

Aerospace Medicine
and Biology
A Continuing
Bibliography
with Indexes

NASA SP-7011(265)
December 1984



(NASA-SP-7011(265)) AEROSPACE MEDICINE AND
BIOLOGY, A CONTINUING BIBLIOGRAPHY WITH
INDEXES (National Aeronautics and Space
Administration) 68 p HC \$7.00

N85-13467

CSCL 06E

Unclas

00/52

12938

Aer
space Medicine & Biology Aero
e Medicine & Biology Aerospace
dicine & Biology Aerospace M
ne & Biology Aerospace Medic
Biology Aerospace Medicine &
gy Aerospace Medicine & Biolo
erospace Medicine & Biology A
pace Medicine & Biology Aeros
Medicine & Biology Aerospace
cine & Biology Aerospace Med
& Biology Aerospace Medicine

Aerospace Medicine and Biology

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges.

STAR (N-10000 Series) N84-31085 - N84-33365

IAA (A-10000 Series) A84-42708 - A84-46525

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 265)

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 November 1984 in

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



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 197 reports, articles and other documents announced during November 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 \$1.45 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 viii.

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, 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 vii.
- 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.

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC: NASA and NASA-sponsored documents and a large number of aerospace publications are available to the public for reference purposes at the library 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 for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *Star*. European requesters may purchase facsimile copy or 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.

FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 50 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. Over 1,300 other depositories also exist. A list of the regional GPO libraries appears on the inside back cover.

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

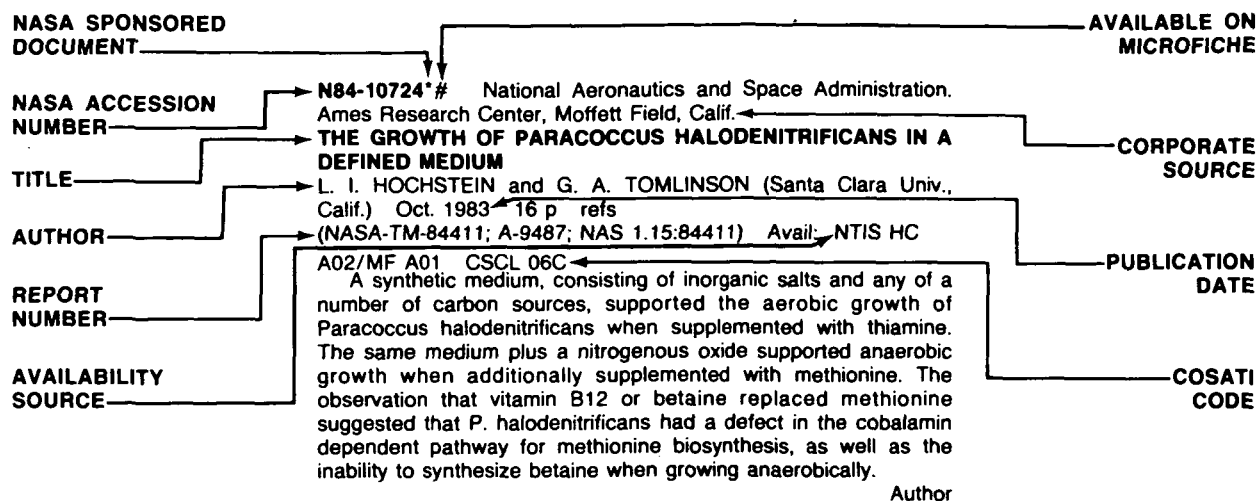
E-99 - Write for quote

N01	35.00	45.00
-----	-------	-------

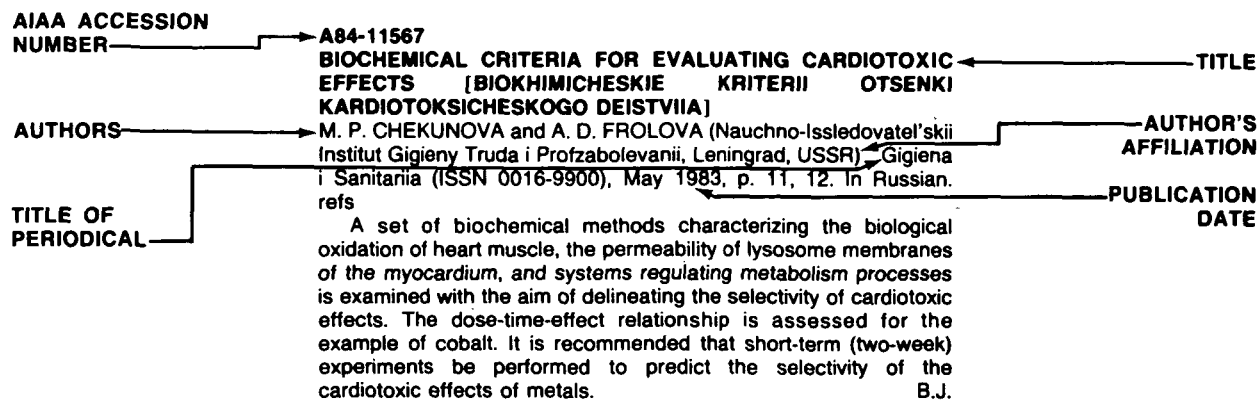
TABLE OF CONTENTS

	Page
Category 51 Life Sciences (General) Includes genetics.	449
Category 52 Aerospace Medicine Includes physiological factors; biological effects of radiation; and weightlessness.	458
Category 53 Behavioral Sciences Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.	470
Category 54 Man/System Technology and Life Support Includes human engineering; biotechnology; and space suits and protective clothing.	474
Category 55 Planetary Biology Includes exobiology; and extraterrestrial life.	477
Subject Index	A-1
Personal Author Index	B-1
Corporate Source Index	C-1
Contract Number Index	D-1
Report Number Index	E-1
Accession Number Index	F-1

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM IAA



AEROSPACE MEDICINE AND BIOLOGY

(A Continuing Bibliography (Suppl. 265))

DECEMBER 1984

51

LIFE SCIENCES (GENERAL)

Includes genetics.

A84-42954

A DETERMINATION OF THE LEVEL OF DNA DAMAGE IN HUMAN AND MAMMALIAN CELLS [OPREDELINIE UROVNIA SPONTANNYKH POVREZHENII DNK KLETOK CHELOVEKA I MLEKOPITAISHCHIKH]

E. F. DAVIDENKOVA, M. V. FILATOV, E. I. SHVARTS, L. A. NOSKIN, A. N. TRELIAKOV, KH. A. GEKSADZE (Akademiia Nauk SSSR, Leningradskii Institut Iadernoi Fiziki, Gatchina, USSR), and S. E. BRESLER Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 291-295. In Russian. refs

A technique is proposed for measuring the amount of spontaneous damage to DNA molecules in intact mammalian cells (human skin fibroblasts and embryonic rat fibroblasts). Arabinoside cytosine and Hydroxurea are shown to inhibit the repair of spontaneously formed gaps in DNA which may lead to double-strand breaks and cell death. The rate of spontaneous damage to the strands is found to vary in different animal species and in different types of tissue. The results of the experiment are considered important to the more general study of the biological aspects of aging. I.H.

A84-42955

PROLIFERATIVE ACTIVITY AND FREQUENCY OF CHROMOSOME ABERRATIONS IN THE FIRST MITOSIS IN 50-, 60-, AND 70-HOUR CULTURES OF IRRADIATED LYMPHOCYTES AND IN MIXED CULTURES OF IRRADIATED AND NONIRRADIATED CELLS [PROLIFERATIVNAIA AKTIVNOST' I CHASTOTA ABERRATSII KHROMOSOM V PERVOM MITOZE V 50-, 60- I V SMESHANNYKH KULTURAKH OBLUCHENNYKH I NEOBLUCHENNYKH KLETOK]

E. K. PIATKIN, V. IU. NUGIS, and V. N. POKROVSKAIA (Ministerstvo Zdravookhraneniia SSR, Institut Biofiziki, Moscow, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 310-314. In Russian. refs

A84-42956

VARIATION IN THE METABOLIC POOL OF FREE AMINO ACIDS IN THE PERIPHERAL BLOOD AND THE SPLEEN FOLLOWING TOTAL-BODY UNIFORM GAMMA IRRADIATION [IZMENENIE METABOLICHESKOGO FONDA SVOBODNYKH AMINOKISLOT PERIFERICHESKOI KROVI SELEZENKI POD DEISTVIEM OBSHEGO RAVNOMERNOGO GAMMA-OBLUCHENIIA]

L. A. KONNOVA and V. E. KOMAR (Ministerstvo Zdravookhraneniia SSSR, Tsentral'nyi Nauchno-Issledovatel'skii Rentgeno-Radiologicheskii Institut, Leningrad, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 330-333. In Russian. refs

A84-42957

A GENERAL SCHEME FOR THE MODIFICATION OF REPRODUCTIVE CELL DEATH [OBSHCHAIA SKHEMA MODIFIKATSII REPRODUKTIVNOI GIBELI KLETOK]

L. KH. EIDUS and IU. N. KORYSTOV (Akademiia Nauk SSSR, Institut Biologicheskoi Khimii, Pushchino, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 337-340. In Russian. refs

A general scheme for changes in the process of reproductive cell death is described. The process is divided into two stages. In the first (physicochemical) stage, changes occur in the consumption of oxygen within the cell which may be the result of variations in the concentrations of thiols, indolyl-alkylamines, oxygen, and substances affecting oxygen consumption within a cell. In the second stage, modifications occur in the enzymatic repair of potential damages, which are associated with mitosis delay, decreases in repair inhibitors and hyperthermia. I.H.

A84-42958

A QUANTITATIVE ANALYSIS OF RADIATION DAMAGE TO THROMBOCYTOPOIESIS [KOLICHESTVENNAIA OTSENKA RADIATSIONNOGO PORAZHENIIA TROMBOTSITOPOEZA]

V. A. SELIVANOV and V. G. TIAZHELOVA (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 355-359. In Russian. refs

From a comparison of results from theoretical and experimental investigations of the kinetics of thrombocytopoietic functions have been determined qualitatively. The parameters are: (1) the percentage of cells killed during the interphase; and (2) the duration of mitosis delay and the rise in abortive activity following irradiation. In experiments with rats and mice, the duration of mitosis delay and the level of abortive activity were found to decrease by factors ranging from 1.3 to 1.5 and 2 to 3, respectively. I.H.

A84-42959

IRON CONTENT OF BLOOD AND IRON SATURATION OF BLOOD SERUM TRANSFERRIN FOLLOWING X-RAY IRRADIATION [SODERZHANIE ZHELEZA V KROVI I NASYSHCHENNOST' ZHELEZOM TRANSFERRINA SYVOROTKI KROVI PRI VOZDEISTVII RENTGENOVYKH LUCHEI]

L. E. GOTSULIAK (Odesskii Meditsinskii Institut, Odessa, Ukrainian SSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 362-364. In Russian. refs

A84-42960

VARIATIONS IN THE ABSORPTION CAPACITY OF THE RETICULO-ENDOTHELIAL SYSTEM UNDER THE COMBINED EFFECT OF RADIATION AND BURN [IZMENENIIA POGLOTITEL'NOI SISTEMY PRI KOMBINIROVANNOM RADIATSIONNO-TERMICHESKOM PORAZHENII]

R. S. BUDAGOV and Z. K. BUDAGOVA (Akademiia Meditsinskikh Nauk SSSR, Obninsk, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 383-385. In Russian. refs

A84-42961

THYROID GLAND HYPERFUNCTION AS A RESULT OF THE SEPARATE AND COMBINED EFFECTS OF RADIATION AND HEAT [GIPOFUNKTSIIA SHCHITOVIDNOI ZHELEZY PRI IZOLIROVANNYKH I KOMBINIROVANNYKH RADIATIONNO-TERMICHESKIKH PORZHENIARKH]

L. N. CHUREEVA, R. S. BUDAGOV, and V. E. ZAICHIK (Akademiia Meditsinskikh Nauk SSSR, Obninsk, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 390-394. In Russian. refs

A84-42962

THE EFFECT OF MICROWAVES OF NONTHERMAL INTENSITY ON THE NUMBER OF ABERRANT HEPATOCYTES IN RATS [VLIANIE MIKROVOLN NETEPLOVOI INTENSIVNOSTI NA CHISLO ABERRANTNYKH GEPATOTSITOV U KRYS]

E. N. ANTIPENKO, I. V. KOVESHNIKOVA, and O. I. TIMCHENKO (Kievskii Nauchno-Issledovatel'skii Institut Obshchei i Kommunal'noi Gigieny, Kiev, Ukrainian SSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 403-405. In Russian. refs

A84-42963

THE ROLE OF THE THYROID GLAND IN THE DEVELOPMENT OF GENETIC EFFECTS OF MICROWAVES OF NONTHERMAL INTENSITY [O ROLI SHCHITOVIDNOI ZHELEZY V RAZVITII GENETICHESKIKH EFFEKTOV MIKROVOLN NETEPLOVOI INTENSIVNOSTI]

E. N. ANTIPENKO, I. V. KOVESHNIKOVA, and O. I. TIMCHENKO (Kievskii Nauchno-Issledovatel'skii Institut Obshchei i Kommunal'noi Gigieny, Kiev, Ukrainian SSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 406-408. In Russian. refs

A84-42964

AN INVESTIGATION OF THE ABSORBING CAPACITY OF THE GASTROINTESTINAL TRACT OF IRRADIATED ANIMALS TREATED WITH RADIOPROTECTIVE AGENTS [IZUCHENIE VSASYVATEL'NOI AKTIVNOSTI ZHELUDOCHNO-KISHECHNOGO TRAKTA U OBLUCHENNYKH ZHIVOTNYKH V USLOVIAKH ZASHCHITY RADIOPROTEKTORAMI]

N. G. CHIGAREVA and V. M. TESLENKO (Voenno-Meditsinskaya Akademiia, Leningrad, USSR) Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 408-410. In Russian.

A fluorescent uranine detector was used to study the absorbing capacity of the gastrointestinal tracts of irradiated mice and dogs. The animals were subjected to a range of dosages and exposure times from 4 to 7.5 gr, and 3 to 12 hours, respectively. The radioprotective agents used were cystamine, para-aminopropiophenon, and S-2(3-aminopropylamino)ethylthiophosphate. The agents are found to have a favorable effect on the functioning of the gastrointestinal tract of the irradiated mice. I.H.

A84-42965

CHARACTERIZATION OF THE ROLE OF THE SEROTONIN HYDROXYL GROUP IN THE PHARMACOLOGICAL AND RADIOPROTECTIVE ACTION OF SEROTONIN [K KHARAKTERISTIKE ROLI GIDROKSIL'NOI GRUPPY SEROTONINA V FARMAKOLOGICHESKOM I PROTIVOLUCHEVOM EFFEKTE SEROTONINA]

M. V. VASIN, V. V. ANTIPOV, N. N. SUVOROV, M. M. ABRAMOV, and N. V. GORELOVA Radiobiologiya (ISSN 0033-8192), vol. 24, May-June 1984, p. 411-414. In Russian. refs

A84-43051

EARTH'S EARLIEST BIOSPHERE: ITS ORIGIN AND EVOLUTION

J. W. SCHOPF, ED. (California, University, Los Angeles, CA) Princeton, NJ, Princeton University Press, 1983, 565 p. For individual items see A84-43052 to A84-43066.

Some of the subjects discussed are related to the early biogeologic history, the nature of the earth prior to the oldest known rock record, the early earth and the Archean rock record,

the prebiotic organic syntheses and the origin of life, Precambrian organic geochemistry, the biochemical evolution of anaerobic energy conversion, the isotopic inferences of ancient biochemistries, Archean stromatolites providing evidence of the earth's earliest benthos, Archean microfossils, the geologic evolution of the Archean-Early Proterozoic earth, and the environmental evolution of the Archean-Early Proterozoic earth. Other topics examined are concerned with geochemical evidence bearing on the origin of aerobiosis, biological and biochemical effects of the development of an aerobic environment, Early Proterozoic microfossils, the evolution of earth's earliest ecosystems, and geographic and geologic data for processed rock samples. Attention is given to a processing procedure for abiotic samples and calculation of model atmospheric compositions, and procedures of organic geochemical analysis. G.R.

A84-43052

EARLY BIOGEOLOGIC HISTORY - THE EMERGENCE OF A PARADIGM

P. CLOUD (California, University, Santa Barbara, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 14-31.

It is pointed out that a study of the origin and evolution of the earth's earliest biosphere involves the blending of biology and geology. This situation provides the basis for a new interdisciplinary science. The most descriptive name for this science appears to be 'biogeology'. The present investigation is concerned with a new biogeological 'paradigm'. The term 'paradigm', as used in this investigation, denotes a dramatic shift of previously prevailing views. The main elements of this paradigm are examined. The emergence of the new biogeological paradigm involves four stages. The first stage is the gestational or embryonic century, 1850-1950. The following stages include the emergent decade of the 1950s, the breakthrough decade of the 1960s, and the take-off decade, the 1970s. A survey is provided of the main elements of the four stages, and some remarks about current views and future prospects are presented. G.R.

A84-43056* Indiana Univ., Bloomington.

PRECAMBRIAN ORGANIC GEOCHEMISTRY - PRESERVATION OF THE RECORD

J. M. HAYES, K. W. WEDEKING (Indiana University, Bloomington, IN), and I. R. KAPLAN (California, University, Los Angeles, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 93-134. (Contract NGR-05-007-221; NGR-15-003-118)

A review of earlier studies is presented, and new results in Precambrian organic geochemistry are discussed. It is pointed out that two lines of evidence can be developed. One is based on structural organic chemistry, while the other is based on isotopic analyses. In the present investigation, the results of both structural and isotopic investigations of Precambrian organic matter are discussed. Processes and products related to organic geochemistry are examined, taking into account the carbon cycle, an approximate view of the principal pathways of carbon cycling associated with organic matter in the present global ecosystem, processes affecting sedimentary organic matter, and distribution and types of organic matter. Attention is given to chemical fossils in Precambrian sediments, kerogen analyses, the determination of the structural characteristics of kerogen, and data concerning the preservation of the Precambrian organic geochemical record. G.R.

A84-43057

BIOCHEMICAL EVOLUTION OF ANAEROBIC ENERGY CONVERSION - THE TRANSITION FROM FERMENTATION TO ANOXYGENIC PHOTOSYNTHESIS

H. GEST (Indiana University, Bloomington, IN) and J. W. SCHOPF (California, University, Los Angeles, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 135-148. (Contract NSF PCM-79-10747)

The search for primary direct evidence of the origin and evolution of earth's earliest biosphere has been largely based on

the preserved rock record. However, there exists another basis for studies of biochemical evolution. This basis is provided by evidence found within the biochemistry and molecular biology of living organisms. A utilization of such a basis involves the sorting out of biochemical and molecular biological features, occurring in living systems, which accurately reflect the evolutionary history. The present chapter provides a summary of results of one approach to this problem. Attention is given to the metabolic characteristics of the earliest forms of life and, in particular, the development of anaerobic photosynthetic prokaryotes from their more primitive fermentative ancestors. Sugars in the primeval soup and early fermentations are considered along with more complex fermentations, sugar fermentation dependent on an 'accessory oxidant', accessory oxidant-dependent fermentation in photosynthetic bacteria, and the origin of anaerobic photophosphorylation. G.R.

A84-43058* Max-Planck-Inst. fuer Chemie, Mainz (West Germany).

ISOTOPIC INFERENCE OF ANCIENT BIOCHEMISTRIES - CARBON, SULFUR, HYDROGEN, AND NITROGEN

M. SCHIDLOWSKI (Max-Planck-Institut fuer Chemie, Mainz, West Germany), J. M. HAYES (Indiana University, Bloomington, IN), and I. R. KAPLAN (California, University, Los Angeles, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 149-186. Sponsorship: Deutsche Forschungsgemeinschaft.

(Contract DFG-SFB-73; NGR-05-007-221; NGR-15-003-118)

In processes of biological incorporation and subsequent biochemical processing sizable isotope effects occur as a result of both thermodynamic and kinetic fractionations which take place during metabolic and biosynthetic reactions. In this chapter a review is provided of earlier work and recent studies on isotope fractionations in the biogeochemical cycles of carbon, sulfur, hydrogen, and nitrogen. Attention is given to the biochemistry of carbon isotope fractionation, carbon isotope fractionation in extant plants and microorganisms, isotope fractionation in the terrestrial carbon cycle, the effects of diagenesis and metamorphism on the isotopic composition of sedimentary carbon, the isotopic composition of sedimentary carbon through time, implications of the sedimentary carbon isotope record, the biochemistry of sulfur isotope fractionation, pathways of the biogeochemical cycle of nitrogen, and the D/H ratio in naturally occurring materials. G.R.

A84-43059

ARCHEAN STROMATOLITES - EVIDENCE OF THE EARTH'S EARLIEST BENTHOS

M. R. WALTER (Baas Beeking Geobiological Laboratory, Canberra, Australia) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 187-213.

In terms of the main objectives considered in the present volume, stromatolites are of importance primarily as a source of biological information. Stromatolites constitute a prime source of data for Archean paleobiology. New data are gradually allowing the formulation of a theoretical 'model' or framework for the interpretation of stromatolites. It has been found that the construction of a stromatolite with a uniform fabric requires a consistent and repeatable set of behavioral responses from a particular relatively invariant, microbial community. That set of responses can be referred to as a syndrome. Counted by major stratigraphic units, eleven occurrences of stromatolites (and possible stromatolites) are known from Archean sequences dating back to 3.5 Ga ago. Early Archean stromatolites were constructed by filamentous prokaryotes and possibly also by unicellular prokaryotes. During the Early Proterozoic, benthonic microbial communities constructed stromatolites in peritidal and relatively deep subtidal environments in the oceans, down to the base of the photic zone. G.R.

A84-43060

ARCHEAN MICROFOSSILS - NEW EVIDENCE OF ANCIENT MICROBES

J. W. SCHOPF (California, University, Los Angeles, CA) and M. R. WALTER (Baas Beeking Geobiological Laboratory, Canberra, Australia) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 214-239.

The disparity between evidence of ancient microbes related to the Archean and the Early Proterozoic is considered, taking into account the fact that the Archean rock record includes only about 10 percent as many established microfossiliferous units as the Early Proterozoic. It is pointed out that as a result of the historical development of the field and of chiefly geologically imposed limitations inherent in its study, the search for cellularly preserved remnants of Archean life has met with only limited success. During the past half-century, some 43 categories of microfossils and microfossil-like objects have been reported from at least 28 geologic units of Archean age. In recent years, useful progress has been made both in terms of critical evaluation of the early fossil record, and of the discovery of new evidence. Attention is given to the criteria for establishing the authenticity of Archean microfossils. G.R.

A84-43063* Indiana Univ., Bloomington.

GEOCHEMICAL EVIDENCE BEARING ON THE ORIGIN OF AEROBIOSIS, A SPECULATIVE HYPOTHESIS

J. M. HAYES (Indiana University, Bloomington, IN) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 291-301.

(Contract NGR-15-003-118)

It is pointed out that the atmosphere and hydrosphere of the early Archean earth were essentially anoxic. The paleontological record shows that life existed in spite of the absence of oxygen. The present investigation is concerned with the presentation of a plausible sequence of events, linking features in the carbon isotopic record to the origin of oxygenic photosynthesis. The investigation takes into account that the record of carbon isotopic abundances in sedimentary organic matter displays marked variations about 2.8 Ga before the present. At least by 2.8 Ga before the present, if not before, something in the carbon cycle began to allow the incorporation in sediments of organic material extraordinarily depleted in C-13. Attention is given to a model for the development of C-13 depleted kerogens, conclusions regarding the late Archean carbon cycle, and the transition in the global ecosystem. G.R.

A84-43064

BIOLOGICAL AND BIOCHEMICAL EFFECTS OF THE DEVELOPMENT OF AN AEROBIC ENVIRONMENT

D. J. CHAPMAN and J. W. SCHOPF (California, University, Los Angeles, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 302-320.

(Contract NSF GB-42461; NSF PCM-78-25852)

Oxygen, in a combined state, is an abundant constituent of all the inner planets and their satellites. However, only the earth has uncombined molecular oxygen as a major atmospheric component, one for which there is no known primary source. Two principal questions about biologic oxygen relations are considered, taking into account the origin of 'aerobic biology', and the possibility of using quantitative aspects of the aerobic biochemistry of modern organisms as a basis to obtain information regarding the pO₂ of the earth's early environment. The first question is concerned with those biochemical processes involved in intracellular protection from, and the photosynthetic production and metabolic biosynthetic use of, molecular oxygen. It is concluded that the origin of oxygenic photosynthesis and the evolution of biologic oxygen relations together have been responsible for the development of the anaerobic-aerobic ecosystem which currently characterizes the planet. G.R.

A84-43065

EARLY PROTEROZOIC MICROFOSSILS

H. J. HOFMANN (Montreal, Université, Montreal, Canada) and J. W. SCHOPF (California, University, Los Angeles, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 321-360.

A summary and an evaluation regarding the previously available data concerning the Early Proterozoic fossil record are provided. Attention is given to the relatively better known assemblages of the 2.5 to 1.6 Ga period, and a description is presented of newly detected fossils from four Early Proterozoic formations. Aspects of paleobiology are discussed, taking into account morphologic categories of Early Proterozoic microfossils, biological affinities and level of organization, and Early Proterozoic paleobiology. It is pointed out that during the past 60 years, microfossils and microfossil-like objects have been reported from at least 40 Early Proterozoic geologic units from North America, Europe, Africa, Australia, and Asia. Nearly 90 percent of the more than 160 publications dealing with these occurrences have appeared since 1965. G.R.

A84-43066

EVOLUTION OF EARTH'S EARLIEST ECOSYSTEMS - RECENT PROGRESS AND UNSOLVED PROBLEMS

J. W. SCHOPF (California, University, Los Angeles, CA), J. M. HAYES (Indiana University, Bloomington, IN), and M. R. WALTER (Baas Becking Geological Laboratory, Canberra, Australia) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 361-384.

It is the ultimate goal of Precambrian paleobiology to decipher and document both the timing and nature of major events in the early history of life. However, many questions which arise in connection with such an objective are still unanswered. The present investigation is concerned with an attempt to order the facts and to bring into focus the present status of the field and the areas of uncertainty. Attention is given to limitations of the early fossil record, major benchmarks in Archean-Early Proterozoic evolution, the categories of evidence, and the assessment of the evidence. A current 'best guess scenario' for the early history of life is provided, taking into account the primitive anaerobic ecosystem, the advanced anaerobic ecosystem, the transitional (anaerobic-amphibiotic) ecosystem, and the onset of the 'modern' (anaerobic-amphibiotic-aerobic) ecosystem. G.R.

A84-43726

A MODEL OF SPINAL CORD DYSBARISM TO STUDY DELAYED TREATMENT. II - EFFECTS OF TREATMENT

D. R. LEITCH and J. M. HALLENBECK (Institute of Naval Medicine, Alverstoke, Hants., England; U.S. Navy, Naval Medical Research Institute and Naval Medical Center; Uniformed Services University of the Health Sciences, Bethesda, MD) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 679-684. refs

(Contract NAVY TASK M0099,PN001,1151)

Using the spinal cord decompression sickness model described in Part I, the effects of delay to treatment on the recovery of spinal evoked potentials (SEP) are explored. The primary treatments of oxygen at 60 fsw (2.8 bar) and air at 165 fsw (6.0 bar) were studied. In this exploratory study the results were surprisingly poor in all treatments applied. There is evidence that in this model a delay of 15-18 min between diagnosis and start of therapy would generally allow some recovery of SEP, which would rarely be complete. Supporting experiments involving cord ischemia are described. The results from this study make it possible to design a set of practicable experimental criteria for the purpose of discovering the optimal combinations of oxygen and pressure for the treatment of spinal cord decompression sickness. Author

A84-43727

FLUID-ELECTROLYTE METABOLISM AND RENAL FUNCTION OF WHITE RATS IN EXPERIMENTS ABOARD COSMOS BIOSATELLITES

O. G. GAZENKO, I. V. NATOCHIN, E. A. ILIN, N. A. ILIUSHKO, I. I. KONDRATIEV, E. A. LAVROVA, and E. I. SHAKHMATOVA (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 685-691. refs

Rat experiments on the Cosmos biosatellites demonstrated that the percentage of renal excretion of consumed water after flight was lower than after synchronous experiment. This can be attributed not only to water retention but also to a different level of extrarenal losses postflight. Weightless rats showed increased sodium excretion after water load tests and increased potassium excretion after potassium load tests. The sodium, potassium, and calcium balance was positive after weightlessness. Analysis of the electrolyte composition of different kidney zones revealed a decreased potassium content in the medulla, which is considered to be one of the causes of changed renal iono- and osmoregulatory function in weightlessness. The normalizing effect of artificial gravity on the natri- and kaliuretic renal function was demonstrated.

Author

A84-43731

THE ENDOTOXIN-PRETREATED, OXYGEN-ADAPTED RAT MODEL IN HYPERBARIC HYPEROXIA

R. M. JACKSON and J. B. PISARELLO (Pennsylvania, University, Philadelphia, PA) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 709-714. refs

Rats pretreated with 500 micrograms/kg endotoxin are resistant to the pulmonary toxic effects of normobaric hyperoxia exceeding 95 percent O₂. After endotoxin-pretreatment and exposure to 1.0 ATA O₂ for 72 h, such rats are found to have elevated total superoxide dismutase, glutathione peroxidase, and catalase activities in homogenates of whole lungs. Despite increases in these protective antioxidant enzymes which persist in 2.0 ATA O₂ (4 h) and 4.0 ATA O₂ (1.0 h), such rats do not have improved survival in hyperbaric hyperoxia. Likewise, endotoxin-pretreatment immediately prior to 2.0 or 4.0 ATA O₂ exposure does not prolong survival compared to controls. It is likely that lung injury during the normobaric oxygen preexposure and the central nervous system toxicity of hyperbaric oxygen interact to limit survival. Author

A84-43733

EFFECTS OF CONSTANT MAGNETIC FIELDS ON RATS AND MICE - A STUDY OF WEIGHT

A. BELLOSSI, M. TH. SUTTER-DUB, and B. CH. J. SUTTER (Rennes I, Université, Rennes, France) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 725-730. refs

Variations in the growth of animals from exposure to a magnetic field have been reported by several authors. In this study, young rats and mice were exposed daily to constant uniform magnetic fields. The strength of the field was 400, 600 or 800 mT. Rats were exposed for four weeks and mice for 250 d or more. Some mice were exposed in a permanent way to a nonuniform magnetic field of 4.6 mT. No significant effect on the growth was observed.

Author

A84-43790

A NOVEL COLD-TOLERANT INSECT FOUND IN A HIMALAYAN GLACIER

S. KOHSHIMA (Kyoto University, Kyoto, Japan) Nature (ISSN 0028-0836), vol. 310, July 19, 1984, p. 225-227. refs

The discovery of a new species of cold-tolerant midge (Chironomidae, *Diamesa Meigen* sp.) in a high-altitude glacier of the Nepal Himalayas is reported. The adult insect, characterized by reduced wings and antennae, is unable to fly, and is found walking on the surface of the glacier and in small cavities beneath it. The larvae grow in melt-water drainage channels under the ice and feed on blue-green algae and bacteria. The insect is the first

to be found which spends its entire life cycle in the snow and ice of a glacier - the coldest insect habitat ever recorded. The insect was active at temperatures as low as -16 C, well below those at which activity has been seen in insects living in other cold habitats, including Antarctic ones. The study also reveals a previously unsuspected ecosystem based on the algae and bacteria growing on glacial ice. Author

A84-43796

RESPONSE OF THE AUDITORY ANALYZER TO THE COMBINED EFFECT OF NOISE, HIGH TEMPERATURE, AND CARBON MONOXIDE [REAKTSIIA ZVUKOVOGO ANALIZATORA NA KOMBINIROVANNOE VOZDEISTVIE SHUMA, POVYSHENNOI TEMPERATURY I OKISI UGLERODA]

IU. K. REVSKOI, O. V. DAVYDOV, and G. M. ZHERDEV (Voenno-Meditsinskaia Akademiia, Leningrad, USSR) Vestnik Otorinolaringologii (ISSN 0042-4668), July-Aug. 1984, p. 14-17. In Russian. refs

The results of experiments performed on ocean vessels to study the combined effect of high-temperature, noise, and CO on aural sensitivity are reported. The subjects of the experiments included 51 sailors and 126 porpoises and test parameters consisted of noise levels between 10 and 127 dB (1000-4000 Hz), temperatures between 20 and 40 C, and CO concentrations of 50, 500 and 5000 mg/sq m. It is found that noise sensitivity was altered in the presence of stable acoustic noise accompanied by the remaining stressors. The applicability of mathematical methods for analyzing the effects of noise, high temperature, and CO exposure is also discussed. I.H.

A84-43817

CALCIUM SOURCE FOR EXCITATION-CONTRACTION COUPLING IN MYOCARDIUM OF NONHIBERNATING AND HIBERNATING CHIPMUNKS

N. KONDO (Mitsubishi-Kasei Institute of Life Sciences, Tokyo, Japan) and S. SHIBATA (Hawaii, University, Honolulu, HI) Science (ISSN 0036-8075), vol. 225, Aug. 10, 1984, p. 641-643. refs

The amplitude of the early plateau phase of the action potential and the slow action potential of cardiac muscle were much lower in hibernating chipmunks than in nonhibernating chipmunks. The frequency-dependent contraction was decreased in hibernating animals but increased in nonhibernating animals. Caffeine caused a negative inotropic effect in hibernating animals but a positive inotropic effect in nonhibernating animals. Ryanodine caused greater inhibition in hibernating animals than in nonhibernating animals. These results suggest that the respective roles of the sources of calcium for cardiac excitation-contraction coupling are changed during hibernation. Author

A84-43821

BUBBLE FORMATION IN CRABS INDUCED BY LIMB MOTIONS AFTER DECOMPRESSION

P. M. MCDONOUGH and E. A. HEMMINGSEN (California, University, La Jolla, CA) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, July 1984, p. 117-122. refs (Contract NIH-HL-16855)

A84-44078

CORONARY VASCULAR RESPONSE TO ADRENERGIC STIMULATION IN EXERCISE-CONDITIONED DOGS

P. A. GWIRTZ (Texas College of Osteopathic Medicine, Fort Worth, TX) and H. L. STONE (Oklahoma, University, Oklahoma City, OK) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, Aug. 1984, p. 315-320. refs (Contract NIH-HL-22154-01; NIH-HL-31144-01)

A84-44079

PLASMA CATECHOLAMINES AND THEIR EFFECT ON BLOOD LACTATE AND MUSCLE LACTATE OUTPUT

W. N. STAINSBY, C. SUMNERS (Florida, University, Gainesville, FL), and G. M. ANDREW (Queen's University, Kingston, Ontario, Canada) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, Aug. 1984, p. 321-325. refs (Contract NIH-AM-30187)

The effect of infused epinephrine (E) or norepinephrine (NE) at 1.5 microgram/kg body weight min on the O₂ uptake and net lactate output (L) of the surgically isolated resting or contracting (4/sec) gastrocnemius-plantaris muscles is investigated experimentally in dogs. Plasma E and NE concentrations are increased by the surgical procedure and then tripled by the infusions. Infusion of E causes a continuous increase in venous and arterial lactate concentration at rest, but NE infusion has no effect. During the first 10 min of contractions, either infusion leads to a significant increase in peak L compared to controls without infusion, but O₂ uptake is unaffected. T.K.

