NASA

Aerospace Medicine and Biology
A Continuing Bibliography with Indexes

NASA SP-7011(255)
February 1984

Aerospace Medicine & Biology

Aerospace Medicine and Biology

February 1984

NASA SP-7011(255)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 255)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in January 1984 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

NASA Scientific and Technical Information Branch 1984
National Aeronautics and Space Administration
Washington, DC

NASA SP-7011 and its supplements are available from the National Technical Information Service (NTIS). Questions on the availability of the predecessor publications, Aerospace Medicine and Biology (Volumes I - XI) should be directed to NTIS.

This supplement is available as NTISUB/123/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of $7.00 domestic; $14.00 foreign.

INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* lists 278 reports, articles and other documents announced during January 1984 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA).* The first issue of the bibliography was published in July 1964

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the Earth's atmosphere or in interplanetary space References describing similar effects of biological organisms of lower order are also included Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged by *STAR* categories 51 through 55, the Life Sciences division. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals The *IAA* items will precede the *STAR* items within each category.

Six indexes -- subject, personal author, corporate source, contract, report number, and accession number -- are included

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1984 Supplements.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A84-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc (AIAA), as follows: Paper copies of accessions are available at $8 50 per document Microfiche[1] of documents announced in *IAA* are available at the rate of $4 00 per microfiche on demand. Standing order microfiche are available at the rate of $1 75 per microfiche for AIAA meeting papers, and $1 45 per microfiche for *IAA* source documents.

Minimum air-mail postage to foreign countries is $2 50 and all foreign orders are shipped on payment of pro-forma invoices

All inquiries and requests should be addressed to AIAA Technical Information Service Please refer to the accession number when requesting publications

STAR ENTRIES (N84-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation The most commonly indicated sources and their acronyms or abbreviations are listed below If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line

Avail NTIS Sold by the National Technical Information Service Prices for hard copy (HC) and microfiche (MF) are indicated by a price code preceded by the letters HC or MF in the *STAR* citation Current values for the price codes are given in the tables on page vii.

Documents on microfiche are designated by a pound sign (#) following the accession number The pound sign is used without regard to the source or quality of the microfiche

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va 22161

NOTE ON ORDERING DOCUMENTS When ordering NASA publications (those followed by the * symbol), use the N accession number NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number It is also advisable to cite the title and other bibliographic identification

Avail SOD (or GPO) Sold by the Superintendent of Documents, U S Government Printing Office, in hard copy. The current price and order number are given following the availability line (NTIS will fill microfiche requests, as indicated above, for those documents identified by a # symbol)

Avail NASA Public Document Rooms Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Document Room (Room 126), 600 Independence Ave , S.W., Washington, D C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26 1 reduction)

Avail DOE Depository Libraries Organizations in U S cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts* Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center

Avail Univ Microfilms Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm All requests should cite the author and the Order Number as they appear in the citation

Avail USGS Originals of many reports from the U S Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction

Avail HMSO Publications of Her Majesty's Stationery Office are sold in the U S by Pendragon House, Inc (PHI), Redwood City, California The U S price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI

Avail BLL (formerly NLL) British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England Photocopies available from this organization at the price shown (If none is given, inquiry should be addressed to the BLL)

Avail Fachinformationszentrum, Karlsruhe Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM)

Avail Issuing Activity, or Corporate Author, or no indication of availability Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document

Avail U S Patent and Trademark Office Sold by Commissioner of Patents and Trademarks, U S Patent and Trademark Office, at the standard price of 50 cents each, postage free

Avail ESDU Pricing information on specific data items, computer programs, and details on ESDU topic categories can be obtained from ESDU International Ltd Requesters in North America should use the Virginia address while all other requesters should use the London address, both of which are on page vi

Other availabilities If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and Trademarks
U S Patent and Trademark Office
Washington, D C 20231

Department of Energy
Technical Information Center
P O Box 62
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

ESDU International, Ltd
1495 Chain Bridge Road
McLean, Virginia 22101

ESDU International, Ltd
251-259 Regent Street
London, W1R 7AD, England

Fachinformationszentrum Energie, Physik, Mathematik GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

Her Majesty's Stationery Office
P O Box 569, S E 1
London, England

NASA Scientific and Technical Information Facility
P O Box 8757
B W I Airport, Maryland 21240

National Aeronautics and Space Administration
Scientific and Technical Information Branch (NIT-1)
Washington, D C 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U S Government Printing Office
Washington, D C 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd
Tylers Green
London, England

U S Geological Survey Library
National Center – MS 950
12201 Sunrise Valley Drive
Reston, Virginia 22092

U S Geological Survey Library
2255 North Gemini Drive
Flagstaff, Arizona 86001

U S Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U S Geological Survey Library
Box 25046
Denver Federal Center, MS 914
Denver, Colorado 80225

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1983)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 4 50	$ 9 00
A02	001-025	7 00	14 00
A03	026-050	8 50	17 00
A04	051-075	10 00	20 00
A05	076-100	11 50	23 00
A06	101-125	13 00	26 00
A07	126-150	14 50	29 00
A08	151-175	16 00	32 00
A09	176-200	17 50	35 00
A10	201-225	19 00	38 00
A11	226-250	20 50	41 00
A12	251-275	22 00	44 00
A13	276-300	23 50	47 00
A14	301-325	25 00	50 00
A15	326-350	26 50	53 00
A16	351-375	28 00	56 00
A17	376-400	29 50	59 00
A18	401-425	31 00	62 00
A19	426-450	32 50	65 00
A20	451-475	34 00	68 00
A21	476-500	35 50	71 00
A22	501-525	37 00	74 00
A23	526-550	38 50	77 00
A24	551-575	40 00	80 00
A25	576-600	41 50	83 00
A99	601-up	-- 1	-- 2

1/ Add $1 50 for each additional 25 page increment or portion thereof for 601 pages up

2/ Add $3 00 for each additional 25 page increment or portion thereof for 601 pages and more

Schedule E

EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

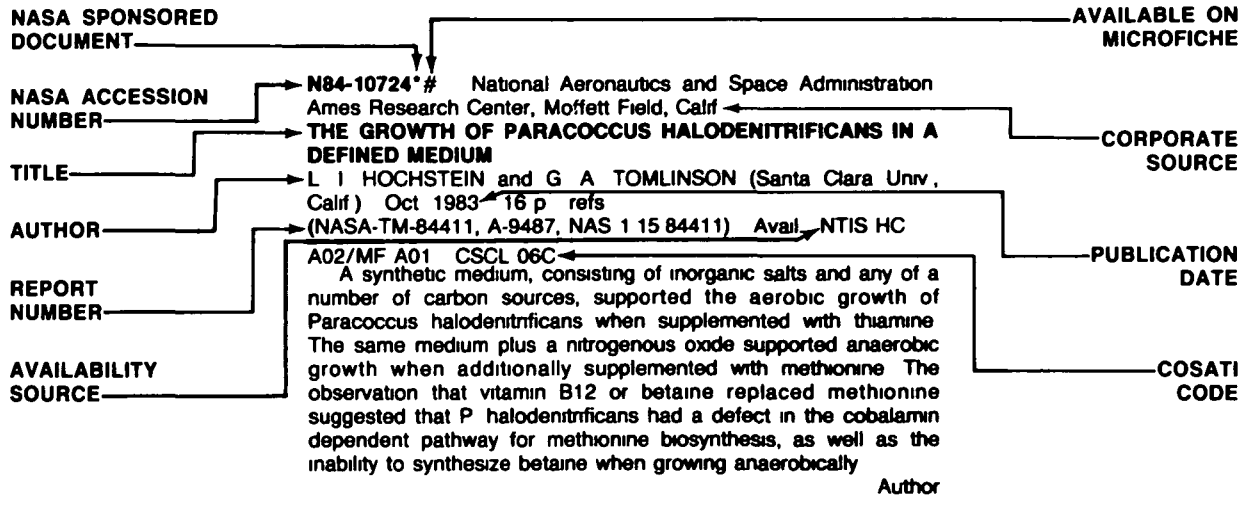
Price Code	North American Price	Foreign Price
E01	$ 6 50	$ 13 50
E02	7 50	15 50
E03	9 50	19 50
E04	11 50	23 50
E05	13 50	27 50
E06	15 50	31 50
E07	17 50	35 50
E08	19 50	39 50
E09	21 50	43 50
E10	23 50	47 50
E11	25 50	51 50
E12	28 50	57 50
E13	31 50	63 50
E14	34 50	69 50
E15	37 50	75 50
E16	40 50	81 50
E17	43 50	88 50
E18	46 50	93 50
E19	51 50	102 50
E20	61 50	123 50

E-99 - Write for quote

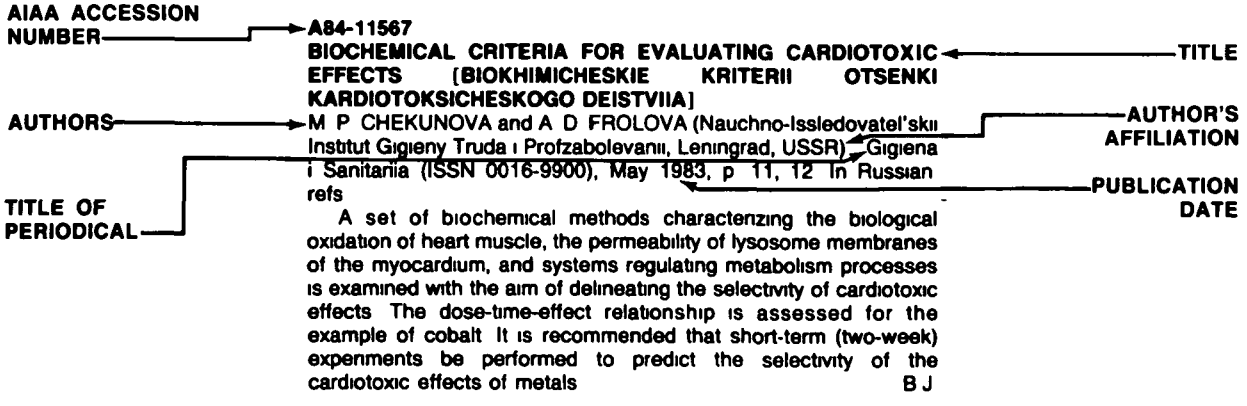
N01	35 00	45 00

TABLE OF CONTENTS

TYPICAL CITATION AND ABSTRACT FROM *STAR*



TYPICAL CITATION AND ABSTRACT FROM *IAA*



AEROSPACE MEDICINE AND BIOLOGY

(A Continuing Bibliography (Suppl. 255)

FEBRUARY 1984

51

LIFE SCIENCES (GENERAL)

Includes genetics

A84-10276
IN VIVO COMPARISON OF CYTOCHROME AA3 REDOX STATE AND TISSUE PO2 IN TRANSIENT ANOXIA
K KARIMAN, F G HEMPEL, and F. F JOBSIS (Duke University Medical Center, Durham, NC) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1057-1063 Research supported by the American Lung Association refs
(Contract NIH-GM-29531)

The relationship in vivo of the dynamics of tissue oxygen partial pressure with the oxidation-reduction state of cytochrome c oxidase (cyt aa3), the direct reductant of O2 in the electron transport system, is investigated Artificially ventilated, anesthetized cats were treated with 100 percent N2 ventilation, and measurements of pyrenebutyric acid-generated fluorescence and dual wavelength reflectance spectrophotometry at 605 and 590 nm through limited bilateral craniotomies were used to monitor cerebral cortical tissue oxygen pressures and cyt aa3 redox changes, respectively Following a 1 5 min N2 exposure, the decrease in tissue oxygen pressure is found to lag behind cyt aa3 reduction, which may serve to prolong O2 availability for other metabolic processes Upon restoration of room air, rapid reoxidation and hyperoxidation to above baseline levels of cyt aa3 occurred followed by the recovery of tissue oxygen pressure, indicative of an increased affinity of cyt aa3 for O2 that was induced by anoxia A L W

A84-10277
VENTILATORY RESPONSE OF INTACT CATS TO CARBON MONOXIDE HYPOXIA
H GAUTIER and M BONORA (Paris VI, Universite, Paris, France) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1064-1071. Research supported by the Institut National de la Sante et de la Recherche Medicale refs

The respiratory effects of hypoxemia resulting either from the inhalation of hypoxic air or of small concentrations of CO in conscious and anesthetized cats are compared, together with effects of hypercapnia in a study of cerebral mechanisms in the control of ventilation In anesthetized animals, CO inhalation is found to produce a progressive decrease in arterial O2 concentration, accompanied by mild increases in ventilation Hypoxic hypoxia is noted to result in a decrease in arterial O2 pressure and concentration and an increase in ventilation Exposure to hypercapnia caused increases in minute ventilation accompanied by lower tidal volumes and consequently higher breathing frequencies for a given ventilation under conditions of hypoxic and CO hypoxia compared to normoxia In conscious animals, low concentrations of CO caused a slight decrease in ventilation, while higher concentrations cause first a slight decrease then a characteristic tachypnea similar to that described in carotid-denervated cats Hypercapnia resulted in changes in ventilatory pattern that were different under CO hypoxic compared to hypoxic and normoxic conditions Results suggest the role of some suprapontine structures which trigger a central hypoxemic tachypnea A L W

A84-10278
INFLUENCE OF TRAINING ON BLOOD FLOW TO DIFFERENT SKELETAL MUSCLE FIBER TYPES
B G MACKIE and R L TERJUNG (New York, State University, Upstate Medical Center, Syracuse, NY) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1072-1078 refs
(Contract NIH-AM-21617)

The influence of an exercise training program on the blood flow capacity of the working skeletal muscles is studied with regard to the different responses of the various muscle fiber types Adult male rats were trained to run at 60 m/min up a 15 percent grade, and then blood flow in the fast twitch white, fast twitch red and slow twitch red muscle fibers of the gastrocnemius-soleus-plantaris muscle group was determined by the radiolabeled microsphere technique during the first and tenth minutes of in situ contractions at frequencies from 7 5 to 90 tetani/min Compared to control, untrained rats, treadmill training resulted in a lesser loss of tension at frequencies of 15 tetani/min and above and increased initial blood flows to fast twitch white fibers A time-dependent relative hyperemia is noted in the red fiber types only, while trained fast twitch white fibers showed a constant 40-50 percent increase in maximal blood flow Although this increase would only have a modest effect on total muscle blood flow and maximal oxygen consumption, it may be important during intense but submaximal exercise A L W

A84-10282
POLYCYTHEMIA AND THE ACUTE HYPOXIC RESPONSE IN AWAKE RATS FOLLOWING CHRONIC HYPOXIA
R FRIED, B MEYRICK, M RABINOVITCH, and L REID (Children's Hospital Medical Center, Harvard University, Boston, MA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1167-1172 refs
(Contract NIH-F-32-HL-06304, NIH-HL-23232)

The effects of the structural remodeling of the pulmonary circulation induced by chronic hypoxia on the pressor response to acute hypoxia is investigated while accounting for the contribution of the polycythemia also induced by hypoxia exposure Twenty-two adult male rats were randomly allocated to one of four groups a group undergoing hypobaric hypoxia for 10 days (hypoxic-polycythemic), a group undergoing hypoxia but with hematocrit reduced to normocytic through red cell pheresis, a group undergoing hypoxia followed by sham red cell pheresis through a pulmonary arterial catheter, and a normoxic normocytic control group Measurements of pulmonary arterial pressure and pulmonary vascular resistance after 24 hr in room air show these values to be greatest in hypoxic polycythemic rats and least in controls, with hypoxic-normocytic rats occupying an intermediate position Acute exposure to 10 percent O2 lead to a rise in pulmonary arterial pressure and resistance in all groups, which was, however, greater in hypoxic rats than controls and in polycythemic than normocytic rats A L W

A84-10283
REGIONAL DISTRIBUTION OF BLOOD FLOW DURING MILD DYNAMIC LEG EXERCISE IN THE BABOON
A R HOHIMER, L B ROWELL, O A SMITH (Washington, University, Seattle, WA), and J R HALES Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1173-1177 refs
(Contract NIH-HL-16910, NIH-HL-07090, NIH-RR-00166)

The distribution of blood flow to all major tissues during mild leg exercise is studied in the baboon Five juvenile male baboons were trained to perform mild dynamic leg exercise under chair restraint, and blood flow was measured by the radiolabeled microsphere technique during periods of rest and exercise During exercise, significant increases were seen in mean arterial blood pressure, heart rate, cardiac output and whole-body oxygen consumption Major increases in blood flow to leg muscles were also observed, together with increases in coronary blood flow in four out of the five animals Blood flow to the skin was reduced in all regions except the toes, as was flow to adipose tissue and sampled nonworking skeletal muscle A reduction in blood flow to the kidneys was also observed in all the animals, while less consistent reductions were noted in blood flow to the visceral organs An increase was noted in flow to the spinal cord, whereas average brain blood flow remained constant Results show mild leg exercise in baboons to cause widespread vasoconstriction similar to that observed in humans, and indicate the suitability of the baboon for studying the vascular responses of tissue that cannot be examined in humans A L W

A84-10286
TIME COURSE OF AIRWAY HYPERRESPONSIVENESS INDUCED BY OZONE IN DOGS
M J HOLTZMAN, L M FABBRI, B -E SKOOGH, P M OBYRNE, E H WALTERS, H AIZAWA, and J A NADEL (California, University, San Francisco, CA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1232-1236 Research supported by Fisons Corp , Council for Tobacco Research, American Lung Association, and Swedish National Association against Heart and Chest Diseases refs
(Contract NIH-HL-24136)

A84-10287
BEHAVIORAL AND AUTONOMIC THERMOREGULATION IN MICE EXPOSED TO MICROWAVE RADIATION
C J GORDON (U S Environmental Protection Agency, Health Effects Research Laboratory, Research Triangle Park, NC) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1242-1248 refs

Behavioral and autonomic thermoregulatory responses of mice to microwave radiation are studied with the use of a specially designed waveguide-exposure system that enables the simultaneous determination of radiation absorption, breathing rate and ambient temperature preference Mice were placed in a shuttle box which was in turn located within a 2450-MHz waveguide in which a thermal gradient had been established, and exposed to microwave radiation at incident powers from 0 to 1 52 W for a period of one hour In the absence of microwave exposure, mice are seen to prefer an average ambient temperature of 31 1 C Specific absorption rates greater than 7 W/kg cause a downward shift in preferred temperature, while breathing rates remained constant up to absorption rates of 20 5 and 32 3 W/kg In mice maintained at an ambient temperature of 31 C, breathing rate increased when absorption exceeded 7 0 W/kg Results show a preferential activation of behavioral to autonomic thermoregulatory responses during microwave exposure A L W

A84-10288
EFFECT OF PHYSICAL TRAINING ON MYOCARDIAL ENZYME ACTIVITIES IN AGING RATS
J A CHESKY, S LAFOLLETTE, M TRAVIS, and C FORTADO (Sangamon State University, Springfield, IL) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1349-1353 Research supported by the American Heart Association, Glenn Foundation for Medical Research, and Sangamon State University refs

The effects of the initiation of an exercise training program at different ages on the activities of enzymes involved in myocardial energy metabolism is investigated Physical training, consisting of forced swimming of duration increasing gradually up to 1 hr by the end of 3 months, was initiated at ages of 1, 6, 12 or 17-22 months in male Fischer rats Physical training begun at any age is found to result in an increase in heart rate relative to body weight, accounted for in the younger age groups primarily by a decrease in body weight Extraction of myocardial actomysin ATPase and creating kinase showed the activities of both enzymes to decrease with advancing age There was no consistent elevation in animals having undergone 3 months of physical training, although enzyme activities in animals starting exercise at 6 months of age were higher than those of sedentary controls, and the oldest animals showed a negative effect Results are in accord with the presence of an age threshold after which exercise does not elicit an adaptive response A L W

A84-10483
THE ROLE OF METALS IN FREE RADICAL OXIDATION PROCESSES IN THE TISSUES OF ORGANISMS ACCORDING TO DATA OF SPONTANEOUS AND INITIATED CHEMILUMINESCENCE [O ROLI METALLOV V PROTSESSAKH SVOBODNORADIKAL'NOGO OKISLENIIA V TKANIAKH ORGANIZMA PO DANNYM SPONTANNOI I INITSIIROVANNOI KHEMILIUMINESTSENTSII]
G A BABENKO, IA I GONSKII, I M ANTONIK, V I IURKIV, V V VAGILEVICH, IU M MATIIASH, T P MAKSIMCHUK, IU M ZAVIISKII, M A MITSKAN, V A SMOLINSKAIA et al IN Biochemiluminescence (Biokhemiliuminestsentsiia) Moscow, Izdatel'stvo Nauka (Moskovskoe Obshchestvo Ispytatelei Prirody, Trudy Volume 58), 1983, p 164-179 In Russian refs

The role of metals in the free radical oxidation of animal tissues was investigated using model experiments with blood serum and nutrients containing various contents of metals, as well as experiments on animals which were fed diets deficient in various metals The method employed in this investigation was the determination of the spontaneous chemiluminescence and the chemiluminescence initiated by hydrogen peroxide and ferrous sulfate (catalyst of the peroxide oxidation of lipids) of homogenates of tumor tissues of rats fed on normal diets and diets containing abnormally low amounts of zinc or other minerals Among other results, it was determined from experiments using cancerous tumors of rats fed on a diet deficient in zinc that zinc plays an antioxidating role in the free radical oxidation processes in the tissues of rats N B

A84-10484
SPONTANEOUS BIOCHEMILUMINESCENCE OF MITOCHONDRIA OF SEVERAL TISSUES IN NORMAL CONDITIONS AND DURING THE ACTION OF PHYSICAL FACTORS [SPONTANNAIA BIOKHEMILIUMINESTSENTSIIA MITOKHONDRII NEKOTORYKH TKANEI V NORME I PRI DEISTVII FIZICHESKIKH FAKTOROV]
S M ZUBKOVA IN Biochemiluminescence (Biokhemiliuminestsentsiia) Moscow, Izdatel'stvo Nauka (Moskovskoe Obshchestvo Ispytatelei Prirody, Trudy Volume 58), 1983, p 180-196 In Russian refs

The kinetics of the biochemiluminescence of the mitochondria of several different tissues of rats, such as the liver, cardiac muscles and cerebral cortex, were investigated A helium-neon laser was employed to change the functional condition of the mitochondria Results show that the intensity of the biochemiluminescence of mitochondria depends on the velocity of electron transport in the

respiratory chain, the level of the coupling of respiration with phosphorylation, and the level of peroxidase activity In addition, experiments using isolated mitochondria showed that S-containing compounds are important in determining the dependence of the biochemiluminescence on the laser action, which is indicated by the cooperative conformational transitions in the mitochondrial membranes during the action of these physical factors The role of peroxide compounds in the functioning of mitochondria and the pathways for the utilization of these compounds were studied N B

A84-10487
PRINCIPLES OF THE PHYSIOLOGY OF FUNCTIONAL SYSTEMS [OSNOVY FIZIOLOGII FUNKTSIONAL'NYKH SISTEM]
K V SUDAKOV, ED Moscow, Izdatel'stvo Meditsina, 1983, 272 p In Russian

The theory of functional systems is examined in relation to general and specific physiological processes which determine the activity of the organism as a whole The physiology of integrated self-regulating systems which produce various results optimal for metabolism is examined The systemic organization of various physiological functions and the patterns of their construction are considered for an understanding of the processes of the organism as a whole Topics studied include the functional systems which determine the optimal level of the volume of the circulating blood, the pH level, the blood pressure, nutrients, temperature, and the osmotic pressure No individual items are abstracted in this volume N B

A84-10489
THE PHYSIOLOGY OF THE VEGETATIVE NERVOUS SYSTEM [FIZIOLOGIIA VEGETATIVNOI NERVNOI SISTEMY]
A D NOZDRACHEV Leningrad, Izdatel'stvo Meditsina, 1983, 296 p In Russian refs

The neurophysiological mechanisms of the transmission of the autonomous reflex excited in the arch are examined The main characteristics of the autonomous structures of the three sections or parts of the autonomous nervous system (sympathetic, parasympathetic, and metasympathetic) are discussed The cytotopical, ultrastructural, and histochemical characteristics of the neurons of the autonomous nerve ganglia and the interneuronal connections are considered The sensitive, associative, and efferent links of the autonomous reflex arch are studied The primary mediators and biologically active compounds which inhibit or activate the processes in the synaptic structures are examined The structural and functional organizations of the metasympathetic section of the autonomous nervous system and particular aspects of nerve-muscle transmissions (adrenergic, cholinergic, and purinergic mechanisms) are investigated N B

A84-10492
THE FRACTIONATION OF PLASMA PROTEINS IN LARGE SCALE PREPARATIONS OF BLOOD [FRAKTSIONIROVANIE BELKOV PLAZMY V PROIZVODSTVE PREPARATOV KROVI]
V M RUSANOV and L. I SKOBELEV Moscow, Izdatel'stvo Meditsina, 1983, 224 p In Russian refs

Laboratory and large scale methods for the fractionation of blood plasma proteins are examined, focusing on fractionation methods used in large scale preparations of medicinal compounds The primary technological instruments and equipment employed in the fractionation of blood plasma proteins are discussed, including sterilizing filtration and the automatic regulation and control of the production processes Aspects discussed include the engineering problems of the production of blood plasma proteins, the automatization of the processes, and the equipping of the technical personnel N.B

A84-10842
THE CARDIOSTIMULATING ACTION OF NOREPINEPHRINE CONTAINED IN THE LIPOSOMES IN CONDITIONS OF ADRENORECEPTOR BLOCKADE [KARDIOSTIMULIRUIUSHCHEE DEISTVIE ZAKLIUCHENNOGO V LIPOSOMY NORADRENALINA V USLOVIIAKH BLOKADY ADRENERGICHESKIKH RETSEPTOROV]
A. V DMITRIEVA, A V STEFANOV, V I BOIKO, M I GUREVICH, V K LISHKO, and L IA SAZONOVA (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1023-1030 In Russian refs

A84-10843
THE EFFECT OF AN INCREASED MECHANICAL LOAD ON THE DEPENDENCE OF THE CONTRACTION OF ISOLATED HEART MUSCLE ON THE CONCENTRATION OF CA(2+) IN THE PERFUSATE [VLIIANIE POVYSHENNOI MEKHANICHESKOI NAGRUZKI NA ZAVISIMOST' SOKRASHCHENIIA IZOLIROVANNOI SERDECHNOI MYSHTSY OT KONTSENTRATSII CA(2+) V PERFUZATE]
V I KAPELKO, M S GORINA, N A NOVIKOVA, and K I MALINOVSKAIA (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1053-1057 In Russian refs

A84-10844
THE PATTERN OF LOCAL VASCULAR RESPONSES IN CONDITIONS OF AN INCREASED ACTIVITY OF THE CEREBRAL CORTEX [DINAMIKA MESTNYKH SOSUDISTYKH REAKTSII V USLOVIIAKH POVYSHENIIA AKTIVNOSTI GOLOVNOGO MOZGA]
D G BRARAMIDZE, IU I LEVKOVICH, and G I MCHEDLISHVILI (Akademiia Nauk Gruzinskoi SSR, Institut Fiziologii, Tbilisi, Georgian SSR, Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1058-1064 In Russian refs

The pattern of the dilatory responses of the small pial artery system on the surface of the cerebral cortex of rabbits was studied in experiments using direct cinemicrography during increased cortical activity due to the direct application of an amount of strychnine above the threshold The diameters of the segments of the pial microvascular system were measured for every frame of the film, including measurements of the relatively large pial arteries (LPA), the sphincters at the offshoots of small artery branches (SO), minor pial arteries (MPA), and precortical arteries (PCA) The relative order of the dilatory responses for the different segments was found to be (in descending order) PCA, SO, MPA, LPA, whereas this pattern was found to be reversed for the latencies It is concluded that this behavior of the pial microvascular system maintains the adequacy of the local blood supply as well as the elimination of the 'steal phenomenon' in the neighboring cortical areas N B

A84-10845
AN ANALYSIS OF THE MECHANISM OF THE HYPOTHERMIC ACTION OF NEUROTROPIC COMPOUNDS [ANALIZ MEKHANIZMA GIPOTERMICHESKOGO DEISTVIIA NEIROTROPNYKH SREDSTV]
IU V LUPANDIN (Petrozavodskii Gosudarstvennyi Universitet, Petrozavodsv, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1074-1078 In Russian refs

The mechanism of the suppression of shivering thermogenesis by the action of several compounds (oxotremorine, nicotine, isoprenaline, and seduxene) was investigated in experiments using anesthetized cats It is determined that these compounds suppress shivering after both intravenous and intraventricular injections, as well as inhibits shivering evoked by the stimulation of the posterior hypothalamous Intravenous injection of antagonists of these compounds are found not to change the amount of stimulation of the medial preoptic region, which is necessary for the threshold inhibition of shivering It is concluded that the hyperthermic action of these compounds is mainly connected with the suppression of

shivering due to their influence at the brain stem level of postural muscular tonus regulation, and not due to the selective action of these compounds on the hypothalamic thermoregulatory center
N B

A84-10846
THE SEASONAL CHARACTERISTICS OF THE EFFECT OF LOW TEMPERATURE ON THE ACTIVITY OF BRAIN MONAMINE OXIDASE AND THE SENSITIVITY OF RATS TO HYPEROXIA [SEZONNYE OSOBENNOSTI VLIIANIIA NIZKOI TEMPERATURY NA AKTIVNOST' MONOAMINOKSIDAZY MOZGA I CHUVSTVITEL'NOST' KRYS K GIPEROKSSII]
I A GOROSHINSKAIA and A A ANANIAN (Rostovskii Gosudarstvennyi Universitet, Rostov-on-Don, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1079-1084 In Russian refs

A84-10847
THE SPATIAL ORGANIZATION OF NEURONS OF THE BRAIN VISUAL CORTEX DURING THE STIMULATION BY LIGHT SPOTS [O PROSTRANSTVENNOI ORGANIZATSII NEIRONOV ZRITEL'NOI KORY MOZGA PRI STIMULIATSII SVETOVYMI PIATNAMI]
S A CHEBKASOV (Nauchno-Issledovatel'skii Institut Neirokibernetiki, Rostov-on-Don, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1099-1101 In Russian refs

A84-10848
AN ANALYSIS OF THE MECHANISMS OF THE ACCELERATING EFFECT OF THE VAGUS NERVE ON THE WORK OF THE HEART [K ANALIZU MEKHANIZMOV USKORITEL'NOGO VLIIANIIA BLUZHDAIUSHCHEGO NERVA NA RABOTU SERDTSA]
V M SMIRNOV (II Moskovskii Gosudarstvennyi Meditsinskii Institut, Moscow, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1101-1104 In Russian refs

A84-10849
THE ROLE OF TEMPORAL PARAMETERS OF THE INTERSPIKE INTERVAL IN THE CODING OF TEMPERATURE [O ROLI VREMENNYKH PARAMETROV MEZHSPAIKOVOGO INTERVALA V KODIROVANII TEMPERATURY]
A M POLIAKOV and V V USHAKOV (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Moscow, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 69, Aug 1983, p 1108-1112 In Russian refs

The characteristics of the tonic activity of neurons are studied using a model of the neuron-receptor tension in the river crayfish The mechanisms which determine the intensity of the firing as a function of temperature are analyzed The investigation employs the model of these processes in the zone of neuron generation during repeated firings developed by Poliakov and Ushakov (1982) The findings of this study demonstrate that the electrogenic sodium pump is the mechanism responsible for the temperature sensitivity of both specific temperature receptors and mechanoreceptors However, the high temperature dependence of the working of this mechanism exerts an influence on the tonic activity by means of action on the dynamic component of the interspike intervals rather than on the static component of the membrane polarization
N B

A84-11115
PSEUDO-CRITICAL HEAT CAPACITY OF SINGLE LIPID BILAYERS
I HATTA, K SUZUKI (Nagoya University, Nagoya, Japan), and S IMAIZUMI (Suzuka College of Technology, Suzuka, Japan) Physical Society of Japan, Journal (ISSN 0031-9015), vol 52, Aug 1983, p 2790-2797 refs

The results of ac calorimetry measurements of the heat capacity of single lipid bilayers of dipalmitoylphosphatidylcholine in aqueous suspension are presented A different result from that found using differential scanning calorimetry is obtained, especially for the anomaly at the first-order main transition The pseudocritical heat capacity is tentatively analyzed in terms of critical-exponent expressions Pippard's relation is used to compare the pseudocritical amplitude of the heat capacity with the results for the thermal expansion and the ultrasound velocity
C D

A84-11253
PROTEIN PHOSPHORYLATION IN THE BRAIN
E J NESTLER and P GREENGARD (Yale University, New Haven, CT) Nature (ISSN 0028-0836), vol 305, Oct 13, 1983, p 583-588 refs

Recent evidence for the critical role of protein phosphorylation in neuronal function is summarized The activation of one of the two types of brain kinases, either cyclic AMP or cyclic GMP, results in the phosphorylation of specific substrate proteins which eventually cause specific biological responses The phosphorylated proteins may have regulatory and/or biochemical effects that involve short-term and long-term memory or gene expression A causal relationship has been established between cyclic AMP-dependent protein phosphorylation and the physiological response of excitable cells Two methods have been developed for identifying phosphorylated bands appearing in excited cell proteins, and methods are being explored for characterizing the substrate proteins that can be phosphorylated, thereby raising the possibility that the molecular basis of neurophysiological phenomena can be understood in terms of the protein kinase/protein phosphatase system that controls the phosphorylation process
M S K

A84-11261
ENDOTHELIUM-DEPENDENT RELAXATION OF CORONARY ARTERIS BY NORADRENALINE AND SCROTONIN
T M COCKS and J A ANGUS (Baker Medical Research Institute, Prahan, Victoria, Australia) Nature (ISSN 0028-0836), vol 305, Oct 13, 1983, p 627-630 Research supported by the National Health and Medical Research Council of Australia refs

The constrictor amines noradrenaline (NA) and serotonin are reported to release a vasodilator substance from endothelial cells that can act as a physiological antagonist of the smooth muscle contractile responses The study was performed on the circumflex coronary artery of pig and dog hearts cut into ring segments The endothelium was removed from some of the samples and all specimens were exposed to NA or adrenaline The contractile responses were monitored The data obtained indicated that stimulation of alpha2-andrenoceptors and 5-HT receptors located on the endothelial cells lining the large arteries produced relaxation in the vessels Attenuation or loss of the vasodilator causing the relaxation is suggested to be responsible for pathological conditions such as variant angina
M S K

A84-11268
ADRENERGIC ACTIVATION OF TRIODOTHYRONINE PRODUCTION IN BROWN ADIPOSE TISSUE
J E SILVA (Brigham and Women's Hospital, Boston, MA) and P. R LARSEN (Harvard University, Boston, MA) Nature (ISSN 0028-0836), vol 305, Oct 20, 1983, p 712, 713 refs
(Contract PHS-AM-18616)

The results of a study of the effects of noradrenaline and acute cold exposure on brown adipose tissue (BAT) in rats are reported The rats were injected with catecholamine agonists or antagonists, exposed to 5 C for 4 hr, then decapitated. BAT was extracted and homogenized and assayed for 5(prime)deiodinase (5'D-II) Noradrenaline was determined to produce an order of magnitude increase in the BAT 5'D-II activity 2 hr after injection, but did not stimulate 5'D-II production in cerebrocortical or pituitary tissue The cold stress also increased 5'D-II activity, but not in consistent amounts in cerebrocortical tissue It was concluded that both noradrenaline and cold stress produce a rapid increase in 5'D-II activity due to alpha(1)-adrenergic receptors The effect of cold stress could be blocked by catecholamine injection, which did not inhibit stimulation by noradrenaline
M S K

