occupational medicine at the launch site
- Selection and stress testing of astronauts
- Biologic effects of high energy practices in space
- Physiologic necessities in simulated lunar flights
- Biomedical monitoring in-flight
- Weightlessness: a physiological problem in space
- Newer aspects of subcellular photosynthesis
- Bio-instrumentation for space flight
- What can man contribute to operations in space
- X-15 operations in pre-lunar studies
- Response of mammalian systems to non-uniform space radiation dose
- Bio-astronautic support of the X-15 and Dyna-Soar
- Interplanetary environment
- Extraterrestrial life
- Propulsion systems for lunar operation
- Ocular effects of particulate space radiation
- Monitoring of moon base atmospheres by gas chromatography
- The ecologic profile of the moon
- Soil-less gardening on the moon
- The lunar crust for life support
- Who owns the moon
- The logistic of re-launch from the moon

6,457

Anon. 1962 MEDICAL AND BIOLOGICAL ASPECTS OF USSR SPACE FLIGHTS  
Trans. of Meditinskii Rabotnik (USSR) 25(72):3, Aug. 17, 1962.  
(Joint Publications Research Service, Washington, D.C.)  
Nov. 16, 1962 JPRS: 16227

CONTENTS:

- Progress in space medicine, By I. Akulinichev
- Radio and Space Medicine, by G. Novikov
- Cybernetics in Space, by A. Prokhorov and I. Zakharov
- The Atmosphere in a Space Ship, by Yu. Ivanov
- Biological Problems in Astronautics, by A. Makarchenko.

6,458

Anon. 1962 (MEDICAL WORKER) 1962 (VOL. 25) 6 FEB: SELECTED ARTICLES.  
Trans. from Meditsinskii Rabotnik (USSR) 25:2-3, 1962, Feb 6.  
(Joint Publications Research Service, New York, N. Y.)  
July 13, 1962 JPRS: 14450

6,459

Anon. 1962 NEWS OF THE ACADEMY OF SCIENCES USSR, BIOLOGY SERIES, 1962,  
NO. 1: SELECTED ARTICLES  
Trans. of Akademiya Nauk SSR Izvestiya, Seriya Biologicheskaya, 27(1):  
84-95, 102-105, 122-130 and 144-150, 1962.  
(Joint Publications Research Service, New York, N. Y.)  
April 24, 1962 JPRS: 13562

6,460

Anon. 1962 95 CHASOV V KOSMOSE. (Ninety-five Hours in the Cosmos)  
Priroda (Moskva), (9):5-7. Sept. 1962. In Russian.

ABSTRACT: This is a brief account of the orbital flights of A.G. Nikolaev and P.R. Popovich in Vostok-3 and Vostok-4 on August 11-15, 1962. The purpose of the flights was to test the effects of space flight on the human organism, the effects of weightlessness on his performance, and to carry out observations which might lead to improvements in space vehicle design, communication systems, and guidance and re-entry systems. Part of the time the cosmonauts took over manual control, part of the time they slept. Data are given on the average pulse rate (78-92, less during sleep) and respiration rate (12-20). The cosmonauts returned to Earth in good physical condition.  
(Aerospace Medicine 34(8):769, Aug. 1963)

6,461

Anon. 1962 QUARTERLY INDEX AND ABSTRACTS OF TECHNICAL DOCUMENTARY REPORTS (Air Force Systems Command, Washington, D.C.) ASTIA AD-275 745

6,462

Anon. 1962 SOVIETS INDICATE TITOV'S SICKNESS IN ORBIT MAY HAVE BEEN EXTENSIVE  
Aviation Week and Space Technology, May 7, 1962, p. 35

ABSTRACT: Soviet Maj. Gherman Titov last week minimized the sickness he experienced during his orbital flight, but other Soviet spokesmen strongly indicated that the

effects may have been more serious than has been reported previously. The first signs of sea-sickness were there...they manufactured themselves when I made an abrupt movement of my head," he said. "But my spirits were high, and my capacity for work was not affected. The best proof of this is that I completed my program." In his autobiography, Titov says flatly that the condition was serious enough to cause him to faint. This was contradicted as an error in translation by Myron Sharpe, the American publisher of the autobiography, who said the word "zamer" should have been translated as "remained still" rather than "fainted." (CARI)

6,463

Anon. 1962 SPACE FLIGHT

Trans. of Nauka i Zhizn' (USSR) 29(5):39-42, 1962.

(Joint Publications Research Service, New York, N. Y.)