A84-44080

BIOCHEMICAL ALTERATIONS IN HEART AFTER EXHAUSTIVE SWIMMING IN RATS

G. N. PIERCE, M. J. B. KUTRYK, K. S. DHALLA, R. E. BEAMISH, and N. S. DHALLA (Manitoba, University, Winnipeg, Canada) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, Aug. 1984, p. 326-331. Research supported by the Manitoba Heart Foundation, Medical Research Council and Canadian Heart Foundation. refs

The effect of daily exhaustive swimming for 1, 3, or 7 days on heart and skeletal-muscle glycogen (G), plasma and heart epinephrine (E) and norepinephrine (NE), the uptake and binding of Ca(2+) by the cardiac sarcoplasmic reticulum (SR) and mitochondria (M), and the function of the sarcolemmal membrane (SM) is investigated experimentally in male Sprague-Dawley rats weighing 250-300 g. Measurements are obtained immediately after exercise on the days indicated. G is significantly depleted in both heart and skeletal muscles at day 1 but recovers to control levels by day 7 in all but the plantaris muscle. Plasma and cardiac E and NE are found to be elevated and depressed, respectively, after each exercise period. SR Ca(2+) binding is depressed at day 3 only; SR Ca(2+) uptake is depressed at days 1 and 3; M Ca(2+) binding and uptake are enhanced at day 3 and depressed at day 7. SM function is unaffected by the exercise program. T.K.

A84-44081

EFFECTS OF ADDITION OF NITROGEN DURING RAPID COMPRESSION OF BABOONS

J. C. ROSTAIN, J. C. DUMAS, B. GARDETTE, J. P. IMBERT (CNRS, Groupement d'Interet Scientifique de Physiologie Hyperbare; Compagnie Maritime d'Expertise, Centre Experimental Hyperbare, Marseille, France), and C. LEMAIRE (Octares, Marseille, France) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, Aug. 1984, p. 332-340. Research supported by the Centre National pour l'Exploitation des Oceans, Direction des Recherches, Etudes et Techniques and Compagnie Maritime d'Expertise. refs

The development of the high-pressure nervous syndrome (HPNS) is monitored in baboons breathing either He-O₂ or He-O₂ + 8 percent N₂ during linear compression at 200 m/h to 800 m sea water or exponential 2-h compression to 600 m sea water. The results are presented in tables and graphs. Addition of N₂ to the mixture at the beginning of linear compression has no effect on HPNS and leads to more severe EEG changes, but HPNS symptoms are less severe in an exponential dive with the N₂ mixture and become less severe when N₂ is added at the end of compression. Progressive addition of N₂ during exponential compression reduces the behavioral symptoms but does not affect the EEG. The implications for the mechanism of HPNS onset are discussed. T.K.

A84-44082

HPNS OF BABOONS DURING HELIUM-NITROGEN-OXYGEN SLOW EXPONENTIAL COMPRESSIONS

J. C. ROSTAIN, B. GARDETTE, M. C. GARDETTE-CHAUFFOUR (CNRS, Groupement d'Interet Scientifique de Physiologie Hyperbare; Compagnie Maritime d'Expertise, Centre Experimental Hyperbare, Marseille, France), and C. FORNI (Institut de Neurophysiologie et Psychophysiologie, Marseille, France) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 341-350. Research supported by the Centre National pour l'Exploitation des Oceans, Direction des Recherches, Etudes et Techniques and Compagnie Maritime d'Expertise. refs

A84-44084

ARTERIAL BLOOD ACID-BASE REGULATION DURING EXERCISE IN RATS

R. F. FREGOSI and J. A. DEMPSEY (Wisconsin, University, Madison, WI) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 396-402. Army-supported research. refs (Contract NIH-HL-15469)

O₂ consumption, CO₂ production, arterial blood gases and lactate concentration, and rectal temperature are measured during 10-min moderate and maximal treadmill exercise in male Wistar rats. The results are presented in graphs and tables and discussed. Mild exercise is accompanied by increases in arterial PO₂ (4.1 + or - 1.5 torr), arterial pH (0.034 + or 0.006), and rectal temperature (0.6 + or - 0.1 C) and a decrease in arterial PCO₂ (5.5 + or - 0.6 torr). The transition to heavy exercise is marked by progressive hyperventilation (to PCO₂ 28.5 + or - 1.4 torr), which precedes the onset of metabolic acidosis (with a 3.4-fold increase in O₂ consumption, a 4.5-fold increase in CO₂ production, a 9-fold increase in lactate concentration, and arterial pH 7.31 + or - 0.02) and is not affected by preventing the associated temperature increase. T.K.

A84-44088

MORPHOLOGICAL AND PHYSIOLOGICAL RESPONSES OF THE LUNGS OF DOGS TO ACUTE DECOMPRESSION

P. W. CATRON, E. T. FLYNN, JR., L. YAFFE, M. E. BRADLEY, L. B. THOMAS, D. HINMAN, S. SURVANSKI, J. T. JOHNSON, and J. HARRINGTON (U.S. Navy, Medical Research Institute, Bethesda, MD) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 467-474. refs (Contract NR TASK-M0099.PN001.1170)

The effects of rapid decompression (60 ft/min) from simulated air dives to 300 ft sea water on the function and structure of the lung are investigated in dogs anesthetized with pentobarbital sodium. The results are presented in graphs, tables, and micrographs and discussed in detail. Decompression is found to produce pulmonary hypertension, systemic hypotension, hemoconcentration, arterial hypoxemia, decreased dynamic compliance, and pulmonary edema. No regular changes in pulmonary resistance, left-ventricular end-diastolic pressure, or the appearance of the airway mucosa on bronchoscopic or histologic inspection are detected. Noncardiac pulmonary edema, possibly resulting from increased microvascular permeability of the lungs due to venous bubble emboli or from an injury to the central nervous system, is identified as the primary response of the lung to this level of rapid decompression. T.K.

A84-44484

ULTRASTRUCTURAL ORGANIZATION OF CELLS OF CHLORELLA VULGARIS BEIJER, STRAIN LARG-1, GROWN IN AUTOTROPHIC CONDITIONS ON SALYUT-6 [UL'TRASTRUKTURNA ORGANIZATSIIA KLITIN CHLORELLA VULGARIS BEIJER, SHTAM LARG-1, SHCHO VIROSLI V AVTOTROFNIKH UMOVAKH NA BORTU NAUKOVOI ORBITAL'NOI STANTSII 'SALIUT-6']

E. L. KORDIUM, A. F. POPOVA, and O. L. MASHINSKII (Akademiiia Nauk Ukrain's'koi RSR, Institut Botaniki, Kiev, Ukrainian SSR) *Ukrains'kii Botanichnii Zhurnal* (ISSN 0372-4123), vol. 41, 1984, p. 30-34. In Ukrainian. refs

Electron-microscope data are presented on *Chlorella vulgaris* Beijer (strain LARG-1) cells grown on Salyut-6 in the IFS-2 apparatus with illumination during 4.5 days. The similarity of ultrastructural organizations of the test and control variants is noted. A tendency to a decrease in the reserve carbohydrate synthesis in the *Ch. vulgaris* cells of the test variant is manifested at the structural level in the absence of starch grains in the chloroplasts or in a decrease of the volume of starch grains. A morphometric analysis confirms these data. B.J.

A84-44498

THE MYSTERY OF MOTION OR WHAT REGULATES THE WORK OF THE MUSCLES AND HOW IS THIS REGULATION EFFECTED [TAINSTVO DVIZHENIIA ILI CHTO I KAK REGULIRUET RABOTU MYSHTS]

A. A. BOLDYREV (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Nauka v SSSR*, no. 1, 1984, p. 39-45. In Russian.

The current understanding of neuromuscular processes of excitation and contraction on the level of biochemistry is examined. Particular attention is given to the role of dipeptides in muscle regulation and to the functioning of ion pumps and their ensembles in membranes. Also examined is recent work done on muscle contraction and dysfunction in Scotland. B.J.

A84-45106

HYDROLYTIC STABILITY OF BIOMOLECULES AT HIGH TEMPERATURES AND ITS IMPLICATION FOR LIFE AT 250 C

R. H. WHITE (Virginia Polytechnic Institute and State University, Blacksburg, VA) *Nature* (ISSN 0028-0836), vol. 310, Aug. 2, 1984, p. 430-432. Research supported by the Jeffress Foundation. refs (Contract NSF PCM-82-17072)

An attempt is made to establish rates for the hydrolysis and/or decomposition of critical biomolecules in order to determine their ability to exist at 250 C. The results clearly indicate that organisms composed of proteins and nucleic acids could not survive at this temperature, due to the very rapid rate of decomposition of such molecules. The 'black smoker' bacteria reported to have been isolated from deep-sea hydrothermal vents, may be nonliving material related to coacerates and microspheres which form when hot solutions of proteins and nucleic acids are cooled. C.D.

A84-45399* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

THE GROWTH OF PARACOCCLUS HALODENITRIFICANS IN A DEFINED MEDIUM

L. I. HOCHSTEIN (NASA, Ames Research Center, Extraterrestrial Research Div., Moffett Field, CA) and G. A. TOMLINSON (Santa Clara, University, Santa Clara, CA) *Canadian Journal of Microbiology* (ISSN 0008-4166), vol. 30, 1984, p. 837-840. Previously announced in STAR as N84-10724 refs (Contract NCA2-OR-685-902)

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 betanine when growing anaerobically.

(Author)

A84-45549* Michigan State Univ., East Lansing.

BETA-INTERFERON INHIBITS CELL INFECTION BY TRYPANOSOMA CRUZI

F. KIERSZENBAUM (Michigan State University, East Lansing, MI) and G. SONNENFELD (Louisville, University, Louisville, KY) *Journal of Immunology* (ISSN 0022-1767), vol. 132, Feb. 1984, p. 905-908. refs

(Contract NIH-AI-14848; NIH-AI-17041; NCC2-213)

Beta interferon has been shown to inhibit the capacity of bloodstream forms of the flagellate *Trypanosoma cruzi*, the causative agent of Chagas' disease, to associate with and infect mouse peritoneal macrophages and rat heart myoblasts. The inhibitory effect was abrogated in the presence of specific antibodies to the interferon. Pretreatment of the parasites with interferon reduced their infectivity for untreated host cells, whereas pretreatment of either type of host cell did not affect the interaction. The effect of interferon on the trypanosomes was reversible; the extent of the inhibitory effect was significantly reduced after 20 min, and was undetectable after 60 min when macrophages were used as host cells. For the myoblasts, 60 min elapsed before the inhibitory effect began to subside and 120 min elapsed before it became insignificant or undetectable. C.D.

A84-45550* Massachusetts Univ., Worcester.

INTERFERON INDUCES NATURAL KILLER CELL BLASTOGENESIS IN VIVO

C. A. BIRON, G. SONNENFELD (Massachusetts, University, Worcester, MA), and R. M. WELSH (Louisville, University, Louisville, KY) *Journal of Leukocyte Biology* (ISSN 0741-5400), vol. 35, 1984, p. 31-37. Research supported by the American Cancer Society. refs

(Contract PHS-AI-17672; PHS-AI-00432; NCC2-213)

Interferon (IFN), types beta and gamma, and IFN inducers polyinosinic-polycytidylic acid and lymphocytic choriomeningitis virus, all stimulated the generation of blast-natural killer (NK) cells in mouse spleens. Blast-NK cells were characterized on the basis of size, 3H-thymidine uptake, and NK cell markers. These data indicate that in addition to augmenting NK cell-mediated lysis, IFN may regulate NK cell proliferation in vivo. Author

A84-45573* Texas Univ., Austin.

LACK OF CORRELATION BETWEEN MYCOPLASMA INDUCED IFN-GAMMA PRODUCTION IN VITRO AND NATURAL KILLER CELL ACTIVITY AGAINST FLD-3 CELLS

V. KUMAR, J. LUST, A. GIFALDI, M. BENNETT (Texas, University, Dallas, TX), and G. SONNENFELD (Louisville, University, Louisville, KY) *Immunobiology*, vol. 165, 1983, p. 445-458. refs

(Contract NIH-CA-33058; NIH-CA-31792; NIH-AI-18811; NCC2-213)

The role of interferon (IFN) in the normal-killer-cell (NK) mediated lysis of tumor cells in vitro is investigated experimentally. Normal mouse spleen cells and spleen cells treated with anti-Thy-1.2 serum are cultured for 24 h with Friend erythroleukemia (FLD-3) cells in RPMI 1640 medium; supernatant fluid from cultures with FLD-3 lysis are assayed for IFN-gamma, and it is found that pretreatment with anti-Thy-1.2 suppresses IFN-gamma generation without affecting the ability of NK to mediate the lysis of FLD-3. Further tests indicate that the generation of IFN-gamma is stimulated by the presence of *Mycoplasma arginini* in the FLD-3 cells. T.K.

A84-45913

STRUCTURAL-FUNCTIONAL ALTERATIONS IN THE SYNAPTIC MEMBRANES OF THE BRAIN AS A RESULT OF AGING [STUKTURNO-FUNKSIONAL'NYE ISMENENIIA SINAPTIKESKIKH MEMBRAN MOZGA PRI STARENII]

A. A. MILIUTIN, E. I. BELIAEVA, K. IA. BULANOVA, A. P. KIRILIUK, T. I. LYSKOVA, I. M. OKUN, S. L. AKSENTSEV, S. V. KONEV, and V. K. KOLTOVER (Akademiia Nauk Belorusskoi SSR, Sektor Gerontologii and Institut Fotobiologii, Minsk, Belorussian SSR; Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Chernogolovka, USSR) *Biofizika* (ISSN 0006-3029), vol. 29, July-Aug. 1984, p. 640-642. In Russian. refs

A84-45995

PHYSIOLOGY OF THERMOREGULATION [FIZIOLOGIIA TERMOREGULIATSII]

K. P. IVANOV, ED. Leningrad, Izdatel'stvo Nauka, 1984, 470 p. In Russian. No individual items are abstracted in this volume.

The principal problems of thermoregulation and heat transfer in the human organism and other mammals are investigated. Consideration is given to the relation between thermoregulation and bioenergetics and the heat sensitive structures of the body including thermoreceptors in the skin and internal organs and thermosensitive neurons in the central nervous system, and to the problem of the maintenance of heat balance in the human body. Some results from several recent clinical investigations of the roles of thermoregulation and brain activity, of the long-term adaptation to heat and cold, and of the evolution of thermoregulatory systems are also discussed. I.H.

A84-46223

PASSIVE TRANSPORT OF SODIUM INTO EPITHELIAL CELLS - METHODS OF STUDY, PROPERTIES, REGULATION, AND ROLE [PASSIVNYI TRANSPORT NATRIIA V EPITELIAL'NYE KLETKI - METODY, IZUCHENIIA, SVOISTVA, REGULIATSII I ROL']

S. T. METELSKII (Nauchno-Issledovatel'skii Institut po Biologicheskim Ispytaniiam Khimicheskikh Soedinenii, Kupavna, USSR) *Uspekhi Fiziologicheskikh Nauk* (ISSN 0301-1798), vol. 15, July-Sept. 1984, p. 23-41. In Russian. refs

A84-46224

CURRENT IDEAS ON ION MECHANISMS FOR CARDIAC ARRHYTHMIAS AND POSSIBLE MECHANISMS FOR THE ACTION OF ANTIARRHYTHMIC DRUGS [SOVREMENNYE PREDSTAVLENIIA OB IONNYKH MEKHAZIMAKH ARITMII SERD TSA I VOZMOZHNYKH MEKHAZIMAKH DEISTV IIA SERDECHNYKH ANTIARITMIKOV]

V. I. POROTIKOV, A. V. LAZAREV, and G. A. GLEZER (Nauchno-Issledovatel'skii Institut po Biologicheskim Ispytaniiam Khimicheskikh Soedinenii, Staraya Kupavna, USSR) *Uspekhi Fiziologicheskikh Nauk* (ISSN 0301-1798), vol. 15, July-Sept. 1984, p. 42-63. In Russian. refs

A84-46225

NONSPECIFIC RESPONSIVITY OF THE BODY AND INDIVIDUAL RADIO SENSITIVITY [NESPETSIFICHESKAIA REAKTIVNOST' ORGANIZMA I INDIVIDUAL'NAIA RADIOCHUVSTVITEL'NOST']

A. IU. GRIGOREV (Ministerstvo Zdravookhraneniia SSSR, Institut Biofiziki, USSR) *Uspekhi Fiziologicheskikh Nauk* (ISSN 0301-1798), vol. 15, July-Sept. 1984, p. 64-82. In Russian. refs

A relationship between total responsivity and radio sensitivity is established. Particular attention is given to the role of the initial state of the central nervous system in the evaluation of the development of radiation sickness under the effect of large radiation doses. It has been shown that individual radio sensitivity can be determined most effectively by a preliminary assessment of the individual adaptive capacities of the body, and of its total responsivity under functional loads. B.J.

51 LIFE SCIENCES (GENERAL)

A84-46260

LOW GRAVITY LOWERS IMMUNITY TO DISEASE

A. TSCHOPP and A. COGOLI (Zuerich, Eidgenoessische Technische Hochschule, Zurich, Switzerland) *New Scientist* (ISSN 0028-6664), vol. 103, Aug. 23, 1984, p. 36.

As biological samples were carried into space during the first space flights, methods of culturing cells were developed and it became possible to perform investigations in conditions of weightlessness. On Spacelab 1, a 3.5 kg incubator, and glass-fiber reinforced Teflon flasks were used to study the activity of lymphocytes. On return to earth, results showed that the lymphocytes, which had been at a temperature of 37 C during the flight, did survive the space flight, and consumed nearly the same amount of glucose as the ground controls. Even though these results cannot be directly related to the fact that the immune system of astronauts is weaker after flight, studies performed in centrifuges on earth show that activation of lymphocytes at 10 times the earth's gravitational field is much higher than at 1-G. This lends some support to the hypothesis that high-G increases, and low-G decreases the proliferation of cells. More experiments are to be performed on future space flights. J.P.

N84-31903# Joint Publications Research Service, Arlington, Va. USSR REPORT: LIFE SCIENCES. EFFECTS OF NONIONIZING ELECTROMAGNETIC RADIATION

6 Jan. 1984 117 p refs Transl. into ENGLISH from various Russian articles

(JPRS-UNE-84-001) Avail: NTIS HC A06

Publications, developments, and progress in international life science studies are presented. Topics discussed include: laser applications in medicine and its effects; age related responses to dehydration and hyperhydration, effects of cold exposure on erythrocytes; climate effects; heart rate changes in response to sensorimotor loads; correlation between individual and alpha rhythm parameters; stability of physiological and psychological function under extreme environmental conditions; and psychophysiological effects of monotonous activity.

N84-31912# SRI International Corp., Menlo Park, Calif. USAFSAM (USAF SCHOOL OF AEROSPACE MEDICINE) REVIEW AND ANALYSIS OF RADIOFREQUENCY RADIATION BIOEFFECTS LITERATURE Interim Report, 17 Jun. 1983 - 16 Mar. 1984

L. N. HEYNICK and P. POLSON May 1984 287 p (Contract F33615-82-C-0610)

(AD-A142961; USAFSAM-TR-84-17; REPT-4) Avail: NTIS HC A13/MF A01 CSCL 06R

The objectives of this project are to acquire, review, and analyze on an ongoing basis, information on research pertaining to the biological effects of radiofrequency radiation (RFR) for the preparation of a computer data base of analyses at the USAF School of Aerospace Medicine (USAFSAM). The method in use is to: (1) select documents judged to be representative of prior and current research on various RFR-bioeffects topics, (2) analyze in detail the contents of each such document, and (3) assess the validity and significance of the results presented. In this fourth report, the major RFR-bioeffects topics are listed and the format used for analyzing each selected document is described. During the period covered by this report, 42 additional analyses were completed, for a total of 160 analyses. The texts of the additional analyses are presented in Appendix A. In addition to the text, each analysis includes information for computer retrieval by authors, key words, year of publication, and RFR parameters. Appendixes B and C are two cumulative indexes to reference citations for all of the analyses completed thus far. In Appendix B, each citation is listed under each pertinent major topic. Appendix C comprises a cumulative list of citations in alphabetical order by first author and without regard to topic. Author (GRA)

N84-31913# New York Univ. Medical Center. Inst. of Environmental Medicine.

EFFECTS OF MICROWAVES ON CELL MEMBRANE PERMEABILITY Final Report, Jul. 1981 - Jun. 1984

R. P. LIBURDY 2 Jul. 1984 69 p

(Contract N00014-81-K-0669)

(AD-A142979; FR-3) Avail: NTIS HC A04/MF A01 CSCL 06R

The objective of this research project was to identify and characterize cell membrane responses to microwave radiation and, importantly, to determine specific conditions or modulators required for these responses. This study has revealed that membrane permeability changes in the erythrocyte and in liposome vesicles, as well as protein shedding in the erythrocyte, are induced by microwaves at the membrane phase transition, and that these responses are strongly dependent on plasma, oxygen tension, and antioxidant free radical scavengers. These findings provide new insight into both the physical and chemical nature of microwave radiation interaction with the cell membrane. GRA

N84-31914# Missouri Univ., Rolla. Dept. of Life Sciences. EFFECTS OF RADIOFREQUENCY RADIATION ON DIFFERENTIATION OF ERYTHROLEUKEMIC CELLS Final Report, 2 Sep. 1982 - 1 Feb. 1984

R. F. BROWN and S. V. MARSHALL May 1984 39 p

(Contract F33615-82-K-0634)

(AD-A143038; USAFSAM-TR-84-12) Avail: NTIS HC A03/MF A01 CSCL 06R

A dose-response study was conducted to determine if chemically induced erythroid differentiation of murine erythroleukemic (MEL) cells is affected by continuous-wave radiofrequency (RF) radiation. RF exposures were at 1180 MHz in a specially constructed anechoic chamber equipped with a constant-temperature-air circulator designed to maintain the cell at 37.4 C. Experiments were performed at incident power densities of 5.5, 11, and 22 mW/sq cm, corresponding to SAR levels of 18.5, 37, and 74 W/kg, respectively. Four replicate experiments were conducted at each power level with two irradiated and two control cultures included in each replicate. Cultures were initiated by suspension of MEL cells in growth medium containing the inducer hexamethylene bisacetamide, 3 mM, in 10-cm cellulose nitrate tubes. One day after addition of the inducer, the cultures were placed in the exposure chamber and irradiated for 48 hr. Cells were then counted, resuspended in normal growth medium (no inducer), and incubation continued for 2 additional days. Number of cells undergoing erythroid differentiation was determined by staining with benzidine, a hemoglobin-specific reagent. Amount of hemoglobin present in lysates prepared from the differential cells was determined by a colorimetric procedure. GRA

N84-31915# Rose-Hulman Inst. of Tech., Terre Haute, Ind. CONFERENCE GRANT FOR 2ND WORLD CONGRESS ON BIOMATERIALS Final Report

J. M. ANDERSON, ed. Jun. 1984 11 p Conf. held in Washington, D.C., 27 Apr. - 1 May 1984

(Contract N00014-84-G-0041; DAMD17-84-G-4005)

(AD-A143129) Avail: NTIS HC A02/MF A01 CSCL 06B

This document reports on the Second World Congress on Biomaterials held in Washington, D.C., on April 27 - May 1, 1984. GRA

N84-31916# Joint Publications Research Service, Arlington, Va. USSR REPORT: LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES

6 Jun. 1984 94 p refs Transl. into ENGLISH from various Russian articles

(JPRS-UBB-84-012) Avail: NTIS HC A05/MF A01

Progress in the sciences, biomedical and behavioral sciences is reported. Topics discussed include: aerospace medicine, human factors engineering, laser effects, and clinical medicine.

N84-31924# Joint Publications Research Service, Arlington, Va.
USSR REPORT: LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES Abstracts Only
 7 Aug. 1984 113 p refs Transl. into ENGLISH from various Russian articles
 (JPRS-UBB-84-017) Avail: NTIS HC A06/MF A01

The current status of soviet research in medicine, agrotechnology, microbiology, human factors engineering, environmental studies, radiation effects, radiation biology, physiology, public health, and veterinary medicine are presented. Topics include surgical techniques, plant protection, bacterial identification, operator performance, environmental protection, effects of nonionizing electromagnetic radiation, medical equipment and facilities design, modelling systems, and disease prevention in animals.

N84-32989 California Univ., Davis.
MECHANISMS OF THERMOREGULATION OF RATS EXPOSED TO HYPERGRAVIC FIELDS Ph.D. Thesis
 C. B. MONSON 1983 105 p
 Avail: Univ. Microfilms Order No. DA8407918

The thermoregulatory response to hypergravity achieved by centrifugation was presented. The role of heat loss, shivering and nonshivering thermogenic mechanisms in the thermoregulatory response to centrifugation, Tc, Tt and rates of oxygen consumption, VO₂, were measured in rats exposed to hypergravic fields of 1.5 to 6G. The changes of Tc and Tt in serotonin depleted rats exposed to 3G fields suggested that serotonergic neurons modulate, rather than directly mediate the response of shivering and nonshivering thermogenic effectors during centrifugation. It is indicated that the controllers and effectors for shivering, nonshivering thermogenesis (NST) and heat loss are arranged in parallel and can be uncoupled during hypergravic exposure. Finally, it appears that shivering NST, and heat loss mechanisms function to regulate Tc during centrifugation but at a level lower than at 1G. The regulation of Tc at a lowered level appears to result from a decrease in the set point, the magnitude of this set point change is dependent on the acceleration field and the ambient temperature. It is indicated that in response to centrifugation, the activity of each of the distinct parallel neurocontrollers for shivering NST, and heat loss is modified and that serotonergic neurons modulate the activity of these neurocontrollers. Dissert. Abstr.

N84-32990*# National Aeronautics and Space Administration, Washington, D. C.
PUBLICATIONS OF THE NASA SPACE BIOLOGY PROGRAM FOR 1980 - 1984
 L. G. PLEASANT, comp. and J. L. SOLBERG, comp. Sep. 1984 99 p Prepared by George Washington Univ., Washington, D.C. (Contract NASW-3165)
 (NASA-TM-86857; NAS 1.15:86857) Avail: NTIS HC A05/MF A01 CSCL 06B

A listing of 562 publications supported by the NASA Space Biology Program for the years 1980 to 1984 is presented. References are arranged under the headings which are plant gravitational research, animal gravitational research, and general. Keyword title indexes and a principal investigator listing are also included. Author

N84-32991# Army Research Inst. of Environmental Medicine, Natick, Mass.
CORRELATION BETWEEN PLASMA FIBRONECTIN LEVEL AND MORTALITY FOLLOWING EXPERIMENTAL RATE HEAT STRESS
 D. A. DUBOSE, J. MCCREARY, and L. SOWDERS 7 Jul. 1984 20 p
 (AD-A143383; USARIEM-M-29/84) Avail: NTIS HC A02/MF A01 CSCL 06S

Reticuloendothelial system (RES) clearance function correlates with the mortality rate associated with stresses which can induce shock. Likewise, mortality rate after experimental rat heat stress (ERHS) is altered by modulation of RES function. Since plasma fibronectin (PF) mediates in vivo phagocytosis by the RES, the

relationship between mean plasma fibronectin level (MPFL) and mortality after ERHS was examined. A comparison of MPFLs prior to ERHS revealed that rats which ultimately comprised the survival group had a MPFL (269.0 + 11.2 microgram/ml) which exceeded the value determined for the non-survivors (252.9 + or - 11.9 microgram/ml). Both groups had elevated MPFLs, up to 12 h following ERHS. However, after this time, MPFL began to decline. The decline was more severe for the non-survivors, with MPFLs at 15, 18, and 24 h, significantly ($p < 0.01$) lower than the values for the survival group. GRA

N84-32992# Ottawa Univ. (Ontario). Dept. of Electrical Engineering.
STUDIES OF THE ELECTRIC FIELD DISTRIBUTION IN BIOLOGICAL BODIES: EXPERIMENTAL DOSIMETRY AT RADIO FREQUENCIES Annual Scientific Report, 1 Jun. 1983 - 31 May 1984
 S. S. STUCHLY and M. A. STUCHLY May 1984 110 p
 (Contract N00014-82-G-0011)
 (AD-A143507) Avail: NTIS HC A06/MF A01 CSCL 06R

This report summarizes research progress in the period from June 1, 1983 to May 31, 1984 in studies of the specific absorption rate (SAR) in a model of the human body exposed to radiofrequency radiation in the far and near field of antennas. The objective of the project was to develop and evaluate a computer-controlled system for measurements of the spatial distribution of the SAR in simulated and real biological bodies and to perform measurements on a model of the human body in the near field of typical antennas. In summary, our investigations of the SAR distribution in a full-scale mode of man showed that relevant dosimetric data in the far and the near field can be conveniently and accurately obtained by the measurements using implantable electric field probes and computer-controlled data acquisition system. Such information cannot be reliably obtained using presently available numerical methods. GRA

N84-32993# Los Alamos Scientific Lab., N. Mex.
RAPID MICROBIAL IDENTIFICATION BY CIRCULAR INTENSITY DIFFERENTIAL SCATTERING
 C. T. GREGG and G. C. SALZMAN Jun. 1984 28 p refs
 Presented at the 4th Intern. Symp. on Rapid Methods and Automation in Microbiol., Berlin, West Germany, 7-10 Jun. 1984
 (Contract W-7405-ENG-36)
 (DE84-013894; LA-UR-84-1796; CONF-8406148-1) Avail: NTIS HC A02/MF A01

Circular Intensity Differential Scattering (CIDS) is a technique of microbial identification. The CIDS spectra can be measured as a function of wavelength, scattering angle, and/or matrix element, and a number of matrix elements can be measured virtually simultaneously. This panoply of measurements potentially gives the method resolving power for microbial identification. Some representative data taken over the past couple of years on CIDS spectra of several antiviral vaccines is presented. DOE

N84-32994# Harvard Univ., Cambridge, Mass.
UNRAVELING PHOTOSYSTEMS Progress Report
 1984 3 p
 (Contract DE-AC02-82ER-12085)
 (DE84-013812; DOE/ER-12085/1) Avail: NTIS HC A02/MF A01

Each of the three cyanobacteria examined contains two or more genes for the B protein of photosystem II of photosynthesis. One of these genes from the cyanobacterium *fremyella diplosiphon* was sequenced. Synthetic oligopeptides were used to raise antibodies to two ten amino acid-long sequences of the 32 kilodalton B protein. To examine whether it is possible for chloroplast promoter sequences (and hence possibly chloroplast genes) to function in cyanobacteria. A series of plasmids containing the chloramphenicol acetyl transferase (CAT) gene minus its bacterial promoter was used. It appears that chloroplast promoters are recognized in cyanobacteria and act efficiently. DOE

51 LIFE SCIENCES (GENERAL)

N84-32995# California Univ., Berkeley. Lawrence Berkeley Lab.

ROLES OF IONIZING RADIATION IN CELL TRANSFORMATION

C. A. TOBIAS, N. W. ALBRIGHT, and T. C. YANG Jul. 1983
33 p refs Presented at Neyman-Kiefer Conf., Berkeley, Calif.,
1 Jul. 1983

(Contract DE-AC03-76SF-00098)

(DE84-013397; LBL-17448; CONF-8307122-2) Avail: NTIS HC
A03/MF A01

The hypothesis that both lethal radiation action and cell transformation are results of similar processes the production of lesions in DNA followed by time dependent repair is presented. Lethal effects of radiation damage and radiation-induced cell transformation both appear to be the results of misrepair. A quantitative biological model intended to describe the lethal effects on mammalian cells of heavily ionizing tracks is introduced.

R.S.F.

N84-32996# Joint Publications Research Service, Arlington, Va.
USSR REPORT: LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES

8 Aug. 1984 117 p refs Transl. into ENGLISH from various Russian articles

(JPRS-UBB-84-018) Avail: NTIS HC A06/MF A01

Research and progress in the USSR in the disciplines of life sciences, biomedical and behavioral science is reported. Topics discussed include: aerospace medicine, biotechnology, food technology, medicine, microbiology, and radiation biology.

N84-32998# Joint Publications Research Service, Arlington, Va.
EFFECT OF CYCLIC CHANGES IN CULTIVATION CONDITIONS OF GROWTH KINETICS AND PHYSIOLOGICAL PROPERTIES OF YEASTS Abstract Only

D. P. SOKOLOV, S. A. LIROVA, and Y. A. SOKOLOVA *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-018) p 9 8 Aug. 1984 Transl. into ENGLISH from Mikrobiologiya (Moscow), v. 52, no. 6, Nov.-Dec. 1983 p 909-916*

Avail: NTIS HC A06/MF A01

The effects of nonstationary conditions created by rapid changes in pH and pO₂ during periodic cultivation of yeasts on their growth rate, economical coefficient and morphophysiological characteristics were evaluated. The nonstationary conditions represented pH changes ranging from 2.6 to 7.5, 4.5 to 7.5 and 4.5 to 2.5 and the reverse of each pair, within a short time interval; pO₂ was altered from the normally required level to a practically anaerobic condition. It is shown that cyclic changes in pH and pO₂ during the experimental growth period increase specific growth rate from 0.33 to 0.5-0.6 hrs⁻¹ without lowering the economic coefficient. The formation of intermediate products during the oxidation of yeasts and their use during aerobic stage of the cyclic regimens was discussed. A mathematical model is described for yeast growth in nonsteady conditions which accounts for the formation of and utilization of possible intermediate biosynthetic products. E.A.K.

N84-32999# Joint Publications Research Service, Arlington, Va.
MICROBIOLOGY AND FOOD PROGRAM

In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-018) p 13-17 8 Aug. 1984 Transl. into ENGLISH of Ekonomicheskaya Gazeta (Moscow), no. 51, Dec. 1983 p 1-2
Avail: NTIS HC A06/MF A01

The importance of the microbiological industry in food supply is outlined. Acceleration of the development of production by microbiological synthesis is discussed. The significance of the output of necessary items in animal husbandry of commercial fodder microbiological protein and lysine and of other production is emphasized. The progress in implementing the scientific and technical programs for the development of progressive technologies and equipment for microbiological industry is discussed. E.A.K.