A84-11326
RHEOENCEPHALOGRAPHY - BIOPHYSICAL FOUNDATIONS, INFORMATION CONTENT, AND LIMITS OF APPLICATION [REOENTSEFALOGRAFIIA - BIOFIZICHESKIE OSNOVY, INFORMATIVNOST', GRANITSY PRIMENENIIA]
IU E MOSKALENKO and G B VAINSHTEIN (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 707-722 In Russian refs

It is noted that the theory underlying rheoencephalography (REG) includes certain unexamined and questionable propositions, the clarification of which is becoming more important with the widespread use of this method in clinical practice A satisfactory interpretation of individual REG indicators in terms of intracranial hemodynamics and the clear delineation of the informational limits of this method are possible only when REG indicators are correlated with the most significant indicators of brain circulation It is also noted that, as the practice of the implantation of intracerebral electrodes becomes more widespread, the necessity for deep (local) REG becomes greater Of especial importance in this area is the unification of measurement conditions and techniques, procedures for the processing and interpretation of REG waves, and the application of graded directed functional loads B J

A84-11349
REGULATORY FUNCTIONS OF ACTIN IN THE CELL [REGULIATORNYE FUNKTSII AKTINA V KLETKE]
B F POGLAZOV (Akademiia Nauk SSSR, Institut Biokhimii, Moscow, USSR) Akademiia Nauk SSSR, Izvestiia, Seriia Biologicheskaia (ISSN 0002-3329), Sept-Oct 1983, p 667-677 In Russian refs

Existing data pertaining to the concentration of actin in muscle and nonmuscle cells are analyzed, noting that actin is present in all living cells in considerable amounts (10-15 percent) The interaction of actin with various proteins is examined, and an analysis is made of data concerning the activating effect of G-actin on the kinase of phosphorylase and glyceraldehyde-e-phosphate-dehydrogenase These data suggest that actin is a protein coordinator of processes in the cell B J

A84-11366
GENERATION OF ELECTRIC POTENTIALS ON MITOCHONDRIAL MEMBRANES DURING THE HYDROLYSIS OF INORGANIC PYROPHOSPHATE [GENERATSIIA ELEKTRICHESKIKH POTENTSIALOV NA MEMBRANE MITOKHONDRII PRI GIDROLIZE NEORGANICHESKOGO PIROFOSFATA]
V F DUKHOVICH, I S KULAEV, S E MANSUROVA, V P SKULACHEV, and IU A SHAKHOV (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) Akademiia Nauk SSSR, Doklady (ISSN 0002-3264), vol 272, no 2, 1983, p 496-499 In Russian refs

A84-11556
THE EFFECT OF ISCHEMIA AND POSTISCHEMIC RESTORATION OF BLOOD CIRCULATION ON THE ULTRASTRUCTURE OF THE NEURONS [VLIIANIE ISHEMII I POSTISHEMICHESKOGO VOSSTANOVLENIIA KROVOOBRASHCHENIIA NA UL'TRASTRUKTURU NEIRONOV]
N N BOGOLEPOV, I I MARSHALA, N I PAVLOVSKAIA, A FERCHAKOVA, and IU ORENDACHOVA (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR, Slovak Academy of Sciences, Neurobiology Institute, Kosice, Czechoslovakia) Arkhiv Anatomii, Gistologii i Embriologii (ISSN 0004-1947), vol 84, May 1983, p 5-12 In Russian refs

A84-11557
A COMPARATIVE STUDY OF DENDRITIC SPINES IN THE PRINCIPAL CORTICAL REGIONS OF THE TURTLE FOREBRAIN [SRAVNITEL'NOE ISSLEDOVANIE DENDRITNYKH SHIPIKOV V OSNOVNYKH KORKOVYKH ZONAKH PEREDNEGO MOZGA CHEREPAKH]
T. V DAVYDOVA and N. V GONCHAROVA (Akademiia Nauk SSSR, Institut Evoliutsionnoi Morfologii i Ekologii Zhivotnykh, Moscow, USSR) Arkhiv Anatomii, Gistologii i Embriologii (ISSN 0004-1947), vol 84, May 1983, p 17-23 In Russian refs

A84-11558
A QUANTITATIVE EVALUATION OF VARIOUS CARDIAC REGIONS IN YOUNG AND OLD WHITE RATS [KOLICHESTVENNAIA OTSENKA RAZNYKH OTDELOV SERDTSA MOLODYKH I STARYKH BELYKH KRYS]
M S GNATIUK (Ternopol'skii Meditsinskii Institut, Ternopol, Ukrainian SSR) Arkhiv Anatomii, Gistologii i Embriologii (ISSN 0004-1947), vol 84, May 1983, p 33-36 In Russian refs

The age-related changes in the macrometric and micrometric parameters of the heart were studied in 35 young white rats (6-8 months) and 40 old white rats (24-28 months) Results show that all of the cardiac regions of the old rats underwent hypertrophy with a predominant increase in the size of the left ventricle The stromal elements were also found to increase in size, as did the diversity of the metric characteristics of the myocytes The blood supply deteriorated, which significantly decreased the compensatory-adaptive potential of the myocardial regions N B

A84-11559
THE DEVELOPMENT AND STRUCTURE OF THE LYMPHOEPITHELIAL PHARYNGEAL RING OF THE MACACUS RHESUS [RAZVITIE I STROENIE LIMFOEPITELIAL'NOGO GLOTOCHNOGO KOL'TSA MACACUS RHESUS]
O L ZHARIKOVA (Minskii Meditsinskii Institut, Minsk, Belorussian SSR) Arkhiv Anatomii, Gistologii i Embriologii (ISSN 0004-1947), vol 84, April 1983, p 44-52 In Russian refs

A84-11560
THE MICROCIRCULATORY BED OF THE LIVER ACCORDING TO DATA OF SCANNING ELECTRON MICROSCOPY [MIKROTSIRKULIATORNOE RUSLO PECHENI PO DANNYM RASTROVOI ELEKTRONNOI MIKROSKOPII]
IU E VYREMKOV and S I KATAEV (Tsentral'nyi Institut Usovershenstvovaniia Vrachei, Moscow, USSR) Arkhiv Anatomii, Gistologii i Embriologii (ISSN 0004-1947), vol 84, April 1983, p 61-70 In Russian refs

A84-11567
BIOCHEMICAL CRITERIA FOR EVALUATING CARDIOTOXIC EFFECTS [BIOKHIMICHESKIE KRITERII OTSENKI KARDIOTOKSICHESKOGO DEISTVIIA]
M P. CHEKUNOVA and A D FROLOVA (Nauchno-Issledovatel'skii Institut Gigieny Truda i Profzabolevanii, Leningrad, USSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 11, 12 In Russian refs

A set of biochemical methods characterizing the biological oxidation of heart muscle, the permeability of lysosome membranes of the myocardium, and systems regulating metabolism processes is examined with the aim of delineating the selectivity of cardiotoxic effects The dose-time-effect relationship is assessed for the example of cobalt It is recommended that short-term (two-week) experiments be performed to predict the selectivity of the cardiotoxic effects of metals B J

A84-11575
AN EVALUATION OF THE BACTERIAL ENVIRONMENT ON MOTOR BUSES [KHARAKTERISTIKA MIKROBNOGO FAKTORA V USLOVIIAKH PASSAZHIRSKIKH AVTOBUSNYKH PEREVOZOK]
B A PLASTUNOV, I I DATSENKO, V S PETRUS, and V A PLASTUNOV (L'vovskii Meditsinskii Institut, L'vovskii Nauchno-Issledovatel'skii Institut Epidemiologii i Mikrobiologii, Lvov, Ukrainian SSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 84-86 In Russian refs

A84-11753#
UTILISATION OF THE EUROPEAN RETRIEVAL CARRIER EURECA FOR LIFE SCIENCE RESEARCH
G SEIBERT (ESA, Paris, France) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983, IAF Paper 83-169 9 p

The design features, mission profiles, and functions of the EURECA free flying platform, to be launched from the Orbiter into a 500 km orbit, then return for retrieval at a later date, are described The 2 2 m spacecraft will weigh about 3 5 tons, feature a 400 N thruster and propellant sufficient for a 400 m/sec velocity change, and interface with the Orbiter RMS arm The missions will support biology, exobiology, and materials processing experiments The first mission will carry a protein crystallization experiment to provide protein crystals for X ray diffraction studies, botany experiments to determine the effect of gravity on plant growth, an experiment to determine the long-term effect of space radiation on biological materials, and the protection afforded biological materials by shielding equipment The EURECA platform will maintain orbit for six months before lowering orbit for a passive capture by the Orbiter M S K

A84-11758#
THE FROG-STATOLITH-EXPERIMENT (STATEX) OF THE GERMAN SPACELAB MISSION D1 - SCIENTIFIC BACKGROUND AND TECHNICAL DESCRIPTION
J NEUBERT, W BRIEGLEB, and A SCHATZ (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Institut fuer Flugmedizin, Cologne, West Germany) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 6 p refs
(IAF PAPER 83-184)

The Spacelab D1 mission incorporates the frog statolith experiment, designated 'STATEX' Frog embryos and tadpoles at various developmental stages will develop under near-weightlessness during 140 hrs of the mission STATEX constitutes one of a number of experiments aimed at establishing the development and function of gravity-sensitive structures in different organisms, and the results obtained may be helpful in understanding the space motion sickness to which half of all astronauts appear susceptible O C

A84-11759#
RESPECTIVE ROLE OF MICROGRAVITY AND COSMIC RAYS ON PARAMECIUM TETRAURELIA CULTURED ABOARD SALYUT 6
H PLANEL, R TIXADOR, G RICHOILLEY, G GASSET, and J TEMPLIER (Toulouse III, Universite, Toulouse, France) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 5 p refs
(IAF PAPER 83-186)

Paramecium tetraurelia cultured aboard Salyut 6 have shown an increase in cell growth rate, cell volume, water content and changes in electrolyte content Additional experiments, carried out in balloon flight and on earth, showed that the stimulating effect observed on cell proliferation is related to exposure to cosmic rays Other changes seem to be due to a direct effect of microgravity on cell Mechanism of gravity action on cell is discussed Author

A84-12060
CARDIOVASCULAR INJURY FROM BLUNT THORACIC IMPACT OF EPINEPHRINE AND ISOPROTERENOL INJECTED RABBITS
D C VIANO (GM Research Laboratories, Warren, MI) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 988-993 refs

Nonpenetrating thoracic impact of 10 anesthetized rabbits injected with epinephrine and experiencing transient hypertension resulted in four incidents of traumatic rupture of the left ventricle Impact of similar severity did not produce ventricular injury in either 11 control or 10 animals injected with isoproterenol and experiencing transient hypotension Immediate death and aortic rupture were most frequent in epinephrine injected animals Impact during cardiac systole produced more frequent cardiovascular lesions in the epinephrine-injected animals than during diastolic loading, whereas the cardiac phase was not a significant factor in the thoracic injuries of the control or isoproterenol injected animals The experiments indicate that the precondition of the myocardium is an important factor in the incidence of ventricular and major vascular rupture in nonpenetrating thoracic impact Author

A84-12063
PHARMACOKINETICS OF PENTOBARBITAL UNDER HYPERBARIC AND HYPERBARIC HYPEROXIC CONDITIONS IN THE DOG
W G KRAMER (Houston, University, Texas Medical Center, Houston, TX), D W WELCH, W P FIFE, B N CHAIKIN, C MEDLOCK, and D R GROSS (Texas A & M University, College Station, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1005-1008 refs
(Contract PHS-210-81-6103, NOAA-NA-81AAD00092)

High hydrostatic pressure has been shown to reverse the anesthetic effects of barbiturates However, attempts to distinguish between two possible causes of this reversal, changes in drug dispositon or changes in drug-receptor interaction, have not been reported This study examined the possible effects of hyperbaria and hyperbaric hyperoxia on the distribution and clearance of pentobarbital in the dog The drug was administered to six mixed-breed dogs as a 30 mg/kg i v bolus at 1 ATA breathing air, 6 ATA breathing air, and 2 8 ATA breathing 100 percent oxygen, with serial blood sampling for 12 h Pharmacokinetic and statistical analyses showed no significant effects of hyperbaria or hyperbaric hyperoxia on the total plasma clearance, volume of distribution or elimination half-life If pressure reversal of barbiturate anesthesia occurs at these pressures, changes in the disposition of the drug are not the causative factors Author

A84-12065* Louisville Univ , Ky
RAT HINDLIMB MUSCLE RESPONSES TO SUSPENSION HYPOKINESIA/HYPODYNAMIA
X J MUSACCHIA, J M STEFFEN, and D R DEAVERS (Louisville, University, Louisville, KY) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1015-1020 refs
(Contract NSG-2191, NSG-2325)

Hypokinetic/hyupodynamic (H/H) whole body suspension of rats eliminates hindlimb load bearing functions while permitting continued use of the forelimbs Responses of hindlimb muscles were assessed in terms of absolute and relative weights during 1 and 2 weeks of H/H suspension Muscle mass loss was in the order soleus greater than gastrocnemius equal to plantaris greater than extensor digitorum longus (EDL) The soleus, a postural antigravity muscle composed mainly of slow twitch fibers, was most sensitive, losing 35 and 45 percent of its weight during the first and second weeks, respectively The gastrocnemius and plantaris showed losses during the first week but no significant loss during the second wee The EDL showed little or no weight loss During post suspension recovery all muscles showed a weight gain H/H suspended rats failed to grow, following removal from suspension they gained weight linearly, comparable to controls Products of muscle metabolism including urea, ammonia, and 3-methylhistidine increased in the urine during H/H suspension and were significantly reduced approaching control levels during

recovery This suspension model offers considerable promise for comparison with H/H responses during weightlessness Author

A84-12066
NEUROPHYSIOLOGICAL EFFECTS OF -X IMPACT ACCELERATION
M S WEISS and M D BERGER (U S Navy, Naval Biodynamics Laboratory, New Orleans, LA) (Joint Committee on Aviation Pathology, Scientific Session, 13th, Toronto, Canada, Oct 1982) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1023-1027 refs

In 19 experiments, eight unanesthetized Rhesus monkeys, with torsos restrained in a seated position, and with head and neck free to move were subjected to peak sled accelerations in the -X direction ranging from 42 m/sq sec to 963 m/sq sec Recordings of cortical somatosensory evoked potentials were made using recording electrodes chronically implanted over the somatosensory cortex Electrical pulse stimuli were delivered at a rate of 5 Hz through spinal electrodes located at L1-L2 Evoked potentials were recorded prior to impact, through the impact event, and subsequent to impact, then subjected to quantitative analysis procedures which included normalized cross-correlation and exponential regression The results of this analysis suggest a neurophysiological effect which holds promise as an indicator of a pre-injurious central nervous system condition This effect is an immediate increase of 2 percent to 5 percent in the latency at peak sled accelerations in the region of 600 m/sq sec This is consistent with previous findings and provides the basis for applying these techniques to human volunteer experiments Previously announced in STAR as N83-19433 Author

A84-12070
FETAL DEVELOPMENT - EFFECTS OF DECOMPRESSION SICKNESS AND TREATMENT
S C GILMAN, M E BRADLEY (U S Navy, Naval Medical Research Institute, Bethesda, MD), K M GREENE (U S Navy, Naval Medical Research and Development Command, Bethesda, MD), and G J FISCHER (Washington State University, Pullman, WA) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1040-1042 • Navy-supported research refs

Pregnant hamsters were exposed to 7 1 ATA (200 fsw) of compressed air breathing for 40 min Comparisons were made between three groups of pregnant hamsters (1) those that developed decompression sickness (DCS), (2) those that did not, and (3) a control (non-divided) group As reported previously maternal DCS if untreated resulted in frequent and severe teratogenic effects Furthermore, fetuses from those females who apparently did not develop DCS were significantly smaller at term than fetuses from the control animals However, fetuses from females that were treated for DCS did not differ from controls This suggests that 40-min, 200-fsw dives per se are detrimental to fetal development in hamsters Author

A84-12151
MATHEMATICAL MODELING OF ECOLOGICAL PROCESSES [MATEMATICHESKOE MODELIROVANIE EKOLOGICHESKIKH PROTSESSOV]
F N SEMEVSKII and S M SEMENOV Leningrad, Gidrometeoizdat, 1982, 280 p In Russian refs

Mathematical models designed expressly for biocenoses are discussed The underlying mathematics is presented, and it is shown how the models can be used in analyzing various types of ecological problems A biocenosis in equilibrium is regarded as a system made up of species in coadaptation, with the individuals of each species maximally adapted to the habitat Particular attention is given to a mathematical analysis of this system, which is based on the principle of optimality With a change in the values of the independent variables describing the habitat, in particular the level of anthropogenic action on the biocenosis, the natural state of equilibrium is upset Exogenetic succession, a transitional process leading to a new state of equilibrium, then begins The biocenosis responds in two ways to an increase in anthropogenic effects by a change in the populations and by changes in the types of individuals making up the several species The mathematical modeling of exogenetic succession is discussed in detail C R

A84-12156
BIOCHEMICAL MECHANISMS OF STRESS [BIOKHIMICHESKIE MEKHANIZMY STRESSA]
L E PANIN Novosibirsk, Izdatel'stvo Nauka, 1983, 234 p In Russian refs

The work examines mechanisms of the nonspecific resistance of the body in different stress phases according to Selye (1936) An analysis is made of the restructuring of the endocrine regulation, providing for transition to a new level of homeostasis Homeostasis is considered as a functional system of the body in accordance with Anokhin's ideas Particular consideration is given to the role of cyclic nucleotides in metabolism regulation, lipoproteins and the regulation of intracellular metabolism, and the participation of lysosomes in adaptation and recovery processes B J

A84-12274* San Francisco Univ , Calif
THE GOLGI-HORTEGA-LAVILLA TECHNIQUE, WITH A USEFUL ADDITIONAL STEP FOR APPLICATION TO BRAIN TISSUE AFTER PROLONGED FIXATION
F E DAMELIO (San Francisco, University, San Francisco, CA) Stain Technology (ISSN 0038-9153), vol 58, no 2, 1983, p 79-84 refs
(Contract NCC2-47)

A84-12425* District of Columbia Univ , Washington, D C
VACUUM UV LASER INDUCED SCISSION OF SIMIAN VIRUS 40 DNA
M JOHNSON-THOMPSON (District of Columbia, University, Washington, DC), J B HALPERN, W M JACKSON (Howard University, Washington, DC), and J GEORGE (Georgetown University, Washington, DC) (U S Navy, Conference on Lasers as Reactants and Probes in Chemistry, Washington, DC, May 12-14, 1982) Photochemistry and Photobiology (ISSN 0031-8655), vol 38, 1983, p 1-8 refs
(Contract NIH-RR-08005-10, NSF CHE-78-05375-A01, NAG5-17)

A84-12568
THE DESTRUCTION OF A BILAYER LIPID MEMBRANE AS A RESULT OF ELECTRICAL BREAKDOWN [RAZRUSHENIE BLM V REZUL'TATE ELEKTRICHESKOGO PROBOIA]
S I SUKHAREV, V B ARAKELIAN, I G ABIDOR, L V CHERNOMORDIK, and V F PASTUSHENKO (Akademiia Nauk SSSR, Institut Elektrokhimii, Moscow, USSR, Akademiia Nauk Armianskoi SSR, Fizicheskii Institut, Yerevan, Armenian SSR) Biofizika (ISSN 0006-3029), vol 28, Sept -Oct 1983, p 756-760 In Russian refs

It is shown that, at the initial stage of the destruction of a bilayer lipid membrane (BLM) due to electrical breakdown, the change of the current I during time t has an exponential character and only slightly depends on the voltage on the BLM This finding agrees with the ideas about the evolution of sufficiently large (supercritical) pores by the energetic profile of the system, which corresponds to zero voltage in the region of the pores The coefficients of pore diffusion in the space of the radius and lateral viscosity of the BLM, calculated from the slope of the dependence lg I (t) are found to be close to the coefficient of lipid self-diffusion and lateral viscosity of lipid bilayers obtained by different methods N B

A84-12569
AN INVESTIGATION OF THE INTERACTION OF POLY A WITH PHOSPHOLIPID MEMBRANES USING AN IR SPECTROSCOPIC METHOD [IZUCHENIE VZAIMODEISTVIIA POLIA S FOSFOLIPIDNYMI MEMBRANAMI METODOM IK-SPEKTROSKOPII]
T V MALTSEVA, E E BICHENKOV, I K KOROBEINICHEVA, and V G BUDKER (Akademiia Nauk SSSR, Institut Organicheskoi Khimii, Novosibirsk, USSR) Biofizika (ISSN 0006-3029), vol 28, Sept -Oct 1983, p 766-770 In Russian refs

A84-12570
THE EFFECT OF A CONSTANT MAGNETIC FIELD ON THE PROCESSES OF PEROXIDE OXIDATION OF LIPIDS IN PHOSPHOLIPID MEMBRANES [VLIIANIE POSTOIANNOGO MAGNITNOGO POLIA NA PROTSESSY PEREKISNOGO OKISLENIIA LIPIDOV V FOSFOLIPIDNYKH MEMBRANAKH]
V M ARISTARKHOV, L L KLIMENKO, A I DEEV, and E V IVANEKHA (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, II Moskovskii Gosudarstvenyi Meditsinskii Institut, Moscow, USSR) Biofizika (ISSN 0006-3029), vol 28, Sept -Oct 1983, p 800-806 In Russian refs

A84-12571
THE HORMONAL REGULATION OF CALCIUM CHANNELS OF CARDIAC MEMBRANES [GORMONAL'NAIA REGULIATSIIA KAL'TSIEVYKH KANALOV MEMBRANY V SERDTSE]
A K FILIPPOV and V I POROTIKOV (Nauchno-Issledovatel'skii Institut po Biologicheskim Ispytaniiam Khimicheskikh Soedinenii, Kupavna, USSR) Biofizika (ISSN 0006-3029), vol 28, Sept -Oct 1983, p 821-825 In Russian refs

Results of experiments on the trabeculae of the auricle of frogs using a method of potential recording show that prostaglandin E1 (PGE1) increases the quantity of working calcium channels in the membrane PGE1, PGF2-alpha, acetylcholine, indometacin (an inhibitor of PG synthesis) and aminazine (an inhibitor of calmodulin) do not decrease the novodrin-induced strengthening of the Ca current These findings indicate that a change in the level of cAMP within the cell modulates the quantity of working Ca channels PG and calmodulin are not needed for the stimulation of adenylate cyclase (AC) by novodrin, and the effect of acetylcholine is not connected with the inhibition of AC N B

A84-12572
THE EFFECT OF MECHANICAL CONDITIONS ON CHRONOINOTROPY OF THE MYOCARDIUM [VLIIANIE MEKHANICHESKIKH USLOVII NA KHRONOINOTROPIIU MIOKARDA]
V IA IZAKOV and S V ZHELAMSKII (Nauchno-Issledovatel'skii Institut Gigieny Truda i Profesional'nykh Zabolevanii, Sverdlovsk, USSR) Biofizika (ISSN 0006-3029), vol 28, Sept -Oct 1983, p 853-857 In Russian refs

The dependence of mechanical activity on the rhythm in isometric, isotonic, and auxotonic regimes is studied in papillary muscles of rabbits by using the input sequence of the interstimulus intervals of the random process It is shown that these regimes differed in their coefficients of amplitude variation of mechanical activity at the same input dispersion, the dependence of the mechanical activity in a given cycle on the amplitude of the previous contraction, and the dependence of the force interval calculated from regression equations The reasons for these differences are examined and the use of chronoinotropic indicators as a measure of contractility is discussed N B

A84-12652
EXERCISE TRAINING AND GLUCOSE UPTAKE BY SKELETAL MUSCLE IN RATS
J L IVY, J C YOUNG, J A MCLANE, R D FELL, and J O HOLLOSZY (Washington, University, St Louis, MO) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1393-1396 refs
(Contract NIH-AM-18986)

Glucose uptake rates at various insulin concentrations were compared in perfused hindlimbs of sedentary and endurance exercise-trained (treadmill-running) rats Rates of glucose uptake by hindlimb muscles were about 50 percent higher in the trained than in the untrained animals on the day after the trained rats' last training session However, by the 2nd day after the trained rats' last training session (40-46 h without exercise), there were no significant differences in glucose uptake rates between the trained and the sedentary rats' hindlimb muscles either in the *absence of insulin, at physiological insulin levels, or at a maximally* effective insulin concentration A bout of exercise, consisting of swimming to fatigue on the day before study, and muscle contraction induced by electrical stimulation, both resulted in significant increases in glucose uptake by the rats' perfused hindlimbs, the magnitude of these increases were similar in the trained and untrained rats It is concluded that differences in muscle glucose uptake between trained and untrained rats are due to residual effects of the last exercise session and that training does not result in a long-term adaptive increase in sensitivity of muscle to insulin Author

A84-12654
AGE-RELATED RESPONSES TO MILD RESTRAINT IN THE RAT
B A RATTNER, S D MICHAEL, and P D ALTLAND (National Institute of Arthritis, Diabetes and Digestive and Kidney Diseases, Bethesda, MD, New York, State University, Binghampton, NY) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1408-1412 refs

Immature, postpubertal, young adult, and middle-aged rats were lightly restrained for 4 h Relative to untreated controls, restraint uniformly reduced body weight and plasma luteinizing hormone concentration and elevated plasma corticosterone concentration in all age groups However, restraint increased activities of plasma alanine and aspartate aminotransferase, cratine phosphokinase, and fructose-diphosphate aldolase in only immature and middle-aged animals This age-related release of tissue enzymes is hypothesized to reflect enhanced responsiveness to catecholamines in immature rats, and possible ischemia related to diminished vasodilatory activity in middle-aged rats On the basis of these changes, tolerance to restraint in postpubertal and young adults appears to be slightly greater than that of immature and middle-aged rats Author

A84-12658
INHIBITION OF GLYCOLYSIS POTENTIATES HYPOXIC VASOCONSTRICTION IN RAT LUNGS
H S STANBROOK and I F MCMURTRY (Colorado, University, Denver, CO) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1467-1473 refs
(Contract NIH-HL-14985)

A84-12659
METABOLIC ACIDS AND H(+) REGULATION IN BRAIN TISSUE DURING ACCLIMATIZATION TO CHRONIC HYPOXIA
T I MUSCH, J A DEMPSEY, C A SMITH, G S MITCHELL, and N T BATEMAN (Wisconsin, University, Madison, WI) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1486-1495 refs
(Contract NIH-HL-15469, NIH-HL-24429, DAMD17-77-C-7006)

The regulation of brain-cortex and brain-stem metabolic-acid (MA) and intracellular-H(+) concentrations during acute (A) and chronic (C), moderate (M) and severe (S) hypoxia (H) is investigated in groups of male rats Brain lactates increase in AMH and ASH, remain high in CMH, decrease in CSH, and remain high after normoxia is restored after CH Brain pH is unaffected by MH but becomes acid in SH, normalizing after 72 h The role of CO2 in these effects is studied by increasing the fraction of CO2 inspired to prevent hypocapnia in AH or to restore normocapnia during post-H normoxia Hypocapnia accounts for all brain-lactate-concentration changes in MH and 40-60 percent of the changes in SH It is suggested that the changes observed in plasma and brain MA and plasma HCO3(-) concentration during CH can account for acidification of cerebral interstitial fluid Since the time course of this process is different for MH and SH, the correlation between pH and ventilatory acclimatization found by Fencl et al (1979) is not confirmed T K

A84-12661
PLATELETS AND LEUKOCYTES IN THE LUNGS AFTER ACUTE HYPOBARIC HYPOXIA
G COATES, C NAHMIAS, and A THIND (McMaster University, Hamilton, Ontario, Canada) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1536-1541 Sponsorship Medical Research Council refs
(Contract MRC-MA-6242)

The effects of decompression to 440 or 350 torr for 18 or 40 h on the aggregation and embolization of platelets and leukocytes in the lungs was studied in rabbits Fe-59-labeled RBC and either Cr-51-labeled platelets or In-111-labeled WBC were injected 2 h prior to decompression in a hypobaric chamber, gamma counts were determined in venous blood and homogenized aliquots of lung and liver after rapid recompression Platelet function and the sensitivity of the method were confirmed in separate ADP-injection trials Decompression did not affect either the lung/liver platelet-count ratio, or the (lung-platelet/lung RBC)/(blood platelet/blood RBC) count ratio but effected a significant (P less than 0 005) decrease in both lung-WBC count ratios Circulating granulocytes in another group of rabbits increased from 3 3 + or - 1 6 x 10 to the 9th/l before decompression (326 torr for 18 h) to 5 3 + or - 2 1 x 10 to the 9th/l afterward The possible role of this peripheral granulocytosis in the development of high-altitude pulmonary edema is discussed T K

A84-12663* Indiana Univ , Bloomington
THERMOREGULATION IN ERYTHROCEBUS PATAS - A THERMAL BALANCE STUDY
M A KOLKA and R S ELIZONDO (Indiana, University, Bloomington, IN) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1603-1608 refs
(Contract NIH-AM-16703, NCA2-OR-335-001)

The ability of nonacclimated patas monkeys (Erythrocebus patas) to maintain a constant core temperature at six ambient temperatures from 15 to 40 C is investigated experimentally in 3 male and 3 female animals weighing 3 9-6 0 kg The monkeys were permitted to reach equilibrium at the test Ta for at least 2 h before O2-uptake, CO2 output, weighted skin temperature (Tsk), rectal temperature (Tre), respiratory evaporative water loss (Eresp) and total evaporative water loss (Etot) were measured for 30 min The results are presented in tables and graphs Tsk is found to vary (from about 30 7 to about 37 2 C) with Ta, while Tre increases only from 37 6 to 38 4 C, Etot increases from about 9 to about 76 W/sq m, mainly due to eccrine sweating Total body conductance, Tsk, and Tre are shown to be lower (the conductance significantly) at 40 C than those of rhesus monkeys It is suggested that the enhanced heat tolerance of E patas makes this species an appropriate subject for further studies of primate temperature regulation T K

N84-10723# Polish Academy of Sciences, Warsaw
CONFERENCE ON ULTRASONICS IN BIOLOGY AND MEDICINE, UBIOMED 6: REPORT SUMMARIES
1983 58 p refs Conf held in Warsaw, 19-23 Sep 1983
(ISSN-0208-5658) Avail Issuing Activity

Bovine kidney cell cultures were used as an experimental model for a complex study of the biophysical mechanism of ultrasonic action The cell cultures were grown in Minimum Essential Medium supplemented with 5-10% calf serum in Roux bottles Suspensions of 1,000,000 cells in ml using trypsin were prepared The sonication of cells at low and very low ultrasound intensity in 37 C water bath was carried out In the first series of experiments the morphological and functional changes of cells immediately after sonication were evaluated In the second series of experiments the sonicated cells were seeded in Roux bottles and grown in optimal conditions In both series of experiments the changes in morphology and viability of cells influenced by ultrasound of low and very low intensity levels were observed The possible mechanisms of ultrasonic action on cell cultures are discussed N W

N84-10724*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
THE GROWTH OF PARACOCCUS HALODENITRIFICANS IN A DEFINED MEDIUM
L I HOCHSTEIN and G A TOMLINSON (Santa Clara Univ , Calif) Oct 1983 16 p refs
(NASA-TM-84411, A-9487, NAS 1 15 84411) Avail NTIS HC A02/MF A01 CSCL 06C

A synthetic medium, consisting of inorganic salts and any of a number of carbon sources, supported the aerobic growth of Paracoccus halodenitrificans when supplemented with thiamine The same medium plus a nitrogenous oxide supported anaerobic growth when additionally supplemented with methionine The observation that vitamin B12 or betaine replaced methionine suggested that P halodenitrificans had a defect in the cobalamin dependent pathway for methionine biosynthesis, as well as the inability to synthesize betaine when growing anaerobically Author

N84-10725# Air Force Academy, Colo
STABILITY OF RAT BRAIN GLUTAMINE SYNTHETASE TO OXYGEN TOXICITY (OXYGEN AT HIGH PRESSURE) Final Report
J T WEBB Jul 1983 17 p refs
(Contract AF PROJ 2308)
(AD-A131049, USAFA-TR-83-12) Avail NTIS HC A02/MF A01 CSCL 06T

Enzyme assays using the gamma-glutamyl transferase method provided estimates of glutamine synthetase activity in rat brain homogenates subjected to a pure oxygen environment for over three hours No loss of activity was detected versus controls subjected to air or pure nitrogen This finding supports the lack of any connection between convulsions caused by in vivo inhibition of glutamine synthetase and convulsions caused by oxygen toxicity (oxygen at high pressure) Author (GRA)

N84-10726# Montana State Univ, Bozeman Dept of Civil Engineering and Engineering Mechanics
MICROBIAL FOULING AND ITS EFFECT ON POWER GENERATION Final Report, 15 May 1980 - 14 May 1983
W G CHARACKLIS, F L ROE, M H TURAKHIA, and N ZELVER Jul 1983 181 p refs
(Contract N00014-80-C-0475)
(AD-A131084) Avail NTIS HC A09/MF A01 CSCL 13J

This report describes results of laboratory experiments conducted to determine the influence of fouling biofilm formation on heat transfer resistance and fluid frictional resistance The research is directed at problems of power generation on ship board GRA

N84-10727# Brookhaven National Lab, Upton, N Y
THE DESIGN AND OPERATION OF SYSTEMS FOR INHALATION EXPOSURE OF ANIMALS
R T DREW 1982 43 p refs
(Contract DE-AC02-76CH-00016)
(DE83-015388, BNL-33103) Avail NTIS HC A03/MF A01

The development, design, and operation of systems for exposure of animals to airborne pollutants are discussed The most significant point is that there are no set ways to perform inhalation studies Many methods and techniques are acceptable The specific protocol developed depends on the objectives of the study or the questions being asked Many chamber designs and operations are suitable to answer specific questions The most important point for an investigator to understand is the limitations of the system he has chosen A wide variety of chamber shapes and sizes are currently in use and are appropriate under certain circumstances In conclusion, those beginning to design facilities or chambers are encouraged to consult with those who are currently operating such systems prior to beginning construction DOE

N84-10728# Oak Ridge National Lab, Tenn
NONPARAMETRIC ESTIMATION OF THE DISTRIBUTION OF TIME TO ONSET FOR SPECIFIC DISEASES IN SURVIVAL/SACRIFICE EXPERIMENTS
B W TURNBULL and T J MITCHELL Jul 1983 41 p refs
(Contract W-7405-ENG-26)
(DE83-013726, ORNL/CSD-111) Avail NTIS HC A03/MF A01

The analysis of an animal survival/sacrifice experiment in which it is desired to investigate the incidence of a particular disease of interest is considered It is assumed that the disease is irreversible and detectable only at death, e g , via a necropsy Each observation is of one of three types, namely, death caused by the disease, death by competing cause (e g , sacrifice) with the disease present, and death with the disease absent A two dimensional EM algorithms is proposed to obtain the nonparametric maximum likelihood estimates of the distribution G(t) of the time to onset (Y) and the distribution F(t) of the time to death (X) from the disease A slight modification of the algorithm enables the construction of likelihood based confidence intervals of F(t), G(t), the medians of X and Y and other functions of interest The methods are illustrated using data from an experiment with laboratory mice in which the disease of interest is reticulum cell sarcoma DOE