6 Aug. 1962 JPRS: 14737

CONTENTS:

The Biosphere in the Cabin of a Space Ship, by V. Borisov and A. Sergeev

Manned Interplanetary Flights of Long Duration, by K. E. Tsiolkovskii

Lost and Restored Weight, by B. Viktorov

6,464

Anon. 1962 SPACE PROGRAMS SUMMARY NO. 37-15, VOLUME II, 1 MARCH - MAY 1962.

THE PLANETARY--INTERPLANETARY PROGRAM (Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena) Contract NAS 7-100

ABSTRACT: Research and development activities are reported for the following projects and components: Mariner R. Project, Mariner B Project, and Voyager Project.

6,465

Anon. 1962 SPACE SIMULATION FACILITIES

J. Environmental Science 5(2):23-24, April 1962

ABSTRACT: The world's largest combined environmental test facility being built at Edwards Air Force Base, California, features a 30 g centrifuge with a load capacity of 30,000 pounds. The environmental complex is designed to assume any combination of acceleration, vibration, temperature, humidity, and altitude. It integrates in one test system a large centrifuge acceleration test machine, vibration exciter, and temperature and vacuum chamber. Vibration stresses and g forces encountered by missiles and spacecraft during take-off and flight will be simulated by a shaker integrally mounted to the test chamber. A tabulated comparison of thermal vacuum test facilities and the space environment simulator is presented. (Aerospace Medicine 33(10):1280, Oct. 1962)

6,466

Anon. 1962 SURVEY OF FACILITIES FOR SPACE ENVIRONMENT SIMULATION  
(Aerospace Research and Testing Committee, Washington, D.C.)  
ARTC Project no. 6-60 ATC Report no. ARTC-30 April 1962.

ABSTRACT: The main body of the report is separated into 11 sections including acoustic test facilities, vibration test facilities, human factors facilities, and general environmental test facilities. These sections explain the function of specific equipment for space environmental simulation. When practical a summary table has been added to the section giving general characteristics of the equipment.

6,467

Anon. 1962 UNPRECEDENTED TANDEM FLIGHT IN SPACE (PRINCIPAL RESULTS).  
Trans. from Pravda, Moscow (USSR) no. 295(16151) p. 1-3, Oct. 22, 1962.  
(Joint Publications Research Service, Washington, D.C.)  
Nov. 6, 1962 JPRS: 16064

6,468

Anon. (U. S. Army) 1961  
U. S. ARMY G-91 RECONNAISSANCE JET FIGHTER ACCIDENT. FORT RUCKER, ALA.  
1 FEBRUARY 1961  
(Cornell-Guggenheim Aviation Safety Center, New York)

ASTIA AD 263 675L

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 a crash landing, with the exception, possibly, of crash landing on a well prepared surface or runway. (AUTHOR)

6,469

Anon. (U. S. Army) 1960  
U. S. ARMY NATIONAL GUARD H-23C HELICOPTER ACCIDENT, PHOENIX, ARIZONA  
8 DECEMBER 1960  
(Cornell-Guggenheim Aviation Safety Center, New York)  
Rept. no. AvCIR 61-3 July ASTIA AD 263 674L

ABSTRACT: A U.S. Army National Guard H-23C helicopter, Serial No. 56-2273, crashed on 8 December 1960 in a flat, unpopulated area north of Phoenix, Arizona, while on a night proficiency flight.

At the time of the crash, only the pilot was aboard the aircraft.

The helicopter was extensively damaged and the pilot was thrown clear of the wreckage without sustaining injuries. A crash injury investigation of the accident was conducted on 8-9 December 1960 Aviation Crash Injury Research (AvCIR) under the provisions of a U. S. Army Transportation Research Command contract. The investigation revealed that the latch on the pilot's safety belt had not been securely fastened. As the pilot flexed forward at impact, the belt opened and he was thrown back-first, feet-up, through the upper portion of the canopy. It was noted during the investigation that there was no shoulder harness installed in the aircraft. (AUTHOR)

6,470

Anon        1963    AN IMPROVED PRESSURE SUIT FOR X-20 PILOTS  
            Astronautics and Aerospace Eng.    1(10):155

ABSTRACT: "--One that can be worn up to 36 hr without discomfort and which will provide 25% more mobility than earlier models--has been announced by the Air Force. The suit features an immobile helmet like that used in the suits of the Soviet cosmonauts; the pilot's head can turn inside the helmet, which will have a wider visual area than earlier models. Joints are eliminated by designing a "distorted angle" inner fabric which will permit knee bends and other movements of the arms and legs. The suit itself is designed for a mixed gas mixture (60% nitrogen, 40% oxygen) during orbital flight, but the pilot may switch to 100% emergency oxygen should cabin pressure drop, and the suit will incorporate an emergency supply of pure oxygen sufficient for 11 min, or equivalent to a free fall of 100,000 ft."