N84-33001# Joint Publications Research Service, Arlington, Va.
RESISTANCE OF MICROORGANISMS FROM MESOSPHERE TO PERIODIC FREEZING-THAWING Abstract Only

A. A. IMSHENETSKIY, S. V. LYSENKO, T. M. KOZLOVA, and A. T. NOVICHKOVA *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-018) p 49-50 8 Aug. 1984 Transl. into ENGLISH from Mikrobiologiya (Moscow), v. 52, no. 6, Nov.-Dec. 1983 p 902-908*

Avail: NTIS HC A06/MF A01

Earth atmosphere represents a gaseous membrane which is subdivided by its composition, temperature and electric characteristics into four subdivisions: troposphere, stratosphere, mesosphere and thermosphere. Microflora exists in earth atmosphere, both in the positive and negative temperature zones. These microorganisms originate in the earth crust and the effect of freezing and thawing on these microorganisms were studied. It is shown that after 10 freeze/thaw cycles the outer backbone layer of these special envelopes broke down and the plasmalemma membrane became stratified. It is found that with sun radiation, the exposure to periodic freeze/thaw cycles lowers the number of microorganisms in earth atmosphere. E.A.K.

N84-33002# Joint Publications Research Service, Arlington, Va.
EFFECTS OF INSULIN AND HYDROCORTISONE ON ENERGY METABOLISM IN RATS IRRADIATED WITH FAST, 60 MEV NEUTRONS Abstract Only

D. A. SUTKOVOY, V. A. BARABOY, and P. M. KHALYAVKO *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-018) p 100-101 8 Aug. 1984 Transl. into ENGLISH from Radiobiologiya (Moscow), v. 23, no. 6, Nov.-Dec. 1983 p 805-807*

Avail: NTIS HC A06/MF A01

Parameters of energy metabolism were studied in rats irradiated with fast neutrons to define the endocrine mechanism responsible for changes in high energy compound metabolism. Irradiation of the animals with 60 MeV neutrons with a single 1 Gy dose or two 0.5 Gy doses at 7 day intervals resulted in similar biochemical changes in hepatic and muscle tissues, consisting a reduction in the concentration of ATP, total nucleotides, and elevation of the ATP/ADP ratio. The administration of exogenous hydrocortisone potentiated the effects of irradiation, while administration of insulin or of insulin-hydrocortisone combinations to the irradiated animals reversed or attenuated the effects of irradiation. It is indicated that sublethal irradiation induces an increase in glucocorticoid secretion via induction of lipid peroxidation. It is suggested that the elevated glucocorticoids are responsible for depression of ATP synthesis, while the injection of the physiological antagonist of glucocorticoids - insulin is successfully used to counteract the effects of glucocorticoids. E.A.K.

52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and weightlessness.

A84-43352#

A STUDY OF PHYSIOLOGICAL EQUIVALENT EFFECT TEMPERATURE

C. PANG and W. JIANG Chinese Society of Astronautics, Journal, no. 2, 1984, p. 10-15. In Chinese, with abstract in English.

Experiments were conducted with various combinations of microclimatic factors in order to assess tolerance to high temperature, and a nomogram was obtained by mathematical processing of the experimental data. The shape of the physiological equivalent effect temperature curves was established by applying a mathematical equation. The results may be of use in designing environmental control systems for vehicles and for medical evaluations. C.D.

A84-43518

INFORMATIVE VALUE OF THE CATEGORY 4-4 OF THE MINNESOTA CODE AS AN EARLY SIGN OF ISCHEMIC HEART DISEASE [INFORMATIVNOST' MINNESOTSKOGO KODA KATEGORII 4-4 KAK RANNEGO PRIZNAKA ISHEMICHESKOI BOLEZNI SERD TSA]

O. M. BREGADZE, N. N. BURKADZE, and S. M. SHAGINOVA (Nauchno-Issledovatel'skii Institut Klinicheskoi i Eksperimental'noi Kardiologii, Georgian SSR) Akademiia Nauk Gruzinskoi SSR, Soobshcheniia (ISSN 0132-1447), vol. 113, Feb. 1984, p. 417-420. In Russian. refs

A diagnostic method for the early identification of coronary insufficiency is proposed which is based on the observation of the sickle-shaped form of the EKG ST-segment. An epidemiological study was performed which involved 150 EKGs with a sickle-shaped form of the ST-segment; the age of the subjects ranged from 35 to 59. Results of dynamic observations clearly showed that the sickle-shaped ST-segment developed into EKGs with depressive T-teeth (category 4-4 of the Minnesota code). It is suggested that the above-mentioned category 4-4 be considered an ischemic code. B.J.

A84-43728

A CHOLINOMIMETIC MODEL OF MOTION SICKNESS AND SPACE ADAPTATION SYNDROME

D. S. JANOWSKY, S. C. RISCH, M. ZIEGLER, B. KENNEDY, and L. HUEY (California, University; U.S. Veterans Administration, Medical Center, San Diego, CA) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 692-696. Sponsorship: U.S. Veterans Administration. refs (Contract USVA-MRIS-4576; NIH-MH-30914)

The space adaptation syndrome is one of the more vexing problems confronted by our nation's astronauts during their journeys. This syndrome may be a variant of motion sickness, although this possibility has been questioned. Physostigmine, a centrally active cholinesterase inhibitor which increases brain acetylcholine, was found to cause a motion sickness-like syndrome - in psychiatric patients and normals - including nausea, emesis, malaise, dysphoria, increases in serum ACTH, beta-endorphin, cortisol, and prolactin. Neostigmine, a non-centrally acting cholinesterase inhibitor, and saline placebo caused no such effects. The above effects closely parallel those of motion sickness. Thus, the effects of physostigmine may be a convenient model for screening for treatments for motion sickness or space adaptation syndrome, or for predicting who will develop these syndromes. Author

A84-43729

RELATIONSHIP BETWEEN THE VALUE OF THE WENCKEBACH POINT AND +GZ TOLERANCE

L. KOPKA, R. DABROWA, and S. BOJENKO (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 697-701. refs

The +Gz acceleration tolerance in a homogeneous group of 21 male clinically healthy pilots or candidates to airtask was evaluated. The +Gz acceleration tolerance was compared with the Wenckebach point, i.e., the lowest rate of atrial stimulation needed to produce constant Wenckebach or Mobitz II atrio-ventricular (AV) block. The Wenckebach point was used as an autonomic nervous system activity index. It was demonstrated that the degree of +Gz acceleration tolerance depends greatly upon autonomic nervous system activity; and is lower in people with enhanced parasympathetic tone. The possibility of pharmacological correction of +Gz acceleration tolerance was discussed. Author

A84-43730* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

CARDIOVASCULAR RESPONSES DURING ORTHOSTASIS - EFFECT OF AN INCREASE IN MAXIMAL O₂ UPTAKE

V. A. CONVERTINO, L. D. MONTGOMERY, and J. E. GREENLEAF (NASA, Ames Research Center, Moffett Field, CA; Arizona, University, Tucson, AZ) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 702-708. refs (Contract NCA2-OR-180-703)

A study is described which tests the hypothesis that changes in aerobic activity (increases in maximum oxygen uptake) will reduce the effectiveness of cardiovascular reflexes to regulate blood pressure during orthostasis. The hypothesis was tested by measuring heart rate, blood pressure and blood volume responses in eight healthy male subjects before and after an eight-day endurance regimen. The results of the study suggest that the physiologic responses to orthostasis are dependent upon the rate of plasma volume loss and pooling, and are associated with training-induced hypervolemia. It is indicated that endurance type exercise training enhances cardiovascular adjustments during tilt. The implications of these results for the use of exercise training as a countermeasure and/or therapeutic method for the prevention of cardiovascular instability during orthostatic stress are discussed. I.H.

A84-43732

EFFECTS OF ENDURANCE FITNESS ON RESPONSES TO COLD WATER IMMERSION

I. JACOBS, T. ROMET, J. FRIM, and A. HYNES (Defence and Civil Institute of Environmental Medicine, Toronto, Canada) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 715-720. refs

The purpose of this study was to determine if the changes in selected blood hormones and substrates, metabolic rate, and rectal temperature in nine males after immersion in 10 C water, while clad in standard flight suits, were related to the level of aerobic fitness. Fitness was evaluated by the blood lactate response to submaximal exercise. Immersion time (IT) was defined as the time required for a 1 C decrease in rectal temperature and averaged 38.5 (range: 21-62) min. Metabolic rate increased 3.4 times the resting rate. Lactate, free fatty acids, triiodothyronine and thyroxine increased by 81, 38, 11, and 8 percent, respectively, in contrast to insulin which decreased by 32 percent, with all changes being statistically significant. Glucagon increased slightly but not significantly (0.11) while glucose levels did not change. The IT was correlated directly with a measure of aerobic fitness, with relative body fat, and with the T3 levels postimmersion (p less than 0.05). The results suggest that the aerobic fitness level can significantly influence the cooling rate during water immersion. Author

A84-43734

NEGATIVE AIR ION EFFECTS ON HUMAN PERFORMANCE AND PHYSIOLOGICAL CONDITION

L. W. BUCKALEW and A. P. RIZZUTO (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, OH) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 731-734. refs (Contract F49620-79-C-0038) (AFAMRL-TR-82-99)

Beneficial effects of exposure to negative air ions have been suggested, to include improved performance, mood, attention, and physiological condition. Existing support is clouded by methodological problems of control and standardization in treatment and equipment. This study investigated effects of negative ions produced by a commercially marketed air purification device on grip magnitude, coding, motor dexterity, reaction time, tracking, pulse, blood pressure, and temperature. Two groups of 12 males were exposed to 6 continuous h of either negative or 'normal' ion environments under a double blind condition. Repeated measures (0, 3, 6 h) on each variable were obtained. MANOVA applied to change scores revealed no differences between groups, and 0 vs 3 and 0 vs 6-h group differences showed no significant

alteration in any measure. Negative ions generated by an air purification device were concluded to produce no general or specific alteration of cognitive or psychomotor performance or physiological condition. Author

A84-43736**CARDIOVASCULAR RESPONSES TO ISOMETRIC NECK MUSCLE CONTRACTIONS - RESULTS AFTER DYNAMIC EXERCISE WITH VARIOUS HEADGEAR LOADING CONFIGURATIONS**

C. A. PHILLIPS and J. S. PETROFSKY (Wright State University, Dayton, OH) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 740-745. refs (Contract DAMD17-80-C-0089)

Experiments have been conducted in order to quantify the cardiovascular responses of blood pressure and heart rate to isometric contractions of the neck muscles after exercises with various types of headgear. In the experiments, five healthy males with various neck sizes were used. The neck muscles were loaded by the head itself (the control group), a standard U.S. Army SPH-4 helmet and a combination of the SPH-4 helmet and Night Vision Goggles (NGV). During two exercise periods, the subjects would rotate the head from side to side of the control, helmet and NVG configurations. An isometric head dynamometer was used to measure sustained right lateral neck muscle contraction. It is found that systolic and diastolic blood pressure increase in response to the contractions, and that these increases are approximately 40 and 50 percent, respectively. Heart rate increased an average of 45 percent from a position of rest to the end of a fatiguing period. The responses are found to be independent of the duration of the exercise period, loading during exercise and specific muscle mass. I.H.

A84-43738**SPHERE AND CYLINDER DISTRIBUTION AMONG THE USAF RATED POPULATION REQUIRING SPECTACLES**

W. F. PROVINIS, W. M. WOESSNER, T. J. TREDICI, and A. J. RAHE (USAF, School of Aerospace Medicine, Brooks AFB, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 751-753.

The refractive error distribution of active duty U.S. Air Force pilots and navigators currently required to wear corrective lenses while flying is determined. Data are collected from an Air Force-wide random sampling survey. The sphere and cylinder forms of the refractive error distribution are given. The results of the survey are expected to be helpful in the development of corrective headgear design requirements, projecting prescription ranges for contact lenses, and in estimating experimental controls for future research. I.H.

A84-43797**PHYSIOLOGICAL VESTIBULAR NYSTAGMUS [FIZIOLOGICHESKII VESTIBILIARNYI NISTAGM]**

V. I. GRINCHUK (Il Moskovskii Gosudarstvennyi Meditsinskii Institut, Moscow, USSR) Vestnik Otorinolaringologii (ISSN 0042-4668), July-Aug. 1984, p. 18-23. In Russian. refs

Electronystagmographs are used to record the physiological, positional, and vestibular nystagmus of 103 healthy subjects. The recordings for the weak, physiological, vestibular nystagmus consisted of 18.33 to 23.9 beats per minute. Some possible mechanisms for creating physiological vestibular nystagmus are identified, including: the functional asymmetry of the vestibular analyzer on the level of its central and peripheral links; the distinctive features of collateral blood circulation in the neck; and a combination of these factors. Electronystagmographs of the representative types of nystagmus are provided. I.H.

A84-43798**THE GENESIS OF POSITIONAL PAROXYSMAL NYSTAGMUS [O GENEZE POZITSIONNOGO PAROKSIZMAL'NOGO NISTAGMA]**

G. M. GRIGOREV (Sverdlovskii Meditsinskii Institut, Sverdlovsk, USSR) Vestnik Otorinolaringologii (ISSN 0042-4668), July-Aug. 1984, p. 23-26. In Russian. refs

On the basis of an analysis of clinical (electronystagmographic) tests performed on 82 patients with positional paroxysmal nystagmus, some possible causes for cupulolithiasis were discovered, including diseases of the middle ear, brain injury, ear surgery, arteriosclerosis, or infection. In patients who showed signs of dystonia in the vertebral-basilar vessels, dizziness and paroxysmal positional nystagmus often developed during episodes of elevated arterial activity. It is believed that cupulolithiasis is not the only possible cause of positional paroxysmal nystagmus, which may develop in connection with vascular dystonia particularly in the labyrinthine artery. I.H.

A84-43799**VASCULAR PERMEABILITY IN PATIENTS WITH NASAL BLEEDING ON THE BACKGROUND OF ATHEROSCLEROSIS AND HYPERTENSION DISEASE, AND ITS RELATIONSHIP TO SOLAR AND GEOMAGNETIC DISTURBANCES [SOSUDISTAIA PRONITSAEMOST' U BOL'NYKH S NOSOVYM KROVOTECHENIEM NA FONE ATEROSKLEROZA I GIPERTONICHESKOI BOLEZNI I EE ZAVISIMOST' OT GELIOGEOMAGNITNYKH VOZMUSHCHENII]**

N. S. ZAGAINOVA (Sverdlovskii Meditsinskii Institut; Gorodskaya Klinicheskaya Bol'nitsa Skoro Meditsinskoi Pomoshchi, Sverdlovsk, USSR) Vestnik Otorinolaringologii (ISSN 0042-4668), July-Aug. 1984, p. 48-51. In Russian. refs

A84-43819**GLUCOSE TURNOVER AND HORMONAL CHANGES DURING INSULIN-INDUCED HYPOGLYCEMIA IN TRAINED HUMANS**

M. KJAER, K. J. MIKINES, N. J. CHRISTENSEN, B. TRONIER, J. VINTEN, B. SONNE, E. A. RICHTER, and H. GALBO (Copenhagen, University; NOVO Research Institute, Copenhagen; University Hospital, Herlev, Denmark) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, July 1984, p. 21-27. Sponsorship: Statens Laegevidenskabelige Forskningsrad. refs (Contract SLF-160-2,5; SLF-12-3817; SLF-12-1611)

In clinical medicine hypoglycemia is induced by administration of insulin to evaluate the function of the endocrine glands secreting counterregulatory hormones. The present investigation is concerned with the influence of training on glucose turnover and hormonal changes during insulin-induced hypoglycemia. It is found that insulin clearance as well as glucose kinetics during insulin-induced hypoglycemia are identical in trained and untrained subjects when the former are studied three days after the last exercise bout. However, the response of epinephrine, growth hormone (GH), and pancreatic polypeptide (PP) to hypoglycemia is exaggerated, and that of glucagon diminished in the trained subjects. These results imply that the patient's state of training should be taken into account before his hormonal response to a hypoglycemia test is interpreted as pathological or not. G.R.

A84-43820**BLOOD O₂ AFFINITY AND MAXIMAL O₂ CONSUMPTION IN ELITE BICYCLE RACERS**

A. VEICSTEINAS, M. SAMAJA, M. GUSSONI, and P. CERRETELLI (Milano, Universita, Milan, Italy; Geneve, Universite, Geneva, Switzerland) Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology (ISSN 0161-7567), vol. 57, July 1984, p. 52-58. Research supported by the Consiglio Nazionale delle Ricerche and Universita di Brescia. refs

A84-43822* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

IMMERSION DIURESIS WITHOUT EXPECTED SUPPRESSION OF VASOPRESSIN

L. C. KEIL, J. E. SILVER, N. WONG, W. A. SPAUL, J. E. GREENLEAF (NASA, Ames Research Center, Laboratory for Human Environmental Physiology, Moffett Field, CA), and S. E. KRAVIK *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, July 1984, p. 123-128. refs

There is a shift of blood from the lower parts of the body to the thoracic circulation during bed rest, water immersion, and presumably during weightlessness. On earth, this central fluid shift is associated with a profound diuresis. However, the mechanism involved is not yet well understood. The present investigation is concerned with measurements regarding the plasma vasopressin, fluid, electrolyte, and plasma renin activity (PRA) responses in subjects with normal preimmersion plasma vasopressin (PVP) concentration. In the conducted experiments, PRA was suppressed significantly at 30 min of immersion and had declined by 74 percent by the end of the experiment. On the basis of previously obtained results, it appears that sodium excretion during immersion may be independent of aldosterone action. Experimental results indicate that PVP is not suppressed by water immersion in normally hydrated subjects and that other factors may be responsible for the diuresis. G.R.

A84-43823

BLOOD LACTATE AND AMMONIUM ION ACCUMULATION DURING GRADED EXERCISE IN HUMANS

M. J. BUONO, T. R. CLANCY, and J. R. COOK (San Diego State University, San Diego, CA) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, July 1984, p. 135-139. Research supported by the San Diego State University. refs

A84-43824

CARDIAC HYPERTROPHY AND FUNCTION IN MASTER ENDURANCE RUNNERS AND SPRINTERS

J. S. CHILD, R. J. BARNARD, and R. L. TAW (California, University, Los Angeles, CA) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, July 1984, p. 176-181. refs

It is pointed out that cardiac enlargement with an increase in left ventricular mass is an adaptive response to prolonged intensive physical conditioning. The long-term effects of athletic cardiac hypertrophy on ventricular pump performance are uncertain. The present investigation involves a study of nine Master endurance runners and 13 Master sprinters by M-mode echocardiography and systolic time intervals at rest and by treadmill stress testing to evaluate cardiac anatomy and function in older (equal to or greater than 40 yr of age) men who have continued intense dynamic exercise training. It was found that maximal oxygen consumption and left ventricular mass index are greater in distance runners than in sprinters, and in each greater than in control subjects. Resting left ventricular function is normal as judged by fractional shortening and systolic time intervals, while aerobic capacity does not directly correlate with left ventricular mass index. G.R.

A84-43825

EFFECT OF HIGH LOCAL TEMPERATURE ON REFLEX CUTANEOUS VASODILATION

W. F. TAYLOR, J. M. JOHNSON, D. OLEARY, and M. K. PARK (Texas, University, San Antonio, TX) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, July 1984, p. 191-196. refs (Contract NIH-HL-20663)

Circulation to skin is modulated by local factors and by reflexes, and elevated local temperature increases skin blood flow (SKBF). The present investigation is concerned with the effect of high local forearm skin temperature on reflex cutaneous vasodilator responses to elevated whole-body skin and internal temperatures. A study was conducted with six healthy male subjects. On the

basis of the obtained results, it is concluded that local warming of the skin to 42 C renders the forearm cutaneous vasculature unresponsive to the reflex drive for vasodilation attendant to increasing whole-body skin and internal temperature. It is proposed that this phenomenon is achieved by a reduction or abolition of cutaneous vascular smooth muscle tone. G.R.

A84-43923

THE PHENOMENON OF 'INFINITE SOUND' AS AN INDICATOR OF THE PHYSICAL FITNESS OF MILITARY PERSONNEL [FENOMEN 'BESKONECHNOGO TONA' KAK POKAZATEL' FIZICHESKOI TRENIROVANNOSTI VOENNOSLUZHASHCHIKH]

E. A. PORUCHIKOV *Voenno-Meditsinskii Zhurnal* (ISSN 0026-9050), June 1984, p. 41-43. In Russian.

Tests were conducted to evaluate the effectiveness of the infinite-sound phenomenon (IFS), involving the reduction to zero of minimum auscultatory pressure, as an indicator of physical fitness. The studies (including bicycle, treadmill, and running-in-place tests) were performed on athletes, nonathletes, flight personnel (18 to 40 years of age), and military personnel (45 to 65 years of age). It is shown that the IFS arising during physical exercise is a reliable indicator of cardiac activity and reflects three important aspects of physical fitness: responsiveness, work capacity, and recovery of initial cardiohemodynamics. B.J.

A84-43924

ANOMALIES OF JOINT TROPISM AND SPINAL OSTEOCHONDROSIS IN FLIGHT PERSONNEL [ANOMALII SUSTAVNOGO TROPIZMA I OSTEOKHONDROZ POZVONOCHNIKA U LITS LETNOGO SOSTAVA]

R. V. POLETAEV *Voenno-Meditsinskii Zhurnal* (ISSN 0026-9050), June 1984, p. 44-46. In Russian.

A84-43925

RELATIONSHIP BETWEEN CERTAIN IMMUNOLOGICAL INDICATORS AND THE SUBJECTIVE STATE OF SEAMEN DURING VOYAGES [VZAIMOSVIAZ' NEKOTORYKH IMMUNOLOGICHESKIKH POKAZATELEI S SUB'EKTIVNYM SOSTOIANIEM MORIAKOV V PLOVANII]

I. A. SAPOV and A. A. POVAZHENKO *Voenno-Meditsinskii Zhurnal* (ISSN 0026-9050), June 1984, p. 46-48. In Russian. refs

A84-44083

CENTRAL HEMODYNAMICS DURING PROGRESSIVE UPPER- AND LOWER-BODY EXERCISE AND RECOVERY

D. S. MILES, M. N. SAWKA, D. E. HANPETER, J. E. FOSTER, JR., B. M. DOERR, and M. A. B. FREY (Wright State University, Dayton, OH) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 366-370. Research supported by the American Heart Association. refs

Stroke volume (SV) and myocardial contractility responses during and immediately after exercise are compared. Nine men (mean 28 yr, 78 kg) completed progressive-intensity discontinuous tests on both arm crank and cycle ergometer. Exercise for each power output (PO) was 7 min, with 20-min rest periods interspersed. Impedance cardiography was used to measure cardiac output (Q), SV, and contractility on a beat-by-beat basis during exercise and a 15-s recovery period. Q increased linearly, and total peripheral resistance decreased exponentially with increasing PO levels. During recovery from exercise, the Q and heart rate (HR) values decreased immediately at all PO levels. When the exercise VO₂ exceeded 1.0 l/min, SV fell significantly during recovery for both exercise modes. In general, the recovery myocardial-contraction indices remained similar to exercise values. It was concluded that immediately after low intensities of exercise, Q decreases because of a fall in HR. After moderate and high-intensity exercise, Q decreases because of a fall in both HR and SV. Author

52 AEROSPACE MEDICINE

A84-44085

HUMAN WHOLE-BLOOD OXYGEN AFFINITY - EFFECT OF TEMPERATURE

A. ZWART, G. KWANT, B. OESEBURG, and W. G. ZIJLSTRA (Groningen, Rijksuniversiteit, Groningen, Netherlands) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 429-434. Research supported by the Nederlandse Organisatie voor Zuiver Wetenschappelijk Onderzoek. refs

O₂ dissociation curves and total proton Haldane factors are measured at 22, 27, 32, 37, and 42 C and controlled pH (7.40) and PCO₂ (40 torr) in blood from three male and three female subjects. The results are presented in graphs and tables and discussed. O₂ dissociation is determined by the method of Zwart et al. (1982) over the entire range of O₂-saturation levels and found to be unaffected by temperature. The Haldane factor is shown to be temperature dependent, the liberation of protons depending on the O₂ saturation. The apparent heat of oxygenation is calculated as 42.7 kJ/mol of monomeric hemoglobin. T.K.

A84-44086

EXERCISE-THERMOREGULATORY STRESS AND INCREASED PLASMA BETA-ENDORPHIN/BETA-LIPOTROPIN IN HUMANS

T. B. KELSO, W. G. HERBERT, F. C. GWAZDAUSKAS, F. L. GOSS, and J. L. HESS (Virginia Polytechnic Institute and State University, Blacksburg, VA) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 444-449. Research supported by the Virginia Polytechnic Institute and State University. refs

A84-44087

COMBINED EFFECTS OF OZONE EXPOSURE AND AMBIENT HEAT ON EXERCISING FEMALES

S. I. GIBBONS and W. C. ADAMS (California, University, Davis, CA) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 450-456. Research supported by the State of California Air Resources Board. refs

A84-44089

EFFECT OF VARIED LACTATE LEVELS ON BICYCLE ERGOMETER PERFORMANCE

M. C. HOGAN and H. G. WELCH (Tennessee, University, Knoxville, TN) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 507-513. Research supported by the American Heart Association. refs

(Contract NIH-AM-29888)

The role of blood lactates in muscle fatigue during exercise is investigated experimentally in six healthy male subjects performing bicycle ergometer tests. The test protocol comprises 5-min work at 95 percent of maximum O₂ uptake breathing a mixture of 16, 21, or 60 percent O₂ in N₂, a 4-min rest period breathing 21-percent O₂, and work to exhaustion at 90 percent of maximum O₂ uptake breathing 21-percent O₂. The hypoxic treatment is found to produce a significantly higher concentration of blood lactates at the time the exhaustive work is begun and significantly shorter performance time to exhaustion (9.1 min) than the hyperoxic treatment (14.8 min). Blood lactate and H(+) concentrations equalize by the end of the final work period. T.K.

A84-44090

HEMOGLOBIN CONCENTRATION AND AEROBIC WORK CAPACITY IN WOMEN FOLLOWING INDUCED ERYTHROCYTHEMIA

R. J. ROBERTSON, R. GILCHER, K. F. METZ, C. J. CASPERSEN, T. G. ALLISON, R. A. ABBOTT, G. S. SKRINAR, J. R. KRAUSE, and P. A. NIXON (Pittsburgh, University, Pittsburgh, PA) *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* (ISSN 0161-7567), vol. 57, Aug. 1984, p. 568-575. refs

Hemoglobin concentration (Hb), cardiovascular parameters, and performance on bicycle-ergometer tests are determined in the nine

healthy female subjects before and 2 d, 8 d, and 14 d after infusion of 334 ml of autologous red blood cells. The tests are begun 8 d after the beginning of menstruation in each subject: results are presented in graphs and tables and discussed. The injection is shown to produce increases in Hb (from 12.7 to 14.7 g/dl), hematocrit (from 38.1 to 44.9 percent), arteriovenous O₂ difference, maximal O₂ uptake, and work capacity, and decreases in submaximal cardiac output and heart rate, which persist through the test period. Submaximal O₂ uptake and stroke volume and maximal cardiac output, heart rate, and stroke volume are unaffected. The increased work capacity and cardiovascular response are attributed to improved O₂ transport due to increased Hb. T.K.

A84-45548* Yale Univ., New Haven, Conn.

RAPID DIAGNOSTIC METHODS FOR INFLUENZA VIRUS IN CLINICAL SPECIMENS - A COMPARATIVE STUDY

A. S. EVANS and B. OLSON (Yale University, New Haven, CT) *Yale Journal of Biology and Medicine* (ISSN 0044-0086), vol. 55, 1982, p. 391-403. refs
(Contract NSG-2185)

A comparison of five rapid viral diagnostic techniques for identifying influenza virus in nasopharyngeal aspirates has been made on patients with influenza-like illnesses. Initial results with immune electron microscopy were positive in only one of 11 specimens from which virus was isolated and further work abandoned. Four other rapid tests were carried out on 39 specimens from which influenza virus had been isolated in tissue culture in 28. Of these 28 specimens yielding virus, 24 (85.7 percent) were positive by an indirect fluorescent antibody test (IFAT) on nasopharyngeal cells, 18 (64.3 percent) by enzyme-linked immunosorbent assay (ELISA), 19 (67.8 percent) by enzyme-linked fluorescent assay (ELFA), and 26 (92.8 percent) by a rapid tissue culture amplification method (TCA) in a continuous Rhesus monkey kidney line (LLC-MK2) with identification of virus by fluorescent antibody. In terms of sensitivity, simplicity, and rapidity, a combination of the IFAT and TCA methods seems to be very useful. Author

A84-45665* Rockefeller Univ., New York.

VESTIBULAR-INDUCED VOMITING AFTER VESTIBULOCEREBELLAR LESIONS

A. D. MILLER and V. J. WILSON (Rockefeller University, New York, NY) *Brain, Behavior and Evolution* (ISSN 0006-8977), vol. 23, 1983, p. 26-31. Previously announced in STAR as N83-24158. refs

(Contract NAG-2164; NSG-2380; NIH-NS-02619)

Vestibular stimulation, by sinusoidal electrical polarization of the labyrinths of decerebrate cats which can produce vomiting and related activity which resembles motion sickness was examined. The symptoms include panting, salivation, swallowing, and retching as well as vomiting. These symptoms can be produced in cats with lesions of the posterior cerebellar vermis. It is suggested that a transcerebellar pathway from the vestibular apparatus through the nodulus and uvula to the vomiting center is not essential for vestibular induced vomiting and the occurrence of many symptoms of motion. E.A.K.

A84-45925

EFFECT OF STIMULATION PARAMETERS ON THE VISUAL DETECTION OF OSCILLATORY MOTION [VLIIANIE PARAMETROV STIMULIATSII NA ZRITEL'NOE OBNARUZHENIE KOLEBATEL'NOGO DVIZHENIIA]

A. N. SOKOLOV (Moskovskii Universitet, Vestnik, Seria 14 - Psikhologiya, Jan.-Mar. 1984, p. 64-66. In Russian. refs

A84-46256

WHY DO ASTRONAUTS SUFFER SPACE SICKNESS?

C. OMAN (MIT, Cambridge, MA) *New Scientist* (ISSN 0028-6664), vol. 103, Aug. 23, 1984, p. 10-13.

Since 1961, space sickness has been experienced by astronauts and cosmonauts, and roughly half of the Shuttle crews have suffered from it. For the past 20 years, research has been

conducted into the possible causes of the illness, and recently scientists have tested Shuttle payload specialists through different experiments which were later performed aboard Spacelab 1. In orbit, the symptoms of the illness were found to be related to head movements, particularly those involving rolling and pitching. Even though space sickness had diminished by the third day, physical signs of fluid shift persisted throughout the mission. Generally, space sickness symptoms in orbit were similar to those documented before the flight, and medication taken to control symptoms was found to have no bad side effects. Data indicate that space sickness is a normal response to an abnormal gravito-inertial environment, and that it can be controlled through both drugs, and visual and tactile cues. J.P.

A84-46257**TILTED ASTRONAUTS REVEAL THE BRAIN'S BALANCING ACT**

L. YOUNG (MIT, Cambridge, MA) *New Scientist* (ISSN 0028-6664), vol. 103, Aug. 23, 1984, p. 14, 15.

Through the monitoring of orientation on Spacelab 1, a study has been made on how the brain mixes signals from the difference sense organs, and how astronauts become more dependent on vision to orient themselves. Tests in an earth-bound laboratory have shown that subjects, who are standing still and are looking in a rotating visual field, have experienced a delay before they feelvection. This may be the result of the absence of visual sensation caused by a lack of signals sent to the brain by the semicircular canals of the vestibular system. It is also shown that signals from the otolith organs oppose any visually induced tilt, that the ear-stone organs prevent substantial continuous roll and do not confirm heat tilt or inversion. On the 'rotating dome' experiment aboard Spacelab, astronauts showed some increasedvection in weightlessness in the erect or supine positions, but strength of the phenomenon did not vary very much on the first, third or sixth day for the four crewmembers tested. Visual effects were also found to be stronger. The firm anchoring of the head to a 'bite board' probably prevented total domination by visual input in the absence of cues or G-forces. J.P.

A84-46259**HOT AIR CHANGES OUR VIEW OF THE EAR**

A. BENSON (RAF, Institute of Aviation Medicine, Farnborough, Hants., England) *New Scientist* (ISSN 0028-6664), vol. 103, Aug. 23, 1984, p. 34, 35.

Experiments were performed on Spacelab 1 astronauts to test a theory of how temperature changes in the ear canal stimulate the sensory receptors of the semicircular canals of the inner ear. Thermal convection, which is believed to cause nystagmus, has been tested in the microgravity of orbital flight by blowing hot air into the ears of a subject at temperatures ranging from 44 to 20 C while he was moved backward and forward. An involuntary oscillation of the eyeballs beating in the same direction was observed. These responses did not differ greatly from those of ground tests before and after the flight. The experiment has raised doubts on the established theory of how thermal stimulation induced eye movement. Further tests are to be conducted on the Spacelab D-1 mission in 1985. J.P.

A84-46435**STABILITY OF PHASE RECOGNITION IN COMPLEX SPATIAL WAVEFORMS**

M. A. GEORGESON and R. S. E. TURNER (Bristol, University, Bristol, England) *Vision Research* (ISSN 0042-6989), vol. 24, no. 8, 1984, p. 851-858. Sponsorship: Science and Engineering Research Council. refs
(Contract SERC-GR/B/14401)

Observers viewed 200 msec presentations of gratings containing first (0.5 c/deg) and third (1.5 c/deg) harmonic components. The phase of the third harmonic and the absolute position of the grating on the screen varied randomly from trial to trial. Classification of the phase relation (0, 90, 180 or 270 deg) was 99 percent perfect. When a 2-sec period of inspection of the grating or its fundamental preceded the test presentation, strong

shifts in perceived waveform were observed that depended on the test grating's position relative to the inspection grating, and resembled the effects seen during continuous viewing. No phase-specific effects were obtained. The pattern of results was exactly that predicted by negative afterimages. Phase recognition at low contrast, and at a high spatial frequency, was also good. Triangular-wave gratings were misperceived (the 'square-wave illusion') only when real or simulated afterimages were present. It is concluded that recognition of phase relations in a complex waveform is stable when the predictable variation due to afterimages is eliminated. Author

A84-46436**THE EFFECTS OF EXPOSURE DURATION AND LUMINANCE ON THE 3-DOT HYPERACUITY TASK**

I. HADANI, M. GURI (Technion - Israel Institute of Technology, Haifa, Israel), and A. Z. MEIRI (Technion - Israel Institute of Technology; GALRAM, Ltd., Haifa, Israel) *Vision Research* (ISSN 0042-6989), vol. 24, no. 8, 1984, p. 871-874. Research supported by the Julius Silver Research Fund. refs

The 3-dot hyperacuity task was given to two subjects under three experimental paradigms: constant luminance, constant energy, and constant duration. Hyperacuity was obtained under conditions (3 dots, 2-msec exposure) which rule out any significant temporal or spatial averaging. There was a clear threshold decrease in the constant-luminance paradigm as exposure duration increased, no significant variations in threshold with the constant-energy paradigm as exposure duration varied, and a U-shaped function in the constant-exposure-duration paradigm as luminance varied. It is concluded that what limits performance, at least for short-exposure durations, is the total energy of the stimulus. The implications of the present results to the static and dynamic approaches to hyperacuity are discussed. Author

A84-46475**HUMAN SUSCEPTIBILITY TO MOTION DISEASE UNDER CONDITIONS OF COMBINED VESTIBULAR AND OPTOKINETIC STIMULATION AND REDUCED FIELD OF VISION [PODVERZHENNOST' CHELOVEKA UKACHIVANIU V USLOVIAKH SOCHETANNOI VESTIBULIARNOI I OPTOKINETICHESKOI STIMULIATSII PRI UMEN'SHENII POLIA ZRENIIA]**

E. V. LAPAEV and O. A. VOROBEV *Akademiia Nauk SSSR, Izvestiia, Seria Biologicheskaiia* (ISSN 0002-3329), July-Aug. 1984, p. 496-500. In Russian. refs

Human susceptibility to motion disease was investigated under conditions of limited fields of vision during open-eye tests in an optokinetic cylinder with continuous Coriolis acceleration which rotated at a higher velocity than the patient's chair. It is shown that under conditions of contradictory vestibular and optokinetic influences the limitation of central and peripheral fields of vision results in a substantial increase in resistance to motion disease, accompanied by a pronounced decrease in sensor activity. I.H.

N84-31229# Joint Publications Research Service, Arlington, Va. **INNOVATIONS IN COSMONAUT MEDICAL MONITORING, PHYSICAL CONDITIONING Abstract Only**

V. PISHCHIK *In its USSR Rept.: Space* (JPRS-USP-84-004) p 25 22 Aug. 1984 *Transl. from Med. Gazeta (Moscow)*, 11 Apr. 1984 p 3

Avail: NTIS HC A07

Medical monitoring information from the manned orbiting station Salyut-7, the status of medical/biological research aimed at heightening the safety and fitness of cosmonauts on prolonged space missions, and results of the first two months of work on board Salyut-7 are discussed. Particular attention is paid to the cosmonauts' metabolism studies and to the physical conditioning regime they are using. Changes are also made in conditioning and examination routines in which effects of negative pressure are produced on the lower half of the body with the aid of a special suit. Blood samples are taken from veins as well as fingers in monitoring of the cosmonauts' hormones, water/salt metabolism and blood. Ultrasonic echocardiography is used for evaluating the

52 AEROSPACE MEDICINE

activity of the cardiovascular system. Psychological training allows the study of certain psychological problems which occur in small groups on prolonged missions. M.A.C.

N84-31230# Joint Publications Research Service, Arlington, Va. **MEDICAL RESEARCH IN FIRST 100 DAYS OF SALYUT-7 FLIGHT Abstract Only**

V. PISHCHIK *In its* USSR Rept.: Space (JPRS-USP-84-004) p 42-43 22 Aug. 1984 Transl. into ENGLISH from Med. Gazeta (Moscow), 18 May 1984 p 4
Avail: NTIS HC A07

The medical research portion of the first 100 days of the mission of the orbiting station Salyut-7 is examined. During the 100 days, 17 medical experiments are performed for the purpose of further studying effects of space flight conditions on the human organism, including studies of the cardiovascular system, the space form of motion, sickness and metabolic processes. Physical conditioning regimens using the exercycle and the running track are used for the purpose of preventing adverse effects of weightlessness. Functional tests in which negative pressure is applied to the lower half of the body is examined. These tests and cardiographic studies are done for the purpose of more fully evaluating reserve potentials of the cardiovascular system at various stages of a mission. The condition of the cosmonauts' hormonal systems, water/salt metabolism and blood systems are monitored. A glucose load functional test is performed to evaluate features of carbohydrate metabolism. A series of psychological and sanitary-and-hygienic studies are performed, as well as a number of otorhinolaryngologic examinations and studies of the fungus of the eye, which yield objective data on dynamics of the blood supply of the rhinopharynx, the tympanic membrane and the eye during various periods of adaptation to weightlessness. M.A.C.

N84-31234# Joint Publications Research Service, Arlington, Va. **HYPOKINESIA EXPERIMENT STUDIES EFFECTS OF WEIGHTLESSNESS Abstract Only**

G. LOMANOV *In its* USSR Rept.: Space (JPRS-USP-84-004) p 80-81 22 Aug. 1984 Transl. into ENGLISH from Sots. Industr. (Moscow), 24 Mar. 1984 p 4
Avail: NTIS HC A07

The methods and objectives of a hypokinesia experiment are described. The metabolic changes which can occur in the human organism during prolonged space missions, as a result of weightlessness are investigated. In the course of the experiment, mineral metabolism and the condition of the osteomuscular system are studied by neutron activation analysis and ultrasonic probing. The circumstances under which imbalances of metabolism occur in conditions of weightlessness and hypokinesia are examined. The potential effectiveness of preventive measures which have been proposed for minimizing losses of mineral substances in these conditions are investigated. M.A.C.

N84-31904# Joint Publications Research Service, Arlington, Va. **MEDICAL APPLICATIONS OF LASERS**

V. A. MILYUSHENKO *In its* USSR Rept.: Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 25-28 6 Jan. 1984 Transl. into ENGLISH from Sov. Export (Moscow), v. 4, no. 145, 1983 p 54-56
Avail: NTIS HC A06

A new trend in laser surgery was developed. Medical applications of lasers rely on the effect of biological tissue vaporization under high intensity radiation. Depending on the nature of intervention and the characteristic features of the organs which are operated on either continuous wave lasers or pulsed lasers with a pulse duration as short as a few nanoseconds are applied. Several laser units for medical applications were developed and are produced in quantity. E.A.K.

N84-31905# Joint Publications Research Service, Arlington, Va. **AGE-RELATED RESPONSES TO DE- AND HYPERHYDRATION Abstract Only**

R. I. AYZMAN *In its* USSR Rept.: Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 37 6 Jan. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 3, May - Jun. 1983 p 454-460
Avail: NTIS HC A06

Age related responses to water deprivation (38-42h) and water loading (2.2% of body weight) were studied in children (4-11 years old) and young adults (18-22 years) on the basis of blood chemistries and urinalysis. It is indicated that in the older age groups, osmoregulation was the dominant factor during the first 16-18 h of water deprivation, while in the younger age group (4-6 years) volume regulation was the predominant physiologic response. Volume regulation became the dominant controlling factor in the other age groups in the late stages of deprivation (38th to 42nd h). Following water loading the osmo and volume regulating mechanisms interact in an age related fashion: the former predominates in the younger (4-6 years) group throughout the entire 210 min period of observation, while in the other groups the early response (120 min) consisted of volume regulation followed by osmoregulatory adjustments in the later stage. Plasma aldosterone increased in all groups in response to water deprivation and loading in direct proportion to age. However, in the youngest group (4-6 years) aldosterone levels decreased toward the end of deprivation, indicating functional exhaustion of the endocrine system. E.A.K.

N84-31906# Joint Publications Research Service, Arlington, Va. **EFFECTS OF WHOLE-BODY COLD EXPOSURE ON ERYTHROCYTE MORPHOLOGY Abstract Only**

A. G. MARACHEV and A. V. KORNEV *In its* USSR Rept.: Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 37-38 6 Jan. 1984 Transl. into ENGLISH from Arkhiv Patol. (Moscow), no. 9, Sep. 1983 p 11-18
Avail: NTIS HC A06

The erythrocyte morphology of 3000 residents of the Soviet Far North, ranging in age from 17 to 52 years was studied. The group included natives and nonnatives with variable periods of residence; populations in Moscow and its environs studied for control. Blood chemistries and scanning electron micrographs showed that the hemoglobin concentration and erythrocyte counts remain within the normal range as long as hypothermia does not develop; however, both parameters show reduction whenever cold is exacerbated. The latter conditions involve the appearance of many young and immature forms of erythrocytes and accelerated destruction of the mature forms, and the appearance of abnormal forms. These changes reflect the hypochromic anemia aspects of cold sickness. E.A.K.

N84-31907# Joint Publications Research Service, Arlington, Va. **EFFECTS OF CLIMATE ON KININOGEN LEVELS IN HEALTHY HUMAN SUBJECTS Abstract Only**

S. C. BERKELIYEVA *In its* USSR Rept.: Life Sci. Effect of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 38 6 Jan. 1984 Transl. into ENGLISH from Zdravookhr. Turkm. (Ashkhabad), no. 7, Jul. 1983 p 16-20
Avail: NTIS HC A06

Effects of geophysical factors on kininogen levels in healthy human subjects were investigated in an arid region and in a temperate climate, and correlated with published findings on the effects of latitude and geomagnetic field on the same parameter. It is found that kininogen concentration increases from arid to temperate zones and also shows a positive correlation with increased amplitudes of short periodic variations in the horizontal components of the geomagnetic field from low to polar latitudes. The vasoactive role of the kinins shows the involvement in the adaptation of the cardiovascular system to ambient geophysical conditions. E.A.K.

N84-31908# Joint Publications Research Service, Arlington, Va.
HEART RHYTHM CHANGES IN RESPONSE TO SENSORIMOTOR LOAD OF VARYING COMPLEXITY Abstract Only

Y. I. SHULMAN, M. Y. GELTSEL, and M. B. SHPARK *In its USSR Rept.; Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 39 6 Jan. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 5, Sep. - Oct. 1983 p 757-761*
 Avail: NTIS HC A06

Heart rhythm changes in response to sensorimotor load of varying complexity while carrying out a push button motor response were studied. In a semireclining position the subjects were exposed to one or two auditory stimuli and, depending on the quantity, quality, and time interval were required to carry out the appropriate response as instructed. Prior to sensorimotor stimuli the heart rate response to the auditory signal(s) consisted of a slight elongation of the first poststimulation R-R interval on the ECG, and recovery of normal R-R intervals at the expense of a shortened third R-R interval. In situations in which decision making was required, a statistically significant prolongation was seen in that R-R interval during which a decision to institute a motor response was made. The second and third R-R intervals were subject to prolongation and indicates that the start up of the response does not coincide with the decision making process itself, but with the final acceptance of the decision. E.A.K.

N84-31909# Joint Publications Research Service, Arlington, Va.
CORRELATION BETWEEN INDIVIDUAL ALPHA-RHYTHM PARAMETERS AND OPERATOR'S PERFORMANCE WHILE SUBJECTED TO MAXIMUM INFORMATION INPUT Abstract Only

S. Y. POPOV, A. V. MIROLYUBOV, and I. L. SOLOMIN *In its USSR Rept.: Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 42 6 Jan. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 5, Sep. - Oct. 1983 p 865-866*
 Avail: NTIS HC A06

A mathematical analysis was conducted on the correlation between alpha rhythms obtained by unipolar recordings from the right and left occipital areas and the performance of 12 male subjects, in a psychological adding test complicated by maximum information input to the subjects. A positive correlation prevailed between the mean period of the alpha waves in the right hemisphere and between the duration of the ascending positive phase with an increase in the frequency of errors, and with a decrease in the time required for onset of mental block. The two alpha rhythm parameters appeared to determine or reflect performance accuracy and immunity to acute mental fatigue. The duration of the descending negative phase and the mean period of the alpha waves in both hemispheres shows negative correlation with fluctuations in the error frequency, and reflects the degree of performance instability. E.A.K.

N84-31910# Joint Publications Research Service, Arlington, Va.
STABILITY OF PHYSIOLOGICAL AND PSYCHOLOGICAL HUMAN FUNCTIONS UNDER EXTREME ENVIRONMENTAL CONDITIONS Abstract Only

A. SLONIM *In its USSR Rept.; Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001) p 43 6 Jan. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 5, Sep. - Oct. 1983 p 873-875*
 Avail: NTIS HC A06

Individual elements of physiological adaptation to extreme environments were described. Topics include: increased resistance to environmental changes ranging from the molecular to the population wide level, an analysis of specific and nonspecific elements of adaptation, and an evaluation of adaptational limitations. Ecological and evolutionary comparisons are used. The regulating and the regulated systems are considered. A hierarchic consideration of adaptational mechanisms is less successful since it is hard to classify energetic components, sensory components, information analysis, decision making, and motivational

mechanisms on that basis. Behavioral adaptation is outlined and the interaction of adaptation and pathology is reported. A theoretical unifying concept for human adaptation is described. E.A.K.

N84-31923# Joint Publications Research Service, Arlington, Va.
IMMEDIATE EFFECTS OF HYPERBARIC OXYGENATION ON BODY OXYGEN SUPPLY Abstract Only

V. I. BURAVTSOV, A. N. TULUPOV, I. P. NIKOLAYEVA, S. A. TATULYAN, and A. L. KOSTYUCHENKO *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-012) p 45 6 Jun. 1984 Transl. into ENGLISH from Anesteziol. i Reanim. (Moscow), no. 1, Jan-Feb. 1984 p 20-21*
 Avail: NTIS HC A05/MF A01

The effectiveness of hyperbaric oxygenation in patients with destructive pulmonary abscesses in improving body oxygen balance was studied. The therapeutic protocol called for 4-6 sessions in a pressure chamber with a pO₂ of 152-183 kPa each session lasting for 30-45 min. Hemodynamic and biochemical studies demonstrated that therapy had no effect on pulmonary gas exchange, but the minute volume was decreased by 32% in patients with an elevated minute volume. Despite diminished oxygen transport, blood flow and arteriovenous difference in oxygen tension, tissue oxygen balance improved as indicated by decreased serum lactate dehydrogenase activity and increased stability of erythrocyte suspensions and electrophoretic mobility of erythrocytes. It is indicated that, following hyperbaric oxygenation, energy expenditures for respiration and circulation are less stringent. E.A.K.

N84-31925# Joint Publications Research Service, Arlington, Va.
LINK BETWEEN INDEXES FOR MENTAL WORK CAPACITY AND PARAMETERS IN CIRCULATORY SYSTEM BEFORE AND AFTER PHYSICAL STRESS Abstract Only

N. I. SAPOVA and T. A. PAVLOVA *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 43 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 897-901*
 Avail: NTIS HC A06/MF A01

The dynamics of mental work capacity following low level physical stress are investigated. Interval cardiograms and rheoencephalograms and integrated total body rheograms are made during the entire period of examinations (20-35 minutes). Respiratory volume is determined by spirometry. The arterial pressure and other circulatory parameters are also measured. Subjects perform tests involving the operational memory at rest and following ergometer stress. Complex physiological and psychophysiological indexes are assessed using the methods of Student and Wilcoxon with the aid of regression analysis. The findings indicate small but definite changes in cerebral circulation and cardiac rhythm in mental work one without substantial nervous/emotional tension and moderate election of mental work capacity following relatively mild physical work. It is concluded that in some cases light physical work of short duration is capable of enhancing mental work capacity. M.A.C.

N84-31929# Joint Publications Research Service, Arlington, Va.
LINK BETWEEN BLOOD CATECHOLAMINE LEVELS AND INDIVIDUAL FEATURES IN DYNAMICS OF OPERATOR ERROR Abstract Only

S. Y. POPOV and A. V. MIROLYUBOV *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 45-46 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 1023-1024*
 Avail: NTIS HC A06/MF A01

At the biochemical level, activating mechanisms are supported by the adrenergic system, whose activeness can be used to determine the dynamics in operator work quality indexes. A comparative study is made of the catecholamine level in the peripheral blood and the periodicity of operator error. Findings indicate a regular association between the catecholamine level, the frequency of operator error and the activity of the central nervous system. Subjects with higher catecholamine levels and displaying greater activeness are able to cope with a greater

52 AEROSPACE MEDICINE

information load. The catecholamine level and activeness seems to be associated only with the dynamic work indexes but not with the overall level of operator error. M.A.C.

N84-31930# Joint Publications Research Service, Arlington, Va.
CHANGES IN ARTERIAL PRESSURE IN STATIC WORK AS FUNCTION OF TIME OF DAY AND DEGREE OF DISTURBANCE IN EARTH'S MAGNETIC FIELD Abstract Only

V. A. KUZMENKO and A. B. BULUYEV *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 69 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 892-896
Avail: NTIS HC A06/MF A01

Changes in the arterial pressure in healthy subjects under various static muscular loads at different times of the day and different values for the geomagnetic field are compared. Measurements are made to determine systolic pressure and heart rate. Geomagnetic disturbance during measurements are assessed from data on the K-index. Circadian patterns in systolic pressure under static muscular load are established. A correlation is found between disturbances in the geomagnetic field and pressor response during segments of the circadian cycle when arterial pressure is normally lower. Changes in arterial pressure did not appear to be associated directly with physical load as correlated with geomagnetic disturbance or with any cardiac response. The range of possible changes in the arterial pressor response as a function of geomagnetic disturbance is commensurable with circadian changes in the excitation of circulatory regulation.

M.A.C.

N84-31931# Joint Publications Research Service, Arlington, Va.
DYNAMICS OF FUNCTIONAL STATUS AND SUBJECTIVE SENSATIONS IN PROCESS OF HEAT ADAPTATION Abstract Only

A. T. MARYANOVICH, V. D. BAKHAREV, L. A. GRIDIN, and P. M. YARTSEV *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 74 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 956-962
Avail: NTIS HC A06/MF A01

Objective functional status and subjective sensations in heat acclimation are compared and correlated. Rectal temperature, heart rate, oxygen demand and carbon dioxide exhalation at rest and during physical exercise are recorded. Subject sensations are reported according to a 7 point scale. Objective and subjective findings are correlated using the Student methods for paired and unpaired samples. During the initial period of heat acclimation, improvement in the thermal status can be achieved through stressing the homeostatic mechanisms, without involving the cardiovascular system but involving increase in the sensation of discomfort. Two individual tactical approaches are possible during the period of heat acclimation in humans: (1) either stressing of the homeostatic mechanisms to reduce impairment of the thermal balance to a minimum, or (2) reducing stress and improving subjective sensations at the cost of elevated body temperature. The subsequent status in which both impairment of the thermal balance and the degree of discomfort experienced subjectively are reduced to a certain minimum level should be regarded as a sign of complete adaptation to the environment. M.A.C.

N84-31932# Joint Publications Research Service, Arlington, Va.
STUDY OF SPATIAL ASYMMETRY IN HUMAN EXTERNAL ELECTRICAL FIELD Abstract Only

Y. V. TORNUYEV and S. A. KUDELKIN *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 75 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 969-973 Original language document previously announced in IAA as A84-15741
Avail: NTIS HC A06/MF A01

The ability to assess the turn angle of the forearm in the horizontal plane was investigated in two series of observations on 150 subjects. In the first series, the subject himself, without visual monitoring, moved his arm to a certain intermediate value specified

by the researcher (active moment A); while in the second series the arm was moved by the researcher (passive movement P). It is shown that the Stevens function power distribution was normal in A movement but asymmetric in P movement. It is suggested that this heterogeneity is caused by an indeterminacy factor in the case of P movement. (IAA)

N84-31934 California Univ., Santa Barbara.
SENSITIVITY TO HYPOXIA IN HUMANS Ph.D. Thesis

F. H. CARLIN 1983 254 p
Avail: Univ. Microfilms Order No. DA8401736

Evaluation of the work performed by others revealed shortcomings in the metrics used to assess human hypoxic drive. The concept of the strong hypoxic drive was developed as an improved assessment and was applied to the data collected from several subjects. The strong hypoxic response appears to be an acceptable measure of relative hypoxic drive, however, it is quite inappropriate for use in a model of ventilatory drive in the control systems sense. Therefore, a method was developed to compute the six coefficients for an arbitrary hyperbola fitting the experimental data. In order to efficiently determine these coefficients it was necessary to specify the asymptotes. The strong hypoxic response estimated one of the asymptotes and a similar technique was used to determine the other asymptote. The second asymptote is termed the weak hypoxic response because it most closely matches the ventilation in the euoxic region. Additional work is indicated to either substantiate the usefulness of the new measures, or determine if some other measure is in fact of higher merit.

Dissert. Abstr.

N84-31935*# National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.

PULMONARY ARTERY LOCATION DURING MICROGRAVITY ACTIVITY: POTENTIAL IMPACT FOR CHEST-MOUNTED DOPPLER DURING SPACE TRAVEL

A. T. HADLEY, III, J. CONKIN (Technology, Inc., Houston, Tex.), J. M. WALIGORA, and D. J. HARRIGAN, JR. Aug. 1984 8 p refs

(Contract NAS9-17200)

(NASA-TM-58262; S-538; NAS 1.15:58262) Avail: NTIS HC A02/MF A01 CSCL 06E

Doppler, or ultrasonic, monitoring for pain manifestations of decompression sickness (the bends) is accomplished by placing a sensor on the chest over the pulmonary artery and listening for bubbles. Difficulties have arisen because the technician notes that the pulmonary artery seems to move with subject movement in a one-g field and because the sensor output is influenced by only slight degrees of sensor movement. This study used two subjects and mapped the position of the pulmonary artery in one-g, microgravity, and two-g environments using ultrasound. The results showed that the pulmonary artery is fixed in location in microgravity and not affected by subject position change. The optimal position corresponded to where the Doppler signal is best heard with the subject in a supine position in a one-g environment. The impact of this result is that a proposed multiple sensor array on the chest proposed for microgravity use may not be necessary to monitor an astronaut during extravehicular activities. Instead, a single sensor of approximately 1 inch diameter and mounted in the position described above may suffice. Author

N84-31936*# Stanford Univ., Calif. Cardiology Div.
PHARMACOLOGIC COUNTER MEASURES MINIMIZING POST-SPACE FLIGHT ORTHOSTATIC INTOLERANCE Interim Report

D. C. HARRISON and R. KATES Mar. 1982 14 p
(Contract NCC2-232)

(NASA-CR-173861; NAS 1.26:173861) Avail: NTIS HC A02/MF A01 CSCL 06E

The effect of bed rest on drug disposition and physiological function was investigated as part of a project to determine the cardiovascular effects of space flight. One group of subjects was given doses of lidocaine, penicillin-G, and ICG during a control period and following seven days of bed rest. Cardiac function

was evaluated by echo-cardiography. Renal function was evaluated in a second group before and after several days of bed rest. Inulin, para-aminohippurate, and dextran clearances were studied. In the first group, the post-bed rest parameters were not statistically different from the pre-bed rest values. In the second study, renal function did not change significantly after seven days of bed rest. Plans for future research are reviewed. R.S.F.

N84-31937# Norwegian Defence Research Establishment, Kjeller.

MODULATION OF THE CHOLINERGIC MECHANISMS IN THE BRONCHIAL SMOOTH MUSCLE Ph.D Thesis

P. AAS Jun. 1984 110 p refs
(NDRE/PUBL-84-1001; ISSN-0800-4412) Avail: NTIS HC A06/MF A01

It is shown that cholinergic nerves to the bronchial smooth muscle were modulated by several independent mechanisms. The release of acetylcholine (Ach) was regulated by presynaptic muscarinic receptors and by adenosine. The presynaptic regulation of release is shown to operate in addition to the postsynaptic stimulation of the bronchial smooth muscle. The function of the cholinergic nervous system in bronchi and the lungs is dependent upon the activities of acetylcholinesterase and cholinesterases, which exhibited rather high activities in the tissues. Serotonin, which is stored in and released from pleural mast cells, potentiated the release of Ach and thereby the contraction of the bronchial smooth muscle. In addition to the presynaptic effect, there was a postsynaptic stimulatory response to serotonin. Special attention was paid to the peptide neurotensin, which potentiated both the release of Ach and stimulated the muscle to contract by postsynaptic receptors. The release of serotonin and histamine from rat pleural mast cells was specifically induced. Author

N84-31938# Brown Univ., Providence, R. I. Dept. of Physics.
CORRELATION OF AFFERENT ACTIVITY AND BINOCULAR RECEPTIVE FIELD PROPERTIES

M. A. PARADISO and L. N. COOPER 13 Jul. 1984 34 p
(Contract N00014-81-K-0136; NR PROJ. 201484)
(AD-A143087; TR-15) Avail: NTIS HC A03/MF A01 CSDL 06P

A theoretical model of synaptic plasticity is used to examine the importance of the correlation of left eye and right eye afferent activities for the development of binocular receptive field properties in visual cortex. Generally, cortical cells that receive less binocularly correlated activity become less binocular. We argue that larger disparity decreases correlation and larger receptive field size increases correlation. Therefore, the consequences of normal uncorrelated activity are: first, disparity selective neurons that are optimally stimulated at the horopter tend to be more binocular than cells selective for nonzero disparities. Second, cortical cells with large receptive fields tend to be more binocular and can maintain larger disparities than small-field cells. Third, low levels of uncorrelated activity allow changes in ocular dominance that accentuate any ocular dominance organization present prior to visual experience. The model also readily accounts for the loss of binocularity caused by monocular deprivation, alternating occlusion, and strabismus. GRA

N84-31939# Civil Aeromedical Inst., Oklahoma City, Okla.
ANTHROPOMETRIC AND MASS DISTRIBUTION CHARACTERISTICS OF THE ADULT FEMALE, REVISED

J. W. YOUNG, R. F. CHANDLER, C. C. SNOW, K. M. ROBINETTE (AF Aerospace Medical Research Lab., Wright-Patterson AFB, Ohio), G. F. ZEHNER (Anthropology Research Project, Inc., Yellow Springs, Ohio), and M. S. LOFBERG (USAF Hospital George, Calif.) Sep. 1983 109 p Supersedes N84-18898
(AD-A143096; FAA-AM-83-16-REV) Avail: NTIS HC A06/MF A01 CSDL 06N

This study of 46 living adult females is part of a long-range research program designed to establish valid analytical relationships between readily measured body dimensions and mass distribution characteristics of living populations. Presented in this report are data describing the mass distribution characteristics of

primary and composite body segments. The report also contains sets of regression equations which can be used to predict segmental volumes and moments of inertia from anthropometric data. The data base is derived from both classical anthropometric measurements and from stereophotogrammetric techniques. Subjects were representative of a general United States population as defined by the 1971-74 Public Health Service, Health and Nutrition Examination Survey (HANES). The data obtained describe segment and segment composite volumes, centers of volume, intersegment cut centroids, principal inertial axes, and surface anatomical landmarks with respect to anatomical axes developed for each segment. Experiments designed to test the validity of research techniques and controls, and to measure the differences between stereophoto-metrically derived values and values obtained by direct measurement techniques are also described here.

GRA

N84-31940# Militair Hospitaal Dr. A. Mathijssen, Utrecht (Netherlands). Afdeling: Oogheilkunde.

OPHTHALMOLOGICAL INVESTIGATION AMONG CONTACT LENS WEARERS IN MILITARY SERVICE [OOGHEELKUNDIG ONDERZOEK BIJ CONTACTLENSDRAGERS IN DE MILITAIRE DIENST]

A. J. P. ROUWEN Dec. 1983 62 p refs In DUTCH; ENGLISH summary
(Contract A82/K/100)
(REPT-AR/MHAM-1983-1; TDCK-78936) Avail: NTIS HC A04/MF A01

Data concerning visual acuity, refraction and biomicroscopy of 644 recruits with contact lenses are correlated with the type of lenses worn (conventional hard, gas permeable hard, and soft). The gas permeable hard contact lenses provide good vision with minimal corneal distortion and less complications compared to soft contact lenses. Before and after a three weeks field exercise the same parameters were compared. Seventy-nine percent of all soldiers wore their lenses during the exercise. In this group only a slight increase in contact lenses associated ocular pathology is observed. Author (ESA)

N84-32037# Tokyo Denki Univ. (Japan). Dept. of Electronic Engineering.

NONLINEAR DYNAMICS IN EXCITABLE NERVE MEMBRANES
K. AIHARA, M. KOTANI, H. NOGUCHI, and T. NUMAZIRI *In its* Res. Repts. of the Fac. of Eng., No. 31 p 29-34 Dec. 1983 refs

Avail: NTIS HC A07/MF A01

Nonlinear oscillations in excitable nerve membranes are theoretically analyzed by the Hodgkin-Huxley ordinary and partial differential equations. The formation of self-sustained oscillation in nerve membranes is described by a subcritical inverted Hopf bifurcation in the nonlinear neutral dynamics. It is also reported that the nonlinear dynamics produces chaotic oscillations and different bifurcating routes into chaos. Author

N84-32997# Joint Publications Research Service, Arlington, Va.
PILOT JET LAG EXPERIMENTS DESCRIBED

V. GOLOVANOV *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-018) p 1-3 8 Aug. 1984 Transl. into ENGLISH from Sovetskaya Rossiya (Moscow), 22 Apr. 1984 p 6

Avail: NTIS HC A06/MF A01

Working conditions for flight crews during long distance flights were investigated. Jet lag, physiological and biological effects during crossing of time and climate zones were measured. Temperature and humidity effects on the pilots were examined. Human short term adjustment to extreme changes in time and climate are discussed. E.A.K.

N84-33000# Joint Publications Research Service, Arlington, Va.
MODELING OF LETHAL ELECTRIC SHOCK

V. A. VOSTRIKOV, V. Y. TABAK, and M. S. BOGUSHEVICH *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPSS-UBB-84-018) p 40-43 8 Aug. 1984 refs Transl. into ENGLISH from Anesteziologiya i Reanomatologiya (Moscow), no. 2, Mar.-Apr. 1984 p 52-53*
Avail: NTIS HC A06/MF A01

The problem of electric shock is examined. Ventricular fibrillation (sudden death) was found to be the most frequent cause of those fatalities; this is a characteristic arrhythmia when a low voltage (127-380 V) A.C. current (50-400 Hz) passes through the cardiac region, which results from functional disturbances in excitation and conduction processes in cardiac muscle. The introduction of electropulse therapy (cardiac defibrillation) into clinical and experimental practice allows the control of this very dangerous rhythmic disturbance. The problem of lethal electric shock, however, is not limited to ventricular fibrillation only. Data on frequent fatalities following high voltage (1000 V) contact both with and without ventricular fibrillation are presented. Substantial injuries both to cardiac muscle and other vitally important organs and systems are indicated. E.A.K.

N84-33003* National Aeronautics and Space Administration, Washington, D. C.**AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES**

Sep. 1984 61 p
(NASA-SP-7011(262); NAS 1.21:7011(262) Avail: NTIS HC \$7.00 CSCL 06E

This bibliography lists 169 reports, articles and other documents introduced into the NASA scientific and technical information system in August 1984. Author

N84-33004# Royal Aircraft Establishment, Farnborough (England).**OXYGEN AFFINITY OF HEMOGLOBIN, 3 HOURS AFTER PASSIVE INCREASE IN ALTITUDE FROM 400 TO 1800 METRES**

E. HUMPELER, K. INAMA, and H. JUNGSMANN Nov. 1983 13 p refs Transl. into ENGLISH from Wiener Klinische Wochenschrift (West Germany), v. 92, no. 9, 1980 p 326-329
(RAE-TRANS-2118; BR92722) Avail: NTIS HC A02/MF A01

An investigation in two parts was undertaken in nine male subjects of the effect of short exposure to moderate altitude on the oxygen affinity of hemoglobin and other parameters. Initial measurements were performed at 425 m and repeated 3 hours after ascent by cable car to an altitude of 1800 m (Untersberg, Salzburg), no muscular activity being allowed. The same protocol was repeated 3 days subsequently but the individuals were exercised on an ergometer bicycle. The intraerythrocytic 2,3-DPG concentration showed a significant increase (1.2 micro MOL/GHB) after 3 hours of altitude exposure with and without muscular exercise. Inorganic plasma phosphates decrease is in both experiments. These findings show that 3 hours after cable-car ascent to a medium altitude a DPG increase occurs which is able to counteract the Bohr effect. B.W.

N84-33005# Minnesota Univ., Duluth. Dept. of Biochemistry.
CEREBRAL METABOLISM AND BLOOD BRAIN TRANSPORT: TOXICITY OF ORGANOPHOSPHOROUS COMPOUNDS Annual Summary Report, 15 Apr. 1982 - 15 Apr. 1983

L. R. DREWES and A. K. SINGH Jun. 1983 37 p
(Contract DAMD17-82-C-2136; DA PROJ. 3M1-61102-BS-10) (AD-A142705; ASR-1) Avail: NTIS HC A03/MF A01 CSCL 06T

The overall objective of this research project is to characterize the toxic effects of sarin and soman on the brain using the isolated perfused canine brain model. During the first contract year our efforts were directed toward the following: (1) establishing the viability of isolated perfused canine brain in the presence of sarin by measuring EEG and cerebral oxygen and glucose consumption; (2) determining the effect of an acute exposure to sarin on

acetylcholinesterase (AChE) activity in the isolated perfused canine brain; (3) measurement of water content and electrolyte levels in various brain regions after exposure to sarin; (4) determining the effects of sarin on free amino acids and neurotransmitters in various brain regions; (5) determining the effects of sarin on unidirectional blood-brain transport of glucose, choline, tyrosine, and glutamic acid by the indicator dilution method; and (6) development of a technique for the analysis of sarin in perfusate blood. In these studies a total of 19 perfusion experiments was conducted. In addition, brain tissue from 4 dogs was collected for non-perfused control experiments. Sarin (400 microgram) produced immediate seizure-like EEG activity in the isolated perfused canine brain. This was accompanied by significant inhibition of brain AChE.

GRA

N84-33006# Science Applications, Inc., Dayton, Ohio.
DEVELOPMENT OF COLOR CRITERIA FOR ADVANCED DISPLAYS Technical Report, Sep. 1982 - Sep. 1983

F. WARD, D. WILSON, and D. L. WALLQUIST Wright-Patterson AFB, Ohio Aerospace Medical Research Lab. May 1984 96 p

(Contract F33615-82-C-0500)
(AD-A143246; SAI-84-02-157; AFAMRL-TR-84-023) Avail: NTIS HC A05/MF A01 CSCL 05E

The research described herein involves color calibration of a CRT, a color discrimination study, and a color-coding system using Synthetic Aperture Radar (SAR) imagery. The results of the color calibration effort showed that, with appropriate regression coefficients, color output, both on a CRT and on film could be predicted. The color discrimination study showed that color discrimination is poorest for red colors. These data agree with our previous studies on color matching and discrimination, and we recommend caution when using the UCS representation as the index of color difference. The radar imagery color-coding study found, as have other investigators, that black and white coding is superior to color coding. If imagery is to be color-coded, hue coding is better than hue-brightness coding. GRA

N84-33007# School of Aerospace Medicine, Brooks AFB, Tex.
MEASUREMENT OF SPECIFIC ABSORPTION RATE IN HUMAN PHANTOMS EXPOSED TO SIMULATED AIR FORCE RADAR EMISSIONS Final Report, Oct. 1980 - Sep. 1981

W. D. HURT Jun. 1984 11 p
(Contract AF PROJ. 775-7)
(AD-A143570; USAFSAM-TR-84-16) Avail: NTIS HC A02/MF A01 CSCL 06R

It has been suggested that pulsed radiofrequency radiation (RFR) fields may produce different specific absorption rate (SAR) distributions than continuous wave (CW) exposures. SAR distributions were measured in a muscle-equivalent slab for various RFR frequencies and duty-cycle combinations. No significant differences in SAR distribution between pulsed and CW were measured. GRA

N84-33008# Health Effects Research Lab., Research Triangle Park, N. C.**IMMUNOLOGIC EFFECTS OF ELECTROMAGNETIC FIELDS (1981 - 1983)**

R. J. SMIALOWICZ May 1984 10 p refs
(PB84-190602; EPA-600/D-84-124) Avail: NTIS HC A02/MF A01 CSCL 06E

In vitro studies provide evidence that support and EM field induced thermal mechanism for immune effects. When proper control of culture temperatures has been achieved during in vitro exposure to EM fields, no alterations have been observed for a variety of immune cell functions. There is conflicting evidence for effects on lymphocytes exposed in vitro to amplitude modulated EM fields at 60Hz. More work is needed to determine if there exists a possible interaction between low frequency modulated EM fields and the immune system. At present, however, there is no convincing evidence from in vivo and in vitro animal studies that EM fields adversely alter the immune system at levels found in the ambient environment. GRA

N84-33009# Northrop Services, Inc., Research Triangle Park, N. C.

DOSIMETRY OF OZONE AND NITROGEN DIOXIDE IN MAN AND ANIMALS

J. H. OVERTON, JR. and F. J. MILLER (Health Effects Research Lab.) May 1984 15 p refs
(PB84-195304; EPA-600/D-84-126) Avail: NTIS HC A02/MF A01 CSCL 06T

Agreement between experimental data on maximum morphological damage and maximal predicated tissue does offer promise that mathematical dosimetry models can contribute to a better understanding of effective doses in animal studies and their correspondence to human exposure levels. Modeling must be a dynamic process to take advantage of new information and evolving conceptualizations of physical, chemical, and biological processes. Qualitative extrapolations from animals to man have been indirectly in setting National Ambient Air Quality Standards. Continued development of dosimetry models, along with information on species differences in sensitivity to pollutants, have the potential to make extrapolations between animals and man more quantitative in the future. GRA

N84-33010# Health Effects Research Lab., Research Triangle Park, N. C.

INTEGRATION OF SPECIES SENSITIVITY AND DOSIMETRY DATA IN THE EXTRAPOLATION OF OZONE AND NITROGEN DIOXIDE HEALTH DATA FROM ANIMALS TO MAN

J. A. GRAHAM and G. E. HATCH May 1984 14 p refs
(PB84-195312; EPA-600/E-84-125) Avail: NTIS HC A02/MF A01 CSCL 06T

Estimations of regional pulmonary doses of O₃ and NO₂ need to be combined with an understanding of the sensitivity of several animal species and man to equivalent tissue doses before animal to man quantitative extrapolations can be performed. Because of potential species differences in anti-oxidant defenses and repair mechanisms it is unlikely that regional lung dose-response effects will be identical across species. The concepts and their current state of experimental or theoretical validation to be addressed include the application of: (1) scaling principles between species following in vitro and in vivo exposure, (2) the parallelogram concept which directly relates acute animal to acute human effects and acute animal to chronic animal effects, thereby permitting the indirect estimation of chronic human effects, and (3) species comparisons of the health effects of O₃. GRA

N84-33011# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

OCCUPATIONAL MEDICINE RELEVANT TO AVIATION MEDICINE

Loughton, England May 1984 74 p refs In ENGLISH and FRENCH Symp. held in London, 4 Oct. 1983
(AGARD-CP-341; ISBN-92-835-0354-6) Avail: NTIS HC A05/MF A01

Laser effects, toxicology, and vision problems are addressed. Among the specific topics considered are: occupational medicine; the biological and pathological effects of hydrazine; the toxicity of combustion products; the relationship among ethyl alcohol consumption, nystagmus, and the balance mechanism of the inner ear; cathode ray tubes and visual perception; laser safety; and laser damage to the eye.

N84-33012# Philips Medical Service, Eindhoven (Netherlands).
REVIEW OF OCCUPATIONAL MEDICINE RELEVANT TO AVIATION MEDICINE

H. ZUIDEMA *In* AGARD Occupational Med. Relevant to Aviation Med. 6 p May 1984
Avail: NTIS HC A05/MF A01

The aim and scope of occupational medicine are reviewed. The conditions required to practice occupational medicine are also considered. The following specific topics are addressed: occupational health care of the individual worker, occupational hygiene, and ergonomics. The preventive character of occupational

medicine is emphasized. Aviation medicine is a subcategory of occupational medicine. R.S.F.

N84-33013# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.

HYDRAZINE TOXICOLOGY: IMPACT ON SAFETY AND HEALTH IN MILITARY AVIATION

G. C. MOHR *In* AGARD Occupational Med. Relevant to Aviation Med. 4 p May 1984 refs
Avail: NTIS HC A05/MF A01

Hydrazine is a chemical of considerable military interest widely used as a rocket fuel and as a propellant for gas turbine generators. Extensive studies of the acute and chronic toxicity of hydrazine were conducted previously. The protocol used for toxicological evaluation of potentially hazardous chemicals is described briefly; pertinent data on acute effects are summarized; and the results of a large scale oncogenic evaluation are reviewed. Currently accepted guidelines for occupational medical management in the workplace are presented. Author

N84-33014# Danish Defence Command, Copenhagen. Medical Services.

HANDLING OF HYDRAZINE IN THE ROYAL DANISH AIR FORCE

K. JESSEN and S. TRAUTNER *In* AGARD Occupational Med. Relevant to Aviation Med. 4 p May 1984
Avail: NTIS HC A05/MF A01

The introduction of the F-16 fighter aircraft into the Royal Danish Air Force included the introduction of hydrazine as a propellant for the emergency power unit (EPU). The EPU and hydrazine are discussed briefly. The pathological effects of hydrazine exposure are reviewed along with environmental safety regulations extant in the Danish Air Force. A health examination program designed to collect baseline medical data is outlined. Three case histories of hydrazine accidents are presented. R.S.F.

N84-33015# Laboratoire Central de Biologie Aerospatiale, Paris (France). Div. de Chimie-Toxicologie.

A COMPARATIVE STUDY IN THE ANIMAL OF THE TOXICITY OF THE COMBUSTION PRODUCTS OF DIVERSE MATERIALS [ETUDE COMPARATIVE CHEZ L'ANIMAL DE LA TOXICITE DES PRODUITS DE THERMOLYSE DE DIVERS MATERIAUX]

J. P. DELCROIX and M. GUERBET *In* AGARD Occupational Med. Relevant to Aviation Med. 14 p May 1984 refs In FRENCH

Avail: NTIS HC A05/MF A01

Materials with minimal toxicity must be chosen in case of fire in an enclosed space and, more particularly, onboard aircraft. An analytical study of atmospheric products is not sufficient for evaluating the risks encountered. There must be experimentation with animals. A methodology was created which associates an original model fire and a protocol for exposing animals to toxic gas products in order to study the response to aggression of the entire organism with its susceptibilities and reactions. Objective toxicological criteria are proposed with a view towards establishing a classification of materials according to chosen danger criteria.

Transl. by A.R.H.

N84-33016# Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario).

AN UNUSUAL TOXICOLOGICAL PROPERTY OF ALCOHOL: THE DENSITY EFFECT ON THE ORGAN OF BALANCE

K. E. MONEY and J. P. LANDOLT *In* AGARD Occupational Med. Relevant to Aviation Med. 8 p May 1984 refs
Avail: NTIS HC A05/MF A01

The relationship among ethyl alcohol consumption, nystagmus, and the balance mechanism of the inner ear was investigated with particular concern for pilot performance during positional alcohol nystagmus (PAN). The following questions were addressed experimentally: (1) does simultaneous ingestion of heavy water with alcohol prevent the occurrence of the first phase of PAN; (2) does the second phase of PAN appear if the first phase is prevented; (3) is the second phase prolonged if the blood alcohol

52 AEROSPACE MEDICINE

level is held high for a long time; and (4) does glycerol, which is denser than water, cause positional nystagmus. Nystagmus was recorded using electronystagmography. Results show that it is possible for the second phase of PAN to persist beyond 11 hours after the cessation of drinking. The cause of the second phase of PAN appears to be the presence of alcohol in the semicircular canals of the inner ear. R.S.F.

N84-33017# Centre d'Etudes et de Recherches de Medecine Aerospatiale, Paris (France).

VISUAL PERCEPTION IN SYSTEMS MANAGEMENT IN AERONAUTICS [LA PERCEPTION VISUELLE DANS LES CONDUITES DE SYSTEME EN AERONAUTIQUE]

J. P. MENU, G. SANTUCCI, and R. AMALBERTI *In* AGARD Occupational Med. Relevant to Aviation Med. 7 p May 1984 refs *In* FRENCH

Avail: NTIS HC A05/MF A01

Informatics is present in all domains of activity and especially in aeronautics where the cathode ray tube is the preferred mechanism for presenting information. Visual perception thus attracted is analyzed under its diverse aspects. How the physical characteristics of the access stimuli are measured is described and mechanisms for information processing are then examined. A method is presented for evaluating the operator's capabilities for integrating preceding information. Transl. by A.R.H.

N84-33018# Bundesministerium der Verteidigung, Bonn (West Germany).

EVALUATION AND CONTROL OF LASER HAZARDS

G. HOLTRUP *In* AGARD Occupational Med. Relevant to Aviation Med. 4 p May 1984

Avail: NTIS HC A05/MF A01

International agreements on laser safety are summarized and the laser safety regulations valid for the West German military forces are presented. Laser materials and their associated output wavelengths are enumerated. Problems which arise from airborne laser operations are discussed along with the development of eye-safe lasers. R.S.F.

N84-33019# Centre de Recherches du Service de Sante des Armees, Clamart (France).

VISUAL FUNCTION AND THE DEFINITION OF THRESHOLDS FOR EXPOSURE TO LASER RADIATION [LA FONCTION VISUELLE ET LA DEFINITION DES SEUILS D'EXPOSITION AU RAYONNEMENT LASER]

L. COURT, D. COURANT, G. SANTUCCI (GERMA), J. P. CHEVALEAUD, and G. PERDRIEL (Service de Sante des Armees) *In* AGARD Occupational Med. Relevant to Aviation Med. 17 p May 1984 refs *In* FRENCH

Avail: NTIS HC A05/MF A01

Dangers presented by the use of lasers and more particularly those related to laser radiation are essentially due to eye impairment. If determination of the maximum value of exposure requires precise knowledge of the physical parameters and associated biological effects, the influence of laser beams on visual function should be evaluated in the dynamic perspective of sensory physiology. The threshold must express the limit value of a relation existing between the energy and/or the power dissipated in the exposed biological structure and the appearance of the smallest functional impairment or a detectable lesion capable of involving damage. This definition introduces two concepts, the choice of criteria, reversible or irreversible impairment, and the measurement, of the associated energy exchange. It thus appears that biological and physical parameters constitute a whole of which the elements react on each other in a complex dynamic. Their descriptions, the definition and criteria, and experimental results illustrate the difficulties encountered in analyzing functional impairment and in determining the exposure limits as well as call to mind the uncertainty of actual norms. Transl. By A.R.H.

N84-33272*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LANGLEY EXPERIENCE WITH ADABAS/NATURAL

A. SWANSON *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 55-56 Sep. 1984

Avail: NTIS HC A07/MF A01 CSCL 05B

The use of the data base management system ADABAS and the companion software NATURAL and COM-LETE at the Langley Research Center is evaluated. A brief overview of data base management system technology is provided as well as system upgrading, user requirements, and use of the system for administrative support. M.A.C.

N84-33362# Massachusetts Inst. of Tech., Cambridge.

COMMUNICATIONS BIOPHYSICS

N. Y. S. KIANG, W. T. PEAKE, W. M. SIEBERT, T. F. WEISS, M. C. BROWN, R. A. EATOCK, D. K. EDDINGTON, J. J. GUINAN, E. M. KEITHLEY, J. B. KOBLER et al. *In its* RLE Progr. Rept. No. 126 p 181-198 Jan. 1984 refs

Avail: NTIS HC A12/MF A01

Topics on the biophysics of the auditory system are discussed. Research emphasis is placed on the anatomical structures and physiological mechanisms of vertebrate hearing and the associated clinical problems. Sound intensity perception, binaural hearing, hearing aid research, auditory discrimination, and the use of tactile sense as a hearing substitute are also examined. M.A.C.

N84-33363# Massachusetts Inst. of Tech., Cambridge.

PHYSIOLOGY

J. Y. LETTVIN, J. GARDNER, S. JHAVERI, L. A. KAMENSKY, D. PERLMAN, G. M. PLOTKIN, S. A. RAYMOND, S. WIESNER, G. GEIGER, L. R. CARLEY et al. *In its* RLE Progr. Rept. No. 126 p 199-224 Jan. 1984 refs

Avail: NTIS HC A12/MF A01

The physiology of sight and image processing is discussed. Investigations of nervous signals, texture sensing, photoreceptor models, image enhancement under textural masking, treatment of Caisson Disease, quantum cryptography, and the development of an improved eye chart are examined. M.A.C.

53

BEHAVIORAL SCIENCES

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

A84-43768

AUDITORY INDUCTION OF DISCRETE TONES IN SIGNAL DETECTION TASKS

K. B. BENNETT, R. PARASURAMAN, J. H. HOWARD, JR., and A. J. OTOOLE (Catholic University of America, Washington, DC) *Perception and Psychophysics* (ISSN 0031-5117), vol. 35, no. 6, June 1984, p. 570-578. Navy-supported research. refs

Previously, auditory induction was examined only in the context of rapid and continuously alternating sounds. The present investigation was concerned with auditory induction in a more generalized task situation (nonalternating, or discrete, sounds) which allows the use of a signal detection paradigm to measure induction effects on perceptual performance. The investigation includes the conduction of three experiments, taking into account the employment of pure tone signals embedded in band-limited noise. Three types of signals were used (constant, rising, or falling in frequency). The obtained results indicate that auditory induction is a general phenomenon which can influence the perception of nonspeech sounds that are either constant or changing in frequency. Effects on the false-alarm rate are considered. G.R.

A84-44093

SYNTHESIZED WARNING MESSAGES - EFFECTS OF AN ALERTING CUE IN SINGLE- AND MULTIPLE-FUNCTION VOICE SYNTHESIS SYSTEMS

M. T. HAKKINEN and B. H. WILLIGES (Virginia Polytechnic Institute and State University, Blacksburg, VA) *Human Factors* (ISSN 0018-7208), vol. 26, April 1984, p. 185-195. refs
(Contract N00014-81-K-0143; NR PROJECT SRO-101)

The present study examined the effectiveness of preceding synthesized voice warning messages with an alerting cue as a function of the amount of information presented by the voice synthesizer and the workload level in the primary task. Subjects performed a simplified air traffic control task in which they were required to monitor two visual displays and to enter commands via a standard keyboard. Emergency messages were always presented by phenome-based synthesized speech. However, the presence of an alerting cue (light and tone) prior to emergency messages and the presentation mode of noncritical messages (visual or auditory) were varied experimentally. When synthesized speech was used only for emergency messages, the presence of an alerting cue lengthened the response time to the message. However, when computer-generated speech was used for multiple functions; more emergency messages were detected when an alerting cue was used. Author

A84-44094

OPERATIONAL EFFICIENCY AND TIME OF DAY

A. CRAIG and R. CONDON (Sussex, University, Brighton, England) *Human Factors* (ISSN 0018-7208), vol. 26, April 1984, p. 197-205. refs

Forty-eight subjects performed a battery of six predominantly perceptual tasks that were relevant to bridge operations on a ship at sea. Sessions were run at six times over an extended waking day, between 0800 and midnight. For some of the tasks performance was noticeably deficient at certain times of day, the diurnal pattern corresponding approximately with that in activation and alertness. However, closer examination of the data reveals that although a genuine efficiency deficit may exist at particular times, a major part of the variation in performance can reasonably be attributed to a shift in the trade-off between speed and accuracy. Because the direction of the shift is towards faster but less careful performance as the day progresses, the shift may be due to accumulating fatigue rather than to time of day per se. Regardless of the primary cause, vulnerability may be increased at certain times due to a slump in operational efficiency. Author

A84-44096* Miami Univ., Coral Gables, Fla.

VIGILANCE AND TASK LOAD - IN SEARCH OF THE INVERTED U

E. L. WIENER (Miami, University, Coral Gables, FL), R. E. CURRY (NASA, Ames Research Center, Moffett Field, CA), and M. L. FAUSTINA (San Jose State University, San Jose, CA) *Human Factors* (ISSN 0018-7208), vol. 26, April 1984, p. 215-222. refs

The 'Inverted-U Hypothesis' states that for a given task, there is an optimal level of workload or demand that yields the highest level of performance. A departure in either direction will result in a monotonically lower performance level, hence an inverted-U-shaped relationship between task demand and quality of performance. Most studies to date have failed to demonstrate the left-hand branch of the curve, that is, the regime in which performance presumably rises as load increases. The purpose of this study was to explore whether low-level additional demand on the monitor would result in improved performance. Four groups of subjects performed a visual monitoring task for 48 min, then two of the four groups were given additional tasks, and a third had potentially distracting information on its display. Results indicated that the two groups with additional demand detected more signals than did the control group or the control-plus-distraction group. There were no significant differences in false alarms. Author

A84-44749

THE MEASUREMENT OF COCKPIT WORKLOAD

P. KOHN (Sanders Associates, Inc., Nashua, NH) and E. STEIN (FAA, Technical Center, Atlantic City, NJ) IN: *Air Traffic Control Association, Annual Fall Conference*, 27th, Atlantic City, NJ, October 18-21, 1982, Proceedings. Arlington, VA, Air Traffic Control Association, 1982, p. 286, 287.

An experiment measuring dynamically perceived cockpit workload is described, as part of a series of experiments conducted by the FAA to determine the correlation between cockpit workload and meteorological conditions and the complexity of interaction with a ground based ATC system. In the experiment, 12 volunteer pilots with previous flying experience in multiengine aircraft were studied. The performance measures of the study were subjective, self-reported estimates of workload, over three simulated flights of approximately 25 minutes duration. Analysis of the data derived from in-flight and postflight questionnaires revealed the following results: (1) pilots were able and willing to enter a workload rating every minute; and (2) no interference with normal pilotage functions was detected, even during simulated emergencies. Since the in-flight and postflight estimates of workload represent two different aspects of the same experience, they are found to be complementary. I.H.

A84-45659

DISTURBANCE OF SLEEP BY NOISE - INDIVIDUAL DIFFERENCES

R. T. WILKINSON (Medical Research Council, Applied Psychology Unit, Cambridge, England) *Journal of Sound and Vibration* (ISSN 0022-460X), vol. 95, July 8, 1984, p. 55-63. refs

The literature on the effects of noise on sleep is searched for evidence on individual differences along the dimensions of age, sex, occupation, personality, neuroticism, and mental health. With the exception of age, little firm evidence is found. Thus, there remains a need to establish at better than the anecdotal level whether or not real individual differences exist. Author

A84-45924

THE CORRELATION OF CLOSED EYE MOVEMENTS WITH THE PROCESS OF TASK PERFORMANCE [SVIAZ' DVIZHENII ZAKRYTYKH GLAZ S PROTSESSOM RESHENIIA ZADACHI]

T. M. BUIAKAS and T. M. FEDOROVA *Moskovskii Universitet, Vestnik, Seria 14 - Psikhologiya*, Jan.-Mar. 1984, p. 45-55. In Russian. refs

The distribution of types of macrodrifts and backward movements of closed eyes in the performance of tactile, mnemonic, graphic and translational tasks is described. It is assumed that the macrodrifts correspond to the stage of activity which demands exertion of a certain amount of inner effort, while the backward movements correspond to the removal of the effort. The analysis of closed eye macrodrifts during the performance of a task reveals the psychological structure and organizational features of the macrodrifts. I.H.

N84-31911# Joint Publications Research Service, Arlington, Va. **PSYCHOPHYSIOLOGICAL ASPECTS OF MONOTONOUS HUMAN ACTIVITY Abstract Only**

A. A. KOLODYNSKIY and V. V. KOLODYNSKA *In its USSR Rept.: Life Sci. Effects of Nonionizing Electromagnetic Radiation (JPRS-UNE-84-001)* p 61 6 Jan. 1984 Transl. into ENGLISH from *Izv. Akad. Nauk Latv. SSR (Riga)*, no. 7, Jul. 1983 p 102-111

Avail: NTIS HC A06

The psychophysiological correlates of monotonous mental and physical activity as it affects human performance are reviewed. The basic mechanisms underlying the negative consequences of such sensory monotony involve activation of the right cerebral hemisphere with simultaneous deactivation of the left hemisphere and motor asymmetry. The activation of the right hemisphere, particularly the posterior temporal area, and the concomitant inverse change in the left one may be key factors leading to perturbation of interhemispheric neurodynamics and suboptimal selfregulation in the brain, finding somatic manifestations as less

53 BEHAVIORAL SCIENCES

efficient task performance. It is concluded that improvement of performance under such conditions may rest on the selective stimulation of the right and left hemispheres to ensure a near physiological functional balance. E.A.K.

N84-31927# Joint Publications Research Service, Arlington, Va. **LINK BETWEEN CHARACTERISTICS OF EEG RHYTHMS IN BIOFEEDBACK CONTROL AND INDEXES FOR OPERATOR ACTIVITY Abstract Only**

V. G. MARKMAN, S. KURGUZOV, and M. Z. KHANDOV *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 44 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 994-998*

Avail: NTIS HC A06/MF A01

The feasibility of predicting operator abilities on the basis of individual characteristics in conscious control of EEG rhythms is examined. After establishing baseline values for comparing the biofeedback control of EEG parameters and the ability to track a radar target on a laboratory simulator, tests are conducted in 160 subjects. Subjects are divided into two groups; one trained to increase the alpha rhythm, the other to reduce theta rhythm. Determinations are then made of the working characteristics of subjects as they solve problems on a radar tracking simulator. Results are shown for visual motor compensation tracking, conscious control of alpha rhythm and work on the radar simulator, and conscious control of alpha and theta rhythm control of EEG parameters is not associated with time based assessments of operator skill. The indexes for biofeedback control of alpha rhythm enable prediction of success in operator task solving in extreme conditions. M.A.C.

N84-31928# Joint Publications Research Service, Arlington, Va. **QUANTITATIVE ASSESSMENT OF ROLE OF SPATIAL FREQUENCIES OF IMAGES IN VISUAL RECOGNITION OF NUMBERS Abstracts Only**

Y. D. BORISOVA *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 45 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 999-1004*

Avail: NTIS HC A06/MF A01

A quantitative evaluation is made of the role of the spatial frequency component of the Fourier spectrum for symbols (figures) during the process of visual recognition. Actual images are used whose spectral composition is altered in accordance with the tasks set. After band elimination spatial filtering in a digital computer, and the spatial frequency above a predetermined level is clipped. The remaining part of the image is not distorted. Psychophysiological characteristics in recognition of the filtered images are studied using a tachistoscopic method. When spatial frequencies higher than 1.22 cycles per degree are filtered out, images are virtually unrecognizable. Image recognition patterns are retained when contrast is reduced within specific limits, but reduction of contrast causes lower correct recognition values when exposure time is reduced. M.A.C.

N84-31933# Joint Publications Research Service, Arlington, Va. **PSYCHOPHYSICS OF PROPRIOCEPTIVE SENSIBILITY Abstract Only**

I. A. RYBIN, A. N. SERGEYEVA, and A. P. KASATOV *In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 75-76 7 Aug. 1984 Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 974-978*

Avail: NTIS HC A06/MF A01

Results are presented from a study of subjective assessment of spatial shifts based on the sensory system of the musculoskeletal system. The ability of subjects to assess the angle of rotation of the forearm in the horizontal plane without visual control is investigated. Results are processed using the method of least squares. Results are presented in graphic and tabular form showing the distribution of subjects for the Stevens' function in active and passive movement compared with normal distribution, and the

distribution of individual indexes for subjects in subgroups. Differences in active and passive movements are discussed and it is concluded that care should be taken with regard to the effectiveness of simulation training for sportsmen since development of motor skills is less adequate than in active training where learning to eliminate error promotes acquisition of a high level of resistance to noise in sensory signals. M.A.C.

N84-31941# Rice Univ., Houston, Tex. Dept. of Psychology. **THE EFFECT OF INFORMATION DISPLAY FORMAT ON MULTIPLE-CUE JUDGMENT**

S. P. KERKAR and W. C. HOWELL Jun. 1984 53 p (Contract N00014-82-C-0001)

(AD-A142884; TR-84-2) Avail: NTIS HC A04/MF A01 CSCL 05J

Since empirical evidence on the effects of display features in cognitive tasks is sparse, three studies were conducted to explore various aspects of the relationship. In all three, subjects were required to combine multiple predictive items (teacher attributes, applicant test scores) into overall evaluations (teacher effectiveness; qualification for a defined position) under conditions of either graphic or numerical display. Using the policy capturing methodology, in which multiple regression is used to model behavior, a description of individual judgment strategies was obtained. Display format was found to have a direct influence on the importance attached to (the weighting of) the separate pieces of information (viz., intelligence, etc.) in forming an overall evaluation. Moreover, simultaneous presentation of graphic information tended to produce holistic processing in contrast with the serial processing of numerical information. These findings appear to have important implications for the design of computer-based information processing systems. GRA

N84-31942# Tennessee Univ., Knoxville. **VARIABILITY OF PRACTICE AND THE TRANSFER OF TRAINING OF MOTOR SKILLS**

C. A. WRISBERG and T. P. WINTER Nov. 1983 50 p (Contract MDA903-81-C-0216; DA PROJ. 2Q1-61101-B-74-F) (AD-A142896; ARI-TR-596) Avail: NTIS HC A03/MF A01 CSCL 05I

The Training and Simulation Technical Area of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) maintains a program of research in support of the systems approach to training. A major focus of this program is the development of fundamental data and technology in the areas of skill acquisition, retention and transfer necessary for fielding training systems that improve individual job performance. Typically, soldiers are trained in service schools on only a portion of those tasks required for effective job performance. The remaining tasks are trained on the job once soldiers arrive in their operational units. Because unit training resources are limited, a primary goal of school training is to promote effective positive transfer of school-taught tasks to those additional tasks required on the job. Such transfer would reduce unit training demands and promote better on-the-job performance and associated combat readiness. This basic research report examines the effects of amount and variability of practice on the transfer of training of motor skills. The findings indicate that transfer improves with increased initial task training but that the effects of variety are task specific. GRA

N84-32227# Air Force Human Resources Lab., Williams AFB, Ariz. Operations Training Div. **PILOT ORIENTED PERFORMANCE MEASUREMENT**

J. DEMAIIO, H. H. BELL, and J. BRUNDERMAN *In American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 27-31 16 Nov. 1983* (AD-P003450) Avail: NTIS HC A17/MF A01 CSCL 05I

Flight simulators provide a complete quantitative record of a pilot's flying performance. Evaluating this record is complicated by the volume of data and by its fine detail, dozens of flight parameters, sampled many times per second. Automated performance measurement systems (APMS) reduce the volume of

data to an amount which is manageable and understandable. The usual APMS is aircraft state oriented. The APMS keys on aircraft state (e.g., X-Y position, bank angle) to define intervals over which performance data are integrated. This PAMS is relatively insensitive to pilots' intentions and so may average performances which had differing objectives, based only on their having occurred at the same point during the task sequence. An alternative APMS has been developed which is piloted oriented. This APMS defines measurement intervals based on control inputs. Control inputs are identified by discrete changes in flight path. These intervals are psychologically relevant in that they begin with a goal-directed control input and end with a countervailing input. By relating performance in the pilot defined intervals to state defined intervals, it is possible to quantify performance on given flight segments (e.g., a level turn), and to specify factors which lead to a given level of performance. Author (GRA)

N84-32228# McDonnell-Douglas Electronics Co., St. Charles, Mo.

NEW CONCEPTS IN AIRCREW TRAINING USING COMPUTER GENERATED IMAGERY: A STUDY REPORT

D. HAUCK and M. VERSTEGEN *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 32-38 16 Nov. 1983 (AD-P003451) Avail: NTIS HC A17/MF A01 CSCL 05I

The results of a study of the use of computer generated imagery in non-traditional training techniques are reported. These techniques complement and extend the role of a simulator from that of aircraft replicator to that of a training device. The study had three primary objectives: (1) exploit the flexibility of CGI to generate new concepts in aircrew training methods; (2) develop and demonstrate examples of these concepts; and (3) perform exploratory testing of the examples to assess their effectiveness and pilot acceptance. For future study, the concept of using the simulator as a specific visual task trainer is discussed.

Author (GRA)

N84-32235# Air Force Human Resources Lab., Williams AFB, Ariz. Operations Training Div.

VISUAL CUEING EFFECTIVENESS: COMPARISON OF PERCEPTION AND FLYING PERFORMANCE

J. DEMAIQ, E. J. RINALDUCCI (Georgia Inst. of Tech.), R. BROOKS, and J. BRUNDERMAN *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 92-96 16 Nov. 1983 (AD-P003458) Avail: NTIS HC A17/MF A01 CSCL 05I

Growing emphasis on simulation of low altitude and air-to-air tactical scenarios has greatly increased the requirement for simulator visual systems capable of providing the pilot high-fidelity out-of-the-cockpit cues. Evaluation of visual system performance through simulator flying studies has been the primary measure of system quality. Such studies can be costly and time consuming, and often they provide equivocal results. The present set of experiments was conducted to investigate the use of psychophysical measurement methodology to provide quick, low-cost evaluation of the altitude cueing effectiveness of simulator visual displays. Experiment 1 examined altitude perception in several visual environments. Experiment 2 was a validation effort, in which flying performance was evaluated in selected visual environments. In Experiment 1 pilots made altitude estimates based on static and dynamic presentations of visual displays containing texture and varying sizes of 3-dimensional objects. Best-fitting power functions were used to relate perceived altitude to actual altitude. In Experiment II Air force pilots flew the Advanced Simulator for Pilot Training F-16 through five selected visual environments at 600 ft and 150 ft AGL. Reliable difference were found as a function of display variables. GRA

N84-32242# Falcon Research and Development Co., Buffalo, N. Y.

MARINE CORPS GROUND SIMULATOR TRAINING NEEDS IN THE 1985-1995 TIME FRAME

P. PATTI and J. MARLIN (Marine Corps., Quantico, Va.) *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 127-139 16 Nov. 1983

(AD-P003465) Avail: NTIS HC A17/MF A01 CSCL 15E

This study was initiated to develop a document to be used for the planning and programming of simulation acquisition in support of Marine Corps training. Generic training task requirements in the ground combat (C), combat support (CS) and combat service support (CSS) fields which can be enhanced through the use of simulation were identified. Tradeoff analyses were performed to develop prioritized lists of the tasks for which simulators should be developed and of recommended generic-type simulation devices. The extent of the need for simulation was assessed by determining which of the training task requirements would be improved by the use of simulation, taking into account the technology state-of-the-art (SOA). Measures of quality of training used included: performance, time to train, training cost, personnel support, technological risk, integratability with other training, and special assets requirements. This paper describes the methodology applied and the results obtained. Special emphasis is put on the criteria utilized and the planned future use of the results.

Author (GRA)

N84-32261# Air Force Human Resources Lab., Williams AFB, Ariz. Operations Training Div.

TRAINING THE MULTIPLE-AIRCRAFT COMBAT ENVIRONMENT

P. A. COOK and C. L. HANSON *In* American Defense Preparedness Association Proc. of the 5th Interservice/Ind. Training Equipment Conf., Vol. 1 p 350-355 16 Nov. 1983 (AD-P003495) Avail: NTIS HC A17/MF A01 CSCL 05I

Aircrew training devices for the teaching of tactical combat maneuvering currently range from simple desk-top trainers to large weapon system trainers with limited visual systems. Still missing from the spectrum is the capability to practice full-mission multi-ship scenarios. At present such training can only be provided by major field exercises such as Red Flag, at great expense. A network of hostile-environment simulators could greatly increase the frequency of training, provide more realistic training, and keep pilots at a higher state of readiness than by using aircraft alone. The Air Force Human Resources Laboratory is exploring technology requirements for multiple aircraft simulation under Project 2743, the Combat Mission Trainer (CMT) program. The goal is to develop a full-mission combat simulator affordable at the wing level and capable of training all air-to-air and air-to-ground tasks.

Author (GRA)

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

A84-43440*# Massachusetts Inst. of Tech., Cambridge. RESULTS OF THE M.I.T. BEAM ASSEMBLY TELEOPERATOR AND INTEGRATED CONTROL STATION

J. R. SPOFFORD and D. L. AKIN (MIT, Cambridge, MA) IN: Guidance and Control Conference, Seattle, WA, August 20-22, 1984, Technical Papers . New York, American Institute of Aeronautics and Astronautics, 1984, p. 351-359. refs

(Contract NAGW-21)

(AIAA PAPER 84-1890)

To examine the issues of optimum human-machine mixtures for orbital assembly operations, a full six degree-of-freedom teleoperator system for assembly of large space structures has been developed by the Space Systems Laboratory. This consists of a free-flying neutrally buoyant Beam Assembly Teleoperator (BAT) with two manipulators, and a modular Integrated Control Station (ICS). The design and configuration of both the BAT and the ICS are described in some detail in this paper. In addition, qualitative results from early tests of the system are presented. These tests concentrated mostly on free-flying operations and grasping. Future tests will involve complete teleoperated assembly. Author

A84-43446*# Purdue Univ., Lafayette, Ind. TIME SERIES MODELING OF HUMAN OPERATOR DYNAMICS IN MANUAL CONTROL TASKS

D. J. BIEZAD and D. K. SCHMIDT (Purdue University, West Lafayette, IN) IN: Guidance and Control Conference, Seattle, WA, August 20-22, 1984, Technical Papers . New York, American Institute of Aeronautics and Astronautics, 1984, p. 399-414. refs

(Contract NAG4-1)

(AIAA PAPER 84-1899)

A time-series technique is presented for identifying the dynamic characteristics of the human operator in manual control tasks from relatively short records of experimental data. Control of system excitation signals used in the identification is not required. The approach is a multi-channel identification technique for modeling multi-input/multi-output situations. The method presented includes statistical tests for validity, is designed for digital computation, and yields estimates for the frequency responses of the human operator. A comprehensive relative power analysis may also be performed for validated models. This method is applied to several sets of experimental data; the results are discussed and shown to compare favorably with previous research findings. New results are also presented for a multi-input task that has not been previously modeled to demonstrate the strengths of the method. Author

A84-43735 AUDIO-OCULAR RESPONSE - SACCADIC PROGRAMMING

S. TRACCIS, L. A. ABEL, and L. F. DELLOSSO (U.S. Veterans Administration, Medical Center, Case Western Reserve University, Cleveland, OH) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 735-739. Research supported by the U.S. Veterans Administration. refs

The eye movements elicited by auditory stimuli - the audio-ocular response (AOR) - differ from those made in response to a visual target. The movements consist of both monosaccadic and multiple saccadic refixations (MSR). In visual refixation, monosaccadic refixations are always accurate; in AOR, they rarely are. In MSR, many strategies were used in the attempt to find the target but they were not always successful. However, final amplitudes of the total refixation were quite accurate in both MSR and monosaccadic refixations. Velocity profiles of the AOR showed such anomalies

as discrete decelerations and multiple, closely-spaced saccades. These data suggest that, without visual feedback, the location of acoustic targets is difficult. In the absence of visual afference, when vigilance may be decreased by the lack of arousal, the velocity profiles also became abnormal, even at small amplitudes. Thus, for cockpit warning devices, a combination of auditory and visual indicators should be used. Author

A84-43737

THE ENERGY EXPENDITURE OF HELICOPTER PILOTS

R. THORNTON, G. A. BROWN, and C. HIGENBOTTAM (RAF, Institute of Aviation Medicine, Farnborough, Hants., England) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 55, Aug. 1984, p. 746-750. refs

The results of an experiment to measure the energy cost of Army Air Corps and Royal Air Force helicopter pilots during flight in Gazelle and Puma helicopters are reported. For comparison, the energy expenditure of the subjects was measured at rest and while walking to and from the aircraft. Heart rates were also recorded. The results of the experiment confirm the findings of other authors that the energy cost of flying helicopters is about 50 percent higher than that of sitting at rest. I.H.

A84-44091

CORRELATES OF OCULAR AND SOMATIC SYMPTOMS AMONG VIDEO DISPLAY TERMINAL USERS

A. B. SMITH, S. TANAKA, W. HALPERIN (U.S. Public Health Service, National Institute for Occupational Safety and Health, Cincinnati, OH), and R. D. RICHARDS (Maryland, University, Baltimore, MD) Human Factors (ISSN 0018-7208), vol. 26, April 1984, p. 143-156. refs

A cross-sectional survey was conducted among employees of a large newspaper company (1) to define the type of ocular and somatic complaints reported by video display terminal (VDT) users and to identify their relationship to VDT use, (2) to determine the association between symptoms and the participants' adequacy of correction of refractive errors for their jobs, and (3) to assess the prevalence of eye abnormalities, especially cataracts, and their relationship to VDT use. Poor visual clarity of the VDT screen explained the plurality of work-associated symptoms. These associations were independent of the effects of potential confounding variables. The relationships with headaches associated with work and changes in visual function were replicated in a small, independent sample. One qualitative and two quantitative VDT-use variables that suggested lesser skill or experience were associated with headaches. No meaningful relationship was found between adequacy of the participants' refractions, including the wearing of glasses with bi- or multifocal lenses, and the reporting of work-associated symptoms. No significant association was found between VDT use and the prevalence of eye abnormalities, including cataracts. Author

A84-44095

DEXTERITY PERFORMANCE AND REDUCED AMBIENT TEMPERATURE

M. W. RILEY and D. J. COCHRAN (Nebraska, University, Lincoln, NE) Human Factors (ISSN 0018-7208), vol. 26, April 1984, p. 207-214. refs

(Contract NIH-1-R01-OH-0129-02)

The results of an experimental evaluation of the dexterity performance of 70 male and female subjects at ambient temperatures of 1.7, 12.8, and 23.9 C are reported. The tests consisted of four manipulative, pencil-point tapping and assembly tasks, as well as the Purdue Pegboard test. The results showed little change in performance from the high ambient temperature to the middle temperature (23.9 to 12.8 C), but considerable change from the high and middle temperatures to the low ambient temperature (1.7 C). It is pointed out that there should exist some range at which significant decrements in performance begin to take place. Several differences were found in the relative performances of men and women, and some possible explanations for the differences are discussed. I.H.

A84-44751

THE FLIGHT SERVICE AUTOMATION SYSTEM

J. T. REHMANN (FAA, Technical Center, Atlantic City, NY) IN: Air Traffic Control Association, Annual Fall Conference, 27th, Atlantic City, NJ, October 18-21, 1982, Proceedings. Arlington, VA, Air Traffic Control Association, 1982, p. 307-312.

Results of an evaluation of selected functions of the Flight Service Automation System (FSAS), Model 2, are presented. The FSAS provides a means of rapid information retrieval as well as continuously updated graphics and radar products. Flight and weather data are processed and stored in computers for immediate call-up on CRT displays. The evaluation, which has been performed in the laboratory under conditions closely simulating actual operation conditions, has prompted changes to several messages to improve their effectiveness. The advantages of the evaluations of this kind are discussed, with particular attention given to data distribution and optimal human factor design. V.L.

A84-45160

AN APPROACH TO CONTROL LAWS FOR ARM MOTION

A. AILON (Rensselaer Polytechnic Institute, Troy, NY), G. LANGHOLZ (Tel Aviv University, Tel Aviv, Israel; Florida State University, Tallahassee, FL), and M. ARCAN (Tel Aviv University, Tel Aviv, Israel) IEEE Transactions on Biomedical Engineering (ISSN 0018-9294), vol. BME-31, Sept. 1984, p. 605-610. refs

This paper is concerned with the investigation of arm motion between fixed boundary conditions within a two-dimensional space. An approach to the mathematical modeling and formulation of the control laws which govern arm reaching motion is presented.

Author

A84-46258

DEXTERITY IS JUST A FUMBLE IN SPACE

H. ROSS (Stirling, University, Stirling, Scotland) New Scientist (ISSN 0028-6664), vol. 103, Aug. 23, 1984, p. 16, 17.

An experiment was performed aboard Spacelab 1 to determine whether or not mass discrimination and weight discrimination could return to normal values under prolonged weightlessness. The apparatus consisted of a box containing 24 balls ranging from 50 to 64 grams in mass. The balls were picked up in pairs, shaken in the hand, and returned to the box, determining then which felt heavier. The crew members were tested prior to the flight, which resulted in an error of approximately 25 percent, rising to 33 percent during the flight. The 10-day mission showed no sign of improvement, and postflight performance was poorer than that of preflight. The crew showed postural and other after-effects of weightlessness, and their ability to discriminate weight was impaired. The main result of the experiment seems to be that weight is a more important component of the sensation of heaviness than is inertial mass. J.P.

N84-31917# Joint Publications Research Service, Arlington, Va.

FIRST MIXED CREW IN SPACE Abstract Only

In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-012) p 1 6 Jun. 1984 Transl. into ENGLISH from Zdorovye (Moscow), no. 11, Nov. 1982 p 12-14

Avail: NTIS HC A05/MF A01

The Soyuz T-7 flight was the first to include a woman crew member. Medical and biological changes during the flight were investigated. No significant differences were found in the physiological reactor of the females or males to the extreme factors of space flight. It is shown that women adapt more rapidly and successfully to hypokinesia than men. It is found that women are well suited for future, longer space flights. E.A.K.

N84-31918# Joint Publications Research Service, Arlington, Va. **ERGONOMIC ANALYSIS OF HUMAN OPERATION OF VIDEO TERMINAL Abstract Only**

V. M. BONDAROVSKAYA In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-012) p 30 6 Jun. 1984 Transl. into ENGLISH from Prib. i Sistemy Uprav. (Moscow), no. 7, Jul. 1983 p 6-7

Avail: NTIS HC A05/MF A01

Ergonomics and video terminal systems were analyzed. The activity of the users of a number of editing systems was studied and fatigue was observed in 70% of cases after 2 hours of work. Recommendations were developed to improve the organization of labor of terminal users, which includes arrangement of information on the screen in a manner convenient for reading and for location of fragments of text rather than as a continuous sequence of characters, reduction in the quantity of information presented at one time, adjustment of computer response time to the user in accordance to the structure of the activity which is performed, and provisions of a reaction by the computer to virtually every action by the operator. Five to 10 minute breaks are recommended each 2 hours of work. E.A.K.

N84-31919# Joint Publications Research Service, Arlington, Va. **RESULTS OF PSYCHOPHYSIOLOGICAL STUDY OF VIDEOTON TERMINAL OPERATORS Abstract Only**

O. A. LIKHACHEVA, L. P. STEPANOVA, and V. K. KHUKHLAYEV In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-012) p 30-31 6 Jun. 1984 Transl. into ENGLISH from Prib. i Sistemy Uprav. (Moscow), no. 7, Jul. 1983 p 7-8

Avail: NTIS HC A05/MF A01

Studies were performed using a combination of methods including measurement of critical blinking frequency, reaction to sound, endurance and strength of the hands in order to determine the basic properties of the central nervous system during work with the Videoton computer terminal. Subjects were 18 to 33 years of age and had been working with the terminal for one month to 6 years. It was found that operator fatigue, headache and other symptoms are characteristic of CRT terminal workers and increase with an increase in the information load. The study did not answer whether the specific source of these sensations is the hardware itself, the blinking of the signal characters, the density of information on the screen or something else. E.A.K.

N84-31920# Joint Publications Research Service, Arlington, Va. **REALIZATION OF HUMAN WORK CAPACITY: INTERDISCIPLINARY PROBLEMS Abstract Only**

B. S. MARYENKO, K. R. KOPYSTYANSKAYA, and N. A. TITOVA In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-012) p 31 6 Jun. 1984 Transl. into ENGLISH from Visn. Akad. Nauk Ukr. RSR (Kiev), no. 1, Jan. 1984 p 25-33

Avail: NTIS HC A05/MF A01

Approaches to utilization of human work capacity are discussed from a psychophysiological and organizational point of view. In addition to relying on physiological and psychological testing of applicants for a position to determine their suitability, factors such as creating favorable work environments and rational work assignment and management are important. Optimum production and productivity can only be expected when all the factors pertinent to a given work situation are scientifically analyzed and evaluated. This also implies the need for periodic reassessment of both the health and attitudes of the workers, and of the changing job requirements. E.A.K.

N84-31921# Joint Publications Research Service, Arlington, Va. **STRESS IN WORK Abstract Only**

K. M. SMIRNOV In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-012) p 32 6 Jun. 1984 Transl. into ENGLISH from Usp. Fiz. Nauk (Moscow), v. 15, no. 1, Jan-Feb. 1984 p 76-99

Avail: NTIS HC A05/MF A01

Labor physiology concerns itself with the state and activity of the human body during performance of some work. Concepts,

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

terminology and general ideas of labor physiology are defined to distinguish between stress and strain. Work strain is discussed for general physical labor, local physical effort and nonphysical exertion. The effect of the environment and the cumulative effect of multiple factors on human performance are addressed. Evaluation criteria and possible normalization of labor stress are addressed. Data on labor stress and strain are a component of the knowledge on human physiology and are considered in hygienic and ergonomic evaluations and productivity analyses. E.A.K.

N84-31926# Joint Publications Research Service, Arlington, Va.
EFFECT OF BODY TEMPERATURE ON HUMAN WORK CAPACITY Abstract Only

A. S. PAVLOV *In its* USSR Rept.: Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-84-017) p 43-44 7 Aug. 1984
Transl. into ENGLISH from Fiz. Cheloveka (Moscow), v. 9, no. 6, Nov.-Dec. 1983 p 963-968

Avail: NTIS HC A06/MF A01

Changes of a variety of indicators of physical and mental work capacity were investigated in trained and untrained persons at various levels of gradually developing muscular hyperthermia in the range of 1.5-2.0 deg. It is shown that in conditions of such hyperthermia the work-capacity indicator first increase by 108-112 percent and then decline. These results lead to the conclusion that an increase of body temperature under physical-load conditions is a positive phenomenon. (IAA)

N84-31943 Ohio State Univ., Columbus.
MODELING, CONTROL AND SIMULATION OF THREE-DIMENSIONAL ROBOTIC SYSTEMS WITH APPLICATION TO BIPED LOCOMOTION Ph.D. Thesis

Y. F. ZHENG 1984 197 p refs

Avail: Univ. Microfilms Order No. DA8410448

A three dimensional, five link biped system is established. Newton/Euler state space formulation is employed to derive the equations of the system. The constraint forces involved in the equations can be eliminated by projection onto a smaller state space system for deriving advanced control laws. A model referenced adaptive control scheme is developed to control the system. Impact effects of biped contact with the environment are modeled and studied. A mathematical model of the skeletal muscle is discussed. A physical threshold model is proposed for recruitment which encompasses the size principle, its manifestations and exceptions to the size principle. Dissert. Abstr.

N84-31944*# Martin Marietta Corp., Denver, Colo.
TELEOPERATOR HUMAN FACTORS STUDY Progress Report, 8 May - 8 Jun. 1984

Jun. 1984 3 p

(Contract NAS8-35184)

(NASA-CR-171120; NAS 1.26:171120; MCR-83-607) Avail:

NTIS HC A02/MF A01 CSCL 05H

The progress made on the Teleoperator Human Factors Study program is summarized. Technical and programmatic problems that were encountered were discussed along with planned activities. The report contains four sections: Work Performed, Future Work, Problems Encountered, and Cost Information R.S.F.

N84-31945*# Ohio State Univ., Columbus. Dept. of Industrial and Systems Engineering.
RESEARCH ON COMPUTER AIDED TESTING OF PILOT RESPONSE TO CRITICAL IN-FLIGHT EVENTS Final Report, 1 Jan. 1983 - 31 Mar. 1984

W. C. GIFFIN, T. H. ROCKWELL, and P. J. SMITH 1 Jun. 1984
277 p refs

(Contract NAG2-112)

(NASA-CR-173871; NAS 1.26:173871) Avail: NTIS HC A13/MF A01 CSCL 05H

Experiments on pilot decision making are described. The development of models of pilot decision making in critical in flight events (CIFE) are emphasized. The following tests are reported on the development of: (1) a frame system representation describing how pilots use their knowledge in a fault diagnosis

task; (2) assessment of script norms, distance measures, and Markov models developed from computer aided testing (CAT) data; and (3) performance ranking of subject data. It is demonstrated that interactive computer aided testing either by touch CRT's or personal computers is a useful research and training device for measuring pilot information management in diagnosing system failures in simulated flight situations. Performance is dictated by knowledge of aircraft subsystems, initial pilot structuring of the failure symptoms and efficient testing of plausible causal hypotheses. E.A.K.

N84-31946# Inflation Systems International, Canyon Country, Calif.

DEVELOPMENT, TEST AND DELIVERY OF SOLID PROPELLANT GENERATORS FOR INFLATION OF PFD'S Final Report, Oct. 1980 - Oct. 1981

G. HOLCOMBE, B. HAMILTON, and T. BORLAND 22 Oct. 1981
59 p refs

(Contract DTCG-23-80-C-20031)

(AD-A130047; USCG-D-31-82) Avail: NTIS HC A04/MF A01
CSCL 211

The objective of the program is to develop and test solid propellant gas generation system as a practical replacement for CO2 cartridges for inflatable life jackets and/or hybrid life jackets, with enhanced reliability and performance over a temperature range of -65 F to 185 F. To document comparative performance of the CO2 and solid propellant systems, test beds of 20 lb. and 35 lb. buoyancy inflatables are employed. Repetitive tests are made of each system, over the indicated environmental span, with specimens subjected to shock, vibration, cycling, and many other tests necessary to prove functional and life savings reliability and capability. The solid propellant inflator (SPI) test results reflect uniform performance across the temperature range at time/pressure levels considered ideal for the usage. The CO2 cartridge performance was poor at soak temperatures below 20 F and above 150 F. As the SPI is pressured only upon activation, leakage during storage is not possible. Operating pressure is under 500 psi and a small overpressure device negates the possibility of overpressure stress from a blocked orifice condition. It is concluded that the SPI represents a significant improvement in the inflation of life jackets and similar buoyant devices, having the need for prompt, reliable, fail/safe performance. Author

N84-31947# California Univ., Los Angeles.
MEASUREMENT AND MODIFICATION OF SENSORIMOTOR SYSTEM FUNCTION DURING VISUAL-MOTOR PERFORMANCE Annual Technical Report, 30 Sep. 1982 - 29 Sep. 1983

M. B. STERMAN Apr. 1984 10 p

(Contract AF-AFOSR-0335-82)

(AD-A142919; AFOSR-84-0520TR) Avail: NTIS HC A02/MF A01 CSCL 05J

Studies conducted during the initial phase of this project had two major objectives. The first was the selection of a visual-motor performance task that met the needs of (1) long term operation, (2) physiological and functional appropriateness, (3) relevance to the Air Force mission, and (4) feasibility within the resources available to us. Towards this end four video games were tested on each of six adult subjects. Evaluation of these tasks as well as EEG correlates of performance led to the selection of one for subsequent studies. Our second objective was to determine if the quantitative analysis of somatosensory EEG characteristics could yield information predictive of performance. Preliminary findings indicate that specific frequency components do, indeed, change in relation to response accuracy and speed. These consistent observations provided support for our basic assumptions and will guide the focus of subsequent studies. GRA

N84-31948# Monroney (Mike) Aeronautical Center, Oklahoma City, Okla. Protection and Survival Lab.
UNIFORM MASS DISTRIBUTION PROPERTIES AND BODY SIZE APPROPRIATE FOR THE 50 PERCENTILE MALE AIRCREWMEMBER, 1980 - 1990
 R. F. CHANDLER and J. YOUNG 27 Mar. 1981 21 p
 (AD-A142946; AAC-119-81-4) Avail: NTIS HC A02/MF A01 CSCL 05E

The design and analysis of aircraft seating, restraint and interior systems requires careful consideration of human factors relating to the mission to be performed and to the characteristics of the occupant. If comparisons are to be made among different system concepts, it is desirable to have a uniform basis for describing the characteristics of the human occupant and of any tools used as a human surrogate in the design, analysis or evaluation of the system. To this end, the U.S. Army Aeromedical Research Laboratory initiated an effort for the promotion of a tri-service Standard Man military specification in February 1980. The immediate goal of that effort was to develop a specification for body dimensions, joint locations, sitting heights, and mass distribution of military aircrewmembers. A meeting was held in March 1980 to discuss this effort and to establish a program to accomplish the work. GRA

N84-33020*# Old Dominion Univ., Norfolk, Va. Center for Applied Psychological Studies.

VISUAL INFORMATION TRANSFER. 1: ASSESSMENT OF SPECIFIC INFORMATION NEEDS. 2: THE EFFECTS OF DEGRADED MOTION FEEDBACK. 3: PARAMETERS OF APPROPRIATE INSTRUMENT SCANNING BEHAVIOR Progress Report, 15 Feb. - 15 Aug. 1984

J. R. COMSTOCK, JR., R. H. KIRBY, and G. D. COATES Aug. 1984 4 p
 (Contract NAG1-451)
 (NASA-CR-173913; NAS 1.26:173913; PAL-84-32) Avail: NTIS HC A02/MF A01 CSCL 05H

Pilot and flight crew assessment of visually displayed information is examined as well as the effects of degraded and uncorrected motion feedback, and instrument scanning efficiency by the pilot. Computerized flight simulation and appropriate physiological measurements are used to collect data for standardization.

M.A.C.

N84-33021*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SHOULDER AND HIP JOINT FOR HARD SPACE SUITS AND THE LIKE Patent Application

H. C. VYKUKAL, inventor (to NASA) 20 Aug. 1984 22 p
 (NASA-CASE-ARC-11534-1; NAS 1.71:ARC-11534-1;
 US-PATENT-APPL-SN-642602) Avail: NTIS HC A02/MF A01 CSCL 06Q

A joint between the covering and the upper arm covering (i.e., shoulder) or between the torso covering and upper leg covering (i.e., hip) is disclosed. Each joint has an outer covering and an inner covering. The outer covering has plural truncated toroidal sections decreasing in size proceeding outwardly. To accommodate the decreased size of the next section, at the smaller end of each section is an end wall filling what would otherwise be a gap between the sections. Bellows like inner walls are also provided for each section fixed at one end to an inner cylindrical flange and, at the opposite end, to an end wall. Each outer section may rotate 360 deg relative to the next outer section, whereas the bellows sections do not rotate, but rather expand or contract locally as the rigid sections rotate relative to each other. NASA

N84-33022*# Martin Marietta Corp., Denver, Colo.
TELEOPERATOR HUMAN FACTORS STUDY Progress Report, 8 Aug. - 8 Sep. 1984
 Sep. 1984 3 p
 (Contract NAS8-35184)
 (NASA-CR-173890; NAS 1.26:173890; MCR-83-607) Avail: NTIS HC A02/MF A01 CSCL 05H

The progress made on the Teleoperator Human Factors Study program is summarized. Technical and programmatic problems that were encountered are discussed along with planned activity. Work performed, future work, problems encountered, and cost information comprise the topics addressed herein. R.S.F.

N84-33023*# Narco Scientific, Houston, Tex.
DEVELOPMENT OF ENGINEERING PROTOTYPE OF LIFE SUPPORT MODULE (LSM) Final Report

Aug. 1984 104 p
 (Contract NAS9-16723)
 (NASA-CR-171806; NAS 1.26:171806) Avail: NTIS HC A06/MF A01 CSCL 06K

The development of an engineering prototype of a life support system is discussed. The module consists of an electrocardiogram, a defibrillator, a resuscitator, and an aspirator, as well as body temperature and blood pressure measuring instruments. A drug kit is included. R.J.F.

55

PLANETARY BIOLOGY

Includes exobiology; and extraterrestrial life.

A84-43055* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PREBIOTIC ORGANIC SYNTHESIS AND THE ORIGIN OF LIFE
 S. CHANG, D. DESMARAIS, R. MACK (NASA, Ames Research Center, Extraterrestrial Research Div., Moffett Field, CA), S. L. MILLER (California, University, La Jolla, CA), and G. E. STRATHEARN (California, University, Los Angeles, CA) IN: Earth's earliest biosphere: Its origin and evolution. Princeton, NJ, Princeton University Press, 1983, p. 53-92.
 (Contract NAGW-20)

The outline of a modern paradigm for the origins of life on earth was first formulated by Oparin (1924). According to the considered hypothesis, living organisms arose naturally on the primitive earth through a lengthy process of chemical evolution of organic matter which began in the atmosphere and culminated in the primordial seas. Details regarding the chemical evolution paradigm are discussed, and chemical evolutionary processes formulated by principal contributors are reviewed in a historical context. Attention is given to the Oparin model of the prebiotic earth, the Urey model, the Rubey model, a multistage model for early atmospheric evolution, and other variations on the theme of prebiotic atmospheres. Evidence in support of the chemical evolution paradigm is considered along with modern models regarding the accretion of earth and the formation of its core, and problems and prospects for future studies. G.R.

A84-45119* Salk Institute for Biological Studies, San Diego, Calif.

CHIRAL SELECTION IN POLY(C)-DIRECTED SYNTHESIS OF OLIGO(G)

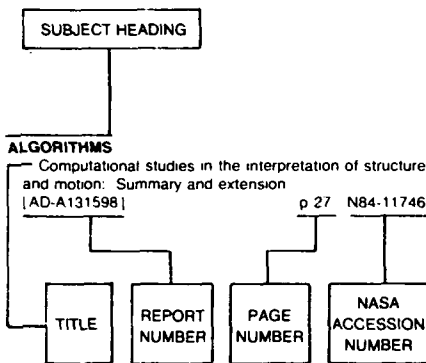
G. F. JOYCE, L. E. ORGEL (Salk Institute for Biological Studies, San Diego, CA), G. M. VISSER, J. H. VAN BOOM, J. VAN WESTRENNEN (Leiden, Rijksuniversiteit, Leiden, Netherlands), and C. A. A. VAN BOECKEL (Organon International, Oss, Netherlands) Nature (ISSN 0028-0836), vol. 310, Aug. 16, 1984, p. 602-604. NIH-NASA-supported research.- refs

An experimental study is reported which shows that poly(C)-directed oligomerization of activated guanosine

55 PLANETARY BIOLOGY

mononucleotides proceeds readily if the monomers are of the same optical handedness as the template, and is far less efficient if the monomers are of the opposite handedness. However, in template-directed reactions with a racemic mixture, monomers of the opposite handedness to the template are incorporated as chain terminators at the 2'(3') end of the products. This inhibition raises an important problem for many theories of the origin of life. C.D.

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

- ALGORITHMS**
Computational studies in the interpretation of structure and motion: Summary and extension [AD-A131598] p 27 N84-11746
- TITLE** **REPORT NUMBER** **PAGE NUMBER** **NASA ACCESSION NUMBER**
- ACTIVITY (BIOLOGY)**
Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
Psychophysiological aspects of monotonous human activity p 471 N84-31911
- ADAPTATION**
Relationship between certain immunological indicators and the subjective state of seamen during voyages p 461 A84-43925
Stability of physiological and psychological human functions under extreme environmental conditions p 465 N84-31910
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004
- ADAPTIVE CONTROL**
Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion p 476 N84-31943
- ADDITIVES**
Microbiology and food program p 458 N84-32999
- ADENOSINE TRIPHOSPHATE**
Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002
- ADRENAL METABOLISM**
Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929
- ADRENERGICS**
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
- AEROBES**
Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063
Biological and biochemical effects of the development of an aerobic environment p 451 A84-43064
- AEROSPACE ENVIRONMENTS**
Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
Medical research in first 100 days of Salyut-7 flight p 464 N84-31230
Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998
- AEROSPACE MEDICINE**
A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729
Why do astronauts suffer space sickness? p 462 A84-46256
Low gravity lowers immunity to disease p 456 A84-46260
Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
Medical research in first 100 days of Salyut-7 flight p 464 N84-31230
USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935
Aerospace Medicine and Biology: A continuing bibliography with indexes [NASA-SP-7011(262)] p 468 N84-33003
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
Review of occupational medicine relevant to aviation medicine p 469 N84-33012
Visual perception in systems management in aeronautics p 470 N84-33017
- AFFERENT NERVOUS SYSTEMS**
Correlation of afferent activity and binocular receptive field properties [AD-A143087] p 467 N84-31938
- AFFINITY**
Human whole-blood oxygen affinity - Effect of temperature p 462 A84-44085
- AFTERIMAGES**
Stability of phase recognition in complex spatial waveforms -- in visual discrimination tasks p 463 A84-46435
- AGE FACTOR**
Age-related responses to de- and hyperhydration p 464 N84-31905
- AGING (BIOLOGY)**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
- AGRICULTURE**
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-017] p 457 N84-31924
- AIR PURIFICATION**
Negative air ion effects on human performance and physiological condition [AFAMRL-TR-82-99] p 459 A84-43734
- AIR TRAFFIC CONTROL**
Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems p 471 A84-44093
- AIRCRAFT CONTROL**
Time series modeling of human operator dynamics in manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446
- AIRCRAFT EQUIPMENT**
Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948
- AIRCRAFT MANEUVERS**
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261
- AIRCRAFT PILOTS**
Sphere and cylinder distribution among the USAF rated population requiring spectacles p 460 A84-43738
- AIRCRAFT POWER SUPPLIES**
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014
- AIRCRAFT SAFETY**
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014
- ALDOSTERONE**
Age-related responses to de- and hyperhydration p 464 N84-31905
- ALTITUDE**
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004
- AMINO ACIDS**
Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956
- AMMONIA**
Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823
- AMPLITUDE MODULATION**
Immunologic effects of electromagnetic fields (1981 - 1983) [PB84-190602] p 468 N84-33008
- ANAEROBES**
Biochemical evolution of anaerobic energy conversion - The transition from fermentation to anoxygenic photosynthesis p 450 A84-43057
- ANGULAR VELOCITY**
Psychophysics of proprioceptive sensibility p 472 N84-31933
- ANIMALS**
Publications of the NASA space biology program for 1980 - 1984 -- bibliographies [NASA-TM-86857] p 457 N84-32990
Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009
- ABILITIES**
Variability of practice and the transfer of training of motor skills [AD-A142896] p 472 N84-31942
- ABIOTICITY**
Earth's earliest biosphere: Its origin and evolution -- Book p 450 A84-43051
Chiral selection in poly(C)-directed synthesis of oligo(G) -- autocatalytic amplification of optical asymmetry in polynucleotides p 477 A84-45119
- ABSORPTANCE**
An investigation of the absorbing capacity of the gastrointestinal tract of irradiated animals treated with radioprotective agents p 450 A84-42964
- ABSORPTION**
Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007
- ABSTRACTS**
USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
- ACCELERATION TOLERANCE**
Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729
- ACETYL COMPOUNDS**
Modulation of the cholinergic mechanisms in the bronchial smooth muscle [NDRE/PUBL-84-1001] p 467 N84-31937
- ACID BASE EQUILIBRIUM**
Arterial blood acid-base regulation during exercise in rats p 454 A84-44084

Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010

ANTHROPOMETRY
 Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939

ANTIRADIATION DRUGS
 Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965

ARM (ANATOMY)
 An approach to control laws for arm motion p 475 A84-45160
 Psychophysics of proprioceptive sensibility p 472 N84-31933

ARMED FORCES (FOREIGN)
 Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014

ARMED FORCES (UNITED STATES)
 Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242

ARRHYTHMIA
 Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224

ARTERIES
 Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935

ARTERIOSCLEROSIS
 Vascular permeability in patients with nasal bleeding on the background of atherosclerosis and hypertension disease, and its relationship to solar and geomagnetic disturbances p 460 A84-43799

ASTRONAUT PERFORMANCE
 Tilted astronauts reveal the brain's balancing act p 463 A84-46257
 Dexterity is just a fumble in space p 475 A84-46258

ASTRONAUTS
 Why do astronauts suffer space sickness? p 462 A84-46256
 Hot air changes our view of the ear p 463 A84-46259
 Low gravity lowers immunity to disease p 456 A84-46260

ASYMMETRY
 Chiral selection in poly(C)-directed synthesis of oligo(G) --- autocatalytic amplification of optical asymmetry in polynucleotides p 477 A84-45119

ATHLETES
 Psychophysics of proprioceptive sensibility p 472 N84-31933

AUDIOLOGY
 Communications biophysics p 470 N84-33362

AUDITORY DEFECTS
 Communications biophysics p 470 N84-33362

AUDITORY PERCEPTION
 Auditory induction of discrete tones in signal detection tasks p 470 A84-43768
 Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796
 Communications biophysics p 470 N84-33362

AUDITORY STIMULI
 Audio-ocular response - Saccadic programming p 474 A84-43735

AUDITORY TASKS
 Auditory induction of discrete tones in signal detection tasks p 470 A84-43768

AUTOCATALYSIS
 Chiral selection in poly(C)-directed synthesis of oligo(G) --- autocatalytic amplification of optical asymmetry in polynucleotides p 477 A84-45119

AUTOMATION
 The Flight Service Automation System p 475 A84-44751

AUTONOMIC NERVOUS SYSTEM
 Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729

AXONS
 Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

B

BED REST
 Pharmacologic counter measures minimizing post-space flight orthostatic intolerance --- bed rest, drug disposition, and physiological function [NASA-CR-173861] p 466 N84-31936

BEHAVIOR
 USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916

BELLOWS
 Shoulder and hip joint for hard space suits and the like [NASA-CASE-ARC-11534-1] p 477 N84-33021

BIBLIOGRAPHIES
 Publications of the NASA space biology program for 1980 - 1984 --- bibliographies [NASA-TM-86857] p 457 N84-32990
 Aerospace Medicine and Biology: A continuing bibliography with indexes [NASA-SP-7011(262)] p 468 N84-33003

BINAURAL HEARING
 Communications biophysics p 470 N84-33362

BIOACOUSTICS
 The phenomenon of 'infinite sound' as an indicator of the physical fitness of military personnel p 461 A84-43923

BIOASTRONAUTICS
 Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
 A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728

BIOCHEMICAL OXYGEN DEMAND
 Biological and biochemical effects of the development of an aerobic environment p 451 A84-43064
 The endotoxin-pretreated, oxygen-adapted rat model in hyperbaric hypoxia p 452 A84-43731

BIOCHEMISTRY
 Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
 Hydrolytic stability of biomolecules at high temperatures and its implication for life at 250 C p 454 A84-45106
 Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies [AD-A143507] p 457 N84-32992

BIOCONVERSION
 Biochemical evolution of anaerobic energy conversion - The transition from fermentation to anoxygenic photosynthesis p 450 A84-43057

BIODYNAMICS
 Study of spatial asymmetry in human external electrical field p 466 N84-31932

BIOELECTRIC POTENTIAL
 A model of spinal cord dysbarism to study delayed treatment. II - Effects of treatment p 452 A84-43726
 Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817

BIOENGINEERING
 Conference Grant for 2nd World Congress on Biomaterials [AD-A143129] p 456 N84-31915
 USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-018] p 458 N84-32996
 Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998

BIOFEEDBACK
 Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927

BIOGEOCHEMISTRY
 Earth's earliest biosphere: Its origin and evolution --- Book p 450 A84-43051
 Prebiotic organic syntheses and the origin of life p 477 A84-43055
 Precambrian organic geochemistry - Preservation of the record p 450 A84-43056
 Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058
 Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063
 Biological and biochemical effects of the development of an aerobic environment p 451 A84-43064
 Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066

BIOLOGICAL EFFECTS
 Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995
 Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998

Aerospace Medicine and Biology: A continuing bibliography with indexes [NASA-SP-7011(262)] p 468 N84-33003
 Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
 Hydrazine toxicology: Impact on safety and health in military aviation p 469 N84-33013
 A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015
 An unusual toxicological property of alcohol: The density effect on the organ of balance p 459 N84-33016
 Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019

BIOLOGICAL EVOLUTION
 Early biogeologic history - The emergence of a paradigm p 450 A84-43052
 Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066

BIOLOGICAL MODELS (MATHEMATICS)
 A study of physiological equivalent effect temperature p 458 A84-43352
 Sensitivity to hypoxia in humans p 466 N84-31934
 Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion p 476 N84-31943
 Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995
 Physiology p 470 N84-33363

BIOLOGY
 USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916

BIOMAGNETISM
 Effects of constant magnetic fields on rats and mice - A study of weight p 452 A84-43733
 Vascular permeability in patients with nasal bleeding on the background of atherosclerosis and hypertension disease, and its relationship to solar and geomagnetic disturbances p 460 A84-43799

BIOMEDICAL DATA
 Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
 Medical research in first 100 days of Salyut-7 flight p 464 N84-31230

BIOPHYSICS
 Communications biophysics p 470 N84-33362

BIOSPHERE
 Earth's earliest biosphere: Its origin and evolution --- Book p 450 A84-43051
 Early biogeologic history - The emergence of a paradigm p 450 A84-43052

BIOSYNTHESIS
 Prebiotic organic syntheses and the origin of life p 477 A84-43055
 The growth of *Paracoccus halodentrificans* in a defined medium p 454 A84-45399

BLOOD
 Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005

BLOOD CIRCULATION
 Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925

BLOOD PLASMA
 Iron content of blood and iron saturation of blood serum transferrin following X-ray irradiation p 449 A84-42959
 Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823
 Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079
 Arterial blood acid-base regulation during exercise in rats p 454 A84-44084
 Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991

BLOOD PRESSURE
 Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930

BLOOD VOLUME
 Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090

BODY SIZE (BIOLOGY)
 Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
 Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948

BODY TEMPERATURE
 Effect of body temperature on human work capacity p 476 N84-31926

- Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989
- BODY WEIGHT**
Effects of constant magnetic fields on rats and mice - A study of weight p 452 A84-43733
- BONES**
Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924
- BOTANY**
Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
- BRAIN**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
Tilted astronauts reveal the brain's balancing act p 463 A84-46257
Psychophysiological aspects of monotonous human activity p 471 N84-31911
- BRONCHI**
Modulation of the cholinergic mechanisms in the bronchial smooth muscle [NDRE/PUBL-84-1001] p 467 N84-31937
- BUBBLES**
Bubble formation in crabs induced by limb motions after decompression p 453 A84-43821
- BURNS (INJURIES)**
Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960
Thyroid gland hyperfunction as a result of the separate and combined effects of radiation and heat p 450 A84-42961
- C**
- CALCIUM METABOLISM**
Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
- CALIBRATING**
Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006
- CARBOHYDRATE METABOLISM**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
- CARBON CYCLE**
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058
Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063
- CARBON MONOXIDE**
Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796
- CARDIOLOGY**
Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224
- CARDIOVASCULAR SYSTEM**
Cardiovascular responses during orthostasis - Effect of an increase in maximal O₂ uptake p 459 A84-43730
Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736
Conference Grant for 2nd World Congress on Biomaterials [AD-A143129] p 456 N84-31915
Pharmacologic counter measures minimizing post-space flight orthostatic intolerance --- bed rest, drug disposition, and physiological function [NASA-CR-173861] p 466 N84-31936
- CATECHOLAMINE**
Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929
- CATHODE RAY TUBES**
Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006
Visual perception in systems management in aeronautics p 470 N84-33017
- CELLS (BIOLOGY)**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
A general scheme for the modification of reproductive cell death p 449 A84-42957
The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963
Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
Passive transport of sodium into epithelial cells - Methods of study, properties, regulation, and role p 455 A84-46223
Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913
Effects of radiofrequency radiation on differentiation of erythroleukemic cells [AD-A143038] p 456 N84-31914
Roles of ionizing radiation in cell transformation [DE84-01397] p 458 N84-32995
Immunologic effects of electromagnetic fields (1981 - 1983) [PB84-190602] p 468 N84-33008
- CENTRAL NERVOUS SYSTEM**
Nonspecific responsivity of the body and individual radio sensitivity p 455 A84-46225
Results of psychophysiological study of Videotop terminal operators p 475 N84-31919
Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929
- CENTRIFUGING STRESS**
Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision p 463 A84-46475
- CERAMICS**
Conference Grant for 2nd World Congress on Biomaterials [AD-A143129] p 456 N84-31915
- CEREBELLUM**
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909
- CEREBRUM**
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005
- CHARACTER RECOGNITION**
Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909
- CHEMICAL EVOLUTION**
Prebiotic organic syntheses and the origin of life p 477 A84-43055
Precambrian organic geochemistry - Preservation of the record p 450 A84-43056
Biochemical evolution of anaerobic energy conversion - The transition from fermentation to anoxygenic photosynthesis p 450 A84-43057
- CHEMICAL FRACTIONATION**
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058
- CHEMICAL REACTIONS**
Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906
- CHEMORECEPTORS**
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
- CHIRAL DYNAMICS**
Chiral selection in poly(C)-directed synthesis of oligo(G) --- autocatalytic amplification of optical asymmetry in polynucleotides p 477 A84-45119
- CHLOROPHYLLS**
Unraveling photosystems [DE84-013812] p 457 N84-32994
- CHLOROPLASTS**
Unraveling photosystems [DE84-013812] p 457 N84-32994
- CHOLINESTERASE**
Modulation of the cholinergic mechanisms in the bronchial smooth muscle [NDRE/PUBL-84-1001] p 467 N84-31937
- CHROMOSOMES**
Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
- CIRCADIAN RHYTHMS**
Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-018] p 458 N84-32996
Pilot jet lag experiments described p 467 N84-32997
- CLIMATE**
Effects of climate on kininogen levels in healthy human subjects p 464 N84-31907
- CLINICAL MEDICINE**
Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518
Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224
USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903
Medical applications of lasers p 464 N84-31904
Age-related responses to de- and hyperhydration p 464 N84-31905
Effects of climate on kininogen levels in healthy human subjects p 464 N84-31907
Modeling of lethal electric shock p 468 N84-33000
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014
- COCKPIT SIMULATORS**
The measurement of cockpit workload p 471 A84-44749
- COGNITIVE PSYCHOLOGY**
The correlation of closed eye movements with the process of task performance p 471 A84-45924
- COLD ACCLIMATIZATION**
Physiology of thermoregulation p 455 A84-45995
- COLD TOLERANCE**
Effects of endurance fitness on responses to cold water immersion p 459 A84-43732
A novel cold-tolerant insect found in a Himalayan glacier p 452 A84-43790
Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906
- COLOR CODING**
Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006
- COMBAT**
Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261
- COMBUSTION PRODUCTS**
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015
- COMPUTER ASSISTED INSTRUCTION**
Research on computer aided testing of pilot response to critical in-flight events [NASA-CR-173871] p 476 N84-31945
- COMPUTER GRAPHICS**
The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941
New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228
- COMPUTER SYSTEMS DESIGN**
Langley experience with ADABAS/NATURAL p 470 N84-33272
- COMPUTER SYSTEMS PERFORMANCE**
Langley experience with ADABAS/NATURAL p 470 N84-33272
- COMPUTERIZED SIMULATION**
Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion p 476 N84-31943
- CONFERENCES**
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
- CONSUMPTION**
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005
- CONTACT LENSES**
Ophthalmological investigation among contact lens wearers in military service [REPT-AR/MHAM-1983-1] p 467 N84-31940

CONTINUOUS RADIATION

Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions
[AD-A143570] p 468 N84-33007

CONTINUOUS WAVE LASERS

Medical applications of lasers p 464 N84-31904

CONTROL SIMULATION

Time series modeling of human operator dynamics in manual control tasks
[AIAA PAPER 84-1890] p 474 A84-43446

CONTROL THEORY

An approach to control laws for arm motion p 475 A84-45160

CONTROLLED SYSTEMS DESIGN

Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station
[AIAA PAPER 84-1890] p 474 A84-43440

CORONARY ARTERY DISEASE

Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518

CORRELATION

Correlation of afferent activity and binocular receptive field properties
[AD-A143087] p 467 N84-31938

COSMONAUTS

First mixed crew in space p 475 N84-31917

CREW PROCEDURES (INFLIGHT)

The measurement of cockpit workload p 471 A84-44749

CUES

Visual cueing effectiveness: Comparison of perception and flying performance
[AD-P003458] p 473 N84-32235

CULTURE TECHNIQUES

The growth of Paracoccus halodenitrificans in a defined medium p 454 A84-45399
Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548

CYTOGENESIS

Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550

CYTOLOGY

Lack of correlation between mycoplasma induced [FN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573

D

DAMAGE

A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954

DATA BASE MANAGEMENT SYSTEMS

Langley experience with ADABAS/NATURAL p 470 N84-33272

DATA CORRELATION

Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931
Psychophysics of proprioceptive sensibility p 472 N84-31933

DATA SYSTEMS

The Flight Service Automation System p 475 A84-44751

DEATH

A general scheme for the modification of reproductive cell death p 449 A84-42957

DECISION MAKING

The effect of information display format on multiple-cue judgment
[AD-A142884] p 472 N84-31941
Research on computer aided testing of pilot response to critical in-flight events
[NASA-CR-173871] p 476 N84-31945
Visual perception in systems management in aeronautics p 470 N84-33017

DECOMPRESSION SICKNESS

A model of spinal cord dysbarism to study delayed treatment. II - Effects of treatment p 452 A84-43726
Bubble formation in crabs induced by limb motions after decompression p 453 A84-43821
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel
[NASA-TM-58262] p 466 N84-31935

DEHYDRATION

Age-related responses to de- and hyperhydration p 464 N84-31905

DENMARK

Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014

DENSITY

Conference Grant for 2nd World Congress on Biomaterials
[AD-A143129] p 456 N84-31915

DEOXYRIBONUCLEIC ACID

A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
Roles of ionizing radiation in cell transformation
[DE84-013397] p 458 N84-32995

DIAGNOSIS

Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548

DIFFERENTIATION

Effects of radiofrequency radiation on differentiation of erythroleukemic cells
[AD-A143038] p 456 N84-31914

DISEASES

Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090

DISPLAY DEVICES

Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919
The effect of information display format on multiple-cue judgment
[AD-A142884] p 472 N84-31941

DIURESIS

Immersion diuresis without expected suppression of vasopressin p 461 A84-43822

DIURNAL VARIATIONS

Operational efficiency and time of day p 471 A84-44094

DOSIMETERS

Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies
[AD-A143507] p 457 N84-32992
Dosimetry of ozone and nitrogen dioxide in man and animals
[PB84-195304] p 469 N84-33009
Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man
[PB84-195312] p 469 N84-33010

DRUGS

Pharmacologic counter measures minimizing post-space flight orthostatic intolerance --- bed rest, drug disposition, and physiological function
[NASA-CR-173861] p 466 N84-31936

DYNAMIC CONTROL

An approach to control laws for arm motion p 475 A84-45160

E

EAR

Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
Hot air changes our view of the ear p 463 A84-46259

ECONOMIC ANALYSIS

Ergonomic analysis of human operation of video terminal p 475 N84-31918

ECOSYSTEMS

Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066

EFFERENT NERVOUS SYSTEMS

Variability of practice and the transfer of training of motor skills
[AD-A142896] p 472 N84-31942
Measurement and modification of sensorimotor system function during visual-motor performance
[AD-A142919] p 476 N84-31947

ELECTRIC FIELDS

Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies
[AD-A143507] p 457 N84-32992

ELECTRIC TERMINALS

Ergonomic analysis of human operation of video terminal p 475 N84-31918
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919

ELECTRICITY

Modeling of lethal electric shock p 468 N84-33000

ELECTROCARDIOGRAPHY

Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518

ELECTROENCEPHALOGRAPHY

Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909

Measurement and modification of sensorimotor system function during visual-motor performance
[AD-A142919] p 476 N84-31947

ELECTROLYTE METABOLISM

Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727

Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds
[AD-A142705] p 468 N84-33005

ELECTROMAGNETIC FIELDS

Immunologic effects of electromagnetic fields (1981 - 1983)
[PB84-190602] p 468 N84-33008

ELECTRONYSTAGMOGRAPHY

Physiological vestibular nystagmus p 460 A84-43797

ENDOCRINE SECRETIONS

Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002

ENDOLYMPH

An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016

ENDOTHELIAL

Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960

ENDOTOXINS

The endotoxin-pretreated, oxygen-adapted rat model in hyperbaric hyperoxia p 452 A84-43731

ENVIRONMENTAL CONTROL

A study of physiological equivalent effect temperature p 458 A84-43352

ENZYME ACTIVITY

A general scheme for the modification of reproductive cell death p 449 A84-42957

EPITHELIAL

Passive transport of sodium into epithelial cells - Methods of study, properties, regulation, and role p 455 A84-46223

ERROR ANALYSIS

Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929

ERYTHROCYTES

Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906

ETHYL ALCOHOL

Occupational Medicine Relevant to Aviation Medicine
[AGARD-CP-341] p 469 N84-33011
An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016

ETIOLOGY

The genesis of positional paroxysmal nystagmus p 460 A84-43798

EXERCISE PHYSIOLOGY

Effects of endurance fitness on responses to cold water immersion p 459 A84-43732
Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736
Blood O₂ affinity and maximal O₂ consumption in elite bicycle racers p 460 A84-43820
Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823
Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
Arterial blood acid-base regulation during exercise in rats p 454 A84-44084
Effect of varied lactate levels on bicycle ergometer performance p 462 A84-44089
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
Psychophysics of proprioceptive sensibility p 472 N84-31933

EXOBIOLGY

Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
Publications of the NASA space biology program for 1980 - 1984 --- bibliographies
[NASA-TM-86857] p 457 N84-32990

- Aerospace Medicine and Biology: A continuing bibliography with indexes [NASA-SP-7011(262)] p 468 N84-33003
- EXPERIMENT DESIGN**
A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015
- EXPOSURE**
Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- EXTRAPOLATION**
Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010
- EYE (ANATOMY)**
Correlation of afferent activity and binocular receptive field properties [AD-A143087] p 467 N84-31938
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- EYE DISEASES**
Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
- EYE MOVEMENTS**
The correlation of closed eye movements with the process of task performance p 471 A84-45924
Hot air changes our view of the ear p 463 A84-46259
- EYEPIECES**
Sphere and cylinder distribution among the USAF rated population requiring spectacles p 460 A84-43738
- F**
- F-16 AIRCRAFT**
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014
- FAR FIELDS**
Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies [AD-A143507] p 457 N84-32992
- FATIGUE (BIOLOGY)**
Ergonomic analysis of human operation of video terminal p 475 N84-31918
- FEASIBILITY ANALYSIS**
Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927
- FEMALES**
Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087
First mixed crew in space p 475 N84-31917
Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
- FIRES**
A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015
- FLIGHT CONDITIONS**
The Flight Service Automation System p 475 A84-44751
- FLIGHT CREWS**
Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948
New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior [NASA-CR-173913] p 477 N84-33020
- FLIGHT SIMULATION**
Pilot oriented performance measurement [AD-P003450] p 472 N84-32227
New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior [NASA-CR-173913] p 477 N84-33020

FLIGHT SIMULATORS

- Visual cueing effectiveness: Comparison of perception and flying performance [AD-P003458] p 473 N84-32235

FLIGHT TRAINING

- New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228

FLYING PERSONNEL

- The phenomenon of 'infinite sound' as an indicator of the physical fitness of military personnel p 461 A84-43923
Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924

FOOD PROCESSING

- Microbiology and food program p 458 N84-32999

FOSSILS

- Archean stromatolites - Evidence of the earth's earliest benthos p 451 A84-43059
Archean microfossils - New evidence of ancient microbes p 451 A84-43060
Early Proterozoic microfossils p 452 A84-43065

FREEZING

- Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

G**GAS GENERATORS**

- Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946

GASTROINTESTINAL SYSTEM

- An investigation of the absorbing capacity of the gastrointestinal tract of irradiated animals treated with radioprotective agents p 450 A84-42964

GENERAL AVIATION AIRCRAFT

- The Flight Service Automation System p 475 A84-44751

GENETIC ENGINEERING

- Unraveling photosystems [DE84-013812] p 457 N84-32994

GENETICS

- The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963

GEOCHRONOLOGY

- Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058

GEOMAGNETISM

- Effects of climate on kininogen levels in healthy human subjects p 464 N84-31907
Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930

GLACIERS

- A novel cold-tolerant insect found in a Himalayan glacier p 452 A84-43790

GLUCOSE

- Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005

GRAPHIC ARTS

- The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941

GRAVITATIONAL EFFECTS

- Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935
Publications of the NASA space biology program for 1980 - 1984 --- bibliographies [NASA-TM-86857] p 457 N84-32990

GRAVITATIONAL PHYSIOLOGY

- Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729

GROWTH

- Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998

H**HAZARDS**

- Evaluation and control of laser hazards p 470 N84-33018

HEAD MOVEMENT

- Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736

HEALTH

- Review of occupational medicine relevant to aviation medicine p 469 N84-33012

HEART

- Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080

HEART DISEASES

- Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518

HEART FUNCTION

- Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817
Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224

HEART RATE

- The energy expenditure of helicopter pilots p 474 A84-43737
Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908

HEAT ACCLIMATIZATION

- Physiology of thermoregulation p 455 A84-45995
Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

HEAT TOLERANCE

- A study of physiological equivalent effect temperature p 458 A84-43352
Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825

HELICOPTERS

- The energy expenditure of helicopter pilots p 474 A84-43737

HELIUM-OXYGEN ATMOSPHERES

- HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions --- High Pressure Nervous Syndrome p 454 A84-44082

HEMATOLOGY

- Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913

HEMATOPOIETIC SYSTEM

- Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991

HEMODYNAMIC RESPONSES

- Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729
Cardiovascular responses during orthostasis - Effect of an increase in maximal O2 uptake p 459 A84-43730
Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930

HEMODYNAMICS

- Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925

HEMOGLOBIN

- Blood O2 affinity and maximal O2 consumption in elite bicycle racers p 460 A84-43820
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
Effects of radiofrequency radiation on differentiation of erythroleukemic cells [AD-A143038] p 456 N84-31914
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004

HEMORRHAGES

- Vascular permeability in patients with nasal bleeding on the background of atherosclerosis and hypertension disease, and its relationship to solar and geomagnetic disturbances p 460 A84-43799

HIBERNATION

- Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817

HIGH GRAVITY ENVIRONMENTS

HIGH GRAVITY ENVIRONMENTS

Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989

HIGH PRESSURE

HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions --- High Pressure Nervous Syndrome p 454 A84-44082

Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923

HIGH TEMPERATURE ENVIRONMENTS

Effect of high local temperature on reflex cutaneous vasodilatation p 461 A84-43825

Hydrolytic stability of biomolecules at high temperatures and its implication for life at 250 C p 454 A84-45106

HIGH VOLTAGES

Modeling of lethal electric shock p 468 N84-33000

HORMONE METABOLISMS

Effects of endurance fitness on responses to cold water immersion p 459 A84-43732

Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819

Immersion diuresis without expected suppression of vasopressin p 461 A84-43822

HUMAN BEHAVIOR

Stability of physiological and psychological human functions under extreme environmental conditions p 465 N84-31910

Research on computer aided testing of pilot response to critical in-flight events [NASA-CR-173871] p 476 N84-31945

HUMAN BEINGS

Sensitivity to hypoxia in humans p 466 N84-31934

Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009

HUMAN BODY

Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948

Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies - [AD-A143507] p 457 N84-32992

HUMAN FACTORS ENGINEERING

USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903

USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916

Ergonomic analysis of human operation of video terminal p 475 N84-31918

Realization of human work capacity: Interdisciplinary problems p 475 N84-31920

Stress in work p 475 N84-31921

Teleoperator human factors study [NASA-CR-171120] p 476 N84-31944

Research on computer aided testing of pilot response to critical in-flight events [NASA-CR-173871] p 476 N84-31945

Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948

Pilot jet lag experiments described p 467 N84-32997

Review of occupational medicine relevant to aviation medicine p 469 N84-33012

Shoulder and hip joint for hard space suits and the like [NASA-CASE-ARC-11534-1] p 477 N84-33021

Teleoperator human factors study [NASA-CR-173890] p 477 N84-33022

HUMAN PATHOLOGY

Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924

Disturbance of sleep by noise - Individual differences p 471 A84-45659

HUMAN PERFORMANCE

Negative air ion effects on human performance and physiological condition [AFAMRL-TR-82-99] p 459 A84-43734

Effect of varied lactate levels on bicycle ergometer performance p 462 A84-44089

Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091

Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems p 471 A84-44093

Vigilance and task load - In search of the inverted U p 471 A84-44096

Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909

Psychophysiological aspects of monotonous human activity p 471 N84-31911

Stress in work p 475 N84-31921

Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927

Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941

Variability of practice and the transfer of training of motor skills [AD-A142896] p 472 N84-31942

HUMAN REACTIONS

Disturbance of sleep by noise - Individual differences p 471 A84-45659

Medical research in first 100 days of Salyut-7 flight p 464 N84-31230

HUMAN TOLERANCES

A study of physiological equivalent effect temperature p 458 A84-43352

Non-specific responsivity of the body and individual radio sensitivity p 455 A84-46225

Modeling of lethal electric shock p 468 N84-33000

HYDRATION

Age-related responses to de- and hyperhydration p 464 N84-31905

HYDRAZINES

Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011

Hydrazine toxicology: Impact on safety and health in military aviation p 469 N84-33013

Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014

HYDROLYSIS

Hydrolytic stability of biomolecules at high temperatures and its implication for life at 250 C p 454 A84-45106

HYDROXYL COMPOUNDS

Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965

HYGIENE

Review of occupational medicine relevant to aviation medicine p 469 N84-33012

HYPEROXIA

The endotoxin-pretreated, oxygen-adapted rat model in hyperbaric hyperoxia p 452 A84-43731

HYPERTENSION

Vascular permeability in patients with nasal bleeding on the background of atherosclerosis and hypertension disease, and its relationship to solar and geomagnetic disturbances p 460 A84-43799

HYPERTHERMIA

Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796

Effect of high local temperature on reflex cutaneous vasodilatation p 461 A84-43825

Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087

Physiology of thermoregulation p 455 A84-45995

Effect of body temperature on human work capacity p 476 N84-31926

Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

HYPERTHERMIA

Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004

HYPOGLYCEMIA

Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819

HYPOKINESIA

Hypokinesia experiment studies effects of weightlessness p 464 N84-31234

First mixed crew in space p 475 N84-31917

HYPOMETABOLISM

Thyroid gland hyperfunction as a result of the separate and combined effects of radiation and heat p 450 A84-42961

HYPOTHERMIA

Dexterity performance and reduced ambient temperature p 474 A84-44095

Physiology of thermoregulation p 455 A84-45995

Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906

HYPOXIA

Sensitivity to hypoxia in humans p 466 N84-31934

I

IDENTIFYING

Rapid microbial identification by circular intensity differential scattering [DE84-013894] p 457 N84-32993

IMAGING TECHNIQUES

Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

IMMUNOASSAY

Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548

Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549

IMMUNOLOGY

Relationship between certain immunological indicators and the subjective state of seamen during voyages p 461 A84-43925

Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550

Low gravity lowers immunity to disease p 456 A84-46260

Immunologic effects of electromagnetic fields (1981 - 1983) [PB84-190602] p 468 N84-33008

IN-FLIGHT MONITORING

The measurement of cockpit workload p 471 A84-44749

INDUSTRIAL SAFETY

Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091

Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011

Review of occupational medicine relevant to aviation medicine p 469 N84-33012

Hydrazine toxicology: Impact on safety and health in military aviation p 469 N84-33013

INFECTIOUS DISEASES

Rapid microbial identification by circular intensity differential scattering [DE84-013894] p 457 N84-32993

INFLATABLE STRUCTURES

Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946

INFLATING

Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946

INFLUENZA

Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548

INFORMATION THEORY

Visual perception in systems management in aeronautics p 470 N84-33017

INSECTS

A novel cold-tolerant insect found in a Himalayan glacier p 452 A84-43790

INTERFERON

Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549

Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550

Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573

ION CONCENTRATION

Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823

ION MOTION

Passive transport of sodium into epithelial cells - Methods of study, properties, regulation, and role p 455 A84-46223

IONIZING RADIATION

Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956

Non-specific responsivity of the body and individual radio sensitivity p 455 A84-46225

Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995

IRON

Iron content of blood and iron saturation of blood serum transferrin following X-ray irradiation p 449 A84-42959

ISCHEMIA

Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518

ISOTOPE EFFECT

Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058

J

- JET LAG**
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-018] p 458 N84-32996
Pilot jet lag experiments described p 467 N84-32997
- JOINTS (ANATOMY)**
Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924
- JOINTS (JUNCTIONS)**
Shoulder and hip joint for hard space suits and the like [NASA-CASE-ARC-11534-1] p 477 N84-33021
- JUDGMENTS**
The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941

K

- KINETIC ENERGY**
Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002
- KINETICS**
Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998

L

- LABYRINTH**
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
- LACTATES**
Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823
Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079
Effect of varied lactate levels on bicycle ergometer performance p 462 A84-44089
- LARGE SPACE STRUCTURES**
Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station [AIAA PAPER 84-1890] p 474 A84-43440
- LASER APPLICATIONS**
USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903
- LASER OUTPUTS**
Evaluation and control of laser hazards p 470 N84-33018
- LASERS**
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
Evaluation and control of laser hazards p 470 N84-33018
- LASING**
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- LATITUDE**
Effects of climate on kininogen levels in healthy human subjects p 464 A84-31907
- LESIONS**
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
- LETHALITY**
Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995
Modeling of lethal electric shock p 468 N84-33000
- LIFE SCIENCES**
USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-018] p 458 N84-32996
- LIFE SUPPORT SYSTEMS**
Development of engineering prototype of Life Support Module (LSM) [NASA-CR-171806] p 477 N84-33023
- LIMBS (ANATOMY)**
Bubble formation in crabs induced by limb motions after decompression p 453 A84-43821
- LIVER**
The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962

LOADING

- Age-related responses to de- and hyperhydration p 464 N84-31905

LONG TERM EFFECTS

- Measurement and modification of sensorimotor system function during visual-motor performance [AD-A142919] p 476 N84-31947

LUNG MORPHOLOGY

- Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088

LYMPHOCYTES

- Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955

LYSINE

- Microbiology and food program p 458 N84-32999

LYSOGENESIS

- Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550

M

MACROPHAGES

- Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549

MAGNETIC EFFECTS

- Effects of constant magnetic fields on rats and mice - A study of weight p 452 A84-43733

MALES

- Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004

MAN MACHINE SYSTEMS

- Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station [AIAA PAPER 84-1890] p 474 A84-43440
Time series modeling of human operator dynamics in manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919
Pilot oriented performance measurement [AD-P003450] p 472 N84-32227

MANAGEMENT INFORMATION SYSTEMS

- Langley experience with ADABAS/NATURAL p 470 N84-33272

MANNED SPACE FLIGHT

- Dexterity is just a fumble in space p 475 A84-46258

MANUAL CONTROL

- Time series modeling of human operator dynamics in manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446

MARINE BIOLOGY

- Archean stromatolites - Evidence of the earth's earliest benthos p 451 A84-43059

MASS DISTRIBUTION

- Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948

MATHEMATICAL MODELS

- Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion p 476 N84-31943

MEDICAL SCIENCE

- USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-017] p 457 N84-31924
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-018] p 458 N84-32996

MELTING

- Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

MEMBRANES

- Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913
Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

MENTAL PERFORMANCE

- Operational efficiency and time of day p 471 A84-44094
The correlation of closed eye movements with the process of task performance p 471 A84-45924
Psychophysiological aspects of monotonous human activity p 471 N84-31911
Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925
Effect of body temperature on human work capacity p 476 N84-31926

MESOSPHERE

- Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

METABOLISM

- Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005

METEOROLOGICAL PARAMETERS

- A study of physiological equivalent effect temperature p 458 A84-43352

METEOROLOGICAL SERVICES

- The Flight Service Automation System p 475 A84-44751

MICROBIOLOGY

- Archean stromatolites - Evidence of the earth's earliest benthos p 451 A84-43059
Archean microfossils - New evidence of ancient microbes p 451 A84-43060
Early Proterozoic microfossils p 452 A84-43065
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-017] p 457 N84-31924
Rapid microbial identification by circular intensity differential scattering [DE84-013894] p 457 N84-32993
USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-018] p 458 N84-32996
Microbiology and food program p 458 N84-32999
Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

MICROMETEOROLOGY

- A study of physiological equivalent effect temperature p 458 A84-43352

MICROORGANISMS

- The growth of Paracoccus halodenitrificans in a defined medium p 454 A84-45399
Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

MICROWAVES

- The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963
USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913

MILITARY OPERATIONS

- Ophthalmological investigation among contact lens wearers in military service [REPT-AR/MHAM-1983-1] p 467 N84-31940

MINERAL METABOLISM

- Passive transport of sodium into epithelial cells - Methods of study, properties, regulation, and role p 455 A84-46223
Hypokinesia experiment studies effects of weightlessness p 464 N84-31234
Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002

MITOSIS

- Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
A general scheme for the modification of reproductive cell death p 449 A84-42957
A quantitative analysis of radiation damage to thrombocytopoiesis p 449 A84-42958

MODULES

- Development of engineering prototype of Life Support Module (LSM) [NASA-CR-171806] p 477 N84-33023

MOLECULAR BIOLOGY

- A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954

MONOCULAR VISION

Hydrolytic stability of biomolecules at high temperatures and its implication for life at 250 C p 454 A84-45106

MONOCULAR VISION

Stability of phase recognition in complex spatial waveforms -- in visual discrimination tasks p 463 A84-46435

MORTALITY

Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991

MOTION PERCEPTION

Effect of stimulation parameters on the visual detection of oscillatory motion p 462 A84-45925
The effects of exposure duration and luminance on the 3-dot hyperacuity task p 463 A84-46436
Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision p 463 A84-46475
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior [NASA-CR-173913] p 477 N84-33020

MOTION SICKNESS

A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
Why do astronauts suffer space sickness? p 462 A84-46256
Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision p 463 A84-46475

MOTIVATION

Psychophysiological aspects of monotonous human activity p 471 N84-31911
Sensitivity to hypoxia in humans p 466 N84-31934

MUSCLES

Modulation of the cholinergic mechanisms in the bronchial smooth muscle [NDRE/PUBL-84-1001] p 467 N84-31937

MUSCULAR FUNCTION

Bubble formation in crabs induced by limb motions after decompression p 453 A84-43821
Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079
Effect of varied lactate levels on bicycle ergometer performance p 462 A84-44089
The mystery of motion or what regulates the work of the muscles and how is this regulation effected p 454 A84-44498
Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930

MUSCULAR TONUS

Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736

MUSCULOSKELETAL SYSTEM

Hypokinesia experiment studies effects of weightlessness p 464 A84-31234
Conference Grant for 2nd World Congress on Biomaterials [AD-A143129] p 456 N84-31915

MYOCARDIUM

Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224

N

NEAR FIELDS

Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies [AD-A143507] p 457 N84-32992

NECK (ANATOMY)

Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736

NEGATIVE IONS

Negative air ion effects on human performance and physiological condition [AFAMRL-TR-82-99] p 459 A84-43734

NERVES

Modulation of the cholinergic mechanisms in the bronchial smooth muscle [NDRE/PUBL-84-1001] p 467 N84-31937
Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

NERVOUS SYSTEM

USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912

NEUROLOGY

Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions -- High Pressure Nervous Syndrome p 454 A84-44082

NEUROMUSCULAR TRANSMISSION

The mystery of motion or what regulates the work of the muscles and how is this regulation effected p 454 A84-44498

NEURONS

Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989

NEUROPHYSIOLOGY

Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
Physiology p 470 N84-33363

NEUROTRANSMITTERS

Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913

NITROGEN

Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions -- High Pressure Nervous Syndrome p 454 A84-44082

NITROGEN DIOXIDE

Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009
Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010

NOISE INTENSITY

Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796

NOISE POLLUTION

Disturbance of sleep by noise - Individual differences p 471 A84-45659

NONLINEARITY

Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

NUTRITIONAL REQUIREMENTS

The growth of *Paracoccus halodentificans* in a defined medium p 454 A84-45399

NYSTAGMUS

Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016

O

OCULOMOTOR NERVES

Audio-ocular response - Saccadic programming p 474 A84-43735

OPERATOR PERFORMANCE

Visual perception in systems management in aeronautics p 470 N84-33017

OPERATORS (PERSONNEL)

Relationship between certain immunological indicators and the subjective state of seamen during voyages p 461 A84-43925
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919
Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927
Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929

OPHTHALMOLOGY

Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
Ophthalmological investigation among contact lens wearers in military service [REPT-AR/MHAM-1983-1] p 467 N84-31940

OPTICAL ACTIVITY

Chiral selection in poly(C)-directed synthesis of oligo(G) -- autocatalytic amplification of optical asymmetry in polynucleotides p 477 A84-45119

OPTICAL ILLUSION

Stability of phase recognition in complex spatial waveforms -- in visual discrimination tasks p 463 A84-46435

OPTOMETRY

Physiology p 470 N84-33363

ORBITAL ASSEMBLY

Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station [AIAA PAPER 84-1890] p 474 A84-43440

ORGAN WEIGHT

Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824

ORGANIC CHEMISTRY

Precambrian organic geochemistry - Preservation of the record p 450 A84-43056

ORGANIC PHOSPHORUS COMPOUNDS

Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005

ORTHOPEDIC

Conference Grant for 2nd World Congress on Biomaterials [AD-A143129] p 456 N84-31915

ORTHOSTATIC TOLERANCE

Cardiovascular responses during orthostasis - Effect of an increase in maximal O2 uptake p 459 A84-43730
Tilted astronauts reveal the brain's balancing act p 463 A84-46257

OSCILLATIONS

Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

OXIDATION

Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998

OXYGEN

Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004

OXYGEN CONSUMPTION

Cardiovascular responses during orthostasis - Effect of an increase in maximal O2 uptake p 459 A84-43730
Blood O2 affinity and maximal O2 consumption in elite bicycle racers p 460 A84-43820
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005

OXYGEN METABOLISM

Biological and biochemical effects of the development of an aerobic environment p 451 A84-43064
Human whole-blood oxygen affinity - Effect of temperature p 462 A84-44085
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923

OXYGEN PRODUCTION

Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063

OXYGENATION

Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923

OXYHEMOGLOBIN

Human whole-blood oxygen affinity - Effect of temperature p 462 A84-44085

OZONE

Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087
Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009
Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010

P

PAIN

Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935

PALEOBIOLOGY

Earth's earliest biosphere: Its origin and evolution -- Book p 450 A84-43051
Early biogeologic history - The emergence of a paradigm p 450 A84-43052
Prebiotic organic syntheses and the origin of life p 477 A84-43055
Precambrian organic geochemistry - Preservation of the record p 450 A84-43056
Biochemical evolution of anaerobic energy conversion - The transition from fermentation to anoxygenic photosynthesis p 450 A84-43057
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058

Archean stromatolites - Evidence of the earth's earliest
benthos p 451 A84-43059

Archean microfossils - New evidence of ancient
microbes p 451 A84-43060

Geochemical evidence bearing on the origin of
aerobiosis, a speculative hypothesis p 451 A84-43063

Biological and biochemical effects of the development
of an aerobic environment p 451 A84-43064

Early Proterozoic microfossils p 452 A84-43065

Evolution of earth's earliest ecosystems - Recent
progress and unsolved problems p 452 A84-43066

PALEONTOLOGY

Early biogeologic history - The emergence of a
paradigm p 450 A84-43052

Archean stromatolites - Evidence of the earth's earliest
benthos p 451 A84-43059

Archean microfossils - New evidence of ancient
microbes p 451 A84-43060

Early Proterozoic microfossils p 452 A84-43065

PARASITIC DISEASES

Beta-interferon inhibits cell infection by *Trypanosoma*
cruzi p 455 A84-45549

PATHOGENS

Rapid microbial identification by circular intensity
differential scattering [DE84-013894] p 457 N84-32993

PATHOLOGICAL EFFECTS

Effects of addition of nitrogen during rapid compression
of baboons p 453 A84-44081

HPNS of baboons during helium-nitrogen-oxygen slow
exponential compressions --- High Pressure Nervous
Syndrome p 454 A84-44082

Handling of hydrazine in the Royal Danish Air Force
p 469 N84-33014

PATTERN RECOGNITION

Quantitative assessment of role of spatial frequencies
of images in visual recognition of numbers p 472 N84-31928

PERCEPTION

Correlation between individual alpha-rhythm parameters
and operator's performance while subjected to maximum
information input p 465 N84-31909

PERCEPTUAL ERRORS

Operational efficiency and time of day p 471 A84-44094

PERCEPTUAL TIME CONSTANT

The effects of exposure duration and luminance on the
3-dot hyperacuity task p 463 A84-46436

PERIPHERAL CIRCULATION

Variation in the metabolic pool of free amino acids in
the peripheral blood and the spleen following total-body
uniform gamma irradiation p 449 A84-42956

Effect of high local temperature on reflex cutaneous
vasodilation p 461 A84-43825

PERMEABILITY

Effects of microwaves on cell membrane permeability
[AD-A142979] p 456 N84-31913

PERSONNEL

Ophthalmological investigation among contact lens
wearers in military service [REPT-AR/MHAM-1983-1] p 467 N84-31940

PERSONNEL SELECTION

Realization of human work capacity: Interdisciplinary
problems p 475 N84-31920

PHARMACOLOGY

Characterization of the role of the serotonin hydroxyl
group in the pharmacological and radioprotective action
of serotonin p 450 A84-42965

PHASE SHIFT

Stability of phase recognition in complex spatial
waveforms --- in visual discrimination tasks p 463 A84-46435

PHONEMES

Synthesized warning messages - Effects of an alerting
cue in single- and multiple-function voice synthesis
systems p 471 A84-44093

PHOTOSYNTHESIS

Biochemical evolution of anaerobic energy conversion
- The transition from fermentation to anoxygenic
photosynthesis p 450 A84-43057

Geochemical evidence bearing on the origin of
aerobiosis, a speculative hypothesis p 451 A84-43063

Biological and biochemical effects of the development
of an aerobic environment p 451 A84-43064

Unraveling photosystems [DE84-013812] p 457 N84-32994

PHYSICAL EXERCISE

Glucose turnover and hormonal changes during
insulin-induced hypoglycemia in trained humans p 460 A84-43819

Exercise-thermoregulatory stress and increased plasma
beta-endorphin/beta-lipotropin in humans p 462 A84-44086

Effect of body temperature on human work capacity
p 476 N84-31926

PHYSICAL FITNESS

Effects of endurance fitness on responses to cold water
immersion p 459 A84-43732

The phenomenon of 'infinite sound' as an indicator of
the physical fitness of military personnel p 461 A84-43923

Innovations in cosmonaut medical monitoring, physical
conditioning p 463 N84-31229

PHYSICAL WORK

Effect of varied lactate levels on bicycle ergometer
performance p 462 A84-44089

PHYSIOCHEMISTRY

A general scheme for the modification of reproductive
cell death p 449 A84-42957

The endotoxin-pretreated, oxygen-adapted rat model in
hyperbaric hyperoxia p 452 A84-43731

Exercise-thermoregulatory stress and increased plasma
beta-endorphin/beta-lipotropin in humans p 462 A84-44086

The mystery of motion or what regulates the work of
the muscles and how is this regulation effected p 454 A84-44498

Lack of correlation between mycoplasma induced
IFN-gamma production in vitro and natural killer cell activity
against FLD-3 cells p 455 A84-45573

PHYSIOLOGICAL DEFENSES

Beta-interferon inhibits cell infection by *Trypanosoma*
cruzi p 455 A84-45549

Interferon induces natural killer cell blastogenesis in
vivo p 455 A84-45550

Low gravity lowers immunity to disease p 456 A84-46260

PHYSIOLOGICAL EFFECTS

The endotoxin-pretreated, oxygen-adapted rat model in
hyperbaric hyperoxia p 452 A84-43731

Effects of constant magnetic fields on rats and mice -
A study of weight p 452 A84-43733

Negative air ion effects on human performance and
physiological condition [AFAMRL-TR-82-99] p 459 A84-43734

Glucose turnover and hormonal changes during
insulin-induced hypoglycemia in trained humans p 460 A84-43819

Plasma catecholamines and their effect on blood lactate
and muscle lactate output p 453 A84-44079

Biochemical alterations in heart after exhaustive
swimming in rats p 453 A84-44080

Arterial blood acid-base regulation during exercise in
rats p 454 A84-44084

Combined effects of ozone exposure and ambient heat
on exercising females p 462 A84-44087

Lack of correlation between mycoplasma induced
IFN-gamma production in vitro and natural killer cell activity
against FLD-3 cells p 455 A84-45573

Medical research in first 100 days of Salyut-7 flight
p 464 N84-31230

Hypokinesia experiment studies effects of
weightlessness p 464 N84-31234

Stability of physiological and psychological human
functions under extreme environmental conditions p 465 N84-31910

First mixed crew in space p 475 N84-31917

Realization of human work capacity: Interdisciplinary
problems p 475 N84-31920

Pharmacologic counter measures minimizing post-space
flight orthostatic intolerance --- bed rest, drug disposition,
and physiological function [NASA-CR-173861] p 466 N84-31936

Occupational Medicine Relevant to Aviation Medicine
[AGARD-CP-341] p 469 N84-33011

Hydrazine toxicology: Impact on safety and health in
military aviation p 469 N84-33013

Handling of hydrazine in the Royal Danish Air Force
p 469 N84-33014

An unusual toxicological property of alcohol: The density
effect on the organ of balance p 469 N84-33016

PHYSIOLOGICAL RESPONSES

A model of spinal cord dysbarism to study delayed
treatment. II - Effects of treatment p 452 A84-43726

Effects of endurance fitness on responses to cold water
immersion p 459 A84-43732

Response of the auditory analyzer to the combined effect
of noise, high temperature, and carbon monoxide p 453 A84-43796

Physiological vestibular nystagmus p 460 A84-43797

Exercise-thermoregulatory stress and increased plasma
beta-endorphin/beta-lipotropin in humans p 462 A84-44086

Morphological and physiological responses of the lungs
of dogs to acute decompression p 454 A84-44088

Age-related responses to de- and hyperhydration
p 464 N84-31905

Effects of whole-body cold exposure on erythrocyte
morphology p 464 N84-31906

Effects of climate on kininogen levels in healthy human
subjects p 464 N84-31907

Heart rhythm changes in response to sensorimotor load
of varying complexity p 465 N84-31908

Variability of practice and the transfer of training of motor
skills [AD-A142896] p 472 N84-31942

Measurement and modification of sensorimotor system
function during visual-motor performance [AD-A142919] p 476 N84-31947

PHYSIOLOGICAL TESTS

The energy expenditure of helicopter pilots p 474 A84-43737

The phenomenon of 'infinite sound' as an indicator of
the physical fitness of military personnel p 461 A84-43923

PHYSIOLOGY

Physiology of thermoregulation p 455 A84-45995

PILOT ERROR

Sphere and cylinder distribution among the USAF rated
population requiring spectacles p 460 A84-43738

PILOT PERFORMANCE

Time series modeling of human operator dynamics in
manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446

The energy expenditure of helicopter pilots p 474 A84-43737

The measurement of cockpit workload p 471 A84-44749

Research on computer aided testing of pilot response
to critical in-flight events [NASA-CR-173871] p 476 N84-31945

Pilot oriented performance measurement [AD-P003450] p 472 N84-32227

An unusual toxicological property of alcohol: The density
effect on the organ of balance p 469 N84-33016

Visual information transfer. 1: Assessment of specific
information needs. 2: The effects of degraded motion
feedback. 3: Parameters of appropriate instrument
scanning behavior [NASA-CR-173913] p 477 N84-33020

PILOT TRAINING

New concepts in aircrew training using computer
generated imagery: A study report [AD-P003451] p 473 N84-32228

Visual cueing effectiveness: Comparison of perception
and flying performance [AD-P003458] p 473 N84-32235

Training the multiple-aircraft combat environment
[AD-P003495] p 473 N84-32261

PILOTS (PERSONNEL)

Pilot jet lag experiments described p 467 N84-32997

PITUITARY GLAND

Immersion diuresis without expected suppression of
vasopressin p 461 A84-43822

PLANETARY EVOLUTION

Earth's earliest biosphere: Its origin and evolution ---
Book p 450 A84-43051

PLANTS (BOTANY)

Publications of the NASA space biology program for
1980 - 1984 --- bibliographies [NASA-TM-86857] p 457 N84-32990

POLYNUCLEOTIDES

Chiral selection in poly(C)-directed synthesis of oligo(G)
--- autocatalytic amplification of optical asymmetry in
polynucleotides p 477 A84-45119

POSITION (LOCATION)

Pulmonary artery location during microgravity activity:
Potential impact for chest-mounted Doppler during space
travel [NASA-TM-58262] p 466 N84-31935

PRECAMBRIAN PERIOD

Early biogeologic history - The emergence of a
paradigm p 450 A84-43052

Precambrian organic geochemistry - Preservation of the
record p 450 A84-43056

Archean stromatolites - Evidence of the earth's earliest
benthos p 451 A84-43059

Archean microfossils - New evidence of ancient
microbes p 451 A84-43060

Early Proterozoic microfossils p 452 A84-43065

PREDICTION ANALYSIS TECHNIQUES

Link between characteristics of EEG rhythms in
biofeedback control and indexes for operator activity p 472 N84-31927

Development of color criteria for advanced displays
[AD-A143246] p 468 N84-33006

PRIMITIVE EARTH ATMOSPHERE

Earth's earliest biosphere: Its origin and evolution ---
Book p 450 A84-43051

Prebiotic organic syntheses and the origin of life
p 477 A84-43055

PROBLEM SOLVING

Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063
 Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066

PROBLEM SOLVING

The correlation of closed eye movements with the process of task performance p 471 A84-45924

PRODUCTIVITY

Realization of human work capacity: Interdisciplinary problems p 475 N84-31920
 Stress in work p 475 N84-31921

PROPRIOCEPTION

Study of spatial asymmetry in human external electrical field p 466 N84-31932
 Psychophysics of proprioceptive sensibility p 472 N84-31933

PROTEIN METABOLISM

Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956

PROTEIN SYNTHESIS

Chiral selection in poly(C)-directed synthesis of oligo(G) --- autocatalytic amplification of optical asymmetry in polynucleotides p 477 A84-45119

PROTEINS

Unraveling photosystems [DE84-013812] p 457 N84-32994
 Microbiology and food program p 458 N84-32999

PROTOBIOLOGY

Prebiotic organic syntheses and the origin of life p 472 A84-43055

PSYCHOACOUSTICS

Auditory induction of discrete tones in signal detection tasks p 470 A84-43768

PSYCHOLOGICAL EFFECTS

Stability of physiological and psychological human functions under extreme environmental conditions p 465 N84-31910
 Realization of human work capacity: Interdisciplinary problems p 475 N84-31920

PSYCHOLOGICAL FACTORS

Relationship between certain immunological indicators and the subjective state of seamen during voyages p 461 A84-43925
 The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941

PSYCHOLOGICAL TESTS

Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909
 Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

PSYCHOLOGY

USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903

PSYCHOMOTOR PERFORMANCE

Dexterity is just a fumble in space p 475 A84-46258
 USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916

PSYCHOPHYSICS

Study of spatial asymmetry in human external electrical field p 466 N84-31932

PSYCHOPHYSIOLOGY

Psychophysiological aspects of monotonous human activity p 471 N84-31911
 Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

PULMONARY CIRCULATION

Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923
 Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935

PULMONARY FUNCTIONS

Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010

PULSE RATE

Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007

PULSED LASERS

Medical applications of lasers p 464 N84-31904

PULSED RADIATION

Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007

PYROLYSIS

A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015

R

RADIATION

Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007

RADIATION DAMAGE

Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956
 A general scheme for the modification of reproductive cell death p 449 A84-42957
 A quantitative analysis of radiation damage to thrombocytopoiesis p 449 A84-42958
 The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
 Nonspecific responsivity of the body and individual radio sensitivity p 455 A84-46225
 Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995

RADIATION DOSAGE

Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
 Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007
 Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009
 Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010
 Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019

RADIATION EFFECTS

Iron content of blood and iron saturation of blood serum transferrin following X-ray irradiation p 449 A84-42959
 Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960
 Thyroid gland hyperfunction as a result of the separate and combined effects of radiation and heat p 450 A84-42961
 The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963
 USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
 Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913
 Effects of radiofrequency radiation on differentiation of erythroleukemic cells [AD-A143038] p 456 N84-31914
 USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-017] p 457 N84-31924

RADIATION HAZARDS

Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009

RADIATION MEASUREMENT

Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007

RADIATION PROTECTION

An investigation of the absorbing capacity of the gastrointestinal tract of irradiated animals treated with radioprotective agents p 450 A84-42964
 Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965

RADIATION TOLERANCE

Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960

RADIO FREQUENCIES

USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
 Effects of radiofrequency radiation on differentiation of erythroleukemic cells [AD-A143038] p 456 N84-31914
 Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies [AD-A143507] p 457 N84-32992
 Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007

RADIOBIOLOGY

Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
 USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
 Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002

REACTION

Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908

REDUCED GRAVITY

Low gravity lowers immunity to disease p 456 A84-46260

REGRESSION ANALYSIS

Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143098] p 467 N84-31939

REGRESSION COEFFICIENTS

Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006

REGULATIONS

Evaluation and control of laser hazards p 470 N84-33018

RENAL FUNCTION

Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
 Pharmacologic counter measures minimizing post-space flight orthostatic intolerance --- bed rest, drug disposition, and physiological function [NASA-CR-173861] p 466 N84-31936

RESPIRATORY PHYSIOLOGY

Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
 Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087
 Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925

RETICULOCYTES

Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960

ROBOTICS

Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion p 476 N84-31943

S

SACCADIC EYE MOVEMENTS

Audio-ocular response - Saccadic programming p 474 A84-43735

SAFETY

Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
 Evaluation and control of laser hazards p 470 N84-33018

SALYUT SPACE STATION

Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
 Medical research in first 100 days of Salyut-7 flight p 464 N84-31230

SEATS

Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948

SEMICIRCULAR CANALS

An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016

SENSITIVITY

Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man
[PBB4-195312] p 469 N84-33010

SENSORIMOTOR PERFORMANCE

Operational efficiency and time of day p 471 A84-44094
Dexterity performance and reduced ambient temperature p 474 A84-44095
Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908
Psychophysiological aspects of monotonous human activity p 471 N84-31911
Measurement and modification of sensorimotor system function during visual-motor performance [AD-A142919] p 476 N84-31947

SEROTONIN

Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965
Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989

SEX FACTOR

First mixed crew in space p 475 N84-31917

SHOCK (PHYSIOLOGY)

Modeling of lethal electric shock p 468 N84-33000

SIGNAL DETECTION

Auditory induction of discrete tones in signal detection tasks p 470 A84-43768

SIGNS AND SYMPTOMS

A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions --- High Pressure Nervous Syndrome p 454 A84-44082

SKIN TEMPERATURE (BIOLOGY)

Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825

SLEEP DEPRIVATION

Disturbance of sleep by noise - Individual differences p 471 A84-45659

SODIUM

Passive transport of sodium into epithelial cells - Methods of study, properties, regulation, and role p 455 A84-46223

SOLID PROPELLANTS

Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946

SOUND PRESSURE

The phenomenon of 'infinite sound' as an indicator of the physical fitness of military personnel p 461 A84-43923

SPACE FLIGHT STRESS

Why do astronauts suffer space sickness? p 462 A84-46256
Low gravity lowers immunity to disease p 456 A84-46260

SPACE PERCEPTION

Stability of phase recognition in complex spatial waveforms --- in visual discrimination tasks p 463 A84-46435

SPACE SUITS

Shoulder and hip joint for hard space suits and the like [NASA-CASE-ARC-11534-1] p 477 N84-33021

SPACEBORNE EXPERIMENTS

Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727

SPACECRAFT ENVIRONMENTS

Tilted astronauts reveal the brain's balancing act p 463 A84-46257

SPECTRUM ANALYSIS

Rapid microbial identification by circular intensity differential scattering [DE84-013894] p 457 N84-32993

SPEECH RECOGNITION

Communications biophysics p 470 N84-33362

SPINAL CORD

A model of spinal cord dysbarism to study delayed treatment. II - Effects of treatment p 452 A84-43726

SPLEEN

Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956

STRESS (PHYSIOLOGY)

Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796
The phenomenon of 'infinite sound' as an indicator of the physical fitness of military personnel p 461 A84-43923

Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086

Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087

Ergonomic analysis of human operation of video terminal p 475 N84-31918

Stress in work p 475 N84-31921
Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925

Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991

STRESS (PSYCHOLOGY)

Vigilance and task load - In search of the inverted U p 471 A84-44096 p 475 N84-31921

STRESS IN WORK

Stress in work p 475 N84-31921

SURGERY

Medical applications of lasers p 464 N84-31904

SYNAPSES

Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
Correlation of afferent activity and binocular receptive field properties [AD-A143087] p 467 N84-31938

SYNTHETIC APERTURE RADAR

Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006

SYSTEM EFFECTIVENESS

Variability of practice and the transfer of training of motor skills [AD-A142896] p 472 N84-31942

T**TARGET RECOGNITION**

Audio-ocular response - Saccadic programming p 474 A84-43735

TASK COMPLEXITY

Operational efficiency and time of day p 471 A84-44094
Vigilance and task load - In search of the inverted U p 471 A84-44096
Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927

TASKS

The correlation of closed eye movements with the process of task performance p 471 A84-45924

TECHNOLOGY ASSESSMENT

USSR report: Life sciences, Biomedical and behavioral sciences [JP85-UBB-84-017] p 457 N84-31924

TELEOPERATORS

Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station [AIAA PAPER 84-1890] p 474 A84-43440
Teleoperator human factors study [NASA-CR-171120] p 476 N84-31944
Teleoperator human factors study [NASA-CR-173890] p 477 N84-33022

TEMPERATURE EFFECTS

Human whole-blood oxygen affinity - Effect of temperature p 462 A84-44085
Dexterity performance and reduced ambient temperature p 474 A84-44095
Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991

THERAPY

A model of spinal cord dysbarism to study delayed treatment. II - Effects of treatment p 452 A84-43726

THERMAL COMFORT

Dexterity performance and reduced ambient temperature p 474 A84-44095

THERMAL ENVIRONMENTS

Hot air changes our view of the ear p 463 A84-46259

THERMAL RESISTANCE

Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

THERMOREGULATION

Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086

Physiology of thermoregulation p 455 A84-45995

Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989

THRESHOLDS (PERCEPTION)

Effect of stimulation parameters on the visual detection of oscillatory motion p 462 A84-45925

The effects of exposure duration and luminance on the 3-dot hyperacuity task p 463 A84-46436

THROMBOCYTES

A quantitative analysis of radiation damage to thrombocytopoiesis p 449 A84-42958

THYROID GLAND

Thyroid gland hyperfunction as a result of the separate and combined effects of radiation and heat p 450 A84-42961

The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963

TIME SERIES ANALYSIS

Time series modeling of human operator dynamics in manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446

TISSUES (BIOLOGY)

Passive transport of sodium into epithelial cells
Methods of study, properties, regulation, and role p 455 A84-46223
Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913

TOXICITY

Cerebral metabolism and blood brain transport: Toxicity of organophosphorus compounds [AD-A142705] p 468 N84-33005
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011
Hydrazine toxicology: Impact on safety and health in military aviation p 469 N84-33013
A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015

TRAINING ANALYSIS

Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242

TRAINING DEVICES

New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228

TRAINING SIMULATORS

Pilot oriented performance measurement [AD-P003450] p 472 N84-32227
Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242

TRANSFER OF TRAINING

Variability of practice and the transfer of training of motor skills [AD-A142896] p 472 N84-31942

TROPISM

Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924

TRYPANOSOME

Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549

TUMORS

Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573

U**UNDERWATER PHYSIOLOGY**

Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions --- High Pressure Nervous Syndrome p 454 A84-44082
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088

USER REQUIREMENTS

Langley experience with ADABAS/NATURAL p 470 N84-33272

V**VASCULAR SYSTEM**

Vascular permeability in patients with nasal bleeding on the background of atherosclerosis and hypertension disease, and its relationship to solar and geomagnetic disturbances p 460 A84-43799

VASODILATION

Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825

VENTILATION

Sensitivity to hypoxia in humans p 466 N84-31934

VERTEBRAL COLUMN

Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924

VESTIBULAR NYSTAGMUS

Physiological vestibular nystagmus p 460 A84-43797

VESTIBULAR TESTS

- The genesis of positional paroxysmal nystagmus
p 460 A84-43798
- Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision
p 463 A84-46475
- VESTIBULAR TESTS**
- Vestibular-induced vomiting after vestibulocerebellar lesions
p 462 A84-45665
- Hot air changes our view of the ear
p 463 A84-46259
- Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision
p 463 A84-46475
- VESTIBULES**
- Vestibular-induced vomiting after vestibulocerebellar lesions
p 462 A84-45665
- VETERINARY MEDICINE**
- USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-017] p 457 N84-31924
- VIBRATION PERCEPTION**
- Effect of stimulation parameters on the visual detection of oscillatory motion
p 462 A84-45925
- VIDEO DATA**
- Ergonomic analysis of human operation of video terminal
p 475 N84-31918
- VIDEO EQUIPMENT**
- Correlates of ocular and somatic symptoms among video display terminal users
p 474 A84-44091
- VIROSES**
- Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study
p 462 A84-45548
- Interferon induces natural killer cell blastogenesis in vivo
p 455 A84-45550
- Roles of ionizing radiation in cell transformation
[DE84-013397] p 458 N84-32995
- VISION**
- Visual function and the definition of thresholds for exposure to laser radiation
p 470 N84-33019
- Physiology
p 470 N84-33363
- VISUAL ACUITY**
- Sphere and cylinder distribution among the USAF rated population requiring spectacles
p 460 A84-43738
- The effects of exposure duration and luminance on the 3-dot hyperacuity task
p 463 A84-46436
- VISUAL AIDS**
- Visual cueing effectiveness: Comparison of perception and flying performance
[AD-P003458] p 473 N84-32235
- VISUAL DISCRIMINATION**
- Effect of stimulation parameters on the visual detection of oscillatory motion
p 462 A84-45925
- Stability of phase recognition in complex spatial waveforms --- in visual discrimination tasks
p 463 A84-46435
- Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers
p 472 N84-31928
- Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior
[NASA-CR-173913] p 477 N84-33020
- Physiology
p 470 N84-33363
- VISUAL FIELDS**
- Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision
p 463 A84-46475
- VISUAL FLIGHT**
- Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior
[NASA-CR-173913] p 477 N84-33020
- VISUAL PERCEPTION**
- Tilted astronauts reveal the brain's balancing act
p 463 A84-46257
- Occupational Medicine Relevant to Aviation Medicine
[AGARD-CP-341] p 469 N84-33011
- Visual perception in systems management in aeronautics
p 470 N84-33017
- VISUAL STIMULI**
- Effect of stimulation parameters on the visual detection of oscillatory motion
p 462 A84-45925
- Physiology
p 470 N84-33363
- VISUAL TASKS**
- Vigilance and task load - In search of the inverted U
p 471 A84-44096
- VOICE COMMUNICATION**
- Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems
p 471 A84-44093
- VOMITING**
- Vestibular-induced vomiting after vestibulocerebellar lesions
p 462 A84-45665

W

- WALKING**
- Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion
p 476 N84-31943
- WARNING**
- Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems
p 471 A84-44093
- WATER IMMERSION**
- Effects of endurance fitness on responses to cold water immersion
p 459 A84-43732
- Immersion diuresis without expected suppression of vasopressin
p 461 A84-43822
- WEIGHTLESSNESS**
- Why do astronauts suffer space sickness?
p 462 A84-46256
- Tilted astronauts reveal the brain's balancing act
p 463 A84-46257
- Dexterity is just a fumble in space
p 475 A84-46258
- Hot air changes our view of the ear
p 463 A84-46259
- Hypokinesia experiment studies effects of weightlessness
p 464 N84-31234
- Publications of the NASA space biology program for 1980 - 1984 --- bibliographies
[NASA-TM-86857] p 457 N84-32990
- WORK CAPACITY**
- The energy expenditure of helicopter pilots
p 474 A84-43737
- Effect of varied lactate levels on bicycle ergometer performance
p 462 A84-44089
- Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia
p 462 A84-44090
- Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress
p 465 N84-31925
- Effect of body temperature on human work capacity
p 476 N84-31926
- WORKLOADS (PSYCHOPHYSIOLOGY)**
- Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems
p 471 A84-44093
- Vigilance and task load - In search of the inverted U
p 471 A84-44096
- The measurement of cockpit workload
p 471 A84-44749
- Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress
p 465 N84-31925

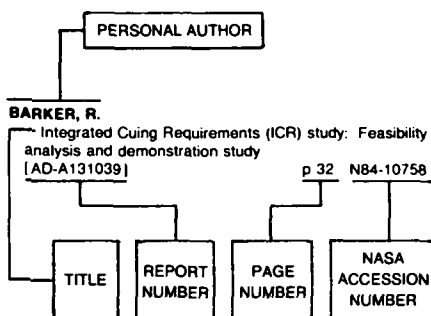
X

- X RAYS**
- Iron content of blood and iron saturation of blood serum transferrin following X-ray irradiation
p 449 A84-42959

Y

- YEAST**
- Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts
p 458 N84-32998

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

AAS, P.
Modulation of the cholinergic mechanisms in the bronchial smooth muscle
[NDRE/PUBL-84-1001] p 467 N84-31937

ABBOTT, R. A.
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090

ABEL, L. A.
Audio-ocular response - Saccadic programming p 474 A84-43735

ABRAMOV, M. M.
Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965

ADAMS, W. C.
Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087

AIHARA, K.
Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

AILON, A.
An approach to control laws for arm motion p 475 A84-45160

AKIN, D. L.
Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station [AIAA PAPER 84-1890] p 474 A84-43440

AKSENTSEV, S. L.
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913

ALBRIGHT, N. W.
Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995

ALLISON, T. G.
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090

AMALBERTI, R.
Visual perception in systems management in aeronautics p 470 N84-33017

ANDERSON, J. M.
Conference Grant for 2nd World Congress on Biomaterials [AD-A143129] p 456 N84-31915

ANDREW, G. M.
Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079

ANTIPENKO, E. N.
The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963

ANTIPOV, V. V.
Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965

ARCAN, M.
An approach to control laws for arm motion p 475 A84-45160

AYZMAN, R. I.
Age-related responses to de- and hyperhydration p 464 N84-31905

B

BAKHAREV, V. D.
Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

BARABOV, V. A.
Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002

BARNARD, R. J.
Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824

BEAMISH, R. E.
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080

BELIAEVA, E. I.
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913

BELL, H. H.
Pilot oriented performance measurement [AD-P003450] p 472 N84-32227

BELLOSI, A.
Effects of constant magnetic fields on rats and mice - A study of weight p 452 A84-43733

BENNETT, K. B.
Auditory induction of discrete tones in signal detection tasks p 470 A84-43768

BENNETT, M.
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573

BENSON, A.
Hot air changes our view of the ear p 463 A84-46259

BERKELIYEVA, S. C.
Effects of climate on kininogen levels in healthy human subjects p 464 N84-31907

BIEZAD, D. J.
Time series modeling of human operator dynamics in manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446

BIRON, C. A.
Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550

BOGUSHEVICH, M. S.
Modeling of lethal electric shock p 468 N84-33000

BOJENKO, S.
Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729

BOLDYREV, A. A.
The mystery of motion or what regulates the work of the muscles and how is this regulation effected p 454 A84-44498

BONDAROVSKAYA, V. M.
Ergonomic analysis of human operation of video terminal p 475 N84-31918

BORISOVA, Y. D.
Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

BORLAND, T.
Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946

BRADLEY, M. E.
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088

BREGADZE, O. M.
Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518

BRESLER, S. E.
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954

BROOKS, R.
Visual cueing effectiveness: Comparison of perception and flying performance [AD-P003458] p 473 N84-32235

BROWN, G. A.
The energy expenditure of helicopter pilots p 474 A84-43737

BROWN, M. C.
Communications biophysics p 470 N84-33362

BROWN, R. F.
Effects of radiofrequency radiation on differentiation of erythroleukemic cells [AD-A143038] p 456 N84-31914

BRUNDERMAN, J.
Pilot oriented performance measurement [AD-P003450] p 472 N84-32227
Visual cueing effectiveness: Comparison of perception and flying performance [AD-P003458] p 473 N84-32235

BUCKALEW, L. W.
Negative air ion effects on human performance and physiological condition [AFAMRL-TR-82-99] p 459 A84-43734

BUDAGOV, R. S.
Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960
Thyroid gland hyperfunction as a result of the separate and combined effects of radiation and heat p 450 A84-42961

BUDAGOVA, Z. K.
Variations in the absorption capacity of the reticulo-endothelial system under the combined effect of radiation and burn p 449 A84-42960

BUIAKAS, T. M.
The correlation of closed eye movements with the process of task performance p 471 A84-45924

BULANOVA, K. IA.
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913

BULUYEV, A. B.
Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930

BUONO, M. J.
Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823

BURAVTSOV, V. I.
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923

BURKADZE, N. N.
Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518

C

CARLEY, L. R.
Physiology p 470 N84-33363

AUTHOR

- CARLIN, F. H.**
Sensitivity to hypoxia in humans p 466 N84-31934
- CASPERSEN, C. J.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- CATRON, P. W.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- CERRETELLI, P.**
Blood O₂ affinity and maximal O₂ consumption in elite bicycle racers p 460 A84-43820
- CHANDLER, R. F.**
Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990 [AD-A142946] p 477 N84-31948
- CHANG, S.**
Prebiotic organic syntheses and the origin of life p 477 A84-43055
- CHAPMAN, D. J.**
Biological and biochemical effects of the development of an aerobic environment p 451 A84-43064
- CHEVALERAUD, J. P.**
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- CHIGAREVA, N. G.**
An investigation of the absorbing capacity of the gastrointestinal tract of irradiated animals treated with radioprotective agents p 450 A84-42964
- CHILD, J. S.**
Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824
- CHRISTENSEN, N. J.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- CHUREEVA, L. N.**
Thyroid gland hyperfunction as a result of the separate and combined effects of radiation and heat p 450 A84-42961
- CLANCY, T. R.**
Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823
- CLOUD, P.**
Early biogeologic history - The emergence of a paradigm p 450 A84-43052
- COATES, G. D.**
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior [NASA-CR-173913] p 477 N84-33020
- COCHRAN, D. J.**
Dexterity performance and reduced ambient temperature p 474 A84-44095
- COGOLI, A.**
Low gravity lowers immunity to disease p 456 A84-46260
- COMSTOCK, J. R., JR.**
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior [NASA-CR-173913] p 477 N84-33020
- CONDON, R.**
Operational efficiency and time of day p 471 A84-44094
- CONKIN, J.**
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935
- CONVERTINO, V. A.**
Cardiovascular responses during orthostasis - Effect of an increase in maximal O₂ uptake p 459 A84-43730
- COOK, J. R.**
Blood lactate and ammonium ion accumulation during graded exercise in humans p 461 A84-43823
- COOK, P. A.**
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261
- COOPER, L. N.**
Correlation of afferent activity and binocular receptive field properties [AD-A143087] p 467 N84-31938
- COURANT, D.**
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- COURT, L.**
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019

- CRAIG, A.**
Operational efficiency and time of day p 471 A84-44094
- CURRY, R. E.**
Vigilance and task load - In search of the inverted U p 471 A84-44096

D

- DABROWA, R.**
Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729
- DAVIDENKOVA, E. F.**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
- DAVYDOV, O. V.**
Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796
- DELCROIX, J. P.**
A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015
- DELLOSSO, L. F.**
Audio-ocular response - Saccadic programming p 474 A84-43735
- DEMAIO, J.**
Pilot oriented performance measurement [AD-P003450] p 472 N84-32227
Visual cueing effectiveness: Comparison of perception and flying performance [AD-P003458] p 473 N84-32235
- DEMPSEY, J. A.**
Arterial blood acid-base regulation during exercise in rats p 454 A84-44084
- DESMARAIS, D.**
Prebiotic organic syntheses and the origin of life p 477 A84-43055
- DHALLA, K. S.**
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
- DHALLA, N. S.**
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
- DOERR, B. M.**
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
- DREWES, L. R.**
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005
- DUBOSE, D. A.**
Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991
- DUMAS, J. C.**
Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081

E

- EATOCK, R. A.**
Communications biophysics p 470 N84-33362
- EDDINGTON, D. K.**
Communications biophysics p 470 N84-33362
- EIDUS, L. KH.**
A general scheme for the modification of reproductive cell death p 449 A84-42957
- EVANS, A. S.**
Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548

F

- FAUSTINA, M. L.**
Vigilance and task load - In search of the inverted U p 471 A84-44096
- FEDOROVA, T. M.**
The correlation of closed eye movements with the process of task performance p 471 A84-45924
- FILATOV, M. V.**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
- FLYNN, E. T., JR.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- FORNI, C.**
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions p 454 A84-44082
- FOSTER, J. E., JR.**
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083

- FREGOSI, R. F.**
Arterial blood acid-base regulation during exercise in rats p 454 A84-44084
- FREY, M. A. B.**
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
- FRIM, J.**
Effects of endurance fitness on responses to cold water immersion p 459 A84-43732

G

- GALBO, H.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- GARDETTE-CHAUFFOUR, M. C.**
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions p 454 A84-44082
- GARDETTE, B.**
Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions p 454 A84-44082
- GARDNER, J.**
Physiology p 470 N84-33363
- GAZENKO, O. G.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- GEIGER, G.**
Physiology p 470 N84-33363
- GEKSADZE, KH. A.**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
- GELTSSEL, M. Y.**
Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908
- GEORGESON, M. A.**
Stability of phase recognition in complex spatial waveforms p 463 A84-46435
- GEST, H.**
Biochemical evolution of anaerobic energy conversion - The transition from fermentation to anoxygenic photosynthesis p 450 A84-43057
- GIBBONS, S. I.**
Combined effects of ozone exposure and ambient heat on exercising females p 462 A84-44087
- GIFALDI, A.**
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573
- GIFFIN, W. C.**
Research on computer aided testing of pilot response to critical in-flight events [NASA-CR-173871] p 476 N84-31945
- GILCHER, R.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- GLEZER, G. A.**
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224
- GOLOVANOV, V.**
Pilot jet lag experiments described p 467 N84-32997
- GORELOVA, N. V.**
Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965
- GOSS, F. L.**
Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086
- GOTSULIAK, L. E.**
Iron content of blood and iron saturation of blood serum transferrin following X-ray irradiation p 449 A84-42959
- GRAHAM, J. A.**
Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010
- GREENLEAF, J. E.**
Cardiovascular responses during orthostasis - Effect of an increase in maximal O₂ uptake p 459 A84-43730
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
- GREGG, C. T.**
Rapid microbial identification by circular intensity differential scattering [DE84-013894] p 457 N84-32993
- GRIDIN, L. A.**
Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

- GRIGOREV, A. IU.**
Nonspecific responsivity of the body and individual radio sensitivity p 455 A84-46225
- GRIGOREV, G. M.**
The genesis of positional paroxysmal nystagmus p 460 A84-43798
- GRINCHUK, V. I.**
Physiological vestibular nