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**PUBLICATIONS ON AEROSPACE MEDICINE  
OF  
DR. H.J. VON BECKH (1941 - 1987)**

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## I. IN ENGLISH

A. *Journals and Proceedings*

- I-A-1 Experiments with animals and human subjects under sub and zero gravity conditions during the dive and parabolic flight. *J. Aviation Medicine*, 25:235-241, 1954. Abstract also published (in Italian) in *Rivista di Medicina Aeronautica*, 18:520-21, Rome, Italy, 1955 and in *J. British Interplanetary Society*, 14:57 (#15), 1955. A similar paper has been previously presented at the 4th International Astronautical Congress, Zurich, Switzerland, Aug. 3-8, 1953. See entry III-A-1.
- I-A-2 Gravity changes in aircraft and ships. *J. British Interplanetary Society*, 15:73-81, 1956.
- I-A-3-a Multi-directional G-protection in flight and during escape. Proceedings, 2nd European Congress of Aviation Medicine, Stockholm Sep 16-19, 1957. Abstract published in *Meddelanden från Flyg- och Navalmedicinska Nämnaden* (Communications from the Swedish State Research Committee on Aviation and Naval Medicine), P. 7, Congress Number Stockholm, Sep 1957.
- I-A-3-b Multi-directional G-protection in space flight and during escape. A theoretical approach. *J. Aviation Medicine*, 29:335-342, 1958.
- I-A-4-a Multi-directional G-protection in space vehicles. Proceedings, 8th International Astronautical Congress, Barcelona, Oct 6-12, 1957, P. 37-46, Publisher Springer Verlag, Vienna, 1958.
- I-A-4-b Multi-directional G-protection in space vehicles. (Abbreviated version of I-A-4a). *J. British Interplanetary Society*, 16:525-533, 1958.
- I-A-5 Centrifuge experiments on high G-loads in mice and their possible alleviation by multi-directional anti-G devices. (Co-author G. J. D. Schock). Proceedings, 29th Annual Meeting of the Aeromedical Association, Washington, D.C., Mar 24-26, 1958. Abstract published in *J. Aviation Medicine*, 29:229, 1958. See also entry I-B-1.
- I-A-6-a Physiology of launching and re-entry stress in rodents. Symposium on Possible Uses of Earth Satellites in Life Science Experiments. National Academy of Sciences - National Research Council, Washington 25, D. C., May 14-17, 1958. Proceedings edited by O. H. Schmitt, Michigan Press, 1959. Also Published: See entry I-B-2.
- I-A-6-b Problems of accelerations, weightlessness, and temperature in space logistics. Space Logistics Panel, Fourth Annual Joint Military-Industry Packaging and Materials Handling Symposium, The Department of the Navy, Office of Navy Materiel, 30 Sep 1958, The Departmental Auditorium, Washington, D. C.
- I-A-7 Weightlessness and space flight. *Astronautics*, 4:2:26-27, 84-86, 1959. Abstract also published: *Aerospace Medicine*, 30:456 (#97), 1959.
- I-A-8-a Flight experiments about human reactions to accelerations which are followed or preceded by weightlessness. Proceedings, 9th International Astronautical Congress, Amsterdam, Aug 25-30, 1958, p. 507-525. Publisher Springer Verlag, Vienna, 1959. Abstract also published in *J. British Interplanetary Society*, 17:66 (#166), 1959 and in *Aerospace Medicine*, 31:437 (#241), 1960.

- I-A-8-b Human reactions during flight to acceleration preceded by or followed by weightlessness. (Abbreviated version of I-A-8-a). *Aerospace Medicine*. 30:391-409. 1959. Abstract also published in *J. British Interplanetary Society*. 17:341(#1950). 1960.
- I-A-9 Space flight hazards caused by weightlessness. Proceedings. 30th Annual Meeting of the Aeromedical Association. Los Angeles. April 27-29. 1959. Abstract published in *J. Aviation Medicine*. 30:208. 1959. and in *J. British Interplanetary Society*. 17:340(#1924). 1960.
- I-A-9-a Pathology of visceral displacement in animal subjects exposed to abrupt deceleration. (With J.E. Cook and J.D. Mosely). Proceedings. 30th Annual Meeting of the Aeromedical Association. Los Angeles. April 27-29. 1959. Abstract published in *J. Aviation Medicine*. 30:180. 1959.
- I-A-10 Multi-directional G-protection during experimental sled runs. Proceedings. 10th International Astronautical Congress. London. Aug 20-Sep 5. 1959. P. 671-682. Publisher Springer Verlag. Vienna. 1960. Abstract also published in *J. British Interplanetary Society*. 17:178(#989). 1959.
- I-A-11 Physiological reactions of humans and animals to the weightless state. Proceedings. 21st International Congress of Physiological Sciences. Buenos Aires. Aug 9-15. 1959. p. 31-32. Buenos Aires. 1959.
- I-A-12 A summary of motion sickness experiences in weightless flights conducted by the Aeromedical Field Laboratory. Symposium on Weightlessness and Motion Sickness. Wright-Patterson AFB. March 29-30. 1960. Proceedings edited by F. W. Banghart. University of Virginia. Charlottesville. Virginia. See also entry I-B-5.
- I-A-13 Weightlessness. Current status of experimentation with humans and animals. Proceedings. 35th Anniversary Congress of the Pan American Medical Association. Mexico City. May 2-11. 1960 p. 74-75.
- I-A-14 The incidence of motion sickness during exposures to the weightless state. Proceedings. Symposium of Space Medicine. 11th International Astronautical Congress. Stockholm. Aug 15-20. 1960. Also published: *J. Astronautik*. 2:4:217-224. Stockholm. 1961. Abstract also published in *Aerospace Medicine*. 33:1166(#689). 1962.
- I-A-15 Survey of recent contributions to the psycho-physiology of weightlessness. Proceedings. 3rd International Symposium on Rockets and Astronautics. Tokyo. Japan. Aug 28 - Sep 1. 1961. Chapter II. Space Medicine and Biology. p. 8. Japanese Rocket Society. Tokyo. Japan. 1961.
- I-A-16 Psycho-physiological reactions to weightlessness as observed on subjects during recent bioballistic and biosatellite experiments. Proceedings. 12th International Astronautical Congress. Washington. D.C.. Oct 1-7. 1961. Vol II, p. 584-585. Academic Press Inc.. New York. 1962.
- I-A-17 Aerospace medical research at Holloman Air Force Base. Proceedings. 13th International Astronautical Congress. Varna. Bulgaria. Sep 21-27. 1962.
- I-A-18 Problem areas of long duration weightlessness. Proceedings. 6th International and 12th European Congress of Aviation and Space Medicine. Rome. Italy. 1-5 Oct 1963. Vol I. p. 429-434. Air Ministry. Office of the Surgeon General. Rome. Italy. 1965. Abstract also published (in French) in *La Presse Medicale*. 72:11:615. Paris. France. 29 Feb 1964. and in *Aerospace Medicine*. 37:168(#653). 1966.

- I-A-19      Cardiovascular reactions to the weightless state. Proceedings. 8th International Congress of Internal Medicine. Buenos Aires. Argentina. 23 - 28 Nov 1964. p. 370-371.
- I-A-20      Rapid decompression of chimpanzees to a near vacuum. Proceedings. XV. Congressus Internationalis Medicinae Aviatricae et Cosmicae. Prague. Czechoslovakia. Sep 26-Oct 1. 1966. *Abstract also published* (in Russian) in *Kosmicheskogo Biologija i Medizina* (Space Biology and Medicine). 1:1:86. January/February 1967. Izdatel'stvo Medicina. Moscow. 1967. *Abstract also published* (In French) in *Revue Francaise d'Astronautique*. 2: 17-21. 1967.
- I-A-21      Decompression hazards in supersonic transports. (with S.J. Gerathewohl). Proceedings of the 6th Annual Meeting of the French-Anglo-United States Supersonic Transport Committee (F.A.U.S.S.T.). Aeromedical Session. (For Official Use Only). Paris. March 1969.
- I-A-22      Decompression of unprotected non human primates in seated and in semi-supine position to simulated altitudes of 38,000 feet. (with A.G. Koestler, S.J. Gerathewohl and R.G. McIver). Proceedings. 40th Annual Scientific Meeting of the Aerospace Medical Association. San Francisco. May 5-8. 1969.
- I-A-23      Decompression emergencies in high performance aircraft. Invited lecture of the NATO-AGARD Course on Advanced Operational Aviation Medicine. held at the Institute of Aviation Medicine. Fuerstenfeldbruck, AFB. West Germany. 18 June 1969.
- I-A-24      Aft-facing aircraft seats? Bioastronautics Report. Trends Publishing Co.. Wash.. D.C.. VIII:17:91. 1969.
- I-A-25      Forward facing versus rearward facing passenger seats during emergency descent of multi Mach/high altitude transport aircraft. *Aerospace Medicine*. 40:1215-1218. 1969. See also entry I-B-7.
- I-A-26      A chronological review of bioastronautical experiments conducted at Holloman Air Force Base (1946-1969). Proceedings. International Orbiting Laboratory and Space Science Conference. sponsored by the International Academy of Astronautics. Cloudcroft. New Mexico. Sept 28-Oct 2. 1969. Session III. Life Sciences. pp. 179-191. Air Force Missile Development Center. MDGC. Holloman AFB. NM. Oct 1969.
- I-A-27      International Orbiting Laboratory and Space Science Conference. sponsored by the International Academy of Astronautics. Cloudcroft. New Mexico. Sept 28-Oct 2. 1969/ (Coeditor of Proceedings). Air Force Missile Development Center. MDGC. Holloman AFB. NM. Oct 1969.
- I-A-28      Decompression and recompression in space rescue. Second International Space Rescue Symposium of the International Academy of Astronautics, held in conjunction with the 20th International Astronautical Congress. Mar Del Plata. Argentina. Oct 5-10. 1969. Proceedings published by The Boeing Company. Space Division. Houston. Texas. pp. 307-369. April 1971.
- I-A-29      The use of nonhuman primates in space related biological experiments. Proceedings. 20th International Astronautical Congress. Session Bioastronautics I. Mar del Plata. Argentina. Oct 5-10. 1969.
- I-A-30      Protection of crewmembers and passengers against accidental decompression in high altitude/multi-Mach transport aircraft. Proceedings. Foruth Annual Symposium on

- Modern Concepts in Civil Aviation Medicine. Manned Spacecraft Center (NASA). Houston, Texas, Nov 2-5, 1969.
- I-A-31 Hypobaric exposure limits in primates (with A. G. Koestler). *United States Air Force Medical Service Digest*, XX: 12:13-14. 1969.
- I-A-32 Protection against accidental decompression by compartmentalization of spacecraft and aircraft. *Aerospace Medicine*, 41:143-153. 1970.
- I-A-33 The importance of body position for the recovery and survival in the event of airliner cabin decompression. *Minerva Aerospaziale*, 2: 48. 1970. Turin, Italy. (English summary of Entry V-A-2).
- I-A-34 The standardization of space vehicle components. A *conditio sine qua non* for successful international rescue operations. Third International Space Rescue Symposium of the International Academy of Astronautics, held in conjunction with the 21st International Astronautical Congress, Constance, West Germany, October 4-10, 1970. Proceedings published by The Boeing Company, Space Division, Houston, Texas. (pp. 193-198).
- I-A-35 The dynamic environment of supersonic transport emergency descent (with S.J. Gerathewohl). Proceedings of the 8th Meeting of the French-Anglo-United States Supersonic Transport Committee (F.A.U.S.S.T.). Session on Aviation Medicine. Paper No. 8.3.3.0.3. State Department Auditorium, Washington, D.C., January 26, 1971.
- I-A-36 The use of man-rated centrifuges for the simulation of dynamic and altered pressure environments. Proceedings of the 21st Armed Forces Flight Surgeons Meeting and 10th Annual Meeting of the German Society of Aerospace Medicine, Bad Godesberg, November 1-4, 1971.
- I-A-37 Positioning of aircrews - ultima ratio of G-protection? *Aerospace Medicine*, 43:743-754. 1972.
- I-A-38 G-protection by tilting aircraft seats, with special consideration given to pelvis and legs elevating (P.A.L.E.) seats. Proceedings of XXth International Congress of Aviation and Space Medicine, Nice, France, September 18-22, 1972. See also Entry I-B-15.
- I-A-39 A novel G-protective pelvis and legs elevating (PALE) aircrew seat. Tri-Service Review or 'research on Sustained Acceleration', U.S. Navy Program. 113th Meeting of the Joint Medical Research Conference (Chairman: Dr. Chris J.D. Zarafonetis), Directorate of Defence Research and Engineering (DDR&E), The Pentagon, Washington, D.C., March 1, 1973. Published in Proceedings of the 113th Joint Medical Research Conference, Part 5 (25 pages), Office of the Director of Defence Research and Engineering, Washington, D.C., May 31, 1973.
- I-A-40 Simultaneous exposure of human volunteers to decompression and sustained G loads. Tri-service Review on 'High Altitude Research', U.S. Navy Program. 115th Meeting of the Joint Medical Research Conference (Chairman Dr. Chris J. D. Zarafonetis), Directorate of Defence Research and Engineering (DDR&E), Air Force Systems Command, Andrews Air Force Base, Washington, D.C., April 26, 1973.
- I-A-41 Biomedical considerations for the development of a PALE (Pelvis and Legs Elevating) G-protective aircrew seat. Proceedings, 44th Annual Scientific Meeting of the Aerospace Medical Association, Las Vegas, Nevada, May 7-10, 1973. Preprint published in '1973

- Annual Scientific Meeting'. pp. 57-58. Aerospace Medical Association. Washington National Airport. Washington. D. C. 20001.
- I-A-42 Centrifuge simulation of accidental decompression and subsequent emergency descent of high altitude/multi Mach transport aircraft. Proceedings. 44th Annual Scientific Meeting of the Aerospace Medical Association. Los Vegas. Nevada. May 7-10. 1973. Preprint published in '1973 Annual Scientific Meeting', pp. 158-159. Aerospace Medical Association. Washington National Airport. Washington. D. C. 20001.
- I-A-43 Simultaneous exposure of human volunteers to buffeting vibrations and sustained combat type accelerations on the human centrifuge. Tri-Service Review of 'Operational Aspects of Vibrations and Related Research Facilities'. U.S. Navy Program. 117th Meeting of the Joint Medical Research Conference (Chairman: Dr. Chris J. D. Zarafonetis). Directorate of Defence Research and Engineering (DDR&E). Naval Medical Research Institute. Bethesda. MD.. August 2, 1973.
- I-A-44 G-protection in winged space vehicles. Proceedings. 24th International Astronautical Congress. Session on Space Medicine. Baku. USSR. October 7-13. 1973.
- I-A-45 24th IAF Congress Report (Contributing Author). *Astronautics and Aeronautics*. 11:12: 58-68. Dec 1973.
- I-A-46 (1) Human centrifuge programs for present and future aerospace medical applications. (2) The role of the human centrifuge in the aerospace medical assessment of air and space crews. (3) The increase of Human G-tolerance in the PALE (Pelvis and Legs Elevating) position as measured in human centrifuge experiments using peripheral light loss (PLL) as endpoint. Proceedings. Expert Conference on Human Acceleration Research. upon invitation of the Advisory Group for Aerospace Medical Research and Development (AGARD) of the North Atlantic Treaty Organization (NATO). Fuerstenfeldbruck Air Force Base. West Germany. June 17-22. 1974.
- I-A-47 Novel methods of acceleration protection in spacecraft. Proceedings. 23rd Annual Space Flight Congress of the Hermann Oberth Society. Salzburg. Austria. June 25-29. 1974.
- I-A-48 High G PALE seat evaluation. Chemo-physiological and psychological analysis. (with V.M. Voge) Flight Surgeons' News. P. 18. Oct 1974. BuMed 51. Department of the Navy. Washington. D. C.
- I-A-49 25th IAF Congress Report (Contributing Author). *Astronautics and Aeronautics*. 12:12: 62-69. Dec 1974.
- I-A-50 Centrifuge evaluation of the G-protective PALE (Pelvis and Legs Elevating) seat concept. (with V.M. Voge and J.S. Bowman). 46th Annual Scientific Meeting of the Aerospace Medical Association. San Francisco. April 28-May 1. 1975. Published in '1975 Annual Scientific Meeting'. pp 49-50. Aerospace Medical Association. Washington National Airport. Washington. D. C. 20001.
- I-A-51 Psycho-physiological assessment of acceleration induced changes in humans positioned in conventional and in PALE seat configurations. (with V.M. Voge). 46th Annual Scientific Meeting of the Aerospace Medical Association. San Francisco. April 28-May 1. 1975. Published in '1975 Annual Scientific Meeting'. pp. 51-52. Aerospace Medical Association. Washington National Airport. Washington. DC 20001.

- I-A-52 Effects of combined stresses on naval air crew performance (with J.S. Bowman, and V.M. Voge). 46th Annual Scientific Meeting of the Aerospace Medical Association. San Francisco. April 28-May 1. 1975. Published in '1975 Annual Scientific Meeting'. pp. 177-178. Aerospace Medical Association. Washington National Airport. Washington. DC 20001.
- I-A-53 Some lesser-known advantages of the metric system for acceleration research. *Aviation, Space, and Environmental Medicine*. 46: 849-850. 1975.
- I-A-54 Psycho-physiological and physio-chemical assessment of acceleration induced changes in humans positioned in various seatback angle configurations. (with V.M. Voge and J.S. Bowman). Advisory Group for Aerospace Research and Development (AGARD/NATO). Aerospace Medical Panel Specialists' Meeting. April 5-9. 1976. Copenhagen. Denmark. Published in 'The pathophysiology of high sustained +G<sub>Z</sub> acceleration, limitation to air combat manoeuvering and the use of centrifuges in performance training'. AGARD-CPP-189:1-8. 1976.
- I-A-55 Dynamic testing of various 15-G rated acceleration protective seat assemblies using the PALE(Pelvis And Legs Elevating) position at onset rates of 3.5 G/s. (with V.M. Voge and J.S. Bowman). 47th Annual Scientific Meeting of the Aerospace Medical Association. Bal Harbour. FL. May 10-13. 1976. Published in '1976 Annual Scientific Meeting'. p. 31-32. Aerospace Medical Association. Washington National Airport. Washington. DC 20001.
- I-A-56 Acceleration induced psycho-physiological changes in various seat and PALE seat configurations. (with V.M. Voge). 47th Annual Scientific Meeting of the Aerospace Medical Association. Bal Harbour. FL. May 10-13. 1976
- I-A-57 Development of psycho-physiological criteria for the evaluation of aviator helmet/mask systems. (with J.S. Bowman and V.M. Voge). 47th Annual Scientific Meeting of the Aerospace Medical Association. Bal Harbour. FL. May 10-13. 1976.
- I-A-58 Centrifuge experiments exposing human volunteers to inertial accelerations up to 14 G<sub>X</sub> for durations of up to 45 seconds. (with J.S. Bowman and V.M. Voge). 19th Plenary Meeting of COSPAR (International Committee of Space Research) Session on Gravitational Biology. 5:7:9. p. 398. Philadelphia. PA June 8-19. 1976.
- I-A-59 The beginnings of aeromedical weightlessness research (with V.M. Voge and J.S. Bowman). 10th International History of Astronautics Symposium. 27th International Astronautical Congress. Anaheim. CA. Oct 10-16. 1976.
- I-A-60 Dr. von Beckh named Director of Research. Formerly Chief Scientist of the 6571st Aeromedical Research Laboratory at Holloman AFB, New Mexico. has recently accepted the position of Director of Research, Aerospace Medical research Department, at the Naval Air Development Center. Warminster. Pennsylvania. 1970. *Aerospace Med.* 41:1334
- I-A-61 Arnold D. Tuttle Award 1972. Established by United Air Lines in memory of Colonel Tuttle. Awarded for original research that has made annually the most significant contribution toward the solution of a challenging problem in Aerospace Medicine. 1972 *Aerospace Med.* 43:577-578.

- I-A-62 Harald von Beckh receives the Hubertus Strughold Award for outstanding research into the problems of Space Medicine. 1976. Aviation, Space and Environmental Med. 47: 1015.
- I-A-63 Hermann Oberth Honor Ring for 1976 goes to H.J. von Beckh. 1976. Aviation, Space and Environmental Med., 47:102.
- I-A-64 Harald J. von Beckh receives congratulations from AIAA President F. A. Cleveland on winning the John Jeffries Medical Research Award which was given annually for significant research contribution to Aerospace Medicine in the areas of weightlessness, acceleration protection and accidental decompression named for Dr. John Jeffries of Boston. who made the first recorded scientific observations from a balloon in 1785. 1977. Aviation, Space and Environmental Med. 48: 297 and 489.
- I-A-65 Harald J. von Beckh is Space Medicine Branch President 1978. Aviation, Space and Environmental Med. 49:843-844
- I-A-66 The Executive Council of the Aerospace Medical Association in the meeting of May 10. 1978 (including D. H. J. von Beckh) 1978. Aviation, Space and Environmental Med. 49:1029.
- I-A-67 Harald J. von Beckh, M.D., President of the Space Medicine Branch, gives to John E. Pickering the Hubertus Strughold Award 1979 and the Physiology paper Award to D. Goldwater. 1979. Aviation, Space and Environmental Med. 50:870.
- I-A-68 The Space Medicine Branch of the Aerospace Medical Association. 1979. Aviation, Space and Environmental Med. 50:513-516.
- I-A-69 Physiologic and Performance Measurements in simulated airborne combined Stress Environments (with J.S. Bowman) 1979. Aviation, Space, and Environmental Med., 604-608.
- I-A-70 Harald J. von Beckh receives the Officer Cross of the Order of Merit. Federal Republic of Germany in the Washington, DC Embassy. 1980. Aviation, Space and Environmental Med., 51:95.
- I-A-71 The 30th International Astronautical Congress. 1979 in Munich, West Germany. Contains a listing of all Life Sciences papers. 1980. Aviation, Space and Environmental Med., 51:428.
- I-A-72 The 32nd International Astronautical Congress. 1981 in Roma, Italy. Contains a listing of all Life Sciences papers. 1982. Aviation, Space and Environmental Med. 53:93.
- I-A-73 The 33rd International Astronautical Congress. 1982 in Paris, France. Contains a listing of all Life Sciences papers. 1983. Aviation, Space and Environmental Med., 54:480-481.
- I-A-74 The 34th International Astronautical Congress. 1983 in Budapest, Hungary. Contains a listing of all Life Sciences Papers. 1984. Aviation, Space and Environmental Med., 55:675.
- I-A-75 History of Aeromedical Acceleration Research. 37th Annual Conference of Engineering in Medicine and Biology, Los Angeles Hilton, California. September 19, 1984.

- I-A-76      The 35th International Astronautical Congress. 1984. in Lausanne. Switzerland. 1985. Aviation. Space and Environmental Med.. 56:518.
- I-A-77      The 37th International Astronautical Congress. 1986 in Innsbruck. Austria. Contains a listing of all Live Sciences Papers. 1986 Aviation. Space and Environmental Med. (in press).
- I-A-78      Former Jeffries Award Winners (including Dr. H.J. Von Beckh) were present at the 1985 ASMA meeting. 1985 Aviation. Space and Environmental Med.. 56:824.
- B.            *Technical Reports*  
Please Note: Qualified users can order these reports from the Defence Documentation Center (DDC). Cameron Station. Alexandria. Virginia 22314.
- I-B-1      Centrifuge experiments on high G loads in mice and their possible alleviation by multi-directional and anti-G devices. Technical Note AFMDC-TN-58-10. 1958. (DDC No. AD 154104). (Co-author G. J. D. Schock). See also entry I-A-5.
- I-B-2      Physiology of launching and reentry stress in rodents. Technical Note AFMDC-TN-58-11. 1958. (DDC No. AD 154105). See also entry I-A-6a.
- I-B-3      Flight experiments about human reactions to accelerations which are followed or preceded by the weightless state. Technical Note AFMDC-TN-58-15. 1958. (DDC No. AD 154108). See also entries I-A-8-a and b.
- I-B-4      MANHIGH III. USAF manned balloon flight into the stratosphere. (Editor). Technical Report AFMDC-TR-60-16. 1961 (DDC No. AD 259635).
- I-B-5      Title classified. Section E. P. 39-45. (DDC No. AD 330266). SECRET.
- I-B-6      Symposium on motion sickness with special reference to weightlessness. Chapter IX. P. 67-72. Technical Documentary Report AMRL-TDR-63-25. June 1963. (Defense Documentation Center No. AD 412818). Abstract also published in *Aerospace Medicine*, 35:81 (#57). 1964. See also entry I-A-12.
- I-B-7      USAF Project Forecast. Bioastronautics Report. Contributing author. SCGF-64-5. May 1964. SECRET - R.D. - NOFORN.
- I-B-8      The exposure of airbreathing, not protected chimpanzees to marginal decompression/recompression profiles in different body positions. (with A.G. Koestler and R. G. McIver). 6571st Aeromedical Research Laboratory Technical Report. ARL-TR-69-14. July 1969.
- I-B-9      The advantages of rearward-facing seats during post decompression emergency descent of multi Mach/high altitude transport aircraft. 6571st Aeromedical Research Laboratory Technical Report. ARL-TR-69-15. July 1969. (DDC No. AD 692508).
- I-B-10     Protective measures against accidental decompression in space and atmospheric flight. 6571st Aeromedical Research Laboratory Technical Report. ARL-TR-70-4. March 1970. (DDC No. AD 705563).
- I-B-11     Forward facing versus rearward facing passenger seats during emergency descent of multi-Mach/high altitude transport aircraft. 6571st Aeromedical Research Laboratory Technical Report. ARL-TR-69-25. November 1969. (DDC No. AD 700640).

- I-B-12 Protection against accidental decompression by compartmentalization of spacecraft and aircraft. 6571st Aeromedical Research Laboratory Technical Report. ARL-TR-70-3. February 1970. (DDC No. AD 702293).
- I-B-13 The dynamic environment during emergency descent of high altitude/multi Mach transport aircraft. (With S.J. Gerathewohl): Naval Air Development Center. Technical Report NADC-CS-7133. December 1971. (DDC No. AD 741686).
- I-B-14 G-protective tilting aircraft seats. Naval Air Development Center Technical Report NADC-72063-CS. March 1972. (DDC No. AD 741202).
- I-B-15 G-protective aircraft seats, with special consideration given to pelvis and legs elevating (PALE) seats. Naval Air Development Center Technical Report NADC-72262-CS. October 1, 1972. (DDC No AD 756630).
- I-B-16 A survey of acceleration protection by transverse positioning of the pilot. A historical review. Naval Air Development Center Technical Report NADC-73098-40. June 1973.
- I-B-17 Final report of the Naval Aviation Biomedicine and Human Effectiveness Workshop. Charleston. S.C., August 6-10. 1973; sponsored by the Office of Naval Research and the Bureau of Medicine and Surgery. Department of the Navy. Contributing author to chapter 3. Physiological Assessment. pp. 14-45: Report No. N00014-73-C-0052. BioTechnology Inc., Falls Church, VA.. February 1974. Controlled distribution.
- I-B-18 Integrated simulation of atmospheric pressures and dynamic forces during accidental decompression and subsequent emergency descent of high altitude transport aircraft. (with W.P. Baas). Naval Air Development Center Technical Report NACD-75021-40. 3 February 1975.
- I-B-19 The Development and Airborne Testing of the PALE Seat. TR NADC-81200-60. June 20. 1981.
- I-B-20 The Beginnings of Aeromedical Acceleration Research. TR NADC-81281-60. Sept. 30. 1981.
- I-B-21 G-Protection by an extreme Crouch Position. RT NADC-84162-20. 4 November 1984.
- I-B-22 The Beginnings of airborne Weightlessness Research TR NADC 85016-60. Jan 1985.
- I-B-23 Publications on Aerospace Medicine by H.J. von Beckh. M.D. TR NADC-86147-60. 31 Dec. 1986.
- C **PATENTS**
- I-C-1 Multi-directional Anti-G device. Filed with U.S. Patent Office. Serial Number 747,208. July 8, 1958. US Patent No. 2,985,413 granted by US Patent Office on May 23, 1961. 8 pages. *Also published: Official Gazette of the US Patent Office*. May 23, 1961.
- I-C-2 Multi-compartment/air-lock design for protection against rapid decompression in aircraft and spacecraft. U.S. Air Force invention No 5912. Disclosure and Record of Invention dated September 19, 1969.
- I-C-3 Life supporting pressurizable vehicles. US Navy Case No. 52469. Disclosure and Record

of Invention filed with US Patent Office Serial Number 74056. Sept 21, 1970. US Patent No. 3.675.878 granted by US Patent Office on July 11, 1972. 6 pages. *Also published: Official Gazette of the US Patent Office.* July 11, 1972.

I-C-4 Pelvis and Legs Elevating G-protective Seat. NADC Case 1362. US Navy Case No. 56139. Disclosure and Record of Invention dated October 27, 1972. Filed with US Patent Office Serial No. 361.730 on May 18, 1973. US Patent No. 3.826.434 granted by US Patent Office on July 30, 1974. 9 pages. *Also published: Official Gazette of the US Patent Office.* July 30, 1974. *Also Published: NADC Technical Review.* July/August 1974. P. 6.

D. *Books and/or Chapters in Books.*

I-D-0 Medical aspects of G-loads. A design handbook. Publication 7540-000-735-549-95101. 28 pp. Martin. Baltimore, 1957.

I-D-1 Physiological effects of weightlessness. (With S.J. Gerathewohl). Chapter 68 in '*Environmental Biology*' edited by Philip L. Altman and Dorothy S. Dittmer. Committee on Biological Handbooks. Federation of American Societies for Experimental Biology. Bethesda, Maryland. 1966. Library of Congress Catalog Card No. 66-27592.

I-D-2 Biodynamics of Space Flight. In '*Encyclopedia of Space*', Paul Hamlyn Publishers. London WC 2. England. 1968.

I-D-3 Criteria for emergency recompression procedures during space flight studied for the exposure of chimpanzees to a near vacuum. Chapter 5 in '*Some Problems of Aviation and Space Medicine*', pp 55-60. Publisher Universitas Karlova. Prague. CSSR. 1968.

I-D-4 Biodynamics of space flight. Chapter 4 in '*The McGraw Hill Encyclopedia of Space*', pp 360-369. McGraw Hill Book Company. New York. 1968. Library of Congress Catalog Card Number 68-26673.

## II. *IN SPANISH*

A. *Journals and Proceedings.*

II-A-1 Aspectos médicos de la astronáutica. (Medical aspects of astronautics). *Revista Nacional de Aeronáutica*. Buenos Aires. 12:128:18-22, 1952.

II-A-2 Consejos médicos para aviadores. (Medical advice for flyers). *Avia*. Buenos Aires. 19:195:44, 1952.

II-A-3 La energía nuclear en una guerra futura. (Nuclear energy in future wars.) *Revista Nacional de Aeronáutica*. Buenos Aires. 13:132:33-37, 1953.

II-A-4 Efecto de la gravitación sobre el organismo. (The effect of gravity on the human organism). Proceedings. Primer Congreso Argentino de Medicina del Deporte (1st Argentine Congress of Sport Medicine). Buenos Aires. April 2-18, 1955. Abstract published in: *El deporte aleman en Sudamerica*. 28:399, 1955. Buenos Aires.

II-A-5 Veloocidad. aceleración, gravitación. (Speed, acceleration, gravity). *Revista Nacional de Aeronáutica*. Buenos Aires. 15:162:58-61, 1955.

II-A-6 El tratamiento hepatoprotector como preventivo de las cinetosis. (Liver protective trate-

- ment as motion sickness preventive). *Semana Médica Buenos Aires*. 108:12:384-385. 1956.
- II-A-7 Protección multidireccional contra las aceleraciones. (Multidirectional protection against acceleration). *Revista Nacional de Aeronáutica*. Buenos Aires 17:186:49-51. 1957.
- II-A-8-a Protección contra las aceleraciones en vehículos espaciales. (Acceleration protection in space vehicles). *Astronáutica*. Barcelona. 5:163-168. 1958.
- II-A-8-b Protección multidireccional contra las aceleraciones durante el vuelo espacial. (Multidirectional protection against accelerations during space flight). Similar version to II-A-8-a. *Revista de la Asociación Argentina Interplanetaria*. 5(18/19):9-15. 1958.
- II-A-9 Los problemas que la gravitación cero plantea para el vuelo espacial. (Problems which weightlessness presents for space flight). Proceedings. Simposio Internacional de Medicina Aeronáutica y Espacial. realizado en homenaje al Sesquicentenario de la Independencia de la República Argentina. (International Symposium of Aerospace Medicine held in observance of the 150th anniversary of the Independence of the Argentine Republic). 5-7 Oct 1960. Buenos Aires. Argentina. *Also published: Boletín del Instituto Nacional de Medicina Aeronáutica y Espacial*. Buenos Aires. 6:12:91.1960.
- II-A-10 Investigaciones médicas aero-espaciales en la base aerea de Holloman. (Aerospace medical research At Holloman Air Force Base). Proceedings. XI. Congreso Internacional de Medicina Aeronáutica y Cosmonáutica (XI. International Congress of Aerospace Medicine). Madrid. Spain. 8-12 Oct. 1962. P. 106.
- II-A-11 Investigaciones recientes relacionadas al ambiente del espacio. (Recent Investigations related to the environment of space). Conferencia Magistral del II. Ciclo de Conferencias sobre Medicina Aéreo-espacial coincidiendo con el XVII. Congreso Internacional Astronáutico. Inspección General de Sanidad del Ejército del Aire. Centro de Investigación de Medicina Aero-náutica (C.I.M.A.). Facultad de Medicina. Catedra de Fisiología. Ciudad Universitaria. Madrid. Spain. 11-22 Oct 1966.
- B. *Books and/or Chapters in Books*
- II-B-1 '*Fisiología Del Vuelo*'. (Physiology of Flight). 147 pp.. Publisher 'ALFA', Buenos Aires. 1955. Library of Congress card No. 58-42478. *Linear Accelerations*. Deceleration distance. Restraint Systems. Experiments with decelerated swing seats and sled. Backward-facing seats. Energy absorbing materials. Glider accidents. Automative crash safety. Investigation and interpretation of aircraft accidents. Escape from disabled aircraft. *The Bail Out*. History. The six phases of the bail out. Effects of acceleration, hypoxia, and cold. Velocity of descent at different altitudes. Effects on ear and paranasal sinus. Disorientation during free fall. Means of decreasing the opening shock. Medical selection and training of parachutists. Landing exercises. Jump towers. The record jumps of Yevdokimoff and Williams. Experimental jumps. Experiences Island and Crete airborne operations. Ejection seats. Ejectable cabins and capsules. *Radial Accelerations*. Hemostatic and hemodynamic factors. Theories of the mechanism of 'Blackout' and 'redout'. Regulations provided by the autonomous nervous system. Symptomatology. Research with humans and animals using modern centrifuges. Tolerance to acceleration. Means of protection. Crouch, prone and supine position. Tiltable seats. Hydraulic and pneumatic anti-G suits. Angular accelerations. Semicircular canals. Coriolis accelerations. Optical Illusions. *Motion Sickness*. Etiology. Labyrinthic and extra labyrinthic factors. Environmental and psychological factors. Symptomatology. Prophylaxis and therapy. Experi-

ments during Atlantic crossings. *Physiological Aspects of Space Flight.* Escape velocity. Accelerations. Escape from disabled space craft. Space Stations. Weightlessness. Free fall. Keplerian ballistic trajectories. Experiments with rockets V-2 and Aerobee. Law of Weber-Fechner. Airborne psychomotor experiments with humans and animals (Chrysemis oranta and hydromedusa tectifera). Interaction of acceleration and weightlessness. Delayed recovery from acceleration induced blackout during weightlessness (pre-weightlessness accelerations). *Radiation Protection.* Heavy Nuclei. Nuclear propulsion. Shielding. *Probability of Collisions with Meteorites.* Penetration equation of Grimminger. Rapid decompression. *Vision to the Future.* Vertical takeoff and landing. 'The barrier of sensorial perception.' *Comparative Historical Table.* Chronological listing of aeronautical achievements in comparison with the simultaneous progress of aeromedical research.

- II-B-2 La biodinámica del vuelo espacial. In '*La gran aventura del espacio*'. Vol I. pp 360-369. Publisher Ediciones Salvat. Barcelona, Spain. 1968.
- III. *IN GERMAN*
- A. *Journals and Proceedings*
- III-A-1 Untersuchungen ueber Schwerelosigkeit an Versuchspersonen und Tieren waehrend des lotrechten Sturzfluges (Investigations about weightlessness on human and animal subjects during vertical diving flights). In: *Space Flight Problems* (Being a complete collection of all lectures held at the 4th International Astronautical Congress. Zurich. Aug 3-8. 1953.) p. 196-202. Publisher Laubscher & Co., Biel-Bienne, Switzerland. Abstract also published: *Technik Neue Zuericher Zeitung*, p. 7. Sep 7. 1953.
- III-A-2 Flugversuche ueber die Ertraeglichkeit von Beschleunigungen, die dem schwerelosen Zustand verausghen, beziehungsweise ihm folgen. (Flight experiments about the tolerance to accelerations which follow or precede the weightless state.) *Raketenbrief*. Bremen. 6:5:13-15. 1958.
- III-A-3 Antersuchungen ueber die Wirkung der Gewichtslosigkeit auf den menschlichen Koerper. (Investigations about the effect of weightlessness on the human body). *Weltraumfahrt*. Frankfurt. 10:1:21-28. 1959.
- III-A-4 Neue Gesichtspunkte der raumfahrtmedizinischen Forschung. (New vistas in aerospace medical research.) Proceedings. 12th Annual Rocket and Spaceflight Conference of the Hermann Oberth Gesellschaft (Formerly German Rocket Society). Hamburg. Germany. 19-22 Sep 1963.
- III-A-5 Haemodynamische Reaktionen des Raumfahrers. (Hemodynamical responses of the Astronaut.) Proceedings. Annual Meeting of the German Society of Aviation and Space Medicine. Munich. Germany. 8-9 Oct 1963. *Zentralblatt fuer Verkehrs-Medizin. Verkehrs-Psychologie. Luft-und Raumfahrt-Medizin*. Muenchen. 10:219-220. 1964.
- III-A-6 Raumfahrtmedizin. Raumfahrtelektronik und klinische Medizin. (Space medicine, space electronics and clinical medicine). Invited paper. Proceedings. Scientific Conference on Medicine and Technology sponsored by the Medical Sciences Division, Akademie Bad Boll. Stuttgart. West Germany. June 27-29. 1969.
- III-A-7 Das Problem des Druckstutzes im Weltraumflug (The problem of rapid decompression in space flight). Proceedings. Nineteenth Space Flight Congress of the Hermann Oberth Gesellschaft. Nuernberg. West Germany. June 25-28. 1970.

III-A-8 Die ersten raumfahrtmedizinischen Schwerelosigkeit Experimente im Flugzeug 1950 - 1953. 33 Raumfahrt Kongress der Hermann Oberth Gesellschaft. Published in Astronautik 3:84:1984.

III-A-9 New Developments in Aerospace Medicine. 23rd Annual Meeting of the German Medical Society of Aeronautics and Astronautics (DGLRM) Seeheim, West Germany. 29 March 1985. Featured Lecture for the Award of the Hubertus Strugod Medaille for Prof. H. J. Von Beckh. Die Laudatio was made by Prof. Dr. B. Mueller. Mitteilungen DGLRM 1:20:85.

B. *Technical Reports*

III-B-1 Praktische Erwaegungen fuer die notwendige Zusammenarbeit der Sanitaetsdienste der Luftwaffe und des Herres fuer den Luftransport von VBerwundeten (Practical considerations referring to the necessary cooperation of the Medical Services of the Airforce and of the Army for the air evacuation of war casualties). Aerztl. Akademie d. Luftwaffe/R.d.L.u.Ob.d.L. -L.In 14, Berlin, Germany. Dec 1941.

III-B-2 Eine geschichtliche Gegenueberstellung der Ausfaelle durch Verwundungen und Infektionskrankheiten in den Heeren des neunzehnten und zwanzigsten Jahrhunderts. (A historical comparison of war casualties and infectious diseases in the armed forces of the nineteenth and twentieth century). Aerztl. Akademie d. Luftwaffe/R.d.L.u.Ob.D.L.-L.In.14, Berlin, Germany, March 1942.

C. *Books and/or Chapters in Books*

III-C-1 Die Biodynamik des Weltraumfluges. In 'Die Sterne ruecken naecher. Enzyklopaedie der Weltraumfahrt.' Vol I. pp 360-369. Publisher C. Bertelsmann Verlag. Guetersloh, Germany. 1968.

IV. *IN RUSSIAN*

A. *Journals*

IV-A-1 Zashchita letchika kosmicheskogo korablya ot uskorenii menyayushchikh svoe napravlenie. (Acceleration protection of the cosmonaut against accelerations which change their direction.) Akademiya Nauk SSSR. Vsesoyuznyi Institut Nauchnoi i Tekhnicheskoi Informatsii. Seriya. Rakatnaya Tekhnika. Razdel Astronavtika. (Academy of Sciences of the Soviet Union. All-Union Institut of Scientific and Technological Information. Rocket Technology Division, Department of Aeronautics). *Ekspress Informatsiya*, 9:25/27:6-9. Moscow. March 1959.

B. *Chapters in Books*

IV-B-1 Zashchita protiv mnogonapravlenykh uskorenii vo vremya kosmicheskogo poleta i katapul'tirovaniya. (Protection against multidirectional accelerations during space flight and during escape). Chapter in the book 'Chelovek v usloviyah vysotnogo i kosmicheskogo poleta.' (Man under the conditions of high altitude and cosmic flight). P. 263-276. Publisher: Izdatel'stvo Inostrannoj Literatury, Moscow, 1960.

V. *IN ITALIAN*

A. *Journals and Proceedings*

V-A-1 Sui Problemi di lunghi periodi di assenza di peso (Problem areas of long duration weightlessness) VI Congresso Internazionale e XX Europeo di Medicina Aeronautica e Spaziale. Roma, 1-5 Ottobre 1963. Relazioni. Vol I, p. 429-434. Ministero Difesa-Aeronautica, Ispettorato di Sanita, Roma, Italia, 1965. (Proceedings of the VIth International and XIIth European Congress of Aviation and Space Medicine, Rome Italy, 1-5 Oct. 1963. Vol I, p. 429-434. Air Ministry, Office of the Surgeon General, Rome, Italy, 1965. Abstract also published (in French) in *La Presse Medicale*, 72:11:615, Paris, France, 29 Feb 1964 and in *Aerospace Medicine*, 37:968(#653), 1966.

V-A-2 La importanza de la posizione del corpo per il ristabilimento e la sopravvivenza nella decompressione de la cabina degli aerei da trasporto. (The importance of the body position for recovery and survival after cabin decompression of transport aircraft.) *Minerva Aerospaziale*, 2:41-49, 1970, Turin, Italy.

**B.** *Books and/or Chapters in Books*

V-B-1 La biodinamica del volo spaziale. In: '*Enciclopedia dello Spazio*', Chapter IV, pp 360-369. Publisher Istituto Geografico de Agostini, Novara, Italy, 1968.

**VI.** *IN FRENCH*

**B.** *Books and/or Chapters in Books*

VI-B-1 La biodynamique du vol spatial. In: '*La grande aventure de l'espace*', Vol I, pp. 360-369. Publisher Editions Rombaldi, Paris, France, 1967.

**VII.** *IN DUTCH*

**B.** *Books and/or Chapters in Books*

VII-B-1 Biodynamica van de ruimtevlucht. Chapter 4/8 in: '*Encyclopedie van de Ruimtevaart*', pp.360-369. Publisher Het Parool, Amsterdam, Netherlands, 1967.

**VIII.** *IN FINNISH*

**B.** *Books and/or Chapters in Books*

VIII-B-1 Avaruuslennon biodynamikkia. Chapter 4/8 in: '*Avaruuden tietokirja*', pp. 360-369. Publisher Werner Soderstrom Osakeyhtio, Helsinki, Finland, 1967.

**SUPPLEMENT**

**PRESENTATIONS AT MEETINGS FROM WHICH NO PROCEEDINGS  
WERE PUBLISHED (INCLUDING PUBLIC SPEAKING)**

**S-A** *In Argentina*

S-A-0 Investigaciones medico-aeronáuticas de las aceleraciones durante el vuelo. (Aeromedical research on accelerations during flight). Instituto Nacional de Medicina Aeronáutica (National Institute of Aviation Medicine), Buenos Aires, 19 Nov 1952.

S-A-1 Problemas médicos de la Astronáutica (Medical Problems of Astronautics). Sexta Con-

ferencia del Ciclo 1952 de la Sociedad Argentina Interplanetaria. Asociación Transradio. Buenos Aires. 1 Dec 1952. *Abstract Published in J. Sociedad Argentina Interplanetaria.* 4:1. 1953. An adapted version of this presentation is listed under entry II-A-1.

- S-A-2 Fisiología del vuelo en alturas extremas. (*Physiology of flight at extreme altitudes*). Tercera conferencia del ciclo 1953 de la Sociedad Argentina Interplanetaria. Auditorium of the Department of Physiology, Medical School, University of Buenos Aires. 20 Aug 1953.
- S-A-3 Investigaciones efectuadas durante vuelos en picada con personas y animales de prueba. (*Investigations on humans and test animals during diving flight maneuvers*). Instituto Nacional de Medicina Aeronáutica. Buenos Aires. 31 Aug 53. *Abstract published in La Semana Médica*. No. 311. Suplemento E, p. 1, 5 Sep 1953.
- S-A-4 La aceleración y su importancia en los accidentes. (*The importance of accelerations in accidents*). Cuarta Sesión de la Sociedad Argentina de Medicina Social. Asociación Médica Argentina. Casa del Médico, Buenos Aires. 14 July 1955.
- S-A-5 Problemas de supervivencia en vuelos espaciales. (*Survival problems in space flights*). Conferencia inaugural. Primera Exposición Sudamericana de Astronáutica. Buenos Aires. 11 Nov 1955.
- S-A-6 Navegación astronáutica: problemas médicos. (*Space flight: Medical problems*). Escuela de Aviación Militar. Salón de Actos del Cuerpo de Cadetes. Córdoba. 18 Sep 1956.
- S-A-7 Problemas principales causados por la ausencia aparente de peso. (*Principal problems caused by the apparent absence of weight*). Escuela de Aviación Militar. Acto Académico en adhesión al Sesquicentenario de la Independencia. Salón de Actos del Cuerpo de Cadetes. Córdoba. 10 Oct 1960.
- S-A-8 Nuevas tendencias en la investigación médica aeroespacial. (*New approaches in Aerospace Medical Research*). Instituto Nacional de Medicina Aeroespacial. (Upon invitation of the Surgeon General of the Argentine Air Force). Buenos Aires. 28 Dec 1965.
- S-A-9 Compartimentalización como protección contra decompresiones accidentales en aeronaves y astronaves. (*Compartmentalization as protection against accidental decompression in aircraft and spacecraft*). Lecture upon invitation of the Surgeon General of the Argentine Air Force at the National Institute of Aerospace Medicine (Instituto Nacional de Medicina Aeroespacial). Buenos Aires. 14 Oct 1969.
- S-B *In Paraguay*
- S-B-1 Estudio de las aceleraciones durante el vuelo. (*Airborne studies of accelerations*). Asociación 'la Unión'. Asunción de Paraguay. 17 Nov 1953.
- S-C *In Brasil*
- S-C-1 Gravitação e subgravitação num voo parabólico. (*Gravity and subgravity in parabolic flight*). Direção de Saúde da Aeronáutica, Ministério da Aeronáutica. (Upon invitation of the Surgeon General of the Brazilian Air Force). Rio de Janeiro. 8 Sep 1955.

- S-D                   *In France*
- S-D-1               Problèmes physiologiques soulevés par la diminution de la pesanteur apparente. (Physiological problems caused by the diminution of the apparent weight). Centre d'Enseignement et de Recherches de Médecine Aeronautique (C.E.R.M.A.). Ministère des Armées. Paris. 12 Sep 1958.
- S-D-2               La capsule anti-G, un dispositif de protection contre les fortes accélérations. (The anti-G capsule, a protective device against high accelerations). Centre d'Enseignement et de Recherches de Médecine Aeronautique (C.E.R.M.A.). Ministère des Armées. Paris. 12 Sep 1958.
- S-D-3               Contributions récentes à la médecine cosmonautique. (Recent contributions to Space Medicine). Centre d'Enseignement et de Recherches de Médecine Aeronautique (C.E.R.M.A.). Ministère des Armées. Paris. 26 Oct 1962.
- S-D-4               Nouvelles méthodes de protection contre les accélérations en vol (Novel methods of protection against in flight accelerations). (Upon invitation of the Advisory Group for Aerospace Research and Development (AGARD) of the North Atlantic Treaty Organization). Laboratoire de Médecine Aero-spatiale, Centre d'essais en vol. Étigny-sur-Guge. France. June 30. 1975.
- S-E                   *In German*
- S-E-1               Beschleunigungs- und Gewichslosigkeitprobleme der Raumfahrt und deren mögliche Lösung. (Acceleration and weightlessness problems of space travel and their possible solutions.) Seventh International Rocket and Astronautics Convention. German Rocket Society. Bremen. 5-8 Oct 1958. A similar, abbreviated version is listed under entry III-A-2.
- S-E-2               Neuere Erkenntnisse auf dem Gebiet der Raumfahrtmedizin. (Recent advances in Aerospace medicine). Upon invitation of the Commander-in-Chief of the 4th Luftwaffe Division. Headquarters. Aurich. Germany. 18 Sept 1963.
- S-E-3               Psycho-physiologische Reaktionen von Versuchstieren in Flugkörpern. (Psycho-physiological reactions of test animals during rocket flight). Institute of Aviation Medicine of the German Research Center for Aeronautics and Astronautics. Bad-Godesberg. Germany. 23 Oct 1963.
- S-E-4               Die Eroberung des Weltraums. Amerikas Weg zum Mond (The conquest of space. America's way to the moon). With Dr. Wernher von Braun und Dr. Kurt Debus. Zweites Deutsches Fernsehen (german Television. channel 2). Mainz. 9 March 1964.
- S-E-5               Die Verwendung von Primaten in der raumfahrtmedizinischen Forschung. (The use of primates in aerospace medical research). Erstes Deutsches Fernsehen (German Television. Channel 1) Hamburg. 20 Nov 1966.
- S-E-6               Luft und Raumfahrt Medizin. Drucksturzversuche mit Primaten. (Aerospace Medicine. Rapid Decompression experiments with primates). With Alfred G. Koestler. Zweites Deutsches Fernsehen. (German Television. Channel 2). Mainz. 18 and 20 Nov 1966.
- S-E-7               Schutzmaßnahmen gegen Drucksturz in multi-Mach Transportflugzeugen. (Means of protection against decompression in multi-Mach transport aircraft.) Institute of Aviation

Medicine of the German Research Center of Aeronautics and Astronautics. Bad Godesberg. West Germany. July 1969.

- S-E-8 Wie kann man Besatzung und Passagiere eines Ueberschalltransport-flugzeuges gegen Drucksturz schuetzen? (How can crew members and passengers of supersonic transport aircraft be protected against rapid decompression?) Zweites Deutsches Fernsehen (German Television. Channel 2). Mainz, West Germany, March 4, 1970.
- S-E-9 Kammerung der Kabine als Schutzmassnahme gegen Drucksturz in Ueberschall transportflugzeugen. (Compartmentalization as protective measure against rapid decompression in supersonic transport aircraft.) Invited Lecture. Institute of Aviation Medicine of the German Airforce. Fuerstenfeldbruck AFB. West Germany. June 24, 1970 (Upon Invitation of the Surgeon General of the German Air Force).
- S-E-10 Die Anfaenge der Raumfahrtmedizin (The beginnings of space medicine) Keynote address delivered upon invitation by the President of the Hermann Oberth Society, in honor of the 81st birthday of Professor Hermann Oberth. Feucht bei Nuernberg. 25 June 1975.
- S-F *In United States*
- S-F-1 Asnimal experiments simulating reentry decelerations. Bio-satellite Symposium. Air Force Missile Development Center. 20-21 Feb 1958.
- S-F-2 Pilot selection procedures for the Man high Project (USAF Manned Balloon Flights into the Stratosphere). Ninth Annual Meeting. Society of Internal Medicine. Spokane. Washington. 9-12 April 1958.
- S-F-3 Medical problems of mannde space flight. Ninth Annual Meeting. Society of Internal Medicine. Spokane. Washington. 9-12 April 1958.
- S-F-4 Gravitational aspects of space travel: Hypogravity and agracity. Seventy-seventh Annual Meeting of the New Mexico Medical Society. New Mexico State University. Las Cruces. 4-7 May 1958.
- S-F-5 Human engineering in the space age. National Engineering Week. SOciety of Professional Engineers. Texas Technological University. Lubbock. 22 Feb 1959.
- S-F-6 Gravity forces and space flight. American Oredance Association Rio Grande Post. Alamogordo. New Mexico. 27 Feb 1959.
- S-F-7 Physiological effects of weightlessness on humans and animals. American Rocket Society. Southern Ohio Section. CIncinnati. 4 Mar 1959.
- S-F-8-a Airborne studies of physiological reactions to weightlessness. Society of the Sigma Xi. New Mexico State University. Las Cruces. N.M.. 6 Dec 1959.
- S-F-8-b Scientific. political and economical collaboration of western countries. Address in observance of World Understanding Week 1961. Radio Station KRAC. Alamogordo. N.M.. 22 March 1961.
- S-F-9 Problem areas of weightlessess. Honorary Biological Society Beta Beta Beta. New Mexico State Unhiversity. Las Cruces. New Mexico. 19 May 1961.

- S-F-10 Recent echievements in aerospace medical research. Ninth ANnual Junior Engineers' and Scientists' Summer Institute. New Mexico State University. Las Cruces. N.M.. 26 June 1964.
- S-F-11 Basic problems of space medicine with special attention given to weightlessness. Space Flight Summer Seminar. Teacher Education Center. New Mexico Western University. Silver City. New Mexico. 2 August 1965.
- S-F-12 The chimpanzee and medical research. South Western Science Symposium. Liberty Hall. El Paso. Texas. 15 October 1965.
- S-F-13 Man in weightlessness. El Paso Senior Science Seminar. El Paso Education Center Auditorium. El Paso. Texas. 27 Oct 1965.
- S-F-14 Animal experiments in support of aerospace medical research. El Paso Senior Science Seminar. El Paso Education Center Auditorium. El Paso. Texas. 3 Nov 1965.
- S-F-15 The career in aerospace medicine. Trans Pecos Medical Careers Conference. Texas Western College. El Pasos. Tecas. 4 Mar 1966.
- S-F-16 The History of aerospace medicine. Trans Pecos Medical Careers Conference. University of Texas in El Paso (UTEP). El Paso. Texas. 3-4 Mar 1967.
- S-F-17 Two decades of aeromedical weightlessness research. IIIrd Annual Summer Conference. New Mexico Academy of Science. Alamogordo. N.M.. 21-22 July 1967. *The New Mexico Academy of Science Bulletin*. 8:2:6. 1967.
- S-F-18 Highlights of scientific accomplishments of the 6571st Aeromedical Research Laboratory. Radio Station KINN. Alamogordo. N.M. 27 July 1967.
- S-F-19 The principles of Aerospace Medicine. Trans Pecos Health Careers Conference. University of El Paso (UTEP). El Paso. Texas. 1 March 1968.
- S-F-20 Exposure limits to hypobaric environments. El Paso County Medical Society. El Paso. Texas. 12 March 1968.
- S-F-21 The challenge of Aviation and Space Medicine. Keynote address of the Trans Pecos Health Careers Conference. University of Texas in El Paso (UTEP). El Paso. Texas. 7 March 1969.
- S-F-22 The pracie of Aerospace Medicine. Trans Pecos Health Careers Conference. University of Texas in El Paso. (UTEP). El Paso. Texas. 6 March 1970.
- S-F-23 Basic problem areas of bio-astronautics. Invited lecutre. XIth Franklin Institute Summer Astronautics Course. 13 July 1971. The Franklin Institute. Philadelphia. PA.
- S-F-24 Novel means of acceleration protection. Invited lecture. NASA-ASEE System Design Faculty Program. NASA Langley Research Center. Hampton. VA.. 19 June 1972.
- S-F-25 The transition from Aviation Medicine to Space Medicine. Keynote address of the semi-annual Scientific Meeting of the Hollywood Academy of Medicine. Roosevelt Hotel. Los Angeles. CA. Nov 14. 1974.

- S-F-26 Acceleration protection by transverse positioning. Naval Reserve Research Company 4-1. The University of Princeton. NJ. April 7, 1976.
- S-G *In India*
- S-G-1 Recent advances in aerospace medicine. Upon invitation of the Ministry of Defence of India. New Delhi. India. 10 Sept 1962.
- S-G-2 Orbital flights of men and animals. Air Force School of Aviation Medicine. Indian Air Force. Bangalore. India. 13 Sep 1962.
- S-G-3 Physiological reactions to the space flight environment. Medical School. University of Mysore. India. 15 Sep 1962.
- S-H *In Austria*
- S-H-1 Neuere Beitraege zur Physiologie des menschlichen Raumfluges. (Recent contributions to the physiology of man in space). Physiologisches Institut der Universitaet Wien (Department of Physiology. Medical School. University of Vienna). Vienna. Austria. 4 Oct 1962.
- S-H-2 Medizinische Progleme der Raumfahrt (Medical problems of space flight). Upon invitation of the Ministry of Defense of Austria. School of the General Staff of the Austrian Forces. Stiftskaserne. Vienna. Austria. 5 Oct 1962.
- S-H-3 Weitere Fortschritte auf dem Gebiet der Raumfahrtmedizin. (Further advances in Aerospace Medicine). U.S. Embassy sponsored presentation for Officers of the Austrian Air Force. accompanied by the NASA 'Faith 7' film (Astronaut Gordon Cooper) and the USAF film 'Aerospace Medical Research at Holloman Air Force Base'. Office of the U.S. Air Attaché. Vienna. Austria. 11 Oct 1963.
- S-H-4 Neue Gesichtspunkte der luftfahrtmedizinischen Forschung. (New vistas in aeromedical research). Upon invitation fo the Surgeon General of the Armed Forces of Austria. Auditorium of the Armed Forces Centerl Hospital. Vienna-Stammersdorf. Austria. 6 Oct 1966.
- S-H-5 Neuere Beitraege zur psycho-physiologie des Drucksturzes. (Recent contributions to the psycho-physiology of rapid decompression). U.S. Embassy sponsored presentation for key personnel of the Austrian Air Force. followed by the projecftion of NASA film MSC-65-287 'Rapid Deocmpression of Chimpanzees to a Near Vacuum'. Office of the U.S. Air Attaché. Vienna. Austria.. 7 Oct 1966.
- S-H-6 Medizinische Ueberlegungen ueber Fluege iin extremen hoehen mit ueberschallge schwindigkeit. (Medical considerations about flights at extreme altitudes with supersonic speed). Invited lecture sponsored by the U.S. Air Attache upon invitation of the General Commanding the War College of the Austrian Forces (Verteidigungsakademie). Stiftskaserne. Vienna. 24 June 1969.
- S-H-7 Neue Methoden des Beschleunigungsschutzes. (Novel methods of acceleration protection) Invited lecture for flight surgeons and fighter pilots of the Austrian Airforce upon invitation of the Surgeon General of the Austrain Armed Forces. Verteidigungsakademie. Stiftskaserne. Vienna. Austria. June 13, 1975.

- S-J                   *In Mexico*
- S-J-1               Investigaciones recientes en al campo de la medicina espacial. (Recent Research in the field of Aerospace Medicine.) U.S. Consulate sponsored presentation to the Medical Staff and the Auxiliary Committee of the General Hospital Ciudad Juárez. U.S. Consulate Ciudad Juárez, Chihuahua, Mexico. 22 June 1966.
- S-J-2               Medicina aeroespacial. Criterios fisiológicos y psicológicos en experimentos con primates. (Aerospace Medicine. Physiological and psychological criteria in experiments with primates.) Auditorio del Instituto Mexicano del Seguro Social, Mazatloan, Sinaloa, Mexico. 27 Dec 1966.
- S-J-3               Los factores hemostáticos y hemodinámicos de las aceleraciones en la aviación y el vuelo espacial. (Hemostatic and hemodynamic factors of accelerations in aviation and space flight.) U.S. Consulate sponsored presentation upon invitation of the Dean of the Medical School, University of Nuevo León, Monterrey, Nuevo León, Mexico. 13 Jan 1967.
- S-J-4               Los efectos fisiológicos de las aceleraciones y desaceleraciones sobre el astronauta. (Physiological effects of accelerations and decelerations on the astronaut.) U.S. Consulate sponsored presentation upon invitation of the Dean of the Medical School, University of Yucatan, Mérida, Yucatán, Mexico. 27 Jan 1967.
- S-J-5               El uso de primates como predecesores del hombre en el vuelo espacial. (The use of primates as predecessors of man in space flight.) Auditorium del Hospital Ferrocarril del Pacífico, Guadalajara, Jalisco, Mexico, 3 Feb 1967.
- S-K                   *In Australia*
- S-K-1               Decompression hazards in Supersonic Transport (SST) aircraft and their possible prevention. Upon invitation of the Medical Department of Quantas Airlines, Sydney, Australia, July 16, 1973
- S-L                   *In Chile*
- The advantages of a pelvis and legs elevating Pilot seat. 30th International Congress of Aviation and Space Medicine, Santiago, Chile, 4-7 Oct 1982.
- S-M                   *In Madeira*
- The PALE (Pelvis and Legs Elevating) Pilot Seat is the solution to protect the pilot against high accelerations during flight. 32nd International Congress of Aviation and Space Medicine, Funchal, Madeira, Sept 30-Oct 5, 1984.

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