N84-10729# Oak Ridge National Lab, Tenn Biology Div
THE RELEVANCE OF EXPERIMENTAL ANIMAL STUDIES TO THE HUMAN EXPERIENCE
R J M FRY 1982 24 p refs Presented at the Conf on Radiation Carcinogenesis Epidemiology and Biol Significance, Washington, D C , 24 May 1982
(Contract W-7405-ENG-26)
(DE83-014053, CONF-8205170-2) Avail NTIS HC A02/MF A01

Animal experiments are being used to examine a number of physical and biological factors that influence risk estimations though not usually in coordination with epidemiologists It is clear that the different mechanisms involved in different types of tumors are reflected in the diversity of dose-response relationships The forms of the dose-response relationships are influenced by both the initial events and their expression Evidence is accumulating that many initiated cells do not get expressed as overt cancers and host factors may play a major role in the expression of potential tumor cells There is a need for information about the relationship of the natural incidence and susceptibility to radiation induction for more tumor types Such experiments will help answer the question of which risk estimate models are appropriate for different tumor types and can be carried out on animals Perhaps because of the importance of host factors risk estimates as a percentage of the natural incidence appear to be similar for human beings and mice for a small number of tumor types DOE

N84-10730# Idaho Univ, Moscow Water and Energy Resources Inst
AQUACULTURE TECHNIQUES: A PRODUCTION FORECASTING MODEL FOR AQUACULTURE SYSTEMS
P C DOWNEY and G W KLONTZ Mar 1983 82 p refs
(Contract DI-14-34-0001-0216)
(PB83-221713, W83-03318, OWRT-A-063-IDA(2)) Avail NTIS HC A05/MF A01 CSCL 06C

Computer implementation of the mathematical models of quantitative relationships in aquaculture systems is a dynamic process which provides a conceptual framework for understanding systems behavior These models can provide useful information on variable significance to systems functioning This computer implemented mathematical model addresses one of the significant limitations of aquaculture systems management, namely, production forecasting, by providing a method of using technology to predict Allowable Growth Rate (AGR) GRA

N84-10731# Health Effects Research Lab, Research Triangle Park, N C Genetic Bioassay Branch
EVALUATION OF MOTOR VEHICLE AND OTHER COMBUSTION EMISSIONS USING SHORT-TERM GENETIC BIOASSAYS
J LEWTAS Jul 1983 20 p refs
(PB83-233270; EPA-600/D-83-078) Avail NTIS HC A02/MF A01 CSCL 06F

Short term genetic bioassays were useful in evaluating unregulated organic combustion emissions from motor vehicles Identification of mutagens and carcinogens in complex exhaust emissions was greatly facilitated by the use of bioassay directed factionation and characterization methods It is also possible to evaluate the effect of fuels, engine types, and control technologies on the rates of mutagenic emissions from motor vehicles Greater differences in the rate of mutagenic emissions were observed between different engines (e g , diesel vs gasoline) and control technologies (e g , with and without catalyst) than between different fuels A comparative evaluation of various combustion sources indicates that motor vehicle emissions make a major contribution to the mutagenicity observed in ambient air GRA

N84-11693# Joint Publications Research Service, Arlington, Va
USSR REPORT: SPACE BIOLOGY AND AEROSPACE MEDICINE, VOLUME 17, NO. 5, SEPTEMBER - OCTOBER 1983
O G GAZENBO, ed 1 Nov 1983 156 p refs Transl into ENGLISH of Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep - Oct 1983 96 p
(JPRS-84655) Avail NTIS HC A08

The effects of long term space flight are examined Metabolism responses and the cardiovascular system are emphasized Certification of pilots through medical examination is included

N84-11705# Joint Publications Research Service, Arlington, Va
MORPHOMETRIC STUDY OF RAT ADRENAL MEDULLA DURING LONG-TERM HYPOKINESIA
A S PANKOVA and Y A SAVINA *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 74-79 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 51-54
Avail NTIS HC A08

Using Wood's differential staining, norepinephrine- and epinephrine-secreting cells of the adrenal medulla of 36 Wistar male rats exposed to 1 to 5 5-month hypokinesia were measured

caryometrically After 2 month hypokinesia the nuclear volume of norepinephrine-secreting cells increased significantly After 5 5-month hypokinesia no dystrophic changes were seen in the adrenal medulla Author

N84-11706# Joint Publications Research Service, Arlington, Va
EFFECT OF ELEUTEROCOCCUS EXTRACT ON RECOVERY PROCESSES IN RATS FOLLOWING SEVEN-DAY HYPOKINESIA
E. I KHASINA, I V DARDYMOV, and I I BREKHMAN *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 81-84 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 55-58
Avail NTIS HC A08

Rats were housed in small cages for 7 days and then were placed into regular cages The hypokinetic animals lagged behind the controls in their weight gain and reached their normal weight 45 days after the exposure The hypokinetic exposure stimulated the pituitary-adrenal system, the effect being most pronounced during the first 12 h after the experiment The hypokinetic effect decreased the glycogen content and the hexokinase and glucose-6-phosphate dehydrogenase activity and increased lactate dehydrogenase and phosphoenol pyruvate carboxykinase activity The parameters examined returned to normal 45 days after the experiment The eleuterococcus preparation, the administration of which began immediately after the exposure, expedited the normalization of the parameters almost twofold (by day 20).
Author

N84-11707# Joint Publications Research Service, Arlington, Va
EFFECT OF HYPOKINESIA ON AMINO ACID METABOLISM IN RATS ON DIETS DIFFERING IN CALCIUM AND PHOSPHORUS CONTENT
T F VLASOVA and Y B MIROSHNIKOVA *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 89-95 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 58-60
Avail NTIS HC A08

The effect of hypokinesia on amino acid metabolism was studied in rats kept on diets with different ratios of calcium and phosphorus It was shown that excessive phosphorus in the diet led to a significant decrease of the amino acid pool, thus aggravating the hypokinetic effect Author

N84-11708# Joint Publications Research Service, Arlington, Va
DEMONSTRATION OF GAS BUBBLES IN CANINE PULMONARY ARTERY AND AORTA BY MEANS OF ULTRASONIC ECHOGRAPHY WITH INTRAVENOUS AIR INFUSION
V P NIKOLAYEV, V P KATUNTSEV, R T KAZAKOVA, R I FINOGENOVA, K. S YUROVA, T D DORONINA, A D MANSFELD, P K CHICHAGOV, and A M REYMAN *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 89-95 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 61-65
Avail NTIS HC A08

The transducer and receiving amplifier of a standard ultrasonic echocardiograph were modified to develop a device for detecting unmasked echocardiographic images of gas bubbles in blood vessels This device was employed to detect gas bubbles passing from the venous to the arterial bed via lungs in anesthesized and thoracotomized dogs during air intravenous infusion Gas bubbles entered the aorta when the dose of infused air was 12 to 15 ml It is postulated that gas bubbles formed in the animal and human body during decompression may pass from the venous into the arterial bed not only through shunts but also through lung capillaries Author

N84-11710# Joint Publications Research Service, Arlington, Va
PREDICTION OF VOMITING IN DOGS EXPOSED TO RADIATION WITH SHIELDING OF MIDABDOMEN
T F OSOKINA, B L RAZGOVOROV, and B I DAVYDOV *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 102-105 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 70-72
Avail NTIS HC A08

Data on vomiting as a primary dose-dependent reaction of dogs to irradiation are presented It is shown that vomiting can be predicted with reference to the average absorbed dose in the abdominal area, provided the animal is irradiated in a lethal dose and the area is shielded It is emphasized that calculated and experimental data are in good agreement Author

N84-11711# Joint Publications Research Service, Arlington, Va
CONDITION OF ERYTHROCYTES DURING LONG-TERM EXPOSURE TO MAGNETIC FIELD
G V CHERKASOV *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 106-110 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 72-75
Avail NTIS HC A08

During and after exposure to a constant magnetic field of 1 6 T mice showed variations in the size distribution to red blood cells, with their shape remaining unchanged and enlarged cells being predominant This shift persisted till exposure day 10 and began to return to normal on days 15, 22 and 30 After irradiation the Price-Jones curve varied in a different manner and recovered by day 6 The changes in the curve were not correlated with variations in the reticulocyte and erythrocyte counts or hemoglobin content It is concluded that an exposure to a constant magnetic field produces insignificant lesions in the red blood cell membrane Mention should be made of a reduction of the reticulocyte count in the peripheral blood after exposure Author

N84-11720*# Texas Univ , Austin Dept of Botany
THE REGULATORY FUNCTIONS OF CALCIUM AND THE POTENTIAL ROLE OF CALCIUM IN MEDIATING GRAVITATIONAL RESPONSES IN CELLS AND TISSUES
S J ROUX, ed Nov 1983 295 p refs Workshop held in Bethesda, Md , 16-18 Sep 1982
(Contract NSG-7480)
(NASA-CP-2286, NAS 1 55 2286) Avail NTIS HC A13/MF A01 CSCL 06B

The hypothesis that calcium plays an important part in regulating cellular response to gravity and to other environmental stimuli is explored Topics covered include the role of calmodulin and other proteins, gravitropic responses, bone demineralization during space flight, and intracellular communication

N84-11721*# Texas Univ , Austin Dept of Botany
EVIDENCE FOR A REGULATORY ROLE OF CALCIUM IN GRAVITROPISM
S J ROUX *In its* The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 2-13 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Experiments conducted to determine the cellular basis of gravitropism, the phenomenon of calcium migration following gravitropic stimulation, and the preferential accumulation of calcium in cells are described Results of autoradiographic studies of cross sections of oat, and the pryoantimony precipitation of calcium in situ are discussed It was found that the movement of calcium during gravimetric stimulation is a redistribution of calcium from the vacuolar regions into the cells walls This movement requires precipitation of a calcium ATPase The control of calcium ATPase by calmodulin and whether chlorpromazine is binding to calmodulin in plants are considered A R H

N84-11722*# Massachusetts Univ, Amherst Dept of Botany
CALCIUM AND MITOSIS
P HEPLER *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 14-27 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Although the mechanism of calcium regulation is not understood, there is evidence that calcium plays a role in mitosis Experiments conducted show that (1) the spindle apparatus contains a highly developed membrane system that has many characteristics of sarcoplasmic reticulum of muscle, (2) this membrane system contains calcium, and (3) there are ionic fluxes occurring during mitosis which can be seen by a variety of fluorescence probes Whether the process of mitosis can be modulated by experimentally modulating calcium is discussed
A R H

N84-11723*# Agricultural Research Center, Beltsville, Md Plant Stress Lab
CALCIUM MODULATION OF PLANT PLASMA MEMBRANE-BOUND ATPASE ACTIVITIES
C CALDWELL *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 28-43 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The kinetic properties of barley enzyme are discussed and compared with those of other plants Possibilities for calcium transport in the plasma membrane by proton pump and ATPase-dependent calcium pumps are explored Topics covered include the ph phase of the enzyme, high affinity of barley for calcium, temperature dependence, activation enthalpy, and the types of ATPase catalytic sites Attention is given to lipids which are both screened and bound by calcium Studies show that barley has a calmodulin activated ATPase that is found in the presence of magnesium and calcium
A R H

N84-11724*# Vanderbilt Univ, Nashville, Tenn
INTRACELLULAR CALCIUM RECEPTORS: CALMODULIN AND RELATED PROTEINS
D M WATTERSON *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 44-56 Nov 1983
Avail NTIS HC A13/MF A01 CSCL 06B

Studies on intracellular calcium receptors, calmodulin and related proteins were carried out Calcium binding proteins, like calmodulin fall into a class of proteins that are predominantly intracellular and reversibly bind calcium with dissociation constants in the micromolar to nanomolar range Calcium regulation of these proteins appears to be due to localized increases in calcium concentrations in the cytoplasm The main thrust of the research is concerned with purifying and characterizing the calcium receptors and trying to elucidate mechanistically how they are involved in cellular responses
B W

N84-11725*# Georgia Univ, Athens Bioluminescence Lab
ROLE OF CALCIUM AND CALMODULIN IN PLANT CELL REGULATION
M J CORMIER *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 57-68 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The role of calcium and calmodulin in plant cell regulation is discussed Experiments are done to discover the level of calcium in plants and animals The effect of intracellular calcium on photosynthesis is discussed
B W

N84-11726*# Connecticut Univ, Farmington Dept of Physiology
LOCAL CALCIUM ENTRY AND THE GUIDANCE OF GROWTH
K R ROBINSON *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 69-82 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The role of calcium in developing cells is illustrated The Fucus egg, a brown algae is used to describe this phenomenom Results of local calcium entry and forced calcium entry into the eggs are given
B W

N84-11727*# State Univ of New York, Stony Brook Dept of Cellular and Comparative Biology
DEVELOPING HIGHER PLANT SYSTEMS IN SPACE
A D KRIKORIAN *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 83-96 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The effects of hypogravity and microgravity environments on plant cells are discussed Experiments on embryos of carrots are discussed Simulation and spacecraft environments were used in experiments
R J F

N84-11728*# Michigan Univ, Ann Arbor Biological Sciences Div
GRAVITROPIC RESPONSES IN THE GRASS PULVINUS: MODEL SYSTEM FOR ASYMMETRIC GROWTH
P B KAUFMAN *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 97-110 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Gravitropic responses in the grass pulvinus consituting a model system for asymmetric growth are discussed The geotropic responses of the grass under various hormonal conditions are discussed
R J F

N84-11729*# National Aeronautics and Space Administration, Washington, D C
BONE AND CALCIUM ALTERATIONS DURING SPACEFLIGHT
E M HOLTON *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 111-126 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Bone demineralization caused by weightlessness during space flight is discussed Bones of rats were examined and the results are given
R J F

N84-11730*# California Univ, Davis Dept of Physiology
GRAVITATIONAL STUDY OF THE CENTRAL NERVOUS SYSTEM
J M HOROWITZ *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 127-132 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

A series of experiments conducted at 1G are discussed with reference to the role of calcium ions in information processing by the central nervous system A technique is described which allows thin sections of a mammalian hippocampus to be isolated while maintaining neural activity Two experiments carried out in hypergravic fields are also addressed, one investigating altered stimulation in the auditory system, the other determining temperature regulation responses in hypergravic fields
M G

N84-11731*# Indiana Univ, Bloomington Dept of Biology
POLARITY OF THE AMPHIBIAN EGG
G M MALACINSKI *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 133-141 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Amphibian egg polarity and the mechanism which generates the polarity is addressed Of particular concern is the question of

whether the activation rotation which responds to gravity is a prerequisite for normal development. M.G

N84-11732*# National Aeronautics and Space Administration, Washington, D C
PROGRAMMATIC COMMENTS
G SOFFEN, B BISHOP, and R YOUNG *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 142-146 Nov 1983
Avail NTIS HC A13/MF A01 CSCL 06B

The life science programs of NASA are informally discussed Research areas can be generally categorized as space biology, aerospace medicine, origins of life, biomedical research, and life support systems The role of the life sciences in the development of the space station and the experimental opportunities afforded by such a facility are addressed M G

N84-11733*# Michigan Univ, Ann Arbor Dept of Anatomy
CALCIUM IONS, STORES, AND MODULATORS: WHAT IS THE GRAVITY RECEPTOR CONNECTION?
M D ROSS *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 147-164 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The effect of weightlessness on gravireceptors is considered in an effort to shed light on the etiology of space motion sickness The structures of the gravireceptors (crystals and neuroepithelium) are examined to determine the role piezoelectricity plays B G

N84-11734*# Yale Univ, New Haven, Conn Dept. of Cell Biology
THE PLASMA MEMBRANE CALCIUM PUMP
H RASMUSSEN *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 165-179 Nov. 1983
Avail NTIS HC A13/MF A01 CSCL 06B

Three aspect of cellular calcium metabolism in animal cells was discussed including the importance of the plasma membrane in calcium homeostasis, experiments dealing with the actual mechanism of the calcium pump, and the function of the pump in relationship to the mitochondria and to the function of calmodulin in the intact cell B G

N84-11735*# Vanderbilt Univ, Nashville, Tenn Dept of Pharmacology
CARBOXYLIC ACID IONOPHORES AS PROBES OF THE ROLE OF CALCIUM IN BIOLOGICAL SYSTEMS
P W REED *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 180-199 Nov. 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The biological effects of calcium ionophores are described, focusing on arachidonic acid oxygenation, and the formation of a number of oxygenated metabolites of arachidonic acid These metabolites are involved in a number of bodily functions, and their production may be regulated by calcium B G

N84-11736*# California Univ, Berkeley
MEASUREMENT AND CONTROL OF FREE CALCIUM INSIDE SMALL INTACT CELLS
R Y TSIEN *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 200-217 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

The use of dye to measure intracellular free calcium concentration was discussed Difficulty in measuring the calcium is caused by two promblems the small amount of calcium available for testing, and the selectivity to bind calcium at 100 nanomolar excludes substances from entering the cell B G

N84-11737*# Baylor Coll of Medicine, Houston, Tex. Dept of Cell Biology
ROLE OF CALMODULIN IN CELL PROLIFERATION
J CHAFOULEAS *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 218-232 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Calmodulin levels were found to increase as cells enter plateau The data suggest that the cells are exiting the cell cycle late in the G sub 1 phase, or that the calmodulin levels in plateau cells are uncoupled to progression into S phase in plateau cells Upon release, calmodulin levels rapidly decrease Following this decrease, there is a increase prior to S phase N W

N84-11738*# Albert Einstein Coll of Medicine, New York Cellular Neurobiology Div
CONTROLS OF INTRACELLULAR COMMUNICATION MEDIATED BY GAP JUNCTIONS
M V L BENNETT *In* Texas Univ The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 233-244 Nov 1983 refs
Avail NTIS HC A13/MF A01 CSCL 06B

Experiments were done using aequorin and no increase in aequorin luminescence during acidification adequate to uncouple cells was seen The pH sensitivity of the conductance of the perfused membrane was essentially the same as that observed with intracellular pH microelectrodes Author

N84-11739*# Texas Univ, Austin
SUMMARY OF STUDY GROUP SESSION DISCUSSIONS
In its The Regulatory Functions of Calcium and the Potential Role of Calcium in Mediating Gravitational Responses in Cells and Tissues p 245-288 Nov 1983
Avail NTIS HC A13/MF A01 CSCL 06B

The relationship between gravitational physiology and calcium metabolism is examined The role of gravity on the problems of bone response, low gravity environments, calcium in plants, and the potential in animal systems for alterations in nerve and muscle function as variations in extracellular calcium levels occurred are discussed Innovative materials for experiments on interactions between calcium and gravity, experiments that could utilize ionospheres or calcium-measuring dyes, and specific gravity calcium experiments are also addressed N W

N84-11740# Illinois Univ, Urbana Dept of Physiology and Biophysics
PHOTOSYNTHESIS IN INTACT PLANTS
A R CROFTS 1983 10 p refs
(Contract DE-AC02-80ER-10701)
(DE83-016045, DOE/ER-10701/T1) Avail NTIS HC A02/MF A01

A four-stage approach to the study of photosynthesis at the molecular level in intact plants is described The approaches are (1) development and construction of laboratory apparatus for the study of photosynthesis in suspensions and in detached leaves in a laboratory environment, (2) laboratory experiments to evaluate the apparatus, (3) development and construction of apparatus for use in the field, and (4) experiments in the field to study the effect of environmental factors on photosynthesis in situ DOE

N84-11741# Oak Ridge National Lab, Tenn Engineering Physics Div
CALCULATIONS OF RADIATION FIELDS AND MONKEY MID-HEAD AND MID-THORAX RESPONSES IN AFRRI-TRIGA REACTOR FACILITY EXPERIMENTS
J O JOHNSON (Tennessee Univ), M B EMMETT, and J V PACE, III Jul 1983 114 p refs
(Contract W-7405-ENG-26)
(DE83-015483, ORNL/TM-8807) Avail NTIS HC A06/MF A01

A computational study was performed to characterize the radiation exposure fields and the mid-head and mid-thorax response functions for monkeys irradiated Discrete ordinates radiation transport calculations were performed in one dimensional hencal

geometry to obtain the energy spectra of the neutrons and gamma rays entering the room through various spectrum modifiers and reaching the irradiation position Adjoint calculations performed in two dimensional cylindrical geometry yielded the mid-head and mid-thorax response functions, which were then folded with flux spectra to obtain the monkey mid-head and mid-thorax doses (kerma rates) received at the irradiation position The results are presented both as graphs and as tables The resulting spectral shapes compared favorably with previous works, however, the magnitudes of the fluxes did not The differences in the magnitudes may be due to the normalization factor used DOE

N84-11742# Hohenheim Univ , Stuttgart (West Germany) Inst fuer Tiermedizin und Tierhygiene

HYGIENIC MICROBIOLOGICAL/VIROLOGICAL EXAMINATION OF AN AIRWASHER CONCERNING THE EMISSION OF AIRBORNE MICROORGANISMS Final Report, Jul. 1982

D STRAUCH and J WEKERLE Bonn Bundesministerium fuer Forschung und Technologie Jun 1983 147 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-83-130, ISSN-0340-7608) Avail NTIS HC A07/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 31

A biological air washer with activated sludge as absorbent is examined The emission of virus aerosols and out-wash efficiency with airborne viruses were tested The washer reduces airborne viruses in waste air by up to 69 5%, when activated sludge is used for absorbent and washer parameters are regulated optimally However, this is accompanied by an emission of airborne virus with the purified air In the absorbent of the washer, an accumulation of test agents used during separation was ascertained Virus accumulation in the absorbent depends upon the test agents, the absorbent turnover and the air throughput Separated virus was emitted out of the absorbent as a function of virus concentration in the absorbent, air throughput and absorbent turnover

Author (ESA)

N84-11743# Health Effects Research Lab , Research Triangle Park, N C

INFLUENCE OF NITROGEN DIOXIDE ON XENOBIOTIC METABOLISM IN ANIMALS

J A GRAHAM, J W ILLING, F J MILLER, and D E GARDNER Jul 1983 12 p refs

(PB83-239723, EP1-600/D-83-062) Avail NTIS HC A02/MF A01 CSCL 06T

Potential extrapulmonary effects of nitrogen dioxide (NO2) on hepatic xenobiotic metabolism were examined Initial studies were conducted using pentobarbital (PEN) induced sleeping time (S T) in mice as an indicator of integrated mechanisms of xenobiotic clearance A 3 hr exposure to concentrations as low as 0 47 mg NO2/cu m (0 25 ppm) caused a significant increase in PEN-induced S T in female mice When exposures were repeated for several days, the magnitude of the effect diminished Investigation of sex sensitivity indicated that female mice were affected by acute exposure (3 hr /day, 1 or 2 days), but males were not It was also observed that a 4 day (3 hr /day) exposure to 1 88 mg NO2/cu m (1 0 ppm) induced tolerance to the effects of 9 4 mg NO2/cu m (5 0 ppm) Author (GRA)

52

AEROSPACE MEDICINE

Includes physiological factors, biological effects of radiation, and weightlessness

A84-10279

RENIN, ANGIOTENSIN-CONVERTING ENZYME, AND ALDOSTERONE IN HUMANS ON MOUNT EVEREST

J S MILLEDGE, D M CATLEY, F D BLUME, and J B WEST (Northwick Park Hospital, Harrow, Middx , England, Bakersfield State College, Bakersfield, California, University, La Jolla, CA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1109-1112 Research supported by the American Alpine Club, Servier Laboratories, Explorers Club, U S Army, and NSF refs (Contract NIH-HL-24335, PHS-3-HR-6-2915)

Plasma renin activity (PRA), serum angiotensin-converting enzyme (ACE) activity, and plasma aldosterone concentration (PAC) were measured in 15 subjects at sea level and at high altitude Previous work has shown that on first ascent to altitude PAC and ACE are reduced, whereas PRA may be raised or reduced After 2-4 wk at 6,300 m all hormones had returned to within + or - 10 percent of sea-level values In seven subjects PRA and PAC were measured when exercise stopped PRA and PAC were both elevated, PRA more than PAC, i e , the PAC response to PRA was markedly blunted Since ACE activity was normal, it is suggested that there may be down regulation, i e , reduction in density of angiotensin II receptors on the adrenal cortex and/or induction of enzymes which degrade angiotensin II This mechanism apparently protects the subjects from very high levels of PAC and sodium retention when hypoxia and exercise raise PRA to very high levels Author

A84-10280

LACTATE ACCUMULATION DURING INCREMENTAL EXERCISE WITH VARIED INSPIRED OXYEN FRACTIONS

M C HOGAN, R H COX, and H G WELCH (Tennessee, University, Knoxville, TN) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1134-1140 Research supported by the American Heart Association refs

(Contract NIH-7088)

The relationship between lactate accumulation and oxygen uptake under conditions of hypoxia, normoxia and hyperoxia is examined at progressively increasing exercise intensities Six healthy subjects performed bicycle ergometer exercise at 60 rpm for 3 min at work rates of 60, 90, 105 W and subsequent increments of 15W until exhaustion while breathing gas mixtures of 17, 21 or 60 percent O2 on three separate occasions The mean oxygen uptakes for the six subjects as a function of work rate are found not to differ among the three treatments Mean blood lactate, measured at the end of each work rate interval, showed a steady trend, with the hypoxic condition showing the highest lactate concentrations and hyperoxia showing the lowest, although values at exhaustion were not significantly different among the three treatment groups Four of the subjects reached their greatest workload under normoxic conditions, while two were able to sustain the same work rate under hyperoxic and normoxic conditions Results thus demonstrate a dissociation of lactate accumulation from oxygen uptake, and suggest that differences in lactate (or H(+)) concentration may partially account for differences in performance under the three conditions A L W

A84-10281
HYPOHYDRATION AND EXERCISE - EFFECTS OF HEAT ACCLIMATION, GENDER, AND ENVIRONMENT
M N SAWKA, M M TONER, R P FRANCESCONI, and K B. PANDOLF (U S Army, Research Institute of Environmental Medicine, Natick, MA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1147-1153 refs

The effects of heat acclimation on physiological responses to exercise during hypohydration in three different environments are investigated in six male and six female subjects matched for maximal aerobic power Subjects performed treadmill exercise in hot-wet (35 C, relative humidity 79 percent), hot-dry (49 C, 20 percent) and comfortable (20 C, 40 percent) environments once when euhydrated and once when hypohydrated by 5 percent of body weight both before and after a 10-day period of heat acclimation Measurements of rectal temperature, mean skin temperature and heart rate show the physiological responses of men and women not to differ significantly in most of the environments studied Hypohydration is found generally to increase rectal temperature and heart rate and decrease sweat rate, while not altering mean skin temperature Heat acclimation acted to reduce rectal temperature and heart rate in the comfortable environment, but only heart rates were reduced in the two hot environments Results thus show that under hypohydration, heat acclimation acts to decrease thermoregulatory and cardiovascular strain in a comfortable environment, but only cardiovascular strain in hot environments A L W

A84-10284
'ANAEROBIC THRESHOLD' - PROBLEMS OF DETERMINATION AND VALIDATION
M P YEH, R M GARDNER, T D ADAMS, F G YANOWITZ, and R O CRAPO (Utah, University, LDS Hospital, Salt Lake City, UT) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1178-1186 Research supported by the LDS Hospital-Deseret Foundation refs
(Contract NIH-GM-23095)

The properties of various invasive and noninvasive measures used to determine an individual's anaerobic threshold, i e , the oxygen consumption or work rate beyond which lactate accumulates, are investigated in an attempt to develop computerized threshold detection criteria Arterial and venous blood samples were drawn and breath-by-breath gas responses were measured in eight normal subjects during rest, zero work load, and a work load increasing at the rate of 20 W/min Arterial lactate appeared to rise smoothly throughout the work period in all subjects, while arterial bicarbonate showed gradual increases, followed by the expected decreases in half Venous lactate levels were observed to lag arterial response by about 1 5 min When four physiologists were asked to determine independently the times of lactate accumulation and the anaerobic threshold from the invasive and noninvasive data, respectively, interreviewer variability on the order of 16 percent was found Invasive measurements thus demonstrate the lack of a threshold phenomenon, while noninvasive measurements show an unacceptably wide range of values for individual subjects A L W.

A84-10285
EFFECT OF A 42.2-KM FOOTRACE AND SUBSEQUENT REST OR EXERCISE ON MUSCLE GLYCOGEN AND ENZYMES
W M SHERMAN, D L COSTILL, W J FINK, F C HAGERMAN, L E ARMSTRONG, and T F MURRAY (Ball State University, Muncie, IN, Ohio University, Athens, OH) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Oct 1983, p 1219-1224 Research supported by the National Dairy Council and Sigma Xi refs

A84-10397#
HUMAN PHYSIOLOGY RESEARCH UNDER MICROGRAVITY CONDITIONS AND THE PROPOSED 'ANTHRORACK' FACILITY
H OSER (ESA, Microgravity Office, Paris, France) and J IVES (ESA, Payload Technology Dept , Noordwijk, Netherlands) ESA Bulletin (ISSN 0376-4265), no 35, Aug 1983, p 40-50

Areas of biomedical concern and the measurements to be made on the Spacelab are discussed The physiological responses to microgravity environment will be examined in terms of the adaptation and function of cardiovascular/pulmonary and sensorimoter functions, as well as metabolic processes Attention will be given to edema due to the absence of hydrostatic forces and to the regulation of circulation, blood pressure, and cardiovascular global and local resistance Astronauts will be monitored through blood and urine samples, the effects of exercise, the motor responses and the susceptibiltiy to motion sickness, postural activity, and responses to acoustic stimulation The anthrorack, a computerized, multi-user work station design concept, has been developed to permit data acquisition, storage, and analyses, as well as sample analyses and cinematography D H K

A84-10488
PHYSICAL METHODS OF TREATMENT IN NEUROLOGY [FIZICHESKIE METODY LECHENIIA V NEVROLOGII]
N I STRELKOVA Moscow, Izdatel'stvo Meditsina, 1983, 272 p In Russian refs

The main natural physical factors which can be employed during the treatment of diseases of the nervous system are discussed The characteristics and various features of the mechanism of action of these types of treatments are examined The etiology, pathogenesis, and clinical features of the most commonly encountered disorders of the nervous system are considered, focusing on disorders of the brain and spinal cord, and the peripheral and vegetative nervous systems, as well as neuroses and nerve-muscle disorders Methods are presented for the physical therapy of these disorders at various stages of the development of the disorders, based on the pathogenesis, severity, and duration of the disorder A differentiated approach to the use of various methods of physical therapy is suggested, which depends on the syndromes of the disorders, the condition of the compensation, and includes the consideration of neurophysiological data N B

A84-10739
INFLIGHT LOSS OF CONSCIOUSNESS
D C JOHANSON (U S Navy, Marine Corps Air Station, El Toro, CA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 212-215 refs

The causes of loss of consciousness (LOC) among aircrew who fly high performance military aircraft capable of 10 g sustained acceleration are examined, together with preventive measures The 10 g acceleration effectively increases the hydrostatic pressure on the blood flow from 28 cm to 2 8 m, significantly raising the pressure against which the heart must pump The result is grayout, blackout (loss of vision), and in the worst case LOC The necessity of anti-g protection was demonstrated when a pilot who had survived a LOC event by ejecting, while the aircraft went on to crash, was exposed to a similar flight profile in a centrifuge and again suffered LOC The presence of a tilt-back seat and an anti-g suit did not prevent the event The pilot, if trained in the M-1 maneuver, may have avoided LOC Specific training in the M-1 straining maneuver, centrifugal tests to identify pilots who are most likely to tolerate high-g maneuvers, and the use of biofeedback sensors to alert pilots to the presence of conditions conducive to LOC conditions are recommended M S K

A84-10742
U.S. NAVY EJECTEE ANTHROPOMETRY - 1 JANUARY 1969 THROUGH 31 DECEMBER 1979
F C GUILL (U S Naval Air Systems Command, Washington, DC) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 241-256

The existing data base on anthropometric values reported in the Medical Officer's Report/Flight Surgeon's Report on aircraft ejectee anthropometry is discussed for accuracy and content The study was performed to assess the necessary anthropometric measurements that need periodic updating in order to design safer and better-fitting personal survival equipment The available data covered only aircraft mishaps where ejection was accomplished Divergences between ejectee data and data on the entire Naval aircrew population are noted, demonstrating that the ejectee data represent an entirely different population than the normal aircrew data cover Further investigation of this factor is indicated.
M S K

A84-11017
HUMAN BODY TEMPERATURE - ITS MEASUREMENT AND REGULATION
Y HOUDAS (Lille, Universite, Lille, France) and E F J RING (Royal National Hospital for Rheumatic Diseases, Bath, England) Research supported by AGA Infrared Systems, Ltd , and Ultrakust GmbH New York, Plenum Press, 1982, 247 p refs

The terminology used in thermal physiology is examined, and principles of heat transfer are discussed, taking into account heat quantity, heat flux, temperature, pressure, quantities used in physiology, a number of common definitions, the equivalence between different forms of energy, the release of potential energy in living tissues, heat transfer without change of state, and heat transfer with change of state Temperature and humidity measurement are considered along with man and his environment, the temperature distribution in the systems and tracts of the human body, physiological changes affecting the temperature distribution, problems of temperature regulation, questions of heat loss and conservation, acclimatization to heat and cold, and disorders of thermoregulation Attention is given to possible thermal imaging applications, causes of temperature irregularities in the head and neck, common causes of increased temperatures of upper limbs, and thermography in disease G R

A84-11327
LEVEL OF ARTERIAL PRESSURE AND VEGETATIVE CARDIAC REGULATION DURING THE SIMULATION OF INTENSE OPERATOR ACTIVITY [UROVEN' ARTERIAL'NOGO DAVLENIIA I VEGETATIVNAIA REGULIATSIIA SERDTSA PRI MODELIROVANII NAPRIAZHENNOI OPERATORSKOI DEIATEL'NOSTI]
R M BAEVSKII, ZH V BARSUKOVA, K K IOSELIANI, and T D SEMENOVA Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 723-728 In Russian refs

A84-11328
DEPENDENCE OF STRUCTURES OF HEART RHYTHM ON THE PHYSICAL WORK CAPACITY OF ATHLETES [ZAVISIMOST' STRUKTURY SERDECHNOGO RITMA OT FIZICHESKOI RABOTOSPOSOBNOSTI SPORTSMENOV]
A K KEPEZHENAS (Vil'niusskii Pedagogicheskii Institut, Vilnius, Lithuanian SSR) and D I ZHEMAITITE (Kavnasskii Meditsinskii Institut, Palanga, Lithuanian SSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 729-739 In Russian refs

An analysis is made of the interrelationship between the physical work capacity of athletes in training and heart-rhythm characteristics under load and at rest The subjects comprised 92 athletes 19 to 25 years in age engaging in different cyclic forms of sport and 28 healthy students of the same age not engaged in sports Results of rhythmography indicate that there is no linear relation between the physical work capacity of the athletes and the characteristics of respiratory arrhythmia and heart-rhythm dispersion It is found that, at rest, the sympathetic influences on the regulation of the trained heart are reduced due to the relative increase of parasympathetic influences The higher the level of parasympathetic influence on the heart-rhythm regulation, the greater are the reserve capacities of the heart with respect to the improvement of the heart's functional indicators under maximum sympathetic influences B J

A84-11329
RHYTHMOINOTROPIC PHENOMENA IN THE HUMAN HEART [RITMOINOTROPNYE IAVLENIIA V SERDTSE CHELOVEKA]
V IA IZAKOV, V F ANTIUFEV, and IU L PROTSENKO (Nauchno-Issledovatel'skii Institut Gigieny Truda i Profzabolevanii, Sverdlovsk, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 740-747 In Russian refs

Intraventricular pressure was studied as a function of the duration of the R-R intervals in patients with flickering arrhythmia The cross-correlation and cross-dispersion functions of interpulse interval-pressure were calculated One random realization made it possible to obtain all the basic characteristics of rhythmoinotropic relationships known for determinate regimes It is shown that the interval-pressure correlation coefficients depend on the mean heart rate, a finding determined by the nonlinearity of the chronoinotropic characteristics A comparison of correlation and dispersion functions shows that linear chronoinotropic estimates are reliable at not very high contraction rates B J

A84-11330
PARAMETERS OF THE DISTRIBUTION OF EKG R-R INTERVALS IN THE PREDICTION OF THE WORK CAPACITY OF HUMAN OPERATORS [PARAMETRY RASPREDELENIIA R-R-INTERVALOV EKG V PROGNOZIROVANII RABOTOSPOSOBNOSTI CHELOVEKA-OPERATORA]
A V TROSHKIN (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 748-752 In Russian refs

An investigation is made of the statistical parameters of the distribution of R-R intervals and the probability of the errorless execution of tracking operations under various levels of psychoemotional stress The test involved the tracking of two luminous points moving toward each other by 32 healthy males 19 to 24 years in age It is shown that a number of parameters of the R-R interval distribution can be used to predict the quality of operator performance An analytical formula is obtained for the probability of task execution as a function of the principal statistical parameters of the R-R interval distribution B J

A84-11331
HEART-RHYTHM REACTION TO SENSORIMOTOR LOADS OF VARYING COMPLEXITY [REAKTSII SERDECHNOGO RITMA PRI SENSOMOTORNYKH NAGRUZKAKH RAZLICHNOI SLOZHNOSTI]
E I SHULMAN, M IU GELTSEL, and M B SHTARK (Akademiia Meditsinskikh Nauk SSSR, Novosibirsk, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 757-761. In Russian refs

Changes in the duration of heart-rhythm intervals caused by motor reaction and an acoustic signal prior to and during sensorimotor activity were studied in 50 human subjects (university students) The utilization of two types of sensorimotor tasks (a simple task and a selection task) made it possible to analyze these changes in connection with load complexity It is shown that prior to sensorimotor activity the acoustic signal causes only a slight extension of the first poststimulus interval The process of decision making in the selection task is found to affect the heart rhythm a statistically reliable extension of the heart-rhythm interval in which the decision is made is observed B J.

A84-11332
CIRCADIAN FLUCTUATIONS OF CERTAIN INDICATORS OF THE CONDITION OF THE CARDIOVASCULAR SYSTEM AND SKIN ELECTRICAL CHARACTERISTICS IN YOUNG FEMALE ATHLETES ENGAGED IN ACADEMIC ROWING [SUTOCHNYE KOLEBANIIA NEKOTORYKH POKAZATELEI SOSTOIANIIA SERDECHNO-SOSUDISTOI SISTEMY I ELEKTRICHESKIKH KHARAKTERISTIK KOZHI U IUNYKH SPORTSMENOK, ZANIMAIUSHCHIKHSIA AKADEMICHESKOI GREBLEI]
S M CHIBISOV, O A SHEVELEV, and E V TSIVAREVA (Universitet Druzhby Narodov, Moscow, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 762-766 In Russian refs

A84-11333
PREDICTION OF HEMODYNAMIC REACTIONS TO ISOMETRIC EXERCISE [PROGNOZIROVANIE REAKTSII GEMODINAMIKI NA IZOMETRICHESKUIU NAGRUZKU]
B G BERSHADSKII, L P LARIKOVA, and T A EVDOKIMOVA (I Leningradskii Meditsinskii Institut, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 767-772 In Russian refs

Patients with incipient hypertension were tested in order to assess the possibility of predicting hemodynamic reactions under isometric exercise of varying intensity depending on the age and sex of the patients, and the condition of the blood-circulation system in a state of rest Age is shown to have a significant influence on circulation indicators in a state of rest In addition, values of hemodynamic indicators under isometric muscular tension were found to diverge from corresponding values in a state of rest Finally, it is shown that the accuracy of the prediction of the hemodynamic state during and after exercise increases with the number of preceding states included in the regression model This accuracy is limited by the indicator-measurement error B J

A84-11334
SKIN CAPILLARY BED UNDER THE PROLONGED LIMITATION OF HUMAN MUSCULAR ACTIVITY IN THE ANTIORTHOSTATIC POSITION [KAPILLIARNOE RUSLO KOZHI PRI DLITEL'NOM OGRANICHENII MYSHECHNOI DEIATEL'NOSTI CHELOVEKA V ANTIORTOSTATICHESKOM POLOZHENII]
N E PANFEROVA and T M PROSKURINA Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 773-777 In Russian

A84-11335
NEURON CORRELATES OF THE RECOGNITION OF VISUAL STIMULI. I DYNAMICS OF THE MEANS AND VARIANCES OF THE CURRENT DISCHARGE FREQUENCY OF NEURON POPULATIONS OF THE HUMAN BRAIN IN TESTS INVOLVING VISUAL-STIMULUS RECOGNITION. II - INVESTIGATION OF SPACE-TIME CORRELATIONS BETWEEN CURRENT FREQUENCIES OF THE IMPULSE ACTIVITY OF NEURON POPULATIONS OF THE HUMAN BRAIN DURING THE RECOGNITION OF VISUAL STIMULI [NEIRONNYE KORRELIATY OPOZNANIIA ZRITEL'NYKH STIMULOV. I DINAMIKA SREDNIKH ZNACHENII I DISPERSII TEKUSHCHEI CHASTOTY RAZRIADA NEIRONNYKH POPULIATSII GOLOVNOGO MOZGA CHELOVEKA V PROBAKH PO OPOZNANIIU ZRITEL'NYKH STIMOLOV. II - IZUCHENIE PROSTRANSTVENNO-VREMENNYKH KORRELIATSIONNYKH SVIAZEI MEZHDU TEKUSHCHIMI CHASTOTAMI IMPUL'SNOI AKTIVNOSTI NEIRONNYKH POPULIATSII MOZGA CHELOVEKA PRI OPOZNANII ZRITEL'NYKH STIMULOV]
IU D KROPOTÓV (Akademiia Meditsinskikh Nauk SSSR, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 778-792 In Russian refs

A84-11336
DEPENDENCE OF THE TIME OF RECOGNITION OF SIGNIFICANT OPTICAL STIMULI ON THE FEATURES CHARACTERIZING THE SPACE-TIME ORGANIZATION OF BRAIN BIPOTENTIALS [ZAVISIMOST' VREMENI RASPOZNAVANIIA ZNACHIMYKH SVETOVYKH STIMULOV OT OSOBENNOSTEI PROSTRANSTVENNO-VREMENNOI ORGANIZATSII BIOPOTENTSIALOV MOZGA]
L A POTULOVA and IA A VASILEV (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 793-798 In Russian refs

A84-11339
THE INFLUENCE OF THE NEUROPEPTIDE ARGININE-VASOPRESSIN ON HUMAN TOLERANCE TO A HOT DRY ENVIRONMENT [VLIIANIE NEIROPEPTIDA ARGININ-VAZOPRESSINA NA PERENOSIMOST' CHELOVEKOM ZHARKOI SUKHOI SREDY]
V D BAKHAREV, A T MARIANOVICH, I B SLIUSAR, L A LEVKIN, O S PAPSUEVICH, and G I CHIPENS (Voenno-Meditsinskaia Akademiia, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 819-827 In Russian refs

Eight healthy males 29 to 35 years of age were tested in a climate chamber for five days, two hours a day, at an air temperature of 49 C, a relative humidity of 20 percent, and an air velocity of 0 5 m/s It was found that (8-arginine)-vasopressin in a dose of 10 ED (60 micrograms) produces a significant reduction in psychic and physiological stress in the human body subjected to a hot dry environment This stress reduction can be accompanied by a reduction in psychomotor productivity These effects are observed not only on the day of drug administration but also on the day after B J

A84-11340
THE EFFECT OF THE ADMINISTRATION OF 8-ARGININE-VASOPRESSIN DURING A PERIOD OF ADAPTATION TO HYPERTHERMIA [EFFEKT PRIMENENIIA 8-ARGININ-VAZOPRESSINA V PERIOD ADAPTATSII K GIPERTERMII]
N V ZGODA, V D BAKHAREV, V I IUNKEROV, N E DOMALCHUK, and IU P OSIPOV (Voenno-Meditsinskaia Akademiia, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 828-836 In Russian refs

Ten healthy male subjects were tested in a microclimate chamber for five days, two hours a day, at a temperature of 49 C, a relative humidity of 20 percent, and an air velocity of 0 5 m/s It was shown that the neuropeptide 8-arginine-vasopressin had a considerable effect on control processes associated with the optimization of the functioning of physiological systems in the transition period The development of an energetically justified model of adaptation to hyperthermia is considered B J

A84-11341
ASSESSMENT OF THE FUNCTIONAL CONDITION OF THE FEMALE ORGANISM IN FACTORIES [K OTSENKE FUNKTSIONAL'NOGO SOSTOIANIIA ZHENSKOGO ORGANIZMA V USLOVIIAKH PROIZVODSTVA]
A. P DORINOVSKAIA and R SH PLIAMOTAIA-ABDRAKHMANOVA (Sverdlovskii Institut Narodnogo Khoziaistva, Sverdlovsk, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 837-843 In Russian refs

A84-11342
MORPHOFUNCTIONAL CORRELATIONS AS EXEMPLIFIED BY THE RELATIONSHIPS BETWEEN THE CARDIOVASCULAR SYSTEM AND THE PHYSIQUE [MORFOFUNKTSIONAL'NYE KORRELIATSII NA PRIMERE VZAIMOSVIAZEI SERDECHNO-SOSUDISTOI SISTEMY I TELOSLOZHENIIA]
T N MOLIARENKO (Tambovskii Gosudarstvennyi Pedagogicheskii Institut, Tambov, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept-Oct 1983, p 844-848 In Russian refs

A84-11350
DISPLACEMENT OF LIQUID IN A MODEL OF SEMICIRCULAR CANALS UNDER THE EFFECT OF ANGULAR ACCELERATIONS IN WEIGHTLESSNESS [SMESHCHENIE ZHIDKOSTI V MODELI POLUKRUZHNYKH KANALOV PRI VOZDEISTVII UGLOVYKH USKORENII V USLOVIIAKH NEVESOMOSTI]
F A SOLODOVNIK, E V LAPAEV, A A PRUSSKII, A A SIMAKOV, and A V CHAPAEV Akademiia Nauk SSSR, Izvestiia, Seriia Biologicheskaia (ISSN 0002-3329), Sept -Oct 1983, p 759-761 In Russian refs

The inertial displacement of liquid in the closed ring of a polychloride tube under the effect of positive and negative angular accelerations was measured in normal ground conditions and in conditions of short-term weightlessness It is shown that the magnitude of the inertial displacement is higher in weightlessness than in normal conditions, which is probably due to the reduced friction between liquid particles and between the liquid and the tube walls The results suggest that, in the semicircular canals of the labyrinth of an astronaut in space flight, the inertial displacement of the endolymph will be greater than in normal ground conditions for the same head movements B J

A84-11551
THE USE OF FUNCTIONAL RHEOVASOGRAPHY FOR THE EXAMINATION OF ATHLETES WITH CIRCULATORY DISORDERS IN LOWER EXTREMITIES [PRIMENENIE FUNKTSIONAL'NOI REOVAZOGRAFII PRI ISSLEDOVANII SPORTSMENOV S NARUSHENIIAMI KROVOOBRASHCHENIIA V NIZHNIKH KONECHNOSTIAKH]
V V KOGAN-IASNYI and T V PRASOLOVA Teoriia i Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), May 1983, p 19-21 In Russian refs

A84-11552
ECONOMICAL REGIMES OF RUNNING FOR ATHLETES OF DIFFERENT AGES IN A HOT CLIMATE [EKONOMICHNYE REZHIMY BEGA U SPORTSMENOV RAZNOGO VOZRASTA V USLOVIIAKH ZHARKOGO KLIMATA]
V A ZAIKIN (Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury, Moscow, USSR, Turkmenskii Gosudarstvennyi Institut Fizicheskoi Kul'tury, Ashkhabad, Turkmen SSR) Teoriia i Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), May 1983, p 17-19 In Russian refs

A84-11553
METABOLISM OF CERTAIN TRACE ELEMENTS AND THE PROPHYLAXIS OF THEIR DEFICIT IN ATHLETES [OBMEN NEKOTORYKH MIKROELEMENTOV I PROFILAKTIKA IKH DEFITSITA V ORGANIZME SPORTSMENOV]
V V NASOLODIN (Iaroslavskii Gosudarstvennyi Universitet, Yaroslavl, USSR) Teoriia i Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), May 1983, p 15-17 In Russian refs

Data on the dynamics of concentrations of iron, copper, manganese, and zinc in the blood of athletes under physical exercise of varying intensity are generalized Results of balance studies of these trace elements are analyzed, and ways to prevent sport-related anemia are examined B J

A84-11554
LONG-TERM RETARDED TRAINING EFFECT OF FORCE LOADS [DOLGOVRREMENNYI OTSTAVLENNYI TRENIROVOCHNYI EFFECT SILOVYKH NAGRUZOK]
IU V VERKHOSHANSKII (Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury, Moscow, USSR) Teoriia i Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), May 1983, p 5-8 In Russian refs

The long-term retarded training effect (LRTE) of concentrated force loads in various forms of athletics is examined The dynamics of the velocity-force characteristics of athletes in prolonged training stages is indicated In particular it is shown that there is a tendency to a stable and prolonged reduction in maximum muscle strength under the effect of concentrated force load, followed by an equally stable and prolonged increase, significantly exceeding the original level Practical recommendations are made regarding the organization of training using the LRTE B J

A84-11555
EXTERIORIZATION OF THE EFFECT OF HYPERTHERMIA BY OBSERVING THE SYMPATHOADRENAL ACTIVITY IN SUBJECTS UNDER PSYCHOEMOTIONAL STRESS [OB'EKTIVIZATSIIA DEISTVIIA GIPERTERMII S POMOSHCH'IU IZUCHENIIA SIMPATO-ADRENALOVOI AKTIVNOSTI U LITS V SOSTOIANII PSIKHOEMOTSIONAL'NOGO NAPRIAZHENIIA]
V N VASILEV, V S CHUGUNOV, and M S EREMEEV (Klinicheskaia Spetsializirovannaia Bolnitsa Klinika Nevrozov, Moscow, USSR) Teoriia i Praktika Fizicheskoi Kul'tury (ISSN 0040-3601), May 1983, p 22, 23 In Russian refs

A84-11561
THE APPLICATION OF AN ELECTROMAGNETIC FIELD IN PATIENTS FOLLOWING DISORDERS OF BRAIN BLOOD CIRCULATION [PRIMENENIE ELEKTROMAGNITNOGO POLIA U BOLNYKH POSLE NARUSHENII MOZGOKOGO KROVOOBRASHCHENIIA]
N I STRELKOVA, S G MASLOVSKAIA, A G GAVRILKOV, and E N STRELTSOVA (Tsentral'nyi Institut Kurortologii i Fizioterapii, Moscow, USSR) Sovetskaia Meditsina, no 5, 1983, p 35-38 In Russian refs

A84-11562
HYPERVENTILATION AS A METHOD FOR DETECTING DISORDERS OF ATRIOVENTRICULAR CONDUCTIVITY IN ATHLETES [GIPERVENTILIATSIIA KAK METOD VYIAVLENIIA NARUSHENII ATRIOVENTRIKULIARNOI PROVODIMOSTI U SPORTSMENOV]
S A MELIKHOV, A V LIRMAN, and ZH A FILIPPOV (Tomskii Meditsinskii Institut, Tomskii Vrachebno-Fizkul'turnyi Dispanser, Tomsk, USSR) Kardiologiia (ISSN 0022-9040), vol 23, May 1983, p 26-29 In Russian refs

A hyperventilation test, dosed with respect to the respiration rate and time, was conducted in 140 athletes with EKG monitoring During the test, one athlete exhibited an episode of a sinoauricular block, and four athletes developed a temporary atrioventricular block of the Wenkebach-Samoilov type (stage II) 20-60 hours following the hyperventilation In these three latter athletes, the EKG at rest showed decelerated atrioventricular conductivity In two of these athletes, this feature was combined with indications of myocardial dystrophy, while for the other athlete this feature was combined with periodically recorded cardiac sinus rhythm Two athletes were placed under long-term observation When repeated tests gave negative results, the block developed in response to hyperventilation following preliminary administration of obsidan N B

A84-11563
THE EFFECT OF DIURETICS ON THE CONCENTRATION OF CALCIUM IN BLOOD SERUM AND ITS EXCRETION WITH THE URINE [VLIIANIE DIURETIKOV NA SODERZHANIE KAL'TSIIA V SYVOROTKE KROVI I EGO EKSKRETSIIU S MOCHOI]
K A MERZON (Donetskii Meditsinskii Institut Donetsk, Ukrainian SSR) Kardiologiia (ISSN 0022-9040), vol 23, May 1983, p 46-49 In Russian refs

A84-11564
PREDICTING VENTRICULAR ARRYTHMIA OF THE HEART IN PATIENTS WITH MYOCARDIAL INFARCTION [K PROGNOZIROVANIIU ZHELUDOCHKOVYKH ARITMII SERDTSA U BOL'NYKH INFARKTOM MIOKARDA]
I M GELFAND, M N STARKOVA, and A L SYRKIN (Akademiia Nauk SSSR, Institut Prikladnoi Matematiki, I Moskovskii Meditsinskii Institut, Moscow, USSR) Kardiologiia (ISSN 0022-9040), vol 23, May 1983, p 9-12 In Russian refs

A84-11565
COMPARATIVE EVALUATION OF CHANGES IN MB CPK ACTIVITY AND INDICATORS OF PRECARDIAL MAPPING [SRAVNITEL'NAIIA OTSENKA IZMENENIIA AKTIVNOSTI MV KFK I POKAZATELEI PREKARDIAL'NOGO KARTIROVANIIA]
A V VINOGRADOV, G P ARUTIUNOV, A. S. GLAZUNOV, I N GELFAND, and O R SULTANBEKOV (II Moskovskii Gosudarstvennyi Meditsinskii Institut, Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR) Kardiologiia (ISSN 0022-9040), vol 23, May 1983, p 34-36 In Russian refs

Twenty patients with acute myocardial infarction were simultaneously subjected to two types of tests peripheral-blood MB CPK (creatine phosphokinase) activity measurement and precardial mapping Extreme values of precardial mapping were compared with those of MB CPK activity peaks, and the duration of increased MB CPK activity was determined It was shown that the extreme mapping values can be detected six-to-nine hours later than the MB CPK activity peaks Necrosis weights estimated on the basis of MB CPK activity and precardial-mapping indicators showed close correlation It is concluded that MB CPK activity measurement is a more accurate way of assessing necrotic-zone spread, while precardial mapping yields a more accurate estimate of necrosis weight B J

A84-11566
A HYGIENIC EVALUATION OF SEVERAL CHARACTERISTICS OF INTERMITTENT NOISE [GIGIENICHESKAIA OTSENKA NEKOTORYKH KHARAKTERISTIK NEPOSTOIANNOGO SHUMA]
A V KOLOGANOV (Donetskii Nauchno-Issledovatel'skii Institut Truda i Profzabolevanii, Donetsk, Ukrainian SSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 8-10 In Russian refs

The relationship between the functional condition of male metallurgical workers (20-45 years of age) and the physical parameters of intermittent noise was studied The correlation coefficients between the level of noise emission and several physiological parameter indicators were determined The dependence of the changes in the auditory analyzer on the rate of sound level changes of the intermittent sound for 1 second was found to have a definite hygienic significance It is found that the deleterious biological activity of intermittent sound can be increased or decreased in situations when the frequency of the noise pulses coincides with important biological rhythms N B

A84-11568
INDICATORS OF CATECHOLAMINE METABOLISM AND HEMODYNAMICS IN AIR TRAFFIC CONTROLLERS WITH NEUROCIRCULATORY DYSTONIA OF THE HYPERTENSION TYPE [POKAZATELI KATEKHOLAMINOVOGO OBMENA I GEMODINAMIKI U AVIADISPETCHEROV PRI NEIROTSIRKULIATORNOI DISTONII GIPERTENZIVNOGO TIPA]
E L KAN, O O MALINOVSKAIA, and V A KUPRIIANOV (Nauchno-Issledovatel'skii Neirokhirurgicheskii Institut, Leningrad, USSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 24-26 In Russian refs

Sixty-five air traffic controllers of Sochi airport were examined, 19 of them had neurocirculatory dystonia of the hypertension type, while 46 were apparently healthy Tests for the diurnal rhythm of catecholamine excretion in the urine showed differences between the test groups with respect to catecholamine excretion level within different periods of 24 hours, in the day/night excretion ratio, and in the mediator and hormonal parameters of the sympathoadrenal system Subjects with neurocirculatory dystonia had significantly higher levels of systole, heart stroke volume, minute blood volume, and systolic arterial pressure In addition, their general peripheral resistance was lower than that of the control group B J

A84-11569
A HYGIENIC EVALUATION OF ELEVATED DYNAMIC LOADS ON PASSENGERS IN URBAN TRANSPORT VEHICLES [GIGIENICHESKAIA OTSENKA POVYSHENNYKH DINAMICHESKIKH NAGRUZOK NA PASSAZHIROV SALONOV GORODSKOGO TRANSPORTA]
G V NOVIKOV, L A BUTCHENKO, and L S LANTSOV (Leningradskii Institut Usovershenstvovaniia Vrachei, Leningrad, USSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 26-28 In Russian.

A84-11571
EXTERNAL RESPIRATION IN ELECTRIC WELDERS [SOSTOIANIE VNESHNEGO DYKHANIIA ELEKTROSVARSHCHIKOV]
V I SVIDOVYI, V F KIRILLOVA, and V N FILIMONOV (Leningradskii Sanitarno-Gigienicheskii Meditsinskii Institut, Leningrad, USSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 57, 58 In Russian refs

A84-11572
HEAT-TRANSFER CHARACTERISTICS OF PORT WORKERS IN THE ARCTIC [OSOBENNOSTI TEPLOOBMENA PORTOVYKH RABOCHIKH ZAPOLIAR'IA]
B V USTIUSHIN, I I DEDENKO, B G LYTKIN, A E SHMONIN, T L IVANOVA, and A S KILEEV (Moskovskii Nauchno-Issledovatel'skii Institut Gigieny, Moscow, USSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 61, 62 In Russian refs

An analysis was made of heat-transfer data for 200 dock workers engaged in the loading and unloading of ships in periods of winter Arctic navigation The data reveal increased evaporative heat release from the skin and lungs, and an increase of heat losses due to the heating of inhaled air B J

A84-11573
CHANGES IN THE AMINO ACID CONTENTS OF SALIVA AND URINE IN OIL AND GAS DRILLERS [IZMENENIE SODERZHANIIA AMINOKISLOT V SLIUNE I MOCHE U BUROVIKOV NEFTEGAZORAZVEDOCHNOI EKSPEDITSII]
A I ZHIKHAREVA and G S OBODCHUK (Tiumenskii Meditsinskii Institut, Tyumen, USSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 63, 64 In Russian refs

A84-11574
A HYGIENIC EVALUATION OF THE WORKING ENVIRONMENT OF OFF-SHORE OIL RIGS [GIGIENICHESKAIA OTSENKA PROIZVODSTVENNOI SREDY NA MORSKIKH NEFTIANYKH PROMYSLAKH]
I I ALEKSPEROV (Azerbaidzhanskii Nauchno-Issledovatel'skii Institut Gigieny Truda i Professional'nykh Zabolevanii, Sumgait, Azerbaizhan SSR) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 64-66 In Russian refs

A84-11760#
OXYGEN REGIMEN IN THE HUMAN PERIPHERAL TISSUE DURING SPACE FLIGHTS
H HAASE, B JARSUMBECK (Institute of Aviation Medicine, Koenigsbrueck, East Germany), E A KOVALENKO, M P BOBROVNITSKII, V N SEMENKOV (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR), A VACEK (Ceskoslovenska Akademie Ved, Biofyziaklni Ustav, Brno, Czechoslovakia), Z SAROL (Wojkowy Instytut Medycijny Lotniczey, Warsaw, Poland), J HIDEG (Institute of Aviation Medicine, Kecskemet, Hungary), and K ZLATAREV International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 18 p refs
(IAF PAPER 83-197)

The study was carried out with a special board-oxymeter based on the polarographic principle A significant decrease in the intracutaneous oxygen partial pressure was observed in the crew visiting the Salyut-6 station on a seven-day mission The decrease

was 3 28 kPa (24 7 mm Hg) Local oxygen utilization decreased significantly, by 0 44 kPa (3 3 mm Hg) During hyperventilation testing after return to earth, a statistically significant decrease in the peak value by 1 39 kPa (10 5 mm Hg) was observed Among the regular crew of the station, the greatest decrease in partial pressure was 3 8 kPa (28 5 mm Hg) and the smallest was 3 4 + or - 0 5 kPa (25 6 + or - 4 0 mm Hg) The decrease in local oxygen utilization during the flight was greater than the decrease observed in the visiting crew C R

A84-11761#
GENERAL RESULTS OF MEDICAL INVESTIGATIONS IN SALYUT-6 MANNED SPACE FLIGHTS
E I VOROBEV, O G GAZENKO, A M GENIN, A D EGOROV, IU G NEFEDOV, and E B SHULZHENKO International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 9 p refs
(IAF PAPER 83-202)

The changes observed after the flight proved to be reversible, and they disappeared completely after a relatively short period of readaptation It has been found that postflight changes do not correlate with the duration of the flight Medical studies carried out during the Salyut-6 flights indicate that the duration of manned space flights can be increased It is noted that the cosmonaut Riumin made his 185-day flight six months after completing a 175-day flight In both missions his health and work capacity were identical, suggesting a complete recovery to his normal physiological state during the six months between flights It is concluded that if the cosmonauts perform special exercises and adhere to a reasonable work/rest schedule, their physiological changes do not progress with increasing flight duration from one to six months C R

A84-11962
FUNCTIONS OF THE FRONTAL LOBES OF THE BRAIN [FUNKTSII LOBNYKH DOLEI MOZGA]
E D KHOMSKAIA and A R LURIIA Moscow, Izdatel'stvo Nauka, 1982, 288 p In Russian

Papers are presented concerning the role of the frontal lobes in the formation of the higher psychic functions in man Variants of the 'frontal syndrome' are discussed, and psychophysiological studies of functions of the frontal lobes are described Particular consideration is given to the role of the frontal lobes in the organization of auditory and speech memory in children and adults, visual-perception disorder in patients with frontal-lobe lesions, vertical rhythmic movements of the eyes in the case of local brain lesions, and self-evaluation disorders in patients with local brain lesions No individual items are abstracted in this volume B J

A84-12061* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
TRANSDERMAL SCOPOLAMINE IN THE PREVENTION OF MOTION SICKNESS EVALUATION OF THE TIME COURSE OF EFFICACY
J L HOMICK, M F RESCHKE, J DEGIOANNI, N M CINTRON-TREVINO (NASA, Johnson Space Center, Houston, TX), and R L KOHL (Technology, Inc , Houston, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 994-1000 refs

This study evaluated the time course of efficacy of transdermal scopolamine in the prevention of motion sickness induced by exposure to coriolis stimulation in a rotating chair We measured levels of efficacy, quantified side effects and symptoms, and determined inter- and intra-subject variability following use of transdermal scopolamine The response to transdermal scopolamine was highly variable, although overall we recorded a 40 percent improvement in test scores 16-72 h after application of the transdermal system This variability could not be explained solely by the levels of scopolamine present in the blood The improvement was not due to the artifactual repression by scopolamine of selected symptoms of motion sickness An unexpectedly high incidence of side effects was reported It was concluded that the therapeutic use of transdermal scopolamine be evaluated individually and that individuals be cautioned that subsequent usage may not always be effective Author

A84-12062* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
CARDIOVASCULAR EXAMINATIONS AND OBSERVATIONS OF DECONDITIONING DURING THE SPACE SHUTTLE ORBITAL FLIGHT TEST PROGRAM
M W BUNGO and P C JOHNSON, JR (NASA, Johnson Space Center, Medical Research Branch, Houston, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1001-1004 refs

During the first four flights of the Space Shuttle, cardiovascular data were obtained on each crewmember as part of the operational medicine requirements for crew health and safety From monitoring blood pressure and electrocardiographic data, it was possible to estimate the degree of deconditioning imposed by exposure to the microgravity environment For this purpose, a quantitative cardiovascular index of deconditioning (CID) was derived to aid the clinician in his assessment Isotonic saline was then investigated as a countermeasure against orthostatic intolerance and found to be effective in partially reversing the hemodynamic consequences It was observed that the space flight environment of reentry might potentially be arrhythmogenic in at least one individual Author

A84-12068
THE CONFIRMATION OF 9-CARBOXY-THC IN URINE BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY
J D WHITING and W W MANDERS (U S Armed Forces Institute of Pathology, Washington, DC) (Joint Committee on Aviation Pathology, Scientific Session, 13th, Toronto, Canada, Oct 1982) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1031-1033

A84-12069
DIAPHRAGMATIC RUPTURE DURING G-MANEUVERS IN A T33 JET TRAINER
P A MANINGAS, M A DIJULIO, and S C DRONEN (U S Army, Madigan Army Medical Center, Tacoma, WA) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1037, 1038 refs

A 26-year-old white male, radar operator, participated in a flight in a U S Air Force T33 jet trainer The patient experienced nausea and vomiting followed by several episodes of retching during maneuvers of positive acceleration Upon landing, he noted severe epigastric pain and shortness of breath After 3 h of persistent symptoms, he presented to the base hospital's emergency department where he was diagnosed as having diaphragmatic herniation of abdominal viscera into the left hemithorax At laparotomy, a large traumatic paraesophageal tear was discovered The abdominal viscera were reduced and the defect repaired The postoperative course was uncomplicated The pathophysiology of blunt, nonpenetrating diaphragmatic herniation is discussed Another mechanism for diaphragmatic rupture resulting from the forces of vomiting and acceleration is proposed Author

A84-12131
FUNCTIONAL ASYMMETRY OF THE CEREBRAL HEMISPHERES AND UNCONSCIOUS PERCEPTION [FUNKTSIONAL'NAIA ASIMMETRIIA POLUSHARII MOZGA I NEOSOZNAVAEMOE VOSPRIIATIE]
E A KOSTANDOV Moscow, Izdatel'stvo Nauka, 1983, 172 p In Russian refs

The physiological basis of such unconscious psychic processes as psychological defense, displacement, and emotions of indeterminate origin is examined from the vantage point of the theory of the mutually complementary functional 'cooperation' between the cerebral hemispheres Data obtained using electrophysiological and psychophysical conditioned-reflex techniques are examined It is shown that it is possible to carry out semantic analysis on the unconscious level and to form associations with the aid of emotionally significant words on this

level A conclusion of the study is that the unconscious in the human psyche can be effectively investigated from the neurophysiological point of view. B J

A84-12154
PROBLEMS IN THEORY AND METHODOLOGY FOR THE INVESTIGATION OF HIGHER NERVOUS ACTIVITY IN MAN - SELECTED WORKS [VOPROSY TEORII I METODOLOGII ISSLEDOVANIIA VYSSHEI NERVNOI DEIATEL'NOSTI CHELOVEKA - IZBRANNYE TRUDY]
L G VORONIN Moscow, Izdatel'stvo Pedagogika, 1982, 176 p In Russian refs

The fundamental ideas of Pavlov's theory are elaborated in the light of present-day neurophysiology Problems in the phylogeny and ontogeny of higher nervous activity in man are discussed along with methodological principles for the investigation of this activity Also considered are some current problems in the investigation of higher nervous activity, including physiological mechanisms of motor skills, typological features of the orientation reflex, the nature of oscillatory processes in conditioned-reflex activity, and physiological principles of activation in the learning process B J

A84-12158
MOTOR UNITS OF HUMAN SKELETAL MUSCLES [DVIGATEL'NYE EDINITSY SKELETNYKH MYSHTS CHELOVEKA]
D KOZAROV and IU T SHAPKOV Leningrad, Izdatel'stvo Nauka, 1983, 256 p In Russian refs

Published literature is surveyed and original experimental results are presented on the activity of motor units of human skeletal muscles for arbitrary movements, postures, reflex activation, and arbitrary control Particular consideration is given to the phenomenon of postactivation potentiation; the role of proprioceptors in regulating the work of motor units, and mechanisms of recruitment and modulation of discharge frequency B J

A84-12651
CARDIORESPIRATORY RESPONSE TO EXERCISE IN MEN REPEATEDLY EXPOSED TO EXTREME ALTITUDE
J S MILLEDGE, M P WARD, E S WILLIAMS, and C R A CLARKE (Northwick Park Hospital, Harrow, Middx , St Andrew's Hospital, St. Bartholomew's Hospital, London, England) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov. 1983, p. 1379-1385 refs

The ventilatory and heart rate responses were studied in four experienced high-altitude climbers at sea level and during a 6-wk period above 4,500 m to discover whether their responses to hypoxia were similar to those of high-altitude natives Comparison was made with results from four scientists who lacked their frequency exposure to extreme altitude The climbers had greater maximum O2 consumption at sea level and altitude but similar ventilatory responses to increasing exercise On acute hypoxia at sea level their ventilatory response was less than that of scientists Their heart rate response did not differ from that of scientists at sea level, but with acclimatization of the reduction in response was significantly greater It is concluded that these climbers, unlike high-altitude residents, have cardiorespiratory responses to exercise similar to those of other lowlanders except that their ventilatory response was lower and the reduction in their heart rate response was greater Author

A84-12653
TRAINING-DEPENDENT CHANGES OF RED CELL DENSITY AND ERYTHROCYTIC OXYGEN TRANSPORT
H MAIRBAEURL, E HUMPELER, G SCHWABERGER, and H PESSENHOFER (Innsbruck, Universitaet, Innsbruck, Graz Universitaet, Graz, Austria) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1403-1407 refs

Prolonged endurance training causes a decreased O2 affinity of Hb, which is due to an increase in erythrocyte 2,3-diphosphoglycerate (2,3-DPG) concentration Possible mechanisms were studied in 20 males with varying degrees of fitness The O2 tension at 50 percent O2 saturation of Hb (P50) was higher in the more fit subjects (+1 3 mmHg) and the 2,3-DPG concentration was higher (+2 3 micromol/g Hb) in this group The mean density was significantly lower in fit subjects (1 1002 g/ml) as compared with less fit subjects (1 1056 g/ml), indicating a lower mean age Density distribution curves show that in the fit subjects more young erythrocytes were in blood and that the very old erythrocytes were missing After correction for the differences in the density distribution, no differences in the P50 value and 2,3-DPC concentration between less fit and fit subjects were found Therefore, the decreased Hb-O2 affinity after training can be explained by the presence of more young erythrocytes in the blood of trained subjects The magnitude of this effect correlates with the training status Author

A84-12655
EFFECT OF INTRAVENOUS DOPAMINE ON HYPERCAPNIC VENTILATORY RESPONSE IN HUMANS
D S WARD and J W BELLVILLE (California, University, Los Angeles, CA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1418-1425 Research supported by the University of California refs.

A84-12656
PLASMA ADRENOCORTICOTROPIN AND CORTISOL RESPONSES TO SUBMAXIMAL AND EXHAUSTIVE EXERCISE
P A FARRELL (Wisconsin, University, Milwaukee, WI), T L GARTHWAITE (Wisconsin, Medical College, Milwaukee, WI), and A B GUSTAFSON (Wood Veterans Administration Medical Center, Milwaukee, WI) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1441-1444 Research supported by the U S Veterans Administration refs

A84-12657
CONTROL OF BREATHING AT THE START OF EXERCISE AS INFLUENCED BY POSTURE
D WEILER-RAVELL, D M COOPER, D J WHIPP, and K WASSERMAN (California, University, Medical Center, Torrance, CA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1460-1466 refs
(Contract NIH-11907)

The results of ventilatory-response tests in one female and nine male subjects performing upright (U) and supine (S) cycle ergometry are reported Each subject performed the 6-min square-wave tests at a work rate below the predetermined anaerobic threshold, three times in each position Breath-by-breath measurements of inspired ventilation (VI), O2 uptake (VO), CO2 output, and end-tidal O2 and CO2 tensions, and beat-by-beat heart rates (HR) are presented in tables and graphs comparing rest and exercise states in U and S positions The VI response to exercise was decreased significantly, from 81 + or - 8 percent in U to 50 + or - 6 percent in S, and similar patterns are seen in VO2 and in the ratio VO2/HR The reduced ventilatory response in the S position is attributed to a decreased pulmonary blood flow, as predicted by the cardiodynamic-hyperpnea model of Wasserman et al (1974) T K

A84-12660
OVERALL 'GAIN' OF THE RESPIRATORY CONTROL SYSTEM IN NORMOXIC HUMANS AWAKE AND ASLEEP
Y HONDA, F HAYASHI, A YOSHIDA, Y OHYABU, Y NISHIBAYASHI, and H KIMURA (Chiba University, Chiba, Japan) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1530-1535 refs

A84-12662
OPTIMIZING THE EXERCISE PROTOCOL FOR CARDIOPULMONARY ASSESSMENT
M J BUCHFUHRER, J E HANSEN, T E ROBINSON, D Y SUE, K WASSERMAN, and B J WHIPP (California, University, Torrance, CA) Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol 55, Nov 1983, p 1558-1564 refs

A comparative study of cycle and treadmill-ergometer 1-min incremental-exercise tests at different levels of work-rate increment in 12 normal male subjects (age 28-54) is reported In initial tests to exhaustion in about 10 min, maximum O2 uptake and anaerobic threshold (AT, at about 50 percent of the maximum uptake) were 6 and 13 percent higher, respectively, with the treadmill than with the cycle In the second set of tests (with 5 subjects) treadmill increments of 0 8, 1 7, 2 5, and 4 2 percent/min at 3 4 mph and 1 7 and 4 2 percent/min at 4 5 mph were compared to cycle increments of 15, 30 and 60 W/min It is shown that AT is independent of test duration, but maximum O2 intake is significantly higher in tests lasting about 8-17 min than in longer (low-increment) or shorter (high-increment) tests of either type A work-rate increment which brings the subject to exhaustion in 10 + or - 2 min is recommended for reproducible evaluation of cardiopulmonary function TK

N84-10732*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
THE PHYSIOLOGICAL EFFECTS OF SIMULTANEOUS EXPOSURES TO HEAT AND VIBRATION Ph.D. Thesis - California Univ., Berkeley
W A SPAUL Sep 1983 181 p refs
(NASA-TM-84400, A-9458, NAS 1 15 84400) Avail NTIS HC A09/MF A01 CSCL 06S

Determination of the effects of exposure to vibration on the body's ability to handle heat stress, and, if so, identification of the specific vibration parameters (frequency and intensity) for both whole-body (wbv) and segmental-body vibration (sbv) that would have the most detrimental effect on the body's ability to maintain thermal homeostasis were studied Rectal and skin temperatures, heart rates, localized sweat rates, arm-segment blood perfusion rates, respiration rates, oxygen uptakes, and respiratory exchange ratios were measured in six men (22 to 33 yr) during simultaneous exposures to heat and vibration - either wbv or sbv, and during a heated 50 min recovery period The heat conditions were T (sub db) = 43 5 + or - 0 5 C (mean + or S E M), and RH = 20 + or - 4% All vibration exposures were divided into two exposure conditions - identical frequencies but at a high intensity (HI) and a low intensity (LI) level The HI wbv exposure was for 25 min/day at 5 Hz, 0 37 g-rms, 10 Hz, 0 46 g-rms, 16 Hz, 0 72 g-rms, 30 Hz, 1 40 g-rms, 80 Hz, 3 70 g-rms The LI wbv exposure was for 2 5 hr/day at the same frequencies but at the following accelerations 0 14 g-rms, 0 18 g-rms, 0 28 g-rms, 0 55 g-rms, 1 44 g-rms During the sbv the subject stood and grasped a vibrating, in the Z-axis, hand grip with both hands Author

N84-10733# Aerospace Medical Research Labs, Wright-Patterson AFB, Ohio
PRELIMINARY INVESTIGATION OF VARIATION IN SOME DARK ADAPTATION ASPECTS FOR POSSIBLE RELEVANCE TO MILITARY HELICOPTER AIRCREW
E DONALDSON Jun 1983 91 p refs
(Contract AF PROJ 7184)
(AD-A130231, AFAMRL-TR-83-053) Avail NTIS HC A05/MF A01 CSCL 05J

The variability in night visual capacity of military aircrew may be relevant to task selection especially for low level night operation of the light observation helicopter The experimental objective was to assess the extent of variation threshold for spatial frequencies and in the time to recovery of dark adaptation after a standard light exposure simulating a flare illumination The subjects were 11 volunteers, five of whom were dark adapted for a period of 30 minutes The level of adaptation was measured with an adaptometer which had the capability of presenting the stimulus at several spatial frenquencies A brief exposure to the simulated flare illumination was immediately followed by assessment of the effect on dark adaptation and time for recovery Considerable variation was demonstrated in the rate and threshold levels of dark adaptation for light and for resolution of several spatial frequencies Following the simulated flare exposure of 0 8 mL for 90 seconds, most subjects attained a threshold level for light within 30 seconds and there was no evidence of a recovery effect in the curves of the threshold luminance for resolution of a 6 25 cycles per degree grating Marked differences in the threshold levels and in the spread of the subjects' estimations were clearly evident GRA

N84-10734# Naval Biodynamics Lab, New Orleans, La Bureau of Medicine and Surgery
EFFECTS OF IMPACT ACCELERATION ON SOMATOSENSORY EVOKED POTENTIALS
M D BERGER and M S WEISS Apr 1983 65 p refs
(AD-A130280, NBDL-83R002) Avail NTIS HC A04/MF A01 CSCL 06S

In order to test and evaluate impact protection devices, an impact-injury model for restrained humans in a crash environment must be developed Disruption of the functioning of the central nervous system (CNS) is an important consequence of impact injury involving the head and neck, and is an important consideration in the development of a useful impact-injury model Ultimately, neurophysiological criteria for functional injury of the CNS are desired The main purpose of the experiments reported here is to identify some of the measures of CNS function which may provide the basis for establishing such criteria In these experiments, eight unanesthatized Rhesus monkeys, with torsos restrained in a seated position, and with head and neck free to move, were subjected to peak sled accelerations in the -X direction ranging from 42 m/s sq second to 963 sq second The results of these analyses indicate that neurophysiological indices of injury may include increases in latencies of the cervical Somatosensory evoked potentials (SEP) peaks exceeding 2 5%, large changes in the amplitude of the cervical SEP, changes in ripples on the cortical primary SEP, and substantial and persistent changes in the surface-positive cortical primary SEP In particular, analysis of shifts in latency of the cervical SEP suggests the possibility of an injury threshold in the vicinity of 700 - 800 sq second Smaller shifts in latency occurring near 600 sq second may indicate a pre-injury condition GRA

N84-10735# Army Research Inst of Environmental Medicine, Natick, Mass Exercise Physiology Div
THE ENERGY COST AND HEART RATE RESPONSE OF TRAINED AND UNTRAINED SUBJECTS WALKING AND RUNNING IN SHOES AND BOOTS
B H JONES, M M TONER, W L DANIELS, and J J KNAPIK 1983 21 p refs
(AD-A131420, USARIEM-M-37/83) Avail NTIS HC A02/MF A01 CSCL 06S

To determine the difference in the energy cost of walking and running in a lightweight athletic shoe and a heavier boot, fourteen male subjects (6 trained and 8 untrained) had their oxygen uptake (VO2) measured while walking and running on a treadmill They wore each type of footwear, athletic shoes of the subjects' choice (average weight per pair = 616g), and leather military boots (average weight per pair = 1776g) at 3 walking speeds (4 0, 5 6 and 7 3 km/ h) and 3 running speeds (8 9 10 5 and 12 1 km/h) The trials for running were repeated at the same three speeds with the subjects wearing shoes and these shoes plus lead weights The weight of the shoes plus the lead weights was equal to the weight of the subjects' boots The VO2 values with boots were significantly (p 05) higher (5 9 to 10 2 percent) at all speeds, except the slowest walk, 4 0 km/h also, VO with shoes plus lead weights were significantly (p 05) higher than shoes alone Weight alone appeared to account for 48-70% of the added energy cost of wearing boots The relative energy cost (VO2m ml/kg/min) of trained and untrained suggests were the same at all speeds, but heart rates for the untrained were significantly higher (p 05) in both shoes and boots except at the slowest walking speed (4 0 km/h) These data indicate that energy expenditure is increased by wearing boots A large portion of this increase may be attributed to weight of footwear GRA

N84-10736# Naval Health Research Center, San Diego, Calif
A SURVEY OF BODY FAT CONTENT OF U.S. NAVY MALE PERSONNEL Interim Report
J A HODGDON and E J MARCINIK Feb 1983 16 p refs
(AD-A131500, NAVHLTHRSCHC-83-4) Avail NTIS HC A02/MF A01 CSCL 06E

In response to DOD directive 1308 1, the United States Navy has released a new instruction, OPNAVINST 6110 1B, covering health and physical readiness This instruction changes the standards for weight control from height/weight tables to a 22% body fat (%BF) standard for men, estimated from neck and abdominal circumferences In order to determine the possible impact of this change, height, weight, age, neck circumference and abdominal circumference measures were collected on a sample of 986 male U S Navy personnel 174 recruits, 309 recruit staff, 436 auxillary vessel crew members, and 67 submarine crew members Percent body fat was determined using the methods described in 6110 1B Compliance with heigh/weight standards was assessed using the table in 6110 1B The mean %BF for the survey sample was 16 8% (+ or - 5 3) Adjusting for differences between age distribution of our sample and that of the total Navy male population, it is estimated that 15 8% (+ or - 1 2) of the Navy male population will exceed the 22% BF standard For the survey sample, 16 5% of the personnel exceeded the 22% standard while 15 4% exceeded the height/weight standards This suggests changing to the %BF standard will not greatly effect the number of personnel on weight control programs GRA

N84-10737# Army Research Inst of Environmental Medicine, Natick, Mass Altitude Research Div
PREVENTION OF ACUTE MOUNTAIN SICKNESS BY DEXAMETHASONE
T S JOHNSON (Beth Israel Hospital), P B ROCK, C S FULCO, L TRAD, R F SPARK, and J T MAHER 27 Jul 1983 20 p refs
(Contract DA PROJ 3E1-62777-A-879)
(AD-A131533, USARIEM-M-38/83) Avail NTIS HC A02/MF A01 CSCL 06E

Acute mountain sickness (AMS) is a syndrome which occurs when unacclimatized individuals rapidly ascend to high altitude It is postulated that cerebral edema causes the symptoms of AMS Since dexamehtasone is useful in treating some forms of cerebral edema, we investigated its role in the prevention of AMS Utilizing a double-blind, crossover design, eight young men were exposed to a simulated altitude of 4570 m (15,000 ft) on two occasions On one occasion, they received dexamethasone (4 mg every 6 h) for 36 h before and throughout the 42 h exposure On the other, they received a placebo Presence of AMS symptoms was established by a questionnaire and a clinical interview Indices of Cerebral and respiratory symptoms(AMS-C and AMS-R, respectively) were derived from the questionnaire During the clinical interview, subjects were scored from 0 (no symptoms) to 3 (severe symptoms) Dexamethasone significantly reduced AMS symptoms AMS-C decreased from (mean + or - SE) 1 09 + or - 0 18 to 0 26 + or - 0 08 and AMS-R decreased from 0 64 + or - 0 09 to 0 31 + or - 0 06 during dexamethasone treatment (both p0 0001) As judged by clinical interview, symptom score decreased from 1 10 + or - 0 11 to 0 28 + or - 0 07 (p0 0001) We conclude that dexamethasone is effective in preventing the symptoms of AMS GRA

N84-10738# Georgia Inst of Tech , Atlanta School of Engineering Science and Mechanics
MEASUREMENT OF LUNG FUNCTION USING THE MAGNETOMETER SYSTEM Final Report
D L VAWTER and J D HUMPHREY Jul 1983 70 p refs
(Contract N00014-81-K-0126)
(AD-A130841) Avail NTIS HC A04/MF A01 CSCL 06P

In the last few years, several investigators have studied the idea of estimating lung volume by measuring the dimensional changes of the chest and abdomen during respiration The prospect of being able to know the value of lung volume from information obtained noninvasively was intriguing The most common method of measuring the dimensional changes is to use magnetometer pairs For the purpose of this report, it is sufficient to note that magnetometer pairs generate a voltage that is proportional to the change in their separation distance The relationship between voltage and the change in separation distance is essentially linear over the separation distances measured in this study GRA

N84-10739# Concordia Univ , Montreal (Quebec) Dept of Electrical Engineering
CERVICAL SPLINE ANALYSIS FOR EJECTION INJURY PREDICTION Final Research Report, Oct. 1980 - Sep. 1982
S GRACOVETSKY, H F FARFAN (St Mary's Hospital), and C D HELLEUR 30 Nov 1982 99 p refs
(Contract AF-AFOSR-0012-81, AF PROJ 2312)
(AD-A131081, AFOSR-83-0590TR) Avail NTIS HC A05/MF A01 CSCL 06S

We have developed a sagittal plane mathematical model for the cervical spine (including T6-T1, C7-C1 and skull) In our model the moments due to the weight of the head and neck and the effect of external forces are balanced by forces generated internally by muscle, ligament, and intervertebral joint With this formulation, the problem is to find a method for distributing the moment between muscle and ligament Our calculations show that the mathematical representation of physiological behavior demands that stress be minimized at the intervertebral joint It is interesting to note that Wolff has observed that bone architecture at the microscopic level responds to stress Our findings suggest the system as a whole is controlled by stress This model was then subjected to simulation in order to determine the maximum acceleration that the cervical spine would take for different postures We found that the maximum supportable acceleration (i e acceleration that would result in any cervical component reaching 2/3 of its limit) depends upon the neck posture and orientation vis-a-vis the acceleration vector GRA

N84-10740# EEG Systems Lab , San Francisco, Calif
NEUROCOGNITIVE PATTERN ANALYSIS Annual Technical Report, 1 Nov. 1982 - 31 Oct. 1983
A S GEVINS, B A CUTILLO, S L BRESSLER, J C DOYLE, R S TANNEHILL, G M ZEITLIN, and B H BONHAM Aug 1983 84 p refs
(Contract N00014-83-C-0022)
(AD-A131302, ONR-83-AE) Avail NTIS HC A05/MF A01 CSCL 05J

Completed and ongoing studies of neurocognitive processes using the new technique of Neurocognitive Pattern (NCP) Analysis are reported The pilot and formal recording phases of a bimanual visuomotor experiment are described, as well as work on the elimination of scalp-muscle and eye-movement artifiacts from single-trial brain-potential data GRA

N84-10741# Brookhaven National Lab , Upton, N Y
FOURIER-PROCESSED IMAGES OF DYNAMIC LUNG FUNCTION FROM LIST-MODE DATA
I G ZUBAL, R W ROWE, I BIZAIS, H SUSSKIND, G W BENNETT, and A B BRILL 1983 5 p refs Presented at the 5th Ann Conf of IEEE/Eng in Med and Biol Soc , Columbus, Ohio, 10 Sep 1983
(Contract DE-AC02-76CH-00016)
(DE83-013276, BNL-33138, CONF-830994-1) Avail NTIS HC A02/MF A01

Time and volume correlated amplitude and phase images are computed from nuclear medical ventilation studies and for dynamic transmission scans of the lungs This is made possible by a hardware interface and data acquisition system, developed in-house, allowing camera events and multiple ancillary physiological signals (including lung volume) to be acquired simultaneously in list mode The first harmonic amplitude and phase images are constructed on an event by event basis These are computed for both equal time and equal lung volume increments Time and volume correlated Fourier images for ventilation studies have shown details and functional structures not usually seen in conventional imaging techniques Processed transmission scans show similar results compared to ventilation images DOE

N84-10742# National Center for Devices and Radiological Health, Rockville, Md
PERFORMANCE OF A NEW 916 MHZ DIRECT CONTACT APPLICATOR WITH REDUCED LEAKAGE, A DETAILED ANALYSIS Final Report
G KANTOR and D M WITTERS, JR Apr 1983 29 p refs Submitted for publication
(PB83-226621, HHS/PUB/FDA-83-8100, FDA/NCDRH-83/42) Avail NTIS HC A03/MF A01 CSCL 06L

The paper demonstrates the feasibility of a direct contact diathermy applicator operating at 915 MHz The design is a circular waveguide internally loaded with two orthogonal pairs of forward ridges to obtain circular polarization and two rear ridges with a probe to excite the guide Two designs were tested a 15-cm diameter applicator with one annular choke covered with a microwave absorber and a 25-cm diameter applicator with two additional concentric chokes to limit radiation leakage In delivering a thermally effective specific absorption rate to a planar phantom, leakage levels were less than 5 mW/sq cm for applicators in direct contact with the phantom If there is a small spacing between these applicators and planar phantoms, the net power and associated leakage is excessive Author (GRA)

N84-10743# Environmental Monitoring and Support Lab , Research Triangle Park, N C Data Management and Analysis Div
RECENT ADVANCES IN EPA'S (ENVIRONMENTAL PROG MONITORING AND METHODS DEVELOPMENT RESEARCH
R H JUNGERS Jul 1983 14 p refs
(PB83-231209, EPA-600/D-83-085) Avail NTIS HC A02/MF A01 CSCL 06E

Several areas of advanced research related to sampling, analysis, and human exposure assessment of exhaust emission in ambient air were developed These include studies of methods for volatile organic compounds and the development and application of personal exposure monitors in screening for polynuclear aromatics (PNA's) and carbon monoxide These methods for screening PNA's are fast, economical and accurate The more expensive and time consuming traditional methods of analysis may be judiciously applied to those samples which the screening methods indicate are high in PNA's Carbon monoxide, an emission product directly related to automobile emissions, is being monitored using personal exposure monitors in urban scale studies to obtain data on population exposures on a real time basis GRA

N84-10744# Research Triangle Inst , Research Triangle Park, N C
PERSONAL EXPOSURE TO VOLATILE ORGANICS AND OTHER COMPOUNDS INDOORS AND OUTDOORS: THE TEAM (TOTAL EXPOSURE ASSESSMENT METHODOLOGY) STUDY
L A WALLACE, E D PELLIZZARI, T D HARTWELL, C SPARACINO, and H ZELON Jul 1983 35 p refs
(Contract EPA-68-03-3679)
(PB83-231357, EPA-600/D-83-082) Avail NTIS HC A03/MF A01 CSCL 06E

A methodology for measuring individual human exposure to toxic substances was developed Methods for estimating body burden with the use of biological measurements were also developed All significant pathways of exposure are addressed Sampling and analytical protocols were tested for volatile organic compounds, organochlorine pesticides, metals, and polyaromatic hydrocarbons Exposure through air and drinking water and excretion rates through inhaled breath were measured for a statistically valid sample population It was determined that personal air median concentrations ranged from 40 to 320% higher than outdoor fixed air concentrations Correlations between personal and outdoor samples were poor GRA

N84-10745# Draper (Charles Stark) Lab , Inc , Cambridge, Mass
PROBABILISTIC MODEL FOR ASSESSING TIME-VARYING CONTAMINANT LEVELS
C WHITNEY 1983 27 p refs
(Contract PHS-HSM-99-72-18)
(PB83-232108) Avail NTIS HC A03/MF A01 CSCL 06J

The health and well being of workers in an industrial environment that emits respirable contaminants depends in part on an effective program to monitor the concentration of airborne pollutants and compare them to given standards The analysis described herein is aimed at some problems faced by an inspector determining exposure levels and making decisions of overexposure/safe-exposure for industrial workers There is at present an acute need for an approach to the monitoring problem that (1) is generally applicable to any industrial environment, (2) specifies the most efficient way to collect the data, (3) indicates how to assess the accuracy and repeatability of the results, and (4) reduces to a few simple rules of thumb, numerical tables or computer programs readily applicable by workers in the field GRA

N84-10746# Rochester Univ , N Y Dept of Medicine
MICROWAVES, HYPERTHERMIA, AND HUMAN LEUKOCYTE FUNCTION Final Report, Aug. 1979 - Jun. 1982
N J ROBERTS, JR , S T LU, and S M MICHAELSON Jul 1983 24 p refs
(Contract EPA-R-808039, EPA-R-806390, F33615-81-K-0616, AF-AFOSR-0111-80)
(PB83-225375, EPA-600/1-83-008) Avail NTIS HC A02/MF A01 CSCL 06R

Studies were performed to determine whether human leukocytes are affected by exposure to microwave energies that equal or even exceed current safety standard recommendations There were no detectable effects on viability or function of human mononuclear leukocytes resulting from exposure to microwave energy at specific absorption rates up to 4 mW/ml In contrast to studies in other

laboratories, the results were highly reproducible and provided no evidence that current safety standard recommendations are inappropriate insofar as leukocyte function is concerned GRA

N84-10747# Health Effects Research Lab , Research Triangle Park, N C
RADIOFREQUENCY RADIATION EXPOSURE FOR BIO-EFFECTS RESEARCH AT THE HEALTH EFFECTS RESEARCH LABORATORY, RESEARCH TRIANGLE PARK, NORTH CAROLINA
J S ALI and C WEIL Mar 1983 64 p refs
(PB83-229591, EPA-600/2-83-018) Avail NTIS HC A04/MF A01 CSCL 06R

The multi-user radiofrequency radiation exposure facilities for bio-effects research is described Four facilities are (1) a 100 MHz CW exposure system, (2) a 2450 MHz CW exposure system, (3) a 2450 MHz AM exposure system, and (4) an X-band pulsed RF exposure system The individual facility descriptions include construction details, specifications, photographs, circuit drawings and block diagrams All of the facilities incorporate environmental control systems and three have RF power-level regulation GRA

N84-10748# National Inst for Occupational Safety and Health, Cincinnati, Ohio
REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES. USER'S GUIDE TO THE RTECS COMPUTER TAPE Annual Report
R L TATKEN and R J LEWIS Jan 1983 79 p
(Contract PHS-NIOSH-210-81-8101)
(PB83-223172, DHEW/DF-83/004A) Avail NTIS HC A05/MF A01 CSCL 06T

The User's Guide defines the record layouts and describes the types of data contained in the computer tape The Guide defines all relevant terms and contains the introductory material and tables The data file contains 218,746 entries (59,224 are names of unique chemicals with their associated toxicity data and 159,522 are synonymous names) and provides basic information on their known toxic and biological effects GRA

N84-10749# SRI International Corp , Menlo Park, Calif
DIRECT BIOLOGICAL EFFECTS OF INCREASED ATMOSPHERIC CARBON DIOXIDE LEVELS
M K BLAND, H C BALEY, and M J LIPSETT Jun 1983 136 p refs
(Contract EPA-68-02-3716)
(PB83-224360, EPA-600/6-83-001) Avail NTIS HC A07/MF A01 CSCL 06T

The likely biological nonclimatic, direct effects of carbon dioxide (CO2) on terrestrial and aquatic ecosystems and on human health are assessed It summarizes the literature on the direct effects of rising CO2 levels on the biosphere is summarized and technical information needs about direct biological effects of rising CO2 levels are identified The environmental and human health implications of these effects were evaluated in the context of four scenarios describing possible carbon dioxide levels Six categories of CO2 control options (1) increasing the rate of carbon fixation or mass transfer, (2) changing the fuel use strategy, (3) changing energy use patterns, (4) using emission source controls (5) using institutional controls to adapt society, and (6) implementing exotic strategies are discussed GRA

N84-11694# Joint Publications Research Service, Arlington, Va
STUDY OF CARDIOVASCULAR SYSTEM DURING LONG-TERM SPACEFLIGHTS
A D YEGOROV and O G ITSEKHOVSKIY *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 1-5 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 4-6
Avail: NTIS HC A08

During the Salyut-6 spaceflights cardiac bioelectrical and mechanical activity, blood content and tone of cerebral and limb vessels, systemic arterial and venous pressure were measured in 10 primary crewmembers The measurements were taken at rest and during LBNP and ergometry tests It is shown that the circulation changes are adaptive reactions of the body to a new environment, particularly weightlessness Cardiovascular responses to the provocative tests were changed and more marked, probably, due to blood redistribution Author

N84-11695# Joint Publications Research Service, Arlington, Va
SIMULATION OF CEREBROCRANIAL TRAUMA FOR EVALUATION AND DEVELOPMENT OF GEAR TO PROTECT PILOTS AGAINST IMPACTS
A S BARER, V I KHARCHENKO, Y G KONAKHEVICH, L N SHOLPO, G N DUBALSKIY, V K PETLYUK, and N A UGLANOVA *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 6-15 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 7-12
Avail NTIS HC A08

The results of developing a model of craniocerebral trauma are presented A man's head model was developed along with a criterion of impact safety The model and the criterion can be used for experimental assessment of pilot's protective helmets Author

N84-11697# Joint Publications Research Service, Arlington, Va
CHANGES IN CARDIAC OUTPUT AND ORTHOSTATIC STABILITY OF COSMONAUTS
P V VASILYEV, A D VOSKRESENKIY, V G DOROSHEV, V V KALINICHENKO, N A LAPSHINA, and V V SHCHIGOLEV *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 32-35 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 25-27
Avail NTIS HC A08

Examinations of 14 cosmonauts who performed orbital flights of 14 to 175 days wwere used to correlate cardiac output (CO) inflight with orthostatic tolerance and ALBNP reactions postflight In 3 crewmembers CO was lower than or close to the preflight level In 4 cosmonauts CO was higher than preflight The remaining 7 crewmembers showed lower orthostatic tolerance and stronger LBNP reactions The difference between mean CO values before and during flight was in negative correlation with orthostatic tolerance (r = -0 6) and in positive correlation with LBNP reactions (r = 0 7) The correlation coefficients were derived from small samples but an identical relationship between the two different tests with inflight CO variations gives evidence that such a relationship actually exists Author

N84-11698# Joint Publications Research Service, Arlington, Va
HEMODYNAMIC REACTIONS TO POSITIVE INTRATHORACIC PRESSURE AT +G SUB Z ACCELERATIONS
M A TIKHONOV, D Y ARKHANGELSKIY, A V KONDAKOV, and V V LITOVCHENKO *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 36-40 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 27-30
Avail NTIS HC A08

Eight male test subjects, aged 20 to 28, were exposed to acceleration +Gz and positive breathing pressure (PBP) of 30 mm Hg to study their hemodynamics under these conditions The calculated and experimental decrease of blood pressure at the eye level during increasing acceleration and voluntary myorelaxation was comparable The exposure to PBP helped tolerate higher (by 1 1 + or - 0 2 G) acceleration values without visual disorders The exposure to 7 0 G and PBP caused a lower increase in heart rate and breathing frequency (by 6% and 12%, respectively), a smaller reduction of blood pressure at the eye level (by 20%) and a decreased muscular tension (by 18%) Author

N84-11699# Joint Publications Research Service, Arlington, Va
NORMAL HUMAN CORONARY CIRCULATION DURING POSTURAL TESTS AND DECOMPRESSION OF LOWER HALF OF BODY
V Y KATKOV, V V CHESTUKHIN, V V RUMYANTSEV, Y V KOLPAKOV, N V PRAVETSKIY, and S V AGAFONOV *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 41-49 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 30-36
Avail NTIS HC A08

The effect of postural changes (orthostatic and antiorthostatic tests) and LBNP on coronary circulation was investigated in 11 healthy male test subjects Volume blood flow velocity and pressure were measured and blood flowing from the heart was withdrawn using a Ganz catheter implanted into the coronary sinus A thin Teflon catheter was implanted into the brachial artery When the test subjects were transferred from the recumbent to the head up position their left ventricular oxygen consumption decreased by 3 2 m/min (21%) and coronary blood flow by 23 8 m/min (19%), while coronary vascular resistance increased by 32% When the test subjects were transferred from the head up to the head down position (at -15 deg), coronary oxygen consumption and blood flow increased by 5 5 (46%) and 45 3 (44%) m/min, respectively, and coronary resistance decreased by 36% In this situation the LBNP test (-30 mm Hg for 20 min) caused a reduction in oxygen consumption and coronary blood flow by 4 4 (25%) and 37 3 (25%) 7 m/min, respectively, and an increase in coronary resistance by 58% Author

N84-11700# Joint Publications Research Service, Arlington, Va
DYNAMICS OF RHEOGRAPHIC PARAMETERS OF CEREBRAL CIRCULATION AND CIRCULATION IN THE EXTREMITIES DURING ACTIVE ORTHOSTATIC TEST
N I SAPOVA *In its* USSR Rept Space Biol and Aerospace Med, V 17, (Moscow), v 17, no 5, Sep-Oct 1983 p 36-39 No 5, Sep-Oct 1983 p 50-55 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med
Avail NTIS HC A08

Rheography was used to study brain, leg and forearm circulation in 30 male test subjects during tilt tests In the head up position blood circulation in the above body parts decreased due to a reduction of stroke volume The orthostatis reaction was considered normal, provided that leg blood content decreased and tone increased, cerebral and forearm blood content and tone varied slightly, and rheographic parameters in the stationary states (lying and standing) remained unchanged Author

N84-11701# Joint Publications Research Service, Arlington, Va
EFFECT OF REDISTRIBUTION OF BLOOD ON SEVERITY OF SPATIAL POSITION ILLUSIONS IN WEIGHTLESSNESS
F A SOLODOVNIK, A V CHAPAYEV, A A PRUSSKIY, and A A SIMAKOV *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 56-60 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 40-43
Avail NTIS HC A08

Blood redistribution was produced using a tilt table (-30 deg) and a LBNP device Illusionary sensations were measured by a Birtok unit and subjective reports of the test subjects In the head down position the feeling of blood rush to the head disappeared as soon as the weightless state was reached In most cases illusionary sensations were similar to those in the horizontal position When exposed to LBNP tests, the subjects developed no illusionary sensations during horizontal flight and felt their upper body going upwards and legs going downwards in the weightless state Thus, illusionary sensations of the spatial position depend at large on blood redistribution in the human body Author

N84-11702# Joint Publications Research Service, Arlington, Va
FREE AMINO ACIDS OF BLOOD BEFORE AND AFTER SHORT-TERM SPACEFLIGHTS
T F VLASOVA, Y B MIROSHNIKOVA, and A S USHAKOV *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 61-63 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 43-45
Avail NTIS HC A08

The amino acid composition of plasma and serum of the crewmembers who performed short term flights (of 3 to 14 days) onboard the Salyut-6 orbital station was investigated Immediately postflight total amino acids remained unchanged while variations in isolated amino acids (tendency toward increased aspartic acid and decreased crystein in plasma, and increased leucin in serum) were adaptive Author

N84-11703# Joint Publications Research Service, Arlington, Va
CHANGES IN BLOOD UREA CONTENT UNDER HYPOKINETIC CONDITIONS
I S BALAKHOVSKIY and T A ORLOVA *In its* USSR Rept. Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 64-69 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 45-48
Avail NTIS HC A08

The blood and urine content of urea and creatinine, as well as urea production and creatinine clearance were measured in 9 test subjects exposed to head-down tilting (at -6 deg) for 8 days The trend for an increased urea content was more marked in the test subjects with its initially low concentration (3 3-4 2 mmol/l) Variations in the urea concentration were similar and included its decrease during the first day and increase thereafter Creatinine excretion and clearance declined uniformly and significantly during the first 5 experimental days No correlation was found between urea concentration and urea production, or between creatinine clearance and urea concentration Author

N84-11704# Joint Publications Research Service, Arlington, Va
ENERGY METALBOLISM ENZYMES IN SIMULATION OF SOME SPACEFLIGHT FACTORS
S KALANDAROV, V P BYCHKOV, I D FRENKEL, L P VOLKOVA, and G I PROSKUROVA *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 70-73 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 49-51
Avail NTIS HC A08

The content of lactate dehydrogenase, amino transferases and creatine kinase was measured in the test subjects of three age groups (41 to 50, 50 to 57 and 26 to 33 years) exposed to head-down tilt, linear acceleration, exercise, and emotional stress The enzyme activity increased in response to head-down tilt, acceleration and exercise The enzyme content normalized under the influence of selected nutrients Author

N84-11712# Joint Publications Research Service, Arlington, Va
EXPERIMENTAL PSYCHOLOGICAL METHODS USED IN EXPERT EVALUATION OF MENTAL WORK CAPACITY OF FLIGHT PERSONNEL IN THE PRESENCE OF FUNCTIONAL DISTURBANCES AND CENTRAL NERVOUS SYSTEM DISEASES
I N LAVRENTYEVA, V I MYASNIKOV, and V F VOLOKHOV *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 111-116 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 76-80
Avail NTIS HC A08

The mental state and work capacity of flight personnel with functional central nervous system disturbances were examined on the basis of assessing the professionally relevant traits and properties Some elements of a pilot's task performance were simulated J M S

N84-11714# Joint Publications Research Service, Arlington, Va.
DETERMINATION OF A SUBJECTS CONDITION ACCORDING TO PITCH OF THE VOCAL VOWEL 'A'
G I AKINSHCHIKOVA and O D VOLCHEK *In its* USSR Rept: Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 121-123 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct. 1983 p 82-83
Avail NTIS HC A08

The phonation of 'A' by more than 200 individuals was recorded under different conditions Several psychophysiological parameters were also recorded Correlation analysis of the results identified a close link between magnitude of PVV" PVV'A' and values of the psychophysiological parameters The e level of significance constituted P = 0 01 to 0.001 J M S.

N84-11716# Joint Publications Research Service, Arlington, Va
A METHOD OF ASSESSING CARDIAC FUNCTION WITH BICYCLE ERGOMETRY IN EXPERT MEDICAL CERTIFICATION OF PILOTS
E G MUKHAMEDOV *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 127-130 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 84-86
Avail NTIS HC A08

The functional state of the myocardium was examined using bicycle ergometry, taking into consideration maximum blood pressure and duration of electrical systole as the most efficient period of the cardiac cycle The results indicate that, in the presence of early signs of atherosclerosis with adequate myocardial coronary reserve, the proposed parameter 'systolic product' could be used as an additional criterion for assessing the functional state of the cardiovascular system in the practice of expert medical certification of flight personnel J M S

N84-11717# Joint Publications Research Service, Arlington, Va
EVALUATION OF SKELETAL MUSCLE TONE BY RECORDING LATERAL RIGIDITY
G I GEVLICH, L S GRIGORYEVA, M I BOYKO, and I B KOZLOVSKAYA *In its* USSR Rept Space Biol and Aerospace Med, V 17, No 5, Sep-Oct 1983 p 131-137 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep-Oct 1983 p 86-89
Avail NTIS HC A08

The method of assessing muscle tone according to parameters of lateral rigidity is described The electromyotonometer was used to record the force of application of the gage and tissular reaction over a wide range of strain energy The findings indicate that when recording the forte of application of the gage and tissue reactions with standardization of position and level of muscular activity, the described method makes it possible to assess with adequate precision and reproducibility the lateral rigidity of muscles It can be used in experiments and clinical practice as a means of quantitative evaluation of muscle tone J M S

N84-11744* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala.
PROSTHETIC OCCLUSIVE DEVICE FOR AN INTERNAL PASSAGEWAY Patent
J B TENNEY, JR, inventor (to NASA) (Rochester General Hospital) 11 Oct. 1983 6 p Filed 23 Apr 1982 Supersedes N82-26962 (20 - 17, p 2451) Sponsored by NASA
(NASA-CASE-MFS-25740-1, US-PATENT-4,408,597, US-PATENT-APPL-SN-371352, US-PATENT-CLASS-128-1R, US-PATENT-CLASS-128-346, US-PATENT-CLASS-128-DIG 25)
Avail US Patent and Trademark Office CSCL 06E

An occlusive device is disclosed for surgical implant to occlude the lumen of an internal organ The device includes a cuff having a backing collar and two isolated cuff chambers The fluid pressure of one chamber is regulated by a pump/valve reservoir unit The other chamber is unregulated in pressure but its fluid volume is adjusted by removing or adding fluid to a septum/reservoir by means of a hypodermic needle Pressure changes are transmitted between the two cuff chambers via faying surfaces which are sufficiently large in contact area and thin as to transmit pressure generally without attenuation By adjusting the fluid volume of the septum, the operating pressure of the device may be adjusted to accommodate tubular organs of different diameter sizes as well as to compensate for changes in the organ following implant without reoperation

Official Gazette of the U S Patent and Trademark Office

N84-11745# Naval Medical Research Inst, Bethesda, Md
EFFICIENCY OF HIGH-FREQUENCY VENTILATION AS DETERMINED BY NITROGEN WASHOUTS: A MODEL STUDY Final Progress Report
J R CLARKE, L D ROMER, and E T FLYNN Apr 1983 26 p refs
(Contract MR0000101)
(AD-A131331, NMRI-83-09) Avail NTIS HC A03/MF A01 CSCL 06S

We examined the frequency dependency of high-frequency ventilation (HFV) by using a two-compartment mechanical model A loudspeaker was used as an oscillator to assist mixing between the two compartments One compartment (C1) contained either O2 or SF6 prior to mixing, while the other (C2) contained air The rate of change of nitrogen concentration in the latter compartment was used as an index of mixing efficiency The speaker was driven with either a sinusoidal or random signal, and the spectral characteristics and acoustic power of the pressures generated in each compartment were determined by a Fast Fourier Transform Analyzer and PDP 11/34 and /70 computers Transport coefficients describing mixing increased approximately linearly with power For a given power in C1, the mixing rates were highly frequency-dependent The frequencies for resonance and optimal mixing were essentially identical, and decreased as gas density increased When powers were matched in C2, however, mixing was much less dependent on frequency Random noise proved as effective in augmenting mixing as sinusoidal excitation It can do so while decreasing the magnitude of pressure changes in the system and while reducing the influence of changing resonant frequencies Author (GRA)

N84-11746# Massachusetts Inst of Tech, Cambridge Artificial Intelligence Lab
COMPUTATIONAL STUDIES IN THE INTERPRETATION OF STRUCTURE AND MOTION: SUMMARY AND EXTENSION
S ULLMAN Mar 1983 28 p refs
(Contract N00014-80-C-0505, NSF MCS-79-23110)
(AD-A131598, AI-M-706) Avail NTIS HC A03/MF A01 CSCL 06P

Computational studies of the interpretation of structure from notion examine the conditions under which three dimensional structure can be recovered from motion in the image The first part of this paper summarizes the main results obtained to date in these studies The second part examines two issues the robustness of the 3-D interpretation of perspective velocity fields, and the 3-D information contained in orthographic velocity fields The two are related because, under local analysis, limitations on the interpretation of orthographic velocity fields also apply to perspective projection The following results are established When the interpretation is applied locally, the 3-D interpretation of the perspective velocity field is unstable, The orthographic velocity field determines the structure of the inducing object exactly up to a depth-scaling, For planar objects, the orthographic velocity field always admits two distinct solutions up to depth-scaling, and The 3-D structure is determined uniquely by a view and a half of the orthographic velocity field Author (GRA)

N84-11747# Utah Univ , Salt Lake City Dept of Mathematics
ULTRASOUND TOMOGRAPHY BY GALERKIN OR MOMENT METHODS
S A JOHNSON and F STENGER 5 May 1983 30 p refs
(Contract DAAG29-83-K-0012, PDP-110B, R01-CA1-29728)
(AD-A131408, ARO-19297 2-MA) Avail NTIS HC A03/MF A01
CSCL 06E

Ultrasound B-scan imaging is now a well established and valuable clinical tool Improvements in transducer arrays and microprocessor controls have lead to the development of real time linear and sector scanners which produce images of remarkable clarity and resolution compared with B-scanners of only a few years ago Further improvements in B-scan images are predicted to occur as larger transducer apertures and improved dynamic focusing methods are employed The use of Doppler ultrasound alone or in combination with real time B-scan imaging is expected to increase in importance as the clinical significance of high resolution Doppler images is appreciated During the past decade X-ray C T (computed tomography) and recently NMR imaging have made remarkable contributions to the field of diagnostic imaging X-ray (C T) and NMR images not only provide resolution of about 1 mm but also can be calibrated by absolute reference standards The resulting quantitative images have proven to be valuable because of the greater ability thus provided to distinguish healthly and diseased tissue by their image values GRA

N84-11748# Pacific Northwest Lab , Richland, Wash
CONCEPTS OF DOSE TO SOFT TISSUE AT THE CELLULAR LEVEL
D R FISHER May 1983 24 p refs Presented at the Health Phys Soc Summer School, Baltimore, 13-17 Jun 1983
(Contract DE-AC06-76RL-01830)
(DE83-013830, PNL-SA-11419, CONF-830665-3) Avail NTIS HC A02/MF A01

Radiation effects begin at the cellular level of biological organization Radiation dosimetry at the cellular level is particularly important for internally deposited alpha and beta particle emitters Microdosimetry is a mechanism for studying the dose imparted to microscopic sites, for determining hit probabilities, and for determining the probability that sites are missed Internal microdosimetry calculations are complex, but can be easily executed using computer programs The target and its size must be specified, the radionuclide activity per unit mass for each region in which targets are located determined, the activity per radioactive particulate described, the geometrical relationship between the activity and the targets understood, and the biological retention of the activity in the region as a function of time accounted for Internal microdosimetry has many potential applications in radiological protection Microdosimetry is a special research area designed to provide a better understanding of the importance of microscopic patterns of radiation interactionn with cells within the broader framework of biochemistry and radiation biology DOE

N84-11749# Pacific Northwest Lab , Richland, Wash
EVALUATION OF A DRAFT STANDARD ON PERFORMANCE SPECIFICATIONS FOR HEALTH PHYSICS INSTRUMENTATION
J L KENOYER, K L SWINTH, R L KATHREN, and J M SELBY Jun 1983 22 p refs Presented at the 28th Health Phys Soc Ann Meeting, Baltimore, 19-23 Jun 1983 Sponsored in part by Nuclear Regulatory Commission
(Contract DE-AC06-76RL-01830)
(DE83-016169, PNL-SA-11055, CONF-830695-3) Avail NTIS HC A02/MF A01

The draft ANSI standard N42 17 on performance specifications for health physics instrumentation was written in 1981, the second draft of this standard is currently being evaluated by Pacific Northwest Laboratory Objectives of this project include the evaluation of the applicability and practicality of the proposed standard and the determination of the degree of conformance of a cross section of currently available commercial instruments to the proposed standard This standard is being tested against such instruments as ionization chambers, G M detectors, alpha survey meters, and neutron dose equivalent survey meters Results on the use of the first two categories will be presented in this paper Procurement of instruments for testing was accomplished by direct purchase ofoff-the-shelf units and by loan from instrument manufacturers and others including DOE laboratories The testing procedures were developed with emphasis on the requirements found in ANSI N42 17 with additional criteria from other draft and current ANSI and IEC standards Details of procedures on effects of temperature, humidity, and ambient pressure, will be presented in this paper DOE

N84-11750# Pacific Northwest Lab , Richland, Wash
EVALUATION OF A DRAFT STANDARD ON PERFORMANCE SPECIFICATIONS FOR HEALTH PHYSICS INSTRUMENTATION
K L SWINTH, J L KENOYER, A P MILEHAM, R L KATHREN, and J M SELBY Jun 1983 20 p Presented at the Health Phys Soc Ann Meeting, Baltimore, 19-23 Jun 1983 Sponsored in part by the Nuclear Regulatory Commission
(Contract DE-AC06-76RL-01830)
(DE83-016186, PNL-SA-11058, CONF-830695-4) Avail NTIS HC A02/MF A01

The draft ANSI standard N42 17D2 on performance specifications for health physics instrumentation is currently being evaluated by the Pacific Northwest Laboratory The primary objective of the project is the evaluation of the applicability and practicality of the proposed standard through testing of a cross-section of currently available commercial instruments to determine how well they conform to the standard The standard is being tested against instruments such as ionization chambers, G M detectors, alpha survey meters, and neutron dose equivalent survey meters This paper presents results of the preliminary radiological performance tests on ionization chambers and G M detectors This includes both the data generated during the tests and a discussion of procedures developed to perform the testing Results are reported for response time, accuracy, precision, radiation overloads, and angular dependence In addition, results are reported for parameters that affect instrument performance including battery lifetime, geotropism and stability DOE

N84-11751# Oak Ridge National Lab , Tenn Health and Safety Research Div
ACCURACY OF EXTERNAL PERSONNEL DOSIMETRY SYSTEMS IN MIXED NEUTRON AND GAMMA RADIATION FIELDS
R E SWAJA 1983 3 p refs Presented at the 7th Intern Conf on Radiation Res , Amsterdam, 3-8 Jul 1983
(Contract W-7405-ENG-26)
(DE83-015712, CONF-830710-6) Avail NTIS HC A02/MF A01

Estimates of biological effects associated with exposure to external radiation fields are generally based on the measured response of passive personnel dosimetry systems to the incident radiation The increasing number of persons occupationally exposed to mixed neutron and gamma fields and recent questions concerning the relative biological hazards of different types of radiation have emphasized the need for accurate personnel radiation dose measurements The performance characteristics of various neutron and gamma personnel dosimetry systems under actual mixed-field conditions have been determined Analysis of the results indicates that significant inaccuracies can occur in neutron and gamma dose measurements in mixed radiation fields unless dosimeter performance and characteristics of the monitoring environment are considered in dosimeter evaluation DOE

N84-11752# Bruker Analytische Messtechnik G m b H, Rheinstetten (West Germany)
DEVELOPMENT AND CONSTRUCTION OF AN APPARATUS BASED ON THE PRINCIPLE OF MULTIDIMENSIONAL NUCLEAR MAGNETIC RESONANCE FOR THE FORMATION OF IMAGES OF ORGANS AND PARTS OF THE BODY Final Report, May 1981
B KNUETTEL Bonn Bundesministerium fuer Forschung und Technologie Jun 1983 37 p In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-83-102, ISSN-0340-7608) Avail NTIS HC A03/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 8

An NMR tomograph which uses an iron magnet and is designed for imaging objects up to 7.5 cm diameter at a frequency of 30 MHz, and an NMR tomograph for application to large objects (head and whole body scanning) with a large air-core magnet at 1 5 kG (6 MHz) were built The iron magnet system has good resolution but long measuring times for two dimensional imaging, while worse resolution and rather shorter time for three dimensional imaging Two dimensional images obtained by the air core magnet provide good resolution even for details like skull bones with scalp Author (ESA) 1

N84-11753# AEG-Telefunken, Heilbronn (West Germany) Geschaeftsbereich Elektronische Bauelemente
CIVIL APPLICATIONS OF INFRARED TECHNIQUES Final Report, Mar. 1982
H MAIER and K ABEL (Eltro GmbH) Bonn Bundesministerium fuer Forschung und Technologie Jul 1983 314 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-T-83-132, ISSN-0340-7608) Avail NTIS HC A14/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 48

Infrared detectors, pyrometers and thermographic cameras were analyzed with respect to applications in medicine, energy conservation, industrial equipment and production control Results show that modern technologies and product programs largely fulfil civil requirements However, adaption to specific problems is often necessary Modifications and additional equipment are suggested where desirable Author (ESA)

N84-11754# Health Effects Research Lab, Research Triangle Park, N C
BIOASSAY OF PARTICULATE ORGANIC MATTER FROM AMBIENT AIR
J L HUISINGH, M WATERS, L CLAXTON, A KOLBER (Research Triangle Inst), T WOLFF (Research Triangle Inst), T HUGHES (Research Triangle Inst), and E. D PELLIZZARI (Research Triangle Inst) Jul 1983 28 p refs
(PB83-239731, EPA-600/D-81-266) Avail NTIS HC A03/MF A01 CSCL 06T

The influence of industrialization and consequent increased concentration of urban particulate matter on the incidence of cancer has long been a concern The first bioassys used to evaluate complex ambient air samples were whole-animal carcinogenesis bioassays. In these studies, organic extracts of urban particulate matter were found to be carcinogenic in rodents Carcinogenic polycyclic aromatic hydrocarbons (PAH), such as benzo(a)pyrene, were defected in these extracts, however, these compounds did not account for all of the carcinogenic activity reported GRA

N84-11755# California Univ, Davis Human Performance Lab
OZONE TOXICITY EFFECTS CONSEQUENT TO PROLONGED, HIGH INTENSITY EXERCISE Final Report, Dec. 1980 - Aug. 1982
W C ADAMS and E S SCHELEGLE Aug 1982 61 p refs
(PB83-237388, ARB-R-83-191) Avail NTIS HC A04/MF A01 CSCL 06T

The purpose of the study was (1) to investigate the effects of ozone exposure combined with very high ventilation volumes during exercise and (2) to study selected ventilatory and respiratory metabolism parameters and subjective symptomatology which suggests mechanisms for loss of maximal aerobic performance following ozone exposure Author (GRA)

53

BEHAVIORAL SCIENCES

Includes psychological factors, individual and group behavior, crew training and evaluation, and psychiatric research

A84-10388* Georgia Inst of Tech, Atlanta
ANALYSIS AND CLASSIFICATION OF HUMAN ERROR
W B ROUSE (Georgia Institute of Technology, Atlanta, GA) and S H. ROUSE (Search Technology, Inc, Norcross, GA) IEEE Transactions on Systems, Man, and Cybernetics (ISSN 0018-9472), vol SMC-13, July-Aug 1983, p 539-549 refs
(Contract NAG2-123)

The literature on human error is reviewed with emphasis on theories of error and classification schemes A methodology for analysis and classification of human error is then proposed which includes a general approach to classification Identification of possible causes and factors that contribute to the occurrence of errors is also considered An application of the methodology to the use of checklists in the aviation domain is presented for illustrative purposes Author

A84-10971* Tufts Univ, Medford, Mass
THE EFFECTS OF CUING IN TIME-SHARED TASKS
R A CHECHILE and D M SADOSKI (Tufts University, Medford, MA) Human Factors (ISSN 0018-7208), vol 25, Aug 1983, p 371-377 refs
(Contract NAG2-51)

The results of two divided-attention experiments involving the editing of route-way-point displays on an avionics computer unit are reported Two side tasks were required of the subjects, and either no cue, verbal cues appearing on the CRT, or symbolic cues (lights on the keyboard adjacent to keys to be used) were given to facilitate the primary editing task Forty female and 30 male undergraduates were trained in the separate and combined tasks and divided randomly into groups of 25 for the cuing tests A second test with three 10-subject groups was conducted at least one month later to investigate the efficacy of cuing for infrequently used procedures It is found that only symbolic cuing significantly improved primary-task performance, increasing editing accuracy in the repetitive tests and reducing editing time in the delayed tests Verbal cuing, probably because it requires additional cognitive effort, has no significant beneficial effect These results are considered important for designing instruments for work environments requiring the performance of concurrent tasks, and as aircraft cockpits T K

A84-10972
AN APPLICATION OF SIGNAL DETECTION THEORY TO AIR COMBAT TRAINING
J L EUBANKS and P R KILLEEN (Arizona State University, Tempe, AZ) Human Factors (ISSN 0018-7208), vol 25, Aug 1983, p 449-456 refs
(Contract F33615-77-C-0054)

Mission-qualified F-4 pilots scheduled for training in the Simulator for Air-to-Air Combat (SAAC) flew two consecutive 2-min engagements against a computer-simulated adversary aircraft both before and after SAAC training The SAAC models the flight characteristics of the different F-4 missile systems and was programmed to specify on a continual basis whether or not the adversary aircraft was within the pilot's weapon-firing envelope for each missile system Data collected were used to calculate hit rates and false-alarm rates in an application of the theory of signal detectability (TSD) Relevant parameters were derived by solving for the (inferred) decision window that optimized goodness-of-fit to power-law ROC curves. The results suggest that TSD represents

a promising approach to systematically studying changes in pilot decision-making behavior as a function of training Author

A84-10973
FLYING PERFORMANCE ON THE ADVANCED SIMULATOR FOR PILOT TRAINING AND LABORATORY TESTS OF VISION
R KRUK, D REGAN, K I BEVERLEY (Dalhousie University, Halifax, Canada), and T LONGRIDGE (USAF, Air Force Human Resources Laboratory, Williams AFB, AZ) Human Factors (ISSN 0018-7208), vol 25, Aug 1983, p 457-466 Sponsorship Natural Sciences and Engineering Research Council of Canada refs (Contract NSERC-A-0323, AF-AFOSR-78-3711)

The results of simulated flight and laboratory visual tests using 12 fighter pilots, 12 instructor pilots, and 12 graduating student pilots as subjects are reported The simulator tasks were formation flight, low-level flight, bombing, and restricted-visibility landing The sensory visual tests involved superthreshold velocity discrimination of a radially expanding flow pattern, depth-motion and frontal-plane-motion manual tracking, moving square motion and contrast thresholds, and a static sinusoidal grating The results are presented in tables and discussed It is found that expanding-flow-pattern discrimination is positively correlated with landing, formation-flight, low-level-flight, and bombing performance, and with aircraft-flying grades (for the student pilots) It is suggested that such visual testing be used in the preselection of candidates for flight training, and that attention be given to improving the accuracy of motion effects in flight-simulator visual displays T K

A84-11337
DISTRIBUTION OF INDIVIDUAL INDICES OF THE SUBJECTIVE EVALUATION OF LOUDNESS [O RASPREDELENII INDIVIDUAL'NYKH POKAZATELEI SUB'EKTIVNOI OTSENKI GROMKOSTI]
I A RYBIN, N V SHAMKOV, V I LUPANDIN, and L I PRIKHODKINA (Ural'skii Gosudarstvennyi Universitet, Sverdlovsk, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 806-811 In Russian refs

An analysis is made of the distribution of individual power-law exponents of subjective loudness scaling in a large sample of subjects (253 persons 9 to 63 years of age) It is shown that the distribution of these exponents has not a normal but a Poisson character This leads to the suggestion that individual variations of this exponent have a discrete character Several peaks were revealed on the distribution curve, indicating the heterogeneity of the sample, analogous peaks were found in the distribution of the rms error of the regression equation An absence of correlation between the peaks of the two distributions indicates that these exponents are independent The distributions of individual evaluations were normal (in the case of mean values of loudness) or positive-excessive B J

A84-11338
THE ROLE OF ADRENALIN IN THE GENESIS OF DISORDERS OF MOTOR SKILLS IN CONDITIONS OF EMOTIONAL STRESS [ROL' ADRENALINA V GENEZE RASSTROISTV DVIGATEL'NYKH NAVYKOV V USLOVIIAKH EMOTSIONAL'NOGO STRESSA]
I S MOROZOV, G S PUKHOVA, and E R IVANOV (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Moscow, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 812-818 In Russian refs

A84-11343
THE RELATIONSHIP BETWEEN THE OPERATOR PERFORMANCE UNDER MAXIMUM INFORMATION LOADS AND THE INDIVIDUAL PARAMETERS OF THE EEG ALPHA RHYTHM [ZAVISIMOST' KACHESTVA RABOTY OPERATOROV V USLOVIIAKH MAKSIMAL'NYKH INFORMATSIONNYKH NAGRUZOK OT INDIVIDUAL'NYKH PARAMETROV AL'FA-RITMA EEG]
S E POPOV, A V MIROLIUBOV, and I L SOLOMIN (Voenno-Meditsinskaia Akademiia, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 9, Sept -Oct 1983, p 865, 866 In Russian

A84-11756#
MODERN METHOD AND INSTRUMENT FOR MEASURING PSYCHIC PERFORMANCE
J HIDEG, P REMES, L BOGNAR, M AGOSTON, and Z KASA (Hungarian Academy of Sciences, Intercosmos Council, Budapest, Hungary) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 6 p refs
(IAF PAPER 83-181)

An objective method of assessing a pilot's psychic performance is presented in terms of a four choice reaction time presentation instrument The device presents a flashing light, to which the subject had to respond by throwing an associated switch, and also by performing a predetermined arithmetic computation The tests are cycled so as to limit the information which can be perceived over a given time period, thereby permitting the bit/sec rate of data processing to be computed by means of an algebraic formulation Once a pilot's psychic response capabilities are quantified, the test can at any time in the future reveal any decrements in the pilot's abilities Likewise, periodic employment of the tests by space station personnel will permit monitoring of the state of the astronauts' long-term mental performance M S K

A84-12786
AN EFFECT OF SPEED ON INDUCED MOTION
H WALLACH and R BECKLEN (Swarthmore College, Swarthmore, PA) Perception and Psychophysics (ISSN 0031-5117), vol 34, no 3, Sept 1983, p 237-242
(Contract PHS-11089)

Reciprocating horizontal motion of a pattern of vertical lines caused horizontal induced motion of a dot that underwent vertical reciprocating motion The real vertical motion and the induced horizontal motion of the dot resulted in a circular or oval apparent path Increasing the two motion speeds caused the horizontal component of this resultant path to become smaller, a change that indicated a diminished induced effect. This effect of high motion speed was not due to a blurring of the moving line pattern at high speeds, since strong objective blurring of the line pattern did not diminish the extent of the induced motion it caused When the eyes pursued the line pattern, speed increases that changed the apparent path of the dot when the dot was tracked had only a small effect, which was shown to result from incomplete tracking It is concluded that, in that case, the dot's apparent path was not due to induced motion, but rather to the retinal path of the dot's image Author

N84-10750# Naval Personnel Research and Development Center, San Diego, Calif
EFFECTS OF BEHAVIORAL OBJECTIVES AND INSTRUCTIONS ON EARNING A CATEGORY TASK Special Report, FY 82
P J KONOSKE and J A ELLIS May 1983 14 p refs
(Contract ZF66512001)
(AD-A130386, NPRDC-SR-83-33) Avail NTIS HC A02/MF A01 CSCL 05I

This study compares the effects of behavioral objectives and explicit instructions on learning a category task Subjects were assigned to one of four groups a read-only control group, a standard Navy behavioral objective group, a revised behavioral objective group, and an instructions group Results of a recall test

and a classification test showed a significant difference in group performance The data indicated that giving students instructions or behavioral objectives that have been revised so that they are clear to the student facilitates recall and classification performance more than giving nonspecific behavioral objectives The instructional implications are that students should be given explicit instructions or behavioral objectives that use familiar terminology and consist of specific information about the nature of the testing situation when learning from text Author (GRA)

N84-10751# Colorado Univ , Boulder Center for Research on Judgment and Policy

DIRECT COMPARISON OF INTUITIVE, QUASI-RATIONAL AND ANALYTICAL COGNITION

K R HAMMOND, R M HAMM, J GRASSIA, and T PEARSON Jun 1983 84 p refs

(Contract N00014-77-C-0336)

(AD-A130273, CRJP-248) Avail NTIS HC A05/MF A01 CSCL 05J

The relative efficacy of intuitive and analytical cognition in analytically competent persons was directly compared More subjects performed best in the intuitive mode when inconsistency was removed from their judgments, an indication that the subjects possessed implicit knowledge that they did not utilize in the analytical mode More subjects made larger errors in the analytical mode than in the intuitive mode Subjects' confidence was generally inappropriately placed Author (GRA)

N84-10752# Air Force Human Resources Lab , Brooks AFB, Tex Plans and Programs Office

FLYING TRAINING R&D (RESEARCH AND DEVELOPMENT) AT THE AIR FORCE HUMAN RESOURCES LABORATORY Final Technical Report

H J CLARK and K W POTEMPA Jun 1983 10 p refs Presented at the Aviation Psychology Symp , Columbus, Ohio, 27-29 Apr 1983

(AD-A130250, AFHRL-TP-83-24) Avail NTIS HC A02/MF A01 CSCL 05I

This paper describes the Air Force Human Resources Laboratory and its research and development (R&D) programs in Flying Training Studies in flight simulation, part-task trainer development, performance measurement, and pilot selection are described R&D issues in Flying Training which merit continued attention are discussed, and opportunities for participation in Air Force sponsored R&D programs by universities and industrial organizations are briefly outlined Author (GRA)

N84-10753# Midwest Research Inst , Kansas City, Mo

TASK VALIDATION FOR STUDIES ON FRAGMENTED SLEEP AND COGNITIVE EFFICIENCY UNDER STRESS Final Report, 1 May 1980 - 30 Sep. 1982

C GRAHAM and H D COHEN Nov 1982 98 p

(Contract DAMD17-80-C-0075, DA PROJ 3E1-62777-A-879)

(AD-A130260, MRI-2007-E) Avail NTIS HC A05/MF A01 CSCL 06S

A computer gaming approach was used to create a new type of automated performance task (STAR) The task unobtrusively measures multiple cognitive skills and risk-taking behavior under various stress and workload conditions A training manual and protocol were developed, and performance criteria established Measurement reliability and performance under different task difficulty levels and crisis conditions were assessed STAR is shown to be a sensitive task which promises to reliably measure major aspects of human function under a variety of conditions Author (GRA)

N84-10754# Naval Biodynamics Lab , New Orleans, La Bureau of Medicine and Surgery

EFFECTS OF HEAD IMPACT ACCELERATION ON HUMAN PERFORMANCE: OVERVIEW AND PRELIMINARY BATTERY IDENTIFICATION

A C BITTNER, JR , J P SHORTAL, III, and M M HARBESON May 1983 18 p refs

(AD-A130286, NBDL-83R004) Avail NTIS HC A02/MF A01 CSCL 05J

A review of the human performance effects of impact acceleration was conducted as part of an effort to assemble an experimental test battery Tasks were designated for inclusion only if suitable for repeated measures applications and sensitive to closed-head impact acceleration Two human performance tasks which met these criteria were identified after separate reviews of experimental and clinical research In addition, three tasks sensitive to impact effects and potentially suitable for repeated measures applications were also identified A third category of tasks which are suitable for repeated measures research but have not yet been shown to be sensitive to impact acceleration have been identified in other reports from this laboratory, but are beyond the scope of the present study Short-term Consonant Memory, Adaptive Serial Addition, and Adaptive Visuospatial Judgement tasks were determined to be sensitive candidate measures with potential for repeated measures applications and were recommended for development Choice Reaction Time (CRT) and Manikan Spatial Orientation Tasks were recommended for inclusion in an impact acceleration test battery for current applications GRA

N84-10755# Rice Univ , Houston, Tex Dept of Psychology

A CRITICAL ANALYSIS OF THE USES OF MULTIPLE REGRESSION IN THE STUDY OF HUMAN JUDGEMENT

S P KERKAR Jul 1983 48 p refs

(Contract N00014-82-C-0001, NR PROJ 197-074)

(AD-A131224, TR-83-2) Avail NTIS HC A03/MF A01 CSCL 05J

The present paper represents an effort toward integration and extension of existing knowledge in one area of the decision-judgment field It analyzes the widespread use that is being made of the multiple regression (MR) paradigm in judgement research, distinguishes two major orientations apparent in that work, and suggests ways to integrated and extend them in the interest of making the resulting data more useful GRA

N84-10756# Syracuse Univ , N Y

EXTENDED DEVELOPMENT PROCEDURE EDEP USER'S MANUAL Final Report

C M REIGELUTH, P DOUGHTY, F SARI, C J POWELL, L FREY, and J SWEENEY Nov 1982 67 p refs Sponsored by Army

(AD-A131381) Avail NTIS HC A04/MF A01 CSCL 05I

This is a reference Manual (not a training manual) organized to be appropriate for use at the level of knowledge of the user about instructional design It provides the essential core of design prescriptions for people who do not have much experience or background in design It is organized in chronological order and takes the form of the steps that are keyed to, and should be integrated into, the steps laid out in the (IPISD)(Interservice Procedures for Instructional Systems Development) This User's Manual and its companion EDeP Advanced Reference Manual outline and describe such macro level activities as selecting and sequencings, then the major instructional requirements for each skill and knowledge that needs to be taught and the planning of major components or strategies for meeting those requirements Selection of the most appropriate instructional approach (or combination of approaches) for each skill and knowledge follows Necessary materials and instructor's manual are then developed in such a way as to utilize the components that were prescribed earlier GRA

N84-10757# California Univ , San Diego, La Jolla Center for Human Information Processing
REPRESENTATION IN MEMORY
D E RUMELHART and D A NORMAN 7 Jun 1983 132 p refs Sponsored in part by the System Development Foundation
(Contract N00014-79-C-0323, NR PROJ 667-437)
(AD-A130662, CHIP-116, REPT-8302-ONR) Avail NTIS HC A07/MF A01 CSCL 05J

This paper provides a review of work on the representation of knowledge from within psychology and artificial intelligence The work covers the nature of representation, the distinction between the represented world and the representing world, and significant issues concerned with propositional, analogical, and superpositional representations Major controversies within psychology - such as distinctions between declarative and procedural representation, propositional and analogical representation, and the nature of visual images - are analyzed and found not to reflect fundamental disagreements Author (GRA)

N84-10758# Boeing Aerospace Co , Seattle, Wash
INTEGRATED CUING REQUIREMENTS (ICR) STUDY: FEASIBILITY ANALYSIS AND DEMONSTRATION STUDY Final Report
R FARRELL and R BARKER Williams AFB, Ark AFHRL Jun 1983 53 p
(Contract F33615-79-C-0014, AF PROJ 6114)
(AD-A131039, AFHRL-TP-82-25(1)) Avail NTIS HC A04/MF A01 CSCL 05I

The goal of the Integrated Cuing Requirements (ICR) Study was to consolidate and synthesize existing human sensory/perceptual data, principles and models in a manner which would make this information readily accessible and useful to the community of aircrew training device (ATD) design engineers There exists an extensive body of research literature on human perception which could potentially be of value in the specification, design, and evaluation of aircrew training devices The data in this domain are distributed among numerous different publications and are written in the specialized terminology of perceptual psychology Consequently, this information is not generally accessible to ATD engineers The goal of the ICR study was to extract and consolidate the relevant data into an accessible format and to provide, where feasible, a synthesis of the literature which included recommendations relevant to equipment design The intended output of this activity was (1) an ICR Data Base containing the available sensory/perceptual data in a form useful for specification and design purposes, and (2) an ICR Users Guide to facilitate access to the data by the ATD engineer GRA

N84-10759# Stanford Univ , Calif Dept of Psychology
REPRESENTATIONS OF PERCEPTIONS OF RISKS
E J JOHNSON (Carnegie-Mellon Univ) and A TVERSKY Jun 1983 36 p refs Sponsored in part by NSF
(Contract N00014-79-C-0077, NR PROJ 197-058)
(AD-A131443) Avail NTIS HC A03/MF A01 CSCL 05J

The perceptions of risks (e g , diseases, accidents, natural hazards) is investigated using a multi-task, multi-model approach We studied the proximities among 18 risks induced by three tasks judgment of similarity, conditional prediction and dimensional evaluation The comparative judgments (similarity and prediction) were reasonably close but the dimensional evaluation did not correlate highly with either similarity or prediction Similarity judgments and conditional predictions appear to be represented best by tree models, which are based on discrete features, while the dimensional evaluations are better explained by spatial models, such as multidimensional scaling and factor analysis We discuss the implications of these results for the study of mental representation and for the analysis of risk perception Author (GRA)

N84-11715# Joint Publications Research Service, Arlington, Va
METHOD FOR ASSESSING MENTAL STRESS IN OPERATORS
B N RYZHOV and V P SALNITSKIY *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 124-126 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 83-84
Avail NTIS HC A08

The method of combining different parameters into an integral evaluation of stress is tested The validity of the method was determined in the first series of studies by finding coefficients of correlation between parameters of tension and rate of delivery of information to the operator Investigation of parameters of productivity of operator work, distinctions of their reactions during work, as well as their own accounts enable us to demonstrate a rather high discriminatory sensitivity of the integral rating for qualitatively dissimilar types of mental tension that are inherent in the types of operator work in question J M S

N84-11756# Carnegie-Mellon Univ , Pittsburgh, Pa Dept of Computer Science
METAPHOR AND COMMON-SENSE REASONING Interim Report
J G CARBONELL and S MINTON 5 Mar 1983 27 p refs
(Contract N00014-79-C-0661, N00014-82-C-5076)
(AD-A131423, CMU-CS-83-110) Avail NTIS HC A03/MF A01 CSCL 05J

Inferences based on metaphors appear to play a major role in human common sense reasoning This paper identifies and analyzes general inference patterns based upon underlying metaphors, in particular the pervasive balance principle Strategies for metaphor comprehension are explored, and analogical mapping structures are proposed as a means of representing metaphorical relationships between domains In addition, a framework for a computational model embodying principles of metaphorical common sense reasoning is discussed GRA

N84-11757# Air Force Human Resources Lab , Brooks AFB, Tex
COMPANION TRAINER AIRCRAFT: CONCEPT TEST Final Report
R T NULLMEYER, T H KILLION, and M E WOOD Jun 1983 53 p refs
(Contract AF PROJ 1123)
(AD-A131378, AFHRL-TR-82-33) Avail NTIS HC A04/MF A01 CSCL 05I

Faced with increasing budget constraints and a need to conserve the B-52 weapon system, the Strategic Air Command (SAC) has pursued several avenues to make continuation training programs more efficient Because actual flight training is considered to be critical, one proposed solution involved the use of a low cost business jet aircraft to supplement reduced B-52 flying schedules This aircraft would be augmented to provide training for the radar navigator, navigator, and electronic warfare officer (EWO), in addition to the pilot and copilot Some training missions would be flown in this Companion Trainer Aircraft (CTA) to reduce the need to fly the B-52 The training effectiveness of a CTA program depends on two main assumptions first, appropriate behaviors trained in the CTA will transfer positively to the B-52, and second, inappropriate behaviors will not transfer A theoretical approach based on transfer-of-learning considerations for a CTA revealed particular difficulties in specifying transfer expectations for pilots and copilots Previous attempts to use a second aircraft as a surrogate trainer have met with mixed results Both positive and negative effects on primary aircraft performance were observed In response to a congressional request for proof of the concept that a CTA could provide effective training, a study was designed involving operational SAC crews This study employed a modified T-39B aircraft to supplement B-52 training for eight aircrews The purpose of the study was to answer two major questions First, what effect does flying the secondary aircraft have on primary aircraft performance? GRA

54

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering, biotechnology, and space suits and protective clothing

A84-10025#
A VOICE INTERACTIVE SYSTEM FOR AIDING AND DOCUMENTATION OF SPACE-BASED TASKS
V RILEY and R VESTEWIG (Honeywell Systems and Research Center, Minneapolis, MN) IN Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1983, p 171-177
(AIAA PAPER 83-2355)

The application of a voice-interactive maintenance-aiding device (VIMAD) to the performance assembly and maintenance tasks in space is considered The problems presented by the complexity of the tasks to be performed, by the crew limitations of space missions, by the space environment in general, and by the further restrictions of extravehicular activities are reviewed VIMAD has been developed for ground use and comprises a helmet-mounted, hand-held, or full-size portable display unit linked by RF or cable to a computer or microcomputer controlling the presentation of video or audio information User command is by voice or portable keyboard, and the instructions and diagrams are stored on random-access video and audio disks The modifications in software and hardware which might be needed to adapt VIMAD to space use are discussed, taking the need for task documentation into account, and the advantages and feasibility of a VIMAD-type system are demonstrated T K

A84-10035*# Mitre Corp , Bedford, Mass
MANNED SPACEFLIGHT ACTIVITY PLANNING WITH KNOWLEDGE-BASED SYSTEMS
J MOGILENSKY, R E DALTON (Mitre Corp , Greenbelt, MD), and E A SCARL (Mitre Corp , Bedford, MA) IN Computers in Aerospace Conference, 4th, Hartford, CT, October 24-26, 1983, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1983, p 224-228. refs
(Contract F19628-82-C-0001, NASA PROJECT 8980)
(AIAA PAPER 83-2374)

An on-board expert system, capable of assisting with crew-activity planning and platform-status monitoring, could provide unprecedented autonomy to the crew of a permanently manned space station To demonstrate this concept's feasibility, an existing knowledge-based system is adapted to support Space Shuttle crew-activity timeline planning Proposed timeline changes are to be checked for compliance with crew capabilities and mission operating guidelines, so that a nonexpert can be guided through a successful plan modification. Early lessons that have been learned about the scope of the adaptation needed to achieve this objective are presented Author

A84-10070*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va
A SYSTEM FOR INTELLIGENT TELEOPERATION RESEARCH
N E ORLANDO (NASA, Langley Research Center, Hampton, VA) American Institute of Aeronautics and Astronautics, Computers in Aerospace Conference, 4th, Hartford, CT, Oct 24-26, 1983 7 p refs
(AIAA PAPER 83-2376)

The Automation Technology Branch of NASA Langley Research Center is developing a research capability in the field of artificial intelligence, particularly as applicable in teleoperator/robotics development for remote space operations As a testbed for experimentation in these areas, a system concept has been developed and is being implemented This system termed DAISIE (Distributed Artificially Intelligent System for Interacting with the Environment), interfaces the key processes of perception, reasoning, and manipulation by linking hardware sensors and manipulators to a modular artificial intelligence (AI) software system in a hierarchical control structure Verification experiments have been performed one experiment used a blocksworld database and planner embedded in the DAISIE system to intelligently manipulate a simple physical environment, the other experiment implemented a joint-space collision avoidance algorithm Continued system development is planned Author

A84-10473
THEORY AND EXPERIMENT IN THE ANALYSIS OF THE WORK OF OPERATORS [TEORIIA I EKSPERIMENT V ANALIZE TRUDA OPERATOROV]
V. F VENDA, ED and V A VAVILOV, ED Moscow, Izdatel'stvo Nauka, 1983, 336 p In Russian

The methodological bases of engineering psychology and problems of the multilevel mutual adaptation of humans and machines in modern systems of control are examined Topics studied include the informational interaction of operators during the solution of a task by a group, a mathematical model of the group activity of an operator with the consideration of individual strategies of behavior, the processes of the adaptation of operators to a system during the course of study, and the psychological analysis of strategies Other aspects discussed include the problems of the agreement of the strategies of airline pilots, the evaluation of the quality of representation during the formulation method of the presentation of information on the screen of an automated control system, structural aspects of the engineering-psychological experiment, and an investigation of methods for increasing the accuracy of the work of operators in hierarchical man-machine systems No individual items are abstracted in this volume N B

A84-10708
BALLISTIC PROTECTIVE HEADGEAR FOR NAVY/MARINE CORPS ROTARY WING AIRCREW
D S MCCAULEY (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 11-14

Experimental results from attempts to define ballistic protective headgear that can handle fragments travelling at 1150 fps are reported Various Kevlar panels were fired at with 17 grain, 22 caliber, type 2 projectiles V50 values were obtained in terms of the five highest velocity partial penetrations and the five lowest velocity total penetrations Kevlar in phenolic/polyvinyl butaryl was determined suitable for both type 1 and type 2 conditions when featuring 8 plies and weighing 17 5 oz The shell will resist fragments with 1250 fps velocities A type 2 helment will weigh up to 50 oz D H K

A84-10710
COMPUTER ANALYSIS IN HELMET DESIGN
R VANDERBY, JR , S J BONIFAS (Illinois Institute of Technology, Chicago, IL), and E E HAHN (Multitech Engineering Associates, Chicago, IL) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 27-30 Research sponsored by the Illinois Institute of Technology refs

A numerical model for analyzing the biodynamic response of a helmeted head to impact is described Consideration is given to nine articulated body segments connected at eight articulation points, yielding 27 deg of freedom The helmet is added as a tenth element Account is taken of gravitational, resisting spring, torsional spring, and linear and torsional damping at each joint, as well as normal, frictional contact, deformation, and restoration forces Model inputs cover the body height, weight, body type, physical condition, linear position and head velocity, and angular positions and velocities of all body segments Numerical output is received on the displacements, velocities, and accelerations of each body segment, together with forces and bending moments

at each joint, peak head accelerations, the Severity Index, and the head injury criteria D H K

A84-10712
THE F-16 ON BOARD OXYGEN GENERATION SYSTEM (OBOGS)
R L CRAMER (Litton Industries, Instruments and Life Support Div, Davenport, IA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 39-42 USAF-supported research

The current status and preliminary results of developing a man-rated molecular sieve oxygen concentration system for the F-16 are reported The system is intended to provide an air mixture directly from the concentrator, be directly interchangeable with existing O2 components, improve breathing by controlling mask pressure swings and affording enhanced peak breathing performance, and provide a back-up O2 supply with pilot override options Data from 35 flights with 20 different pilots verified most design goals, except for two occasions when the O2 supply from the concentrator fell below normal limits Both failure mechanisms were identified and rectified, and improvements were added in terms of the reduction of one of the selector valve options D H K

A84-10713
THE USAFSAM ADVANCED OXYGEN SYSTEM CONCEPT
J B TEDOR and R L MILLER (USAF, School of Aerospace Medicine, Brooks AFB, TX) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 43-46

The design requirements for a new breathing gas system for high performance military aircraft are described, together with probable system components, expected problems, and projected solutions Flows of 50-60 l/min are needed, in conjunction with 200 l/min in high-g maneuvering situations The advanced oxygen system (AOS) regulator will maintain a constant breathing mask flow of 100 l/min, with allowances made for altitudes between 39,000-60,000 ft in case crew members have to leave the aircraft Account will also be taken of maintaining lowered pressure in the aircraft below 25,000 ft to prevent lung collapse or middle ear block Flow control of the emergency O2 supply will also be provided, with control by either pneumatic or electronic means D H K

A84-10716
IN SEARCH OF - AN ACCEPTABLE LAP BELT
B HARRISON (USAF, San Antonio Air Logistics Center, Kelly AFB, TX) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 65-67

The history of testing, use, discovery of defects, corrections, and redesign of ejection seat lap belts for USAF aircraft is traced from the first unit, operational in 1946, to the third generation program initiated in 1977 Problems have persisted in terms of the lap belt opening too early or failing to open after ejection Lap belts until 1980 featured either ballistic powered or pin puller versions for opening The latter mechanism has been incorporated in all new aircraft A redesign started in 1980 resulted in the HBU-12/A production belt, which has male and female halves, a gold key for automatic parachute opening, adjustments for crew member size, and the ability to separate completely from the seat during operation D H K

A84-10717
IMPROVING RESTRAINT SYSTEMS CAPABILITIES IN OLDER EGRESS SYSTEMS
J F BRIGANTI (USAF, San Antonio Air Logistics Center, Kelly AFB, TX) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 68-71 refs

Improvements in ejection seat systems performance in the past 20 yr are reviewed, noting the performance enhancements that will be required in the future Attention is given to the ACES II seat and HBU-12A belt design and performance, and to the benefits and disadvantages of the negative G strap, the latter being ameliorated by proper training Emphasis is laid on the increasing weights of the 95th percentile crewmember due to added survival equipment and clothes Finally, the necessity of incorporating limb restraints into supersonic aircraft ejection seats to prevent flail injuries is stressed, particularly for new aircraft where retrofit costs can be avoided D H K

A84-10719
HEAT STRESS RELATED TO THE OPERATION OF CANADIAN FORCES AIRCRAFT - A HISTORICAL REVIEW AND POSSIBLE SOLUTION
C J BROOKS, A G HYNES, L V ALLIN, and L A KUEHN (Defence and Civil Institute of Environmental Medicine, Toronto, Canada) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 91-94 refs

British and Canadian efforts in the development of liquid cooled garments (LCG) for military aircraft pilots are described LCG development began in the U K in 1959 and consisted of tubes stitched into the fabric Water was used as the heat transfer medium, and the LCG units, attached to chipped ice cooling apparatus, were used in flights over Lybia, Cyprus, and the Far East in 1965, and variants were employed on the Apollo flights Vest cooling was effected with the chiller unit based on a commercial design that produced ice cubes for the DC-10, 747, and A300 Airbus Over 100 hr of successful flight time has been performed with the unit mounted in a Sea King helicopter D H K

A84-10721
COMPATIBILITY ANALYSIS OF THE MBU-14/P OXYGEN MASK AND U.S. NAVY OXYGEN REGULATORS
J W CASTINE (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 107-113 refs

This paper provides information resulting from an investigation concerning the compatibility of the recently introduced MBU-14/P oxygen mask assembly and U S Navy oxygen regulators currently in operational use In addition to providing some brief background information, this paper discusses the problem of occasional excessive resistance to exhalation and the hazard which is created with the use of the MBU-14/P oxygen mask with regulators without safety pressure relief Author

A84-10725
PHYSIOLOGICAL TESTING OF A HELICOPTER MOBILE AIRCREWMAN COOLING SYSTEM
D S MCCAULEY (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 130-133

Helicopter aircrewmen performing missions such as search and rescue, vertical replenishment of cargo, mine counter-measures, anti-submarine warfare, and cargo and troop transport are often required to perform physically demanding work in high temperature environments Heat stress resulting from high temperature environments degrades crewmen performance in accomplishing both physically demanding and psycho-motor tasks The Naval Air Development Center, under the sponsorship of Naval Air Systems Command, has developed a cooling system for the mobile helicopter aircrewman Prototype cooling systems were tested in high temperature environments Physiological responses of subjects with and without cooling systems were measured during testing This paper presents the results of those tests Author

A84-10726
DOWN IN THE ARCTIC - EQUIPMENT AND TRAINING FOR SURVIVAL
P A WENDT (U S Coast Guard, Aviation Training Center, Mobile, AL) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 134-137

The contents of the U S Coast Guard polar survival kit are inventoried and training procedures for a 3-man crew are outlined The hard-shelled kit holds three 5-lb goose-down sleeping bags that are wind and water resistant and colored international yellow or orange, three goose-down parkas and pants, one geodesic four man tent, three pairs of goose-down booties, and three rain gear sets Also included are three bivouac covers, three foam pads, two back packs, a survival stove with fuel and manual, three abandon ship rations, 12 long range rations, two sets of snow shoes, a snow shovel, and a survival radio battery Polar Survival school simulates an aircrew with four students in each class and training in terrain resembling, as much as possible, the worst case crash scenario Prioritizing needs is taught, as are outdoor shelter skills, navigation, innovation, and shelter construction The trainees are given a 24 hr solo with only their clothes as a test M S K

A84-10729
U.S. NAVY LIFE SUPPORT R&D PROGRAMS
D N DESIMONE (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA SAFE Association, 1983, p 153-157

This paper highlights the major research and development programs within the Navy's Aviation Life Support System RDT&E effort for FY-83 Major program discussions include the OBOGS (Onboard Oxygen Generating System) program, the results of the recently curtailed Maximum Performance Escape System (MPES), and how the products of this program will be utilized under a joint Air Force/Navy advanced escape system program, CREST The Navy's Advanced Aircrew Restraint program is progressing well on two fronts, the near-term restraint retrofit program and the downstream advanced aircrew restraint program The Navy's work in the area of multi-wavelength laser protective system, which is based on the use of holograms to defeat a multitude of laser frequencies appears to be the way to go for future aircrew protection A method whereby activities outside the Navy can influence the Navy Life Support R&D new start process is suggested Author

A84-10732
A SERVO CONTROLLED RAPID RESPONSE ANTI-G VALVE
R J CROSBIE (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p. 165-171 refs

Design and circuitry features, as well as test results, with a new servo valve for pilot anti-g suits are described The high acceleration capability of modern combat jets offer a tactical advantage but increase the workload on the heart, which may not be strong enough to maintain a blood supply to the brain The anti-G suit inflates to constrict the blood in the legs and abdominal areas to prevent blood pooling in those locations. However, the inflation level must be tailored to respond to the level of g-forces or the pilot may experience pain and discomfort that inhibit performance, or may not receive adequate, timely protection The servocontrolled valve unit responds to accelerometer signals by increasing or decreasing suit pressure to preset levels Subjects wearing the suit were exposed to centrifuge trials at various acceleration levels, and g-tolerance was compared with that obtained performing the M-1 maneuvers, which alleviate some g-force deletenous effects The M-1 maneuver was more effective when wearing the suit, and it was concluded that new valve significantly augments suit performance M S K

A84-10734
A COCKPIT AND EQUIPMENT INTEGRATION LABORATORY
R C HILL, P H R GILL (USAF, School of Aerospace Medicine, Brooks AFB, TX), and W J SEARS (Technology, Inc , Dayton, OH) IN. SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 179-183.

The background and plan for use of a Cockpit and Equipment Integration Laboratory for effectively reconfiguring or adding apparatus to the personal protection equipment (PPE) for aircrew without degrading their performance are described Various reasons are given for the lack of organization between designers and engineers of PPE, including the constant shifting of personnel and the lack of good communications between development and operations personnel The Laboratory would integrate developmental items for the PPE with existing PPE components, validate the fit and function of PPE equipment at an early development stage, ensure that efforts are directed toward increasing mission effectiveness and aircrew survival at acceptable costs, establish an integration technology, and provide support to other investigators Cockpit mockups, a FOV device, a crewmember suspension system, a rotation chair, immersion capability, and anthropometry equipment will be included in the Laboratory apparatus M S K

A84-10735
AIRCREW RESTRAINT IMPROVEMENT PROGRAM
J RODRIQUEZ (U S Navy, Naval Air Test Center, Patuxent River, MD) and L C MEAD (Sperry Corp , Sperry Univac Div , Lexington Park, MD) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 184-187 refs

Eighteen different harness configurations were evaluated against the U S Navy MA-2 torso harness with respect to protecting a human body from displacements in the -Gz environment Additional attention was given to the effect of the harnesses on comfort, mobility, aircraft ingress and egress, and flight equipment compatibility It was found that the addition of a 5th strap, a center belt, to the MA-2, attached to the seat bucket, offered the best available restraint in the -1Gz environment The supplementary strap configuration is regarded as a good temporary fix, while the study provides a data base for the development of aircrew restraint systems for aircraft in the 1990s M S K

A84-10736
NAVAL AVIATION ON-BOARD OXYGEN GENERATION SYSTEM 1982 - A STATUS REPORT
C F BENTLEY, JR (U S Naval Air Systems Command, Washington, DC) and M J LAMB (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 191-195 refs

The Naval Air Systems Command has been directing a development program, conducted by the Naval Air Development Center (NADC), to incorporate the concept of oxygen enriched air via molecular sieve technology into Naval carrier aircraft The objective of the program is to eliminate hazardous and logistically burdensome liquid oxygen (LOX) installations on ships, as well as forward basing areas Program progress to date includes physiologic assessment (man rating) of the system, laboratory test & evaluation (T & E) TECHEVAL and operational deployment. This paper presents the status of the program, including the final results of a deployment of six aircraft equipped with the system and hardware development. Author

A84-10737
NAVAL AVIATION SOLID CHEMICAL OXYGEN EMERGENCY SYSTEM PROGRAM
C F BENTLEY, JR (U S Naval Air Systems Command, Washington, DC) and R L ROUTZAHN (U S Naval Material Command, Naval Air Development Center, Warminster, PA) IN SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings Van Nuys, CA, SAFE Association, 1983, p 196, 197

The goals, scheudle, and configuration of a qualification program for a solid chemical oxygen (SCOX) supply system for the U S Navy are described Sodium chlorate candles have been manufactured in a way that the product oxygen from burning is regarded as acceptable for emergency breathing oxygen A decade ago two elliptical SCOX candles were incorporated into the lid of the rigid seat survival kits (RSSK) for ignition by connection to the battery or if immersion occurred A new program has been instituted to develop a design of SCOX candles for the SKU-3/A survival container on the F/A-18 The system is required to supply 200 l of breathing O2 using two or three candles The candles will ignite in response to ejection or water immersion, with the gas delivered to the crewmember through an accumulator, filter, and pressure reducer Tests will be run to climatically, environmentally, and shock qualify the equipment M S K

A84-10970
DESIGN STRATEGIES FOR COMPUTER-BASED INFORMATION DISPLAYS IN REAL-TIME CONTROL SYSTEMS
C M MITCHELL (George Mason University, Fairfax, VA) and R A MILLER (Ohio State University, Columbus, OH) Human Factors (ISSN 0018-7208), vol 25, Aug 1983, p 353-369 refs

Two strategies are defined for the design of integrated, computer-based information displays for real-time control systems Subjects controlled a simulated system using a conventional display console or one of two integrated displays The effects of display type on operator performance were considered Integrated displays tended to degrade performance unless the display preprocessed information, synthesizing and presenting it in a form more compatible with an operator's high-level information needs Author

A84-11057#
EXTENSION OF THE CAPABILITY OF ARMY AIRCRAFT PERSONNEL FOR CONDUCTING NIGHT OPERATIONS, BY MEANS OF IMAGE-INTENSIFYING EYEGLASSES [ERWEITERUNG DER NACHTEINSATZFAEHIGKEIT DER HEERESFLIEGERTRUPPE DURCH BILDVERSTAERKER-BRILLEN]
H HESSE (Heeresfliegerwaffenschule, Bueckeburg, West Germany) IN International Helicopter Forum, 14th, Bueckeburg and Hanover, West Germany, May 20, 21, 1982, Proceedings Part 1 Hanover, West Germany, Deutsche Messe- und Ausstellungs-AG, 1983, 11 p In German

According to general expectations with respect to the scenarios in central Europe in the case of an armed conflict, a situation could arise which will require an intensification of army aircraft activities In order to meet these requirements, it will also be necessary to conduct helicopter operations under conditions of darkness and reduced visibility During the last two years, equipment and flight procedures were developed which will provide the army aircraft units with the capabilty needed for these missions, taking into account the implementation of helicopter missions involving low-level night operations, and the general admission of the helicopter models CH-53 G and UH-1D for low-level flight operations during the night Attention is given to helmet-mounted image-intensifying eyeglasses, the solution of map-reading problems, material and personnel requirements, and cockpit modifications, including black-out procedures G R

A84-11058#
ANALYSIS AND OUTLOOK CONCERNING AN EMPLOYMENT OF MILITARY HELICOPTERS IN NIGHT OPERATIONS [NACHTEINSATZ MILITAERISCHER HUBSCHRAUBER ANALYSE UND AUSBLICK]
K SCHYMANIETZ and H-D V BOEHM (Messerschmitt-Boelkow-Blohm GmbH, Munich, West Germany) IN International Helicopter Forum, 14th, Bueckeburg and Hanover, West Germany, May 20, 21, 1982, Proceedings Part 1 Hanover, West Germany, Deutsche Messe- und Ausstellungs-AG, 1983, 19 p In German refs

An important demand which future helicopter weapon systems will have to satisfy is related to the possibility of an operational employment during the night, under adverse weather conditions In the case of a military helicopter used in combat operations, there are additional requirements with respect to an appropriate night-combat vision system The design requirements related to the desired capability of the military helicopter to conduct night flights are made more complex because of simultaneous demands for a contour-flying capability of a very high degree The present investigation is essentially concerned with the possibilities regarding a utilization of vision systems for military helicopters employed in night operations Attention is given to specific mission requirements, the basic tasks of flight control, various types of equipment and sensors which can be used as an aid in the conduction of night operations, the technological possibilities, an evaluation of promising night vision systems, and future systems and possibilities for their employment G R

A84-11059#
INTEGRATION AND EMPLOYMENT OF NIGHT VISION DEVICES FOR THE CONDUCTION OF A MILITARY MISSION UNDER CONDITIONS OF DARKNESS [INTEGRATION UND EINSATZ VON NACHTSICHTGERAETEN FUER DIE DURCHFUEHRUNG EINER VBH-MISSION BEI DUNKELHEIT]
E DANNEBERG (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Institut fuer Flugfuehrung, Brunswick, West Germany) IN International Helicopter Forum, 14th, Bueckeburg and Hanover, West Germany, May 20, 21, 1982, Proceedings Part 1 Hanover, West Germany, Deutsche Messe- und Ausstellungs-AG, 1983, 16 p In German

In cases involving an employment of helicopters at very low altitudes under conditions of darkness and bad weather, it is necessary to compensate for insufficient visibility by providing the pilot with appropriate technical aids Such aids are based on an electrooptical sensor, which will provide images of sufficient brightness even under conditions of a very low level of illumination or which will make the infrared radiation of the ground visible Devices which present an artificial view of the environment on the basis of a utilization of electrooptical sensors include image-intensifying eyeglasses, image-intensifying eyeglasses in combination with a head-down display, a head-down display with mini-FLIR (forward-looking infrared) as sensor, a head-down display with Low Light Level Television (LLLTV) as sensor, a helmet mounted sight/display with FLIR sensor, and a helmet mounted sight/display with LLLTV The results of flight experiments conducted for testing three different night-vision systems are discussed G R

A84-11570
INTEGRATOR OF CLIMATE DATA FOR ASSESSING INDOOR MICROCLIMATE [INTEGRATOR KLIMATICHESKIKH DANNYKH DLIA OTSENKI MIKROKLIMATA POMESHCHENII]
K RUBLAK, R F AFANASEVA, KH GEBELIAIN, N S MIKHAILOVA, KH NOAK, IU A OKOLUKHIN, and G SHULTS (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR, Ministerstvo Zdravookhraneniia, Tsentral'nyi Institut Rabochei Meditsiny, Berlin, East Germany) Gigiena i Sanitariia (ISSN 0016-9900), May 1983, p 47-50 In Russian refs

A method for assessing microclimate using a climate-data integrator is proposed which is based on the measurement and analysis of indoor-microclimate parameters, and of data on the physical activity and degree of clothing heat-insulation of people

in this microclimate The method makes it possible to express the effect of microclimate on the thermal condition of the human body in a single indicator q-dry, the dry heat flux density A direct relation is found between q-dry and thermal responses of the human body (mean-weighted skin temperature, thermal sensations, etc) generally accepted in microclimate hygiene Thermal comfort in a state of rest is observed at q-dry values ranging from -27 to +37 kcal/(sq m h) A block diagram of the integrator is presented B J

A84-11754#
ENVIRONMENTAL CONTROL AND LIFE SUPPORT (ECLS) SYSTEM FOR SPACE STATION - NO SINGLE ANSWER
R E BREEDING and H F BROSE (United Technologies Corp , Hamilton Standard Div , Windsor Locks, CT) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 5 p
(IAF PAPER 83-173)

Design features for a space station environmental and life support control system (ECLS) which will permit flexibility during growth and evolution of the station, as well as permit interfaces with the Orbiter, are discussed Many components and operations have already been defined through development for the Apollo, Skylab, and Orbiter spacecraft Further developments are necessary to close the water and air loops, as well as configure selected equipment so that replacement is facilitated when new systems are produced Studies are still needed to guide choice of fuel cells or batteries for eclipse conditions, with attention given to the fact that fuel cells have an electrolysis system that can be interfaced with the potable water and hygience systems, as well as the air supply One supply of the H2 and O2 would be scavenge-capable Shuttle ETs carrying cryogenic fuels The actual hardware chosen is concluded to be favored in a payback analysis M S K

A84-11755#
BIOLOGICAL LIFE SUPPORT SYSTEM
H P LEISEIFER, A I SKOOG (Dornier System GmbH, Friedrichshafen, West Germany), and A O BROUILLET (United Technologies Corp , Hamilton Standard Div., Windsor Locks, CT) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 11 p
(IAF PAPER 83-174)

The results of a study to assess the feasibility of biological life support systems (BLSS) for a space station are reported The BLSS will, if implemented, be significant in closing the carbon loop in a space station supporting 4-8 person crews for 30-60 day missions. The BLSS would be required to perform atmosphere maintenance, waste water and solid waste reclamation, and food production, thus instilling a regenerative character in the life support system as well as avoiding significant resupply costs The BLSS is a balanced ecological system consisting of a combination of humans, animals, plants, and microorganisms integrated with mechanical and physico-chemical hardware A buffering capability will be needed to assure that space ecosystems will not degrade, die, and decay Studies will be required on the intensification of cultures, waste treatment, and possible control mechanisms, as well as microgravity effects, cosmic ray effects, the use of direct solar insolation in space to enhance growth, and the implementation of appropriate monitoring and control instruments M S K

A84-11757#
STUDY AND DEVELOPMENT ACTIVITIES OF DORNIER SYSTEM ON SPACE BIOLOGY/MEDICINE EQUIPMENT AND PAYLOADS FOR SPACELAB AND FREEFLYING PLATFORM APPLICATION
H W K FRANCOIS and P SCHILLER (Dornier System GmbH, Friedrichshafen, West Germany) International Astronautical Federation, International Astronautical Congress, 34th, Budapest, Hungary, Oct 10-15, 1983 10 p
(IAF PAPER 83-183)

Projects in space biology and medicine being pursued by the Dornier System are outlined. Studies were performed on the biorack, botany rack, and biochamber as life science payloads on the Spacelab The company also designed the environmental control and life support system for the Spacelab Current projects include a 1-g control centrifuge, experiment containers, and passive thermal conditioning units for the Spacelab biocrack The botany facility is being redesigned for installation on the EURECA free-flying platform, and will carry 6 experiments and no centrifuge in that application An Anthrorack is under development for the Spacelab for performing investigations in cardiovascular/pulmonary function and adaptation, metabolic processes and adaptation, hormonal functions, and sensorimotor function and adaptation, as well as recording, transmitting, and analyzing data M S K

A84-11921
HUMAN FACTORS IN FLIGHT SIMULATOR DEVELOPMENT
E A STARK (Singer Co , Link Flight Simulation Div , Binghamton, NY) IN World Congress on System Simulation and Scientific Computation, 10th, Montreal, Canada, August 8-13, 1982, Proceedings Volume 2 Montreal, International Association for Mathematics and Computers in Simulation, 1983, p 76-78

Simulators have a number of advantages with respect to the systems and the environments which they represent These advantages are related to aspects of economy, safety, convenience, and the degree of control permitted over the practice and learning environments Aspects of skill learning are discussed, taking into account parameter recognition, control selection and modulation, a feedback and response comparison, and an evaluation of simulator versus aircraft A description of human factors functions is presented, giving attention to training requirements, learning processes, and instructor/student/simulator relationships There is room for improvement in connection with aspects of user involvement, the learning functions, and simulator utilization G R

A84-11935
SIMULATION OF THE MOTION OF A SHUTTLE-ATTACHED FLEXIBLE MANIPULATOR ARM
R A MILLER, W R GRAHAM, and F R VIGNERON (Department of Communications, Ottawa, Canada) IN World Congress on System Simulation and Scientific Computation, 10th, Montreal, Canada, August 8-13, 1982, Proceedings Volume 3 Montreal, International Association for Mathematics and Computers in Simulation, 1983, p 225-227

An overview of the Shuttle's Remote Manipulator Control System is presented, followed by a description of a two-joint, two-link model of the arm used to study its flexible behavior Two methods of modelling link flexibility are formulated Non real-time and real-time simulations are described, and conclusions regarding the arm's flexible behavior and the simulation methodology are presented Author

A84-12025
BIOFEEDBACK MONITORING-DEVICES FOR ASTRONAUTS IN SPACE ENVIRONMENT
G ROTONDO, P PANCHERI, F MONESI, G GRANTALIANO, and V DEPASCALIS (Roma, Universita, Rome, Italy) (International Astronautical Federation, International Astronautical Congress, 33rd, Paris, France, Sept 27-Oct 2, 1982) Acta Astronautica (ISSN 0094-5765), vol 10, Aug 1983, p 591-598 refs

After a reconsideration of the state-of-the-art in biofeedback research the implementation of biofeedback systems is envisioned as a countermeasure of stress for the psychoprophylaxis of the astronaut A one-session experiment performed on two groups of subjects to assess the interference from EMG-feedback on the performance in a simultaneous psychomotor trial with a view to expanding biofeedback application is described The results show that the experimental group performed in the same way as the control without feedback, but with less CNS activation Some general conclusions are drawn from the advances in technology Author

A84-12059
VERTICAL IMPACT EVALUATION OF THE F/FB-111 CREW RESTRAINT CONFIGURATION, HEADREST POSITION, AND UPPER EXTREMITY BRACING TECHNIQUE
B F HEARON, J W BRINKLEY, and J H RADDIN, JR (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 977-987 refs
(Contract F33615-79-C-0523, F33657-78-C-0651)

The results of experimental studies to compare the vertical impact performances of a modified F/FB-111 restraint system with the in-use model are reported The trials were performed to determine the effects of the restraint harness configuration, the fore-aft headrest position, and the upper extremity bracing technique on humans during vertical impacts A total of 21 subjects submitted to the trials, which were carried out in a crew-ejection module from an F/FB-111 Data were taken on acceleration of the carriage and test seat, the velocity of the carriage, loads at the seat, loads at the harness attachment points, accelerations at the head and chest of the subject, and photometric photography of motions induced in drop tests on a vertical deceleration tower The conventional arrangement was found to produce increases in head acceleration, head severity index, lap belt loads, and seat loads An arms-extended posture procedure was concluded to offer the best bracing configuration for ejected crewmembers preparing for landing impact of the escape module M S K

A84-12064
SINGLE BREATH CARDIAC OUTPUT - ENHANCED SAMPLING AND ANALYSIS TECHNIQUES
N S DENO, E KAMON, and J S ULTMAN (Pennsylvania State University, University Park, PA) Aviation, Space, and Environmental Medicine (ISSN 0095-0562), vol 54, Nov 1983, p 1009-1014 Sponsorship U S Bureau of Mines refs
(Contract USBM-G0155006)

Enhanced sampling and analysis techniques for estimation of the cardiac output using the single breath method are described The computerized technique is applied to calculate oxygen consumption, CO2 elimination rate, and CO2 blood concentration for every breath during a subject's response to exercise Each breath is directed into a pneumotachograph for pressure measurements and then to gas analysis apparatus The computer algorithms for automated analysis of the tidal volume, the instantaneous flow rate, the fraction of expired oxygen, and the instantaneous oxygen fraction are presented, together with the enhancement formulae which permit analysis of the mixed venous CO2 partial pressure Tests were run with four subjects on a treadmill at a resting and two work levels Computer analysis was found to overcome noise levels with sampling rates of 0 05 liters or more Any breathing pattern above that was amenable to the computerized scans M S K

A84-12110
SUFFICIENT CONDITIONS FOR THE ASYMPTOTIC STABILITY OF A HOMEOSTAT [DOSTATOCHNYE USLOVIIA ASIMPTOTICHESKOI USTOICHIVOSTI GOMEOSTATA]
I T BORISENOK IN The method of Liapunov functions in the dynamics of nonlinear systems Novosibirsk, Izdatel'stvo Nauka, 1983, p 150-157 In Russian

The present study examines the stability of a system of multiconnected control simulating the group activity of operators in the course of a psychophysiological experiment based on the homeostatic method A homeostat with three operators is considered, and operator-behavior conditions are established which are sufficient for the asymptotic stability of the homeostat-operator system Particular attention is given to a linear structurally unstable homeostat It is noted that the present approach can be used to develop methods for the creation of conflict stress in a group of people, which is of practical interest for the psychological selection of small groups B J

A84-12127
THE EYE AND LIGHT [GLAZ I SVET]
A V LUIZOV Leningrad, Energoatomizdat, 1983, 144 p In Russian refs

The organization and operation of the eye considered as an optical-information receiver are described The dependence of visual functions on the optical situation is examined, and the establishment of optimal optical conditions for visual work is discussed Reference is made to light-engineering concepts, including the design of signal devices and observing instruments B J

A84-12181
INDUSTRIAL ROBOTS AND THEIR APPLICATIONS - ROBOTICS FOR MACHINE BUILDING (2ND REVISED AND ENLARGED EDITION) [PROMYSHLENNYE ROBOTY I IKH PRIMENENIE - ROBOTOTEKHNIKA DLIA MASHINOSTROENIIA /2ND REVISED AND ENLARGED EDITION/]
P N BELIANIN Moscow, Izdatel'stvo Mashinostroenie, 1983, 312 p In Russian refs

The fundamentals of robotics are reviewed, and the principal design and performance characteristics of various industrial robots manufactured in the USSR are presented Systems for the programmed control of industrial robots are briefly characterized Attention is given to the kinematic analysis of manipulator mechanisms, the dynamic modeling of robots, the structural and kinematic synthesis of manipulators, and the dynamic synthesis of robots Finally, the design and manufacture of hydraulic, pneumatic, and electromechanical robots are discussed V L

A84-12293
MOMENT-METHOD SOLUTIONS AND SAR CALCULATIONS FOR INHOMOGENEOUS MODELS OF MAN WITH LARGE NUMBER OF CELLS
J F DEFORD, O P GANDHI (Utah, University, Salt Lake City, UT), and M J HAGMANN (National Institutes of Health, Bethesda, MD) IEEE Transactions on Microwave Theory and Techniques (ISSN 0018-9480), vol MTT-31, Oct 1983, p 848-851 refs
(Contract NIH-ES-02304)

An iterative band approximation method (BAM) that is useful for solving large matrix equations where the elements of the matrix decrease in magnitude with increasing distance from the diagonal is described Inversion of a band about the diagonal is used to obtain a first estimate of the solution This estimate, along with the remaining elements in the matrix above and below the band, is used to iterate to the final solution The method is applied to the solution of full complex matrix equations involving up to 1698 unknowns BAM is used to obtain distributions of electromagnetic energy absorption for man models with 180-1132 cells C D

N84-10760# Army Aeromedical Research Lab , Fort Rucker, Ala Biodynamics Research Div
IMPACT AND VIBRATION TESTING OF A MODIFIED UH-1 CREW SEAT Final Report
D F SHANAHAN, J L HALEY, J C JOHNSON, J H WELLS, and H KNOCHE (German Air Force, Bonn) Jun 1983 85 p refs
(Contract DA PROJ 3E1-62777-A-878)
(AD-A130279, USAARL-83-10) Avail NTIS HC A05/MF A01 CSCL 01C

The German Air Force has developed a modified UH-1 pilot seat designed to improve comfort by increasing support to the thigh and lower back, providing better vibration dampening and increasing cold weather comfort This seat was tested for vibration dampening, pilot acceptance, and impact tolerance in a side-by-side test with the standard UH-1 seat The modified seat is more comfortable than the standard UH-1 seat The modified seat provides better impact protection than the standard seat, provided that the seat frame and restraint system do not tear loose The modified seat does not provide better vibration dampening than the standard UH-1 seat Author (GRA)

N84-10761# Naval Coastal Systems Lab , Panama City, Fla
DESIGN GUIDELINES FOR CARBON DIOXIDE SCRUBBERS
M L NUCKOLS, A PURER, and G A DEASON May 1983 72 p refs
(AD-A130459, NCSC-TECH-MAN-4110-1-83) Avail NTIS HC A04/MF A01 CSCL 06K

Design data and guidelines are presented to help predict the performance of axial flow carbon dioxide canister designs using alkali metal hydroxide absorbers The design data are derived from a large series of laboratory tests conducted at the Naval Coastal Systems Center to isolate the effects of environmental and geometric parameters on canister absorption efficiency Sample canister designs are considered to demonstrate the use of the derived data to predict effective canister life and pressure drop levels Alternative techniques for the sorption of carbon dioxide are also reviewed GRA

N84-10762# Naval Coastal Systems Center, Panama City, Fla
DEVELOPMENT OF PASSIVE DIVER THERMAL PROTECTION SYSTEM
M W LIPPITT, JR and M I NUCKOLS May 1983 65 p refs
(AD-A130685, NCSC-TM-378-83) Avail NTIS HC A04/MF A01 CSCL 06Q

The development of the US Navy Passive Diver Thermal protection system, designed to satisfy a majority of the air mode thermal protection requirements of fleet diving activities in cold water, is described The requirements, the evolution of system design, the development and test of the various prototypes, and the system operational and performance evaluations are discussed The final system demonstrated its ability to maintain a resting diver within acceptable thermal limits for 6 hours in 4 5 degrees C water The protection system allows sufficient mobility to allow the diver to engage in typical special warfare activities such as helicopter cast and recovery, parachuting, boat cast and recovery, and long surface and underwater swims GRA

N84-10763# Air Force Wright Aeronautical Labs , Wright-Patterson AFB, Ohio Control Dynamics Branch
PROCEEDINGS OF THE 18TH ANNUAL CONFERENCE ON MANUAL CONTROL Interim Report
F L GEORGE Jan 1983 568 p refs Conf held at Dayton, Ohio, 8-10 Jun 1982
(Contract AF PROJ 9991)
(AD-A131256, AFWAL-TR-83-3021) Avail NTIS HC A24/MF A01 CSCL 05H

This volume contains proceedings of the Eighteenth Annual Conference on Manual Control, held at Dayton, Ohio, June 8-10, 1982 These proceedings contain 43 of the 45 Conference papers, either as abstracts or complete manuscripts Topics covered include control and controller design, analysis and definition of display requirements, and integration of control and display considerations GRA

N84-10764# Oak Ridge National Lab , Tenn
INTERCOMPARISON OF STABLE-ELEMENT CONTENT OF FOODS BY STATISTICAL METHODS
H M BRAUNSTEIN, D J. PACK, and T W OAKES 1982 20 p refs Presented at the 16th Ann Conf on Trace Substance in Environ Health, Columbia, Mo , 31 May 1982
(Contract W-7405-ENG-26)
(DE83-014029, CONF-8205201-2) Avail NTIS HC A02/MF A01

The concentrations of 40 elements, which were determined in each of 87 foods from 3 sources and in 7 food groups, were analyzed statistically to develop a basis for intercomparing the foods Mean values of the elemental concentrations are given for each food group and for each source The possibility of fingerprinting a food by examining the distribution of elements in it is explored by using a clustering procedure to isolate groups of foods that have similar ranking patterns The source of a food as well as the extent of processing has a strong influence on its clustering pattern DOE

N84-11339# Joint Publications Research Service, Arlington, Va
REPORT ON DEVELOPMENT, INSTALLATION OF INDUSTRIAL ROBOTS
K KRAKAT *In its* East Europe Rept Sci Affairs, no 789 (JPRS-84426) p 9-24 28 Sep 1983 refs Transl into ENGLISH from FS Analysen (West Germany), no 1,
Avail NTIS HC A03 1981 p 1-23

Different attitudes towards the utilization of industrial robots efficiency in the GDR economy, rationalization solutions to overcome bottle necks and defects, industrial robots for taking over certain working processes, characteristics figures and criteria for the useful economic effect of industrial robots, long term planning objectives, the current use of industrial robots and products of robot technology and their manufacturers N W

N84-11696# Joint Publications Research Service, Arlington, Va
AIRCRAFT CREW DIET IN EMERGENCY SITUATIONS
I G POPOV *In its* USSR Rept. Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 16-31 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 12-24
Avail NTIS HC A08

The problems of emergency rations for flight crews are surveyed. Limitations to providing adequate nutrition and water supply in emergency situations that meet the pilot's nutritional requirements are discussed Methods of providing nutrition, maintaining metabolism and work capacity under the conditions of food and water shortage, and avoiding starvation and dehydration of the body are discussed J M S

N84-11709# Joint Publications Research Service, Arlington, Va
PHYSIOLOGICAL AND ECOLOGICAL CHARACTERISTICS OF THE WATER FERN, AZOLLA PINNATA, AND PROSPECTS OF USING IT IN BIOLOGICAL LIFE-SUPPORT SYSTEM FOR MAN
Y Y SHEPELEV, N THYOK, G I MELESHKO, A A ANTONYAN, T B GALKINA, and V P NAYDINA *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 96-101 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 66-69
Avail NTIS HC A08

The principal physiological and ecological characteristics of Azolla pinnata were investigated in order to determine its potential use in biological life support systems Plant requirements for biogenic elements were specified in order to develop balanced nutrient mixtures for continuous cultivation Data on the growth and development, photosynthetic and nitrogen fixation rate, and biochemical composition of the plant were obtained for optimal cultivation conditions The plant biomass contains large quantities of carotenoids and sulfur-containing amino acids, which are deficient in unicellular algae This makes Azolla an attractive source of the above compounds for biological life support systems and other applications Author

N84-11718# Joint Publications Research Service, Arlington, Va
METHOD FOR IDENTIFYING TRACE CONTAMINANTS IN CHAMBER ATMOSPHERE AT HIGH PRESSURE
B L AVETISYANTS, O A SUKHORUKOV, O N SKALATSKIY, and L B ZHUKOVA *In its* USSR Rept Space Biol and Aerospace Med , V 17, No 5, Sep -Oct 1983 p 138-141 1 Nov 1983 refs Transl into ENGLISH from Kosmich Biol i Aviakosmich Med (Moscow), v 17, no 5, Sep -Oct 1983 p 90-91
Avail NTIS HC A08

Methods for collection, concentration, and chromatographic analysis of trace contaminants in an artificial atmosphere at elevated pressure are described Three different methods are used to collect and concentrate trace contaminants from the atmosphere at the working pressure in the chamber system of cryogenic traps cooled by liquid air; passing samples through adsorption traps, use of adsorption traps without pumping (with diffusion delivery of substances to be analyzed) J M S

N84-11758* National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
ABSORBENT PRODUCT AND ARTICLES MADE THEREFROM Patent
F S DAWN and J V CORREALE, inventors (to NASA) 25 Oct 1983 5 p Filed 14 Apr 1982 Supersedes N82-26960 (20 - 17, p 2450) Division of US Patent-4,338,371, Patent Appl-SN-219681, filed 24 Dec 1981 Sponsored by NASA
(NASA-CASE-MSC-18223-2, US-PATENT-4,411,660, US-PATENT-4,338,371, US-PATENT-APPL-SN-368187, US-PATENT-APPL-SN-219681, US-PATENT-CLASS-604-396, US-PATENT-CLASS-604-378, US-PATENT-CLASS-604-368)
Avail US Patent and Trademark Office CSCL 06K

A multilayer absorbent product for use in contact with the skin to absorb fluids is described The product has a water pervious facing layer for contacting the skin, and a first fibrous wicking layer overlaying the water pervious layer A first container section is defined by inner and outer layers of a water pervious wicking material in between a first absorbent mass and a second container section defined by inner and outer layers of a water pervious wicking material between what is disposed a second absorbent mass, and a liquid impermeable/gas permeable layer overlaying the second fibrous wicking layer
Official Gazette of the U S Patent and Trademark Office

N84-11759 Prins Maurits Lab TNO, Rijswijk (Netherlands)
RESULTS AND INTERPRETATION OF LABOR-HYGIENIC STUDIES IN THE PAINTSHOP OF THE JET ENGINE DEPOT OF THE WOENSDRECHT AIRBASE [RESULTATEN EN INTERPRETATIVE VAN ARBEIDSHGIENISCH ONDERZOEK VERRICHT IN DE SCHILDERSWERKPLAATS VAN HET DEPOT STRAALMOTOREN TEVENS VLIEGBASIS WOENSDRECHT]
J KAAIJK and F OESEBURG Nov 1982 19 p refs In DUTCH, ENGLISH summary
(Contract A78/KLU/065)
(PML-1982-54, TDCK-77638) Avail Issuing Activity

A paintshop atmosphere was analyzed for health hazardous organic gases and dust The concentrations of the identified organic compounds are far below the Dutch Hygienic Standards (MAL-valves) The concentration of total dust is of the order of the MAL value The protection given by the respirators used by the personnel during the work is found to be insufficient
Author (ESA)

N84-11760*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
COMPOSITION AND ANALYSIS OF A MODEL WASTE FOR A CELSS (CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM)
T WYDEVEN Sep 1983 13 p refs
(NASA-TM-84368, A-9350, NAS 1 15 84368, CELSS-24) Avail NTIS HC A02/MF A01 CSCL 06K

A model waste based on a modest vegetarian diet is given, including composition and elemental analysis Its use is recommended for evaluation of candidate waste treatment processes for a Controlled Ecological Life Support System (CELSS) Author

N84-11761*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala
SELF-LOCKING TELESCOPING MANIPULATOR ARM Patent Application
M F NESMITH, inventor (to NASA) 30 Sep 1983 14 p
(NASA-CASE-MFS-25906-1, US-PATENT-APPL-SN-537757)
Avail NTIS HC A02/MF A01 CSCL 05H

A telescoping manipulator arm and pivotable finger assembly are disclosed The telescoping arm assembly includes a generally T-shaped arm having three outwardly extending fingers guided on the grooved roller guides to compensate for environmental variations The pivotable finger assembly includes four pivoting fingers Arcuate teeth are formed on the ends of the fingers A rack having teeth on four sides meshes with each one of the fingers One surface of the rack includes teeth along its entire surface which mesh with teeth of the finger The teeth at the remote end of the rack engage teeth of a gear wheel NASA

N84-11762# Naval Ship Research and Development Center, Bethesda, Md
A SURVEY OF ROBOTIC TECHNOLOGY
G CASTORE Jul 1983 79 p refs
(AD-A130999, DTNSRDC-83/053) Avail NTIS HC A05/MF A01 CSCL 13I

Robotic Technology is surveyed as a prelude to examination of its use in Naval Air Maintenance tasks Topics include Robot Classification schemes, programming techniques, power systems, manipulators, control systems, sensors, and end effectors In this survey, a robot is defined as a machine with three components a multifunctional manipulator to move objects and tools, a controller to store data and direct the manipulator, a power system for the manipulator GRA

N84-11763# Edgerton, Germeshausen and Grier, Inc, Idaho Falls, Idaho
METHOD FOR EVALUATING OPERATOR INPUTS TO DIGITAL CONTROLLERS
J R VEHNUIZEN 1983 6 p refs Presented at the 29th Intern Symp of the Instrument Soc of Am, Albuquerque, N Mex, 2-6 May 1983
(Contract DE-AC07-76ID-01570)
(DE83-013521, EGG-M-17882, CONF-830518-5) Avail NTIS HC A02/MF A01

Most industrial processes employ operator-interactive control systems The performance of these control systems is influenced by the choice of control station (device through which operator enters control commands) While the importance of proper control station selection is widely accepted, standard and simple selection methods are not available for the control station using color graphics terminals A facility for evaluating the effectiveness of various control stations is described In the facility, a process is simulated on a hybrid computer, color graphics display terminals provide information to the operator, and different control stations accept input commands to control the simulation Tests are being conducted to evaluate a keyboard, a graphics tablet, and a CRT touch pane for use as control stations on a nuclear power plant Preliminary results indicate that the facility can be used to determine those situations where each type of station is advantageous
DOE

N84-11764# Sandia Labs, Albuquerque, N Mex
AN APPROACH TO MODELING OF HUMAN PERFORMANCE FOR PURPOSES OF PROBABILISTIC RISK ASSESSMENT
A D SWAIN 1983 29 p refs Presented at the NATO Human Factors Meeting on the Theory and Nature of Human Error, Bellagio, Italy, 5-10 Sep 1983
(Contract DE-AC04-76DP-00789)
(DE83-009292, SAND-83-0447C, CONF-830902-1) Avail NTIS HC A03/MF A01

The general approach taken in NUREG/CR-1278 to model human performance in sufficient detail to permit probabilistic risk assessments of nuclear power plant operations is described To show the basis for the more specific models in the above NUREG, a simplified model of the human component in man-machine systems is presented, the role of performance shaping factors is discussed, and special problems in modeling the cognitive aspect of behavior are described DOE

N84-11765# Institute for Perception RVO-TNO, Soesterberg (Netherlands) Afd Audiologie
TECHNIQUE FOR MEASURING THE SOUND PRESSURE LEVELS UNDER FLYING HELMETS AND HEADSETS
A M MIMPEN and G F SMOORENBURG Dec 1982 25 p refs In DUTCH, ENGLISH summary
(Contract A80/K/112)
(IZF-1982-39, TDCK-77630) Avail NTIS HC A02/MF A01

A measuring technique was developed to determine the equivalent sound pressure levels under flying helmets and

headsets Subjectively these sound levels are qualified as very high and potentially damaging for the ear. A miniature electret microphone placed near the entrance of the ear canal of subjects in the laboratory measured the frequency characteristic, corresponding to the chosen microphone position It is shown that only the difference between the frequency characteristics of the electret microphone and the standard microphone of the noise dose meter is important A frequency dependent correction for the position of the electret microphone near the ear canal is not required However, this is true only if helmets or headsets are used Additional corrections are required for the unprotected ear A preliminary measurement in an Alouette 3 helicopter shows in the cockpit a level of 96 dB(A), an Leq = 85 dB(A) under the helmet without speech and an Leq of about 95 dB(A) with communication speech. Author (ESA)

55

PLANETARY BIOLOGY

Includes exobiology, and extraterrestrial life

A84-10655* National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif

SIMULATION OF VIKING BIOLOGY EXPERIMENTS SUGGESTS SMECTITES NOT PALAGONITES, AS MARTIAN SOIL ANALOGUES

A BANIN (NASA, Ames Research Center, Moffett Field, CA, Jerusalem, Hebrew University, Rehovot, Israel) and L MARGULIES (Jerusalem, Hebrew University, Rehovot, Israel) Nature (ISSN 0028-0836), vol 305, Oct 6, 1983, p. 523-525 refs

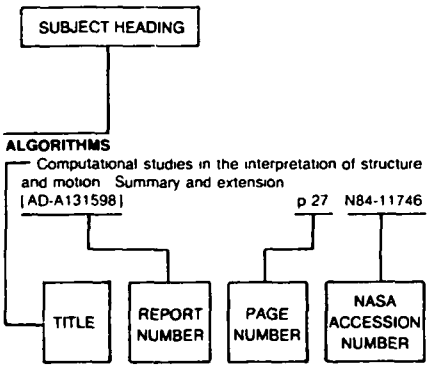
(Contract NSG-7512)

An experimental comparison of palagonites and a smectite (montmorillonite) was performed in a simulation of the Viking Biology Labelled Release (LR) experiment in order to judge which mineral is a better Mars soil analog material (MarSAM) Samples of palagonite were obtained from cold weathering environments and volcanic soil, and the smectite was extracted from Wyoming Bentonite and converted to H or Fe types Decomposition reaction kinetics were examined in the LR simulation, which on the Lander involved interaction of the martian soil with organic compounds Reflectance spectroscopy indicated that smectites bearing Fe(III) in well-crystallized sites are not good MarSAMS The palagonites did not cause the formate decomposition and C-14 emission detected in the LR, indicating that palagonites are also not good MarSAMS Smectites, however, may be responsible for ion exchange, molecular adsorption, and catalysis in martian soil

M S K

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Supplement 255) FEBRUARY 1984

Typical Subject Index Listing



The subject heading is a key to the subject content of the document The title is used to provide a description of the subject matter When the title is insufficiently descriptive of the document content, the title extension is added, separated from the title by three hyphens The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section If applicable, a report number is also included as an aid in identifying the document Under any one subject heading, the accession numbers are arranged in sequence with the AIAA accession numbers appearing first

A

ABDOMEN
Prediction of vomiting in dogs exposed to radiation with shielding of midabdomen p 11 N84-11710

ABSORBENTS
Absorbent product and articles made therefrom
[NASA-CASE-MSC-18223-2] p 40 N84-11758

ACCELERATION STRESSES (PHYSIOLOGY)
Inflight loss of consciousness p 15 A84-10739
A hygienic evaluation of elevated dynamic loads on passengers in urban transport vehicles p 19 A84-11569

ACCELERATION TOLERANCE
Hemodynamic reactions to positive intrathoracic pressure at +G sub z accelerations p 25 N84-11698
Energy metalbolism enzymes in simulation of some *spaceflight factors* p 26 N84-11704

ACCURACY
Evaluation of a draft standard on performance *specifications for health physics instrumentation*
[DE83-016186] p 28 N84-11750
Accuracy of external personnel dosimetry systems in *mixed neutron and gamma radiation fields*
[DE83-015712] p 28 N84-11751

ACID BASE EQUILIBRIUM
Metabolic acids and H(+) regulation in brain tissue during acclimatization to chronic hypoxia p 9 A84-12659

ACOUSTIC MEASUREMENT
Technique for measuring the sound pressure levels under flying helmets and headsets
[IZF-1982-39] p 40 N84-11765

ACTIVATED SLUDGE
Hygienic microbiological/virological examination of an airwasher concerning the emission of airborne microorganisms
[BMFT-FB-T-83-130] p 14 N84-11742

ACTIVITY (BIOLOGY)
Regulatory functions of actin in the cell p 5 A84-11349

ADENOSINE TRIPHOSPHATE
Calcium modulation of plant plasma membrane-bound ATPase activities p 12 N84-11723

ADIPOSE TISSUES
Adrenergic activation of triodothyronine production in brown adipose tissue p 4 A84-11268
A survey of body fat content of U S Navy male personnel
[AD-A131500] p 23 N84-10736

ADRENAL GLAND
Exterionzation of the effect of hyperthermia by observing the sympathoadrenal activity in subjects under psychoemotional stress p 18 A84-11555
Morphometric study of rat adrenal medulla during long-term hypokinesia p 10 N84-11705

ADRENOCORTICOTROPIN (ACTH)
Plasma adrenocorticotropin and cortisol responses to submaximal and exhaustive exercise p 21 A84-12656

AEROSPACE ENVIRONMENTS
Biofeedback monitoring-devices for astronauts in space environment p 37 A84-12025

AEROSPACE MEDICINE
Study and development activities of Dornier System on space biology/medicine equipment and payloads for Spacelab and freeflying platform application
[IAF PAPER 83-183] p 37 A84-11757
General results of medical investigations in Salyut-6 manned space flights
[IAF PAPER 83-202] p 20 A84-11761
Transdermal scopolamine in the prevention of motion sickness Evaluation of the time course of efficacy p 20 A84-12061
Cardiovascular examinations and observations of deconditioning during the Space Shuttle orbital flight test program p 20 A84-12062
Diaphragmatic rupture during G-maneuvers in a T33 jet trainer p 20 A84-12069
USSR report Space Biology and Aerospace Medicine, volume 17, no 5, September October 1983
[JPRS-84655] p 10 N84-11693
Programmatic comments p 13 N84-11732

AGE FACTOR
Effect of physical training on myocardial enzyme activities in aging rats p 2 A84-10288
Economical regimes of running for athletes of different ages in a hot climate p 18 A84-11552
A quantitative evaluation of various cardiac regions in young and old white rats p 5 A84-11558
Age-related responses to mild restraint in the rat p 8 A84-12654

AIR POLLUTION
External respiration in electric welders p 19 A84-11571
The design and operation of systems for inhalation exposure of animals
[DE83-015388] p 10 N84-10727
Recent advances in EPA's (Environmental Prog monitoring and methods development research
[PB83-231209] p 24 N84-10743
Probabilistic model for assessing time-varying contaminant levels
[PB83-232108] p 24 N84-10745
Bioassay of particulate organic matter from ambient air
[PB83-239731] p 29 N84-11754
Results and interpretation of labor-hygienic studies in the paintshop of the jet engine depot of the Woensdrecht airbase
[PML-1982-54] p 40 N84-11759

AIR PURIFICATION
Hygienic microbiological/virological examination of an airwasher concerning the emission of airborne microorganisms
[BMFT-FB-T-83-130] p 14 N84-11742

AIR QUALITY
An evaluation of the bacterial environment on motor buses p 6 A84-11575

AIR SAMPLING
An evaluation of the bacterial environment on motor buses p 6 A84-11575

AIR TO AIR MISSILES
An application of signal detection theory to air combat training p 29 A84-10972

AIR TRAFFIC CONTROLLERS (PERSONNEL)
Indicators of catecholamine metabolism and hemodynamics in air traffic controllers with neurocirculatory dystonia of the hypertension type p 19 A84-11568

AIRBORNE EQUIPMENT
Naval aviation on-board oxygen generation system *1982* - A status report p 35 A84-10736

AIRBORNE/SPACEBORNE COMPUTERS
A voice interactive system for aiding and documentation of space-based tasks
[AIAA PAPER 83-2355] p 33 A84-10025
Manned spaceflight activity planning with knowledge-based systems
[AIAA PAPER 83-2374] p 33 A84-10035

AIRCRAFT EQUIPMENT
A cockpit and equipment integration laboratory p 35 A84-10734
Naval aviation solid chemical oxygen emergency system program p 36 A84-10737
Impact and vibration testing of a modified UH-1 crew seat
[AD-A130279] p 38 N84-10760

AIRCRAFT MAINTENANCE
A survey of robotic technology
[AD-A130999] p 40 N84-11762

AIRCRAFT PILOTS
Inflight loss of consciousness p 15 A84-10739

AIRCRAFT SAFETY
The F-16 on board oxygen generation system (OBOGS) p 34 A84-10712
The USAFSAM advanced oxygen system concept p 34 A84-10713
In search of - An acceptable lap belt p 34 A84-10716
Improving restraint systems capabilities in older egress systems p 34 A84-10717

ALGORITHMS
Computational studies in the interpretation of structure and motion Summary and extension
[AD-A131598] p 27 N84-11746

ALTITUDE ACCLIMATIZATION
Renin, angiotensin-converting enzyme, and aldosterone in humans on Mount Everest p 14 A84-10279
Cardiorespiratory response to exercise in men repeatedly exposed to extreme altitude p 21 A84-12651
Metabolic acids and H(+) regulation in brain tissue during acclimatization to chronic hypoxia p 9 A84-12659

ALTITUDE SICKNESS
Prevention of acute mountain sickness by dexamethasone
[AD-A131533] p 23 N84-10737

AMINO ACIDS
Changes in the amino acid contents of saliva and urine in oil and gas drillers p 19 A84-11573
Free amino acids of blood before and after short-term spaceflights p 26 N84-11702
Effect of hypokinesia on amino acid metabolism in rats on diets differing in calcium and phosphorus content p 11 N84-11707

AMPHIBIA
Polarity of the amphibian egg p 12 A84-11731

AMPLITUDES
Fourier-processed images of dynamic lung function from list-mode data
[DE83-013276] p 24 N84-10741

ANALOGIES
Metaphor and common-sense reasoning
[AD-A131423] p 32 N84-11756

ANALYSIS (MATHEMATICS)
Neurocognitive pattern analysis
[AD-A131302] p 24 N84-10740

B

C

D

E

F

G

H

I

N

O

P

R

S

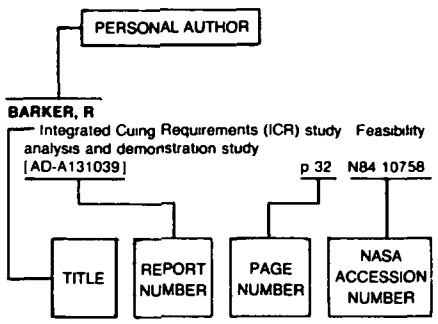
T

U

V

W

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author The title of the document provides the user with a brief description of the subject matter The report number helps to indicate the type of document listed (e g , NASA report, translation, NASA contractor report) The page and accession numbers are located beneath and to the right of the title Under any one author's name the accession numbers are arranged in sequence with the AIAA accession numbers appearing first

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

R

S

T

U

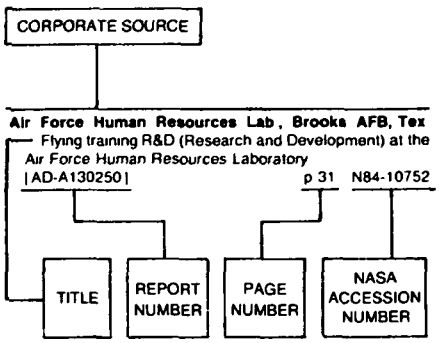
V

W

Y

Z

Typical Corporate Source Index Listing



Listings in this index are arranged alphabetically by corporate source The title of the document is used to provide a brief description of the subject matter The page number and the accession number are included in each entry to assist the user in locating the abstract in the abstract section If applicable, a report number is also included as an aid in *identifying the document*

A

AEG-Telefunken, Heilbronn (West Germany)
Civil applications of infrared techniques
[BMFT-FB-T-83-132] p 29 N84-11753

Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio
Preliminary investigation of variation in some dark adaptation aspects for possible relevance to military helicopter aircrew
[AD-A130231] p 22 N84-10733

Agricultural Research Center, Beltsville, Md
Calcium modulation of plant plasma membrane-bound ATPase activities p 12 N84-11723

Air Force Academy, Colo
Stability of rat brain glutamine synthetase to oxygen toxicity (oxygen at high pressure)
[AD-A131049] p 9 N84-10725

Air Force Human Resources Lab , Brooks AFB, Tex
Flying training R&D (Research and Development) at the Air Force Human Resources Laboratory
[AD-A130250] p 31 N84-10752

Companion trainer aircraft Concept test
[AD-A131378] p 32 N84-11757

Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio
Proceedings of the 18th Annual Conference on Manual Control
[AD-A131256] p 39 N84-10763

Albert Einstein Coll of Medicine, New York.
Controls of intracellular communication mediated by gap junctions p 13 N84-11738

Army Aeromedical Research Lab , Fort Rucker, Ala.
Impact and vibration testing of a modified UH-1 crew seat
[AD-A130279] p 38 N84-10760

Army Research Inst. of Environmental Medicine, Natick, Mass
The energy cost and heart rate response of trained and untrained subjects walking and running in shoes and boots
[AD-A131420] p 23 N84-10735
Prevention of acute mountain sickness by dexamethasone
[AD-A131533] p 23 N84-10737

B

Baylor Coll of Medicine, Houston, Tex.
Role of calmodulin in cell proliferation
p 13 N84-11737

Boeing Aerospace Co., Seattle, Wash
Integrated Cuing Requirements (ICR) study Feasibility analysis and demonstration study
[AD-A131039] p 32 N84-10758

Brookhaven National Lab , Upton, N Y
The design and operation of systems for inhalation exposure of animals
[DE83-015388] p 10 N84-10727
Fourier-processed images of dynamic lung function from list-mode data
[DE83-013276] p 24 N84-10741

Bruker Analytische Messtechnik G.m b H , Rheinstetten (West Germany)
Development and construction of an apparatus based *on the principle of multidimensional nuclear magnetic* resonance for the formation of images of organs and parts of the body
[BMFT-FB-T-83-102] p 29 N84-11752

C

California Univ , Berkeley
Measurement and control of free calcium inside small intact cells p 13 N84-11736

California Univ , Davis.
Gravitational study of the central nervous system
p 12 N84-11730
Ozone toxicity effects consequent to prolonged, high intensity exercise
[PB83-237388] p 29 N84-11755

California Univ , San Diego, La Jolla
Representation in memory
[AD-A130662] p 32 N84-10757

Carnegie-Mellon Univ , Pittsburgh, Pa
Metaphor and common-sense reasoning
[AD-A131423] p 32 N84-11756

Colorado Univ , Boulder
Direct comparison of intuitive, quasi-rational and analytical cognition
[AD-A130273] p 31 N84-10751

Concordia Univ., Montreal (Quebec)
Cervical spline analysis for ejection injury prediction
[AD-A131081] p 23 N84-10739

Connecticut Univ , Farmington
Local calcium entry and the guidance of growth
p 12 N84-11726

D

District of Columbia Univ , Washington, D C
Vacuum UV laser induced scission of Simian virus 40 DNA p 7 A84-12425

Draper (Charles Stark) Lab , Inc , Cambridge, Mass.
Probabilistic model for assessing time-varying contaminant levels
[PB83-232108] p 24 N84-10745

E

Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho
Method for evaluating operator inputs to digital controllers
[DE83-013521] p 40 N84-11763

EEG Systems Lab., San Francisco, Calif
Neurocognitive pattern analysis
[AD-A131302] p 24 N84-10740

Environmental Monitoring and Support Lab , Research Triangle Park, N C
Recent advances in EPA's (Environmental Prog monitoring and methods development research
[PB83-231209] p 24 N84-10743

G

Georgetown Univ , Washington, D C
Vacuum UV laser induced scission of Simian virus 40 DNA p 7 A84-12425

Georgia Inst. of Tech , Atlanta
Analysis and classification of human error
p 29 A84-10388
Measurement of lung function using the magnetometer system
[AD-A130841] p 23 N84-10738

Georgia Univ , Athens
Role of calcium and calmodulin in plant cell regulation
p 12 N84-11725

H

Health Effects Research Lab , Research Triangle Park, N C
Evaluation of motor vehicle and other combustion *emissions using short-term genetic bioassays*
[PB83-233270] p 10 N84-10731
Radiofrequency radiation exposure for bio-effects research at the Health Effects Research Laboratory, Research Triangle Park, North Carolina
[PB83-229591] p 25 N84-10747
Influence of nitrogen dioxide on xenobiotic metabolism in animals
[PB83-239723] p 14 N84-11743
Bioassay of particulate organic matter from ambient air
[PB83-239731] p 29 N84-11754

Hohenheim Univ , Stuttgart (West Germany)
Hygienic microbiological/virological examination of an airwasher concerning the emission of airborne microorganisms
[BMFT-FB-T-83-130] p 14 N84-11742

Howard Univ , Washington, D C
Vacuum UV laser induced scission of Simian virus 40 DNA p 7 A84-12425

I

Idaho Univ , Moscow
Aquaculture techniques A production forecasting model for aquaculture systems
[PB83-221713] p 10 N84-10730

Illinois Univ , Urbana.
Photosynthesis in intact plants
[DE83-016045] p 13 N84-11740

Indiana Univ., Bloomington
Thermoregulation in Erythrocebus patas - A thermal balance study p 9 A84-12663
Polarity of the amphibian egg p 12 N84-11731

Institute for Perception RVO-TNO, Soesterberg (Netherlands).
Technique for measuring the sound pressure levels under flying helmets and headsets
[IZF-1982-39] p 40 N84-11765

J

Joint Publications Research Service, Arlington, Va.
Report on development, installation of industrial robots p 39 N84-11339
USSR report Space Biology and Aerospace Medicine, volume 17, no 5, September - October 1983
[JPRS-84655] p 10 N84-11693
Study of cardiovascular system during long-term spaceflights p 25 N84-11694

SOURCE

L

M

N

O

P

R

S

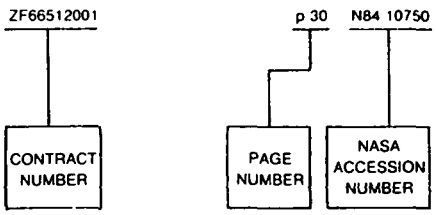
T

U

V

Y

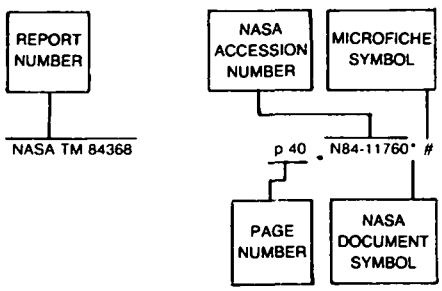
Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the AIAA accession numbers appearing first The accession number denotes the number by which the citation is identified in the abstract section Preceding the accession number is the page number on which the citation may be found

REPORT NUMBER INDEX

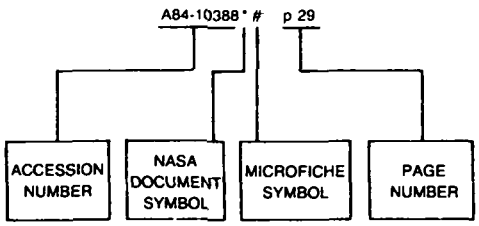
Typical Report Number Index Listing



Listings in this index are arranged alphanumerically by report number The page number indicates the page on which the citation is located The accession number denotes the number by which the citation is identified An asterisk (*) indicates that the item is a NASA report A pound sign (#) indicates that the item is available on microfiche

ACCESSION NUMBER INDEX

Typical Accession Number Index Listing



Listings in this index are arranged alphanumerically by accession number The page number listed to the right indicates the page on which the citation is located An asterisk (*) indicates that the item is a NASA report A pound sign (#) indicates that the item is available on microfiche

1 Report No.	2. Government Accession No	3. Recipient's Catalog No
NASA SP-7011 (255)		

4 Title and Subtitle	5. Report Date
Aerospace Medicine and Biology A Continuing Bibliography (Supplement 255)	February 1984
	6. Performing Organization Code
7 Author(s)	8 Performing Organization Report No
	10. Work Unit No
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	11. Contract or Grant No
	13. Type of Report and Period Covered
12 Sponsoring Agency Name and Address	14 Sponsoring Agency Code

15 Supplementary Notes

16 Abstract

This bibliography lists 278 reports, articles and other documents introduced into the NASA scientific and technical information system in January 1984.

17 Key Words (Suggested by Author(s))	18 Distribution Statement
Aerospace Medicine Bibliographies Biological Effects	Unclassified - Unlimited

19 Security Classif. (of this report)	20 Security Classif (of this page)	21 No of Pages	22. Price*
Unclassified	Unclassified	90	$7.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

NASA-Langley, 1984

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley
COLORADO
University of Colorado, Boulder
DISTRICT OF COLUMBIA
Library of Congress
GEORGIA
Georgia Institute of Technology, Atlanta
ILLINOIS
The John Crerar Library, Chicago
MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge
MISSOURI
Linda Hall Library, Kansas City
NEW YORK
Columbia University, New York
OKLAHOMA
University of Oklahoma, Bizzell Library
PENNSYLVANIA
Carnegie Library of Pittsburgh
WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an '*' following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library
COLORADO
Denver Public Library
CONNECTICUT
Hartford Public Library
MARYLAND
Enoch Pratt Free Library, Baltimore
MASSACHUSETTS
Boston Public Library
MICHIGAN
Detroit Public Library
MINNESOTA
Minneapolis Public Library and Information Center
NEW JERSEY
Trenton Public Library
NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library
OHIO
Akron Public Library
Cincinnati and Hamilton County Public Library
Cleveland Public Library
Dayton Public Library
Toledo and Lucas County Public Library
TEXAS
Dallas Public Library
Fort Worth Public Library
WASHINGTON
Seattle Public Library
WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols '#' and '*', from: ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.

10 1 SP-7011, 840221 S90569ASR850609
NASA
SCIEN & TECH INFO FACILITY
ATTN: ACCESSIONING DEPT
P O BOX 8757 BWI ARPRT
BALTIMORE MD 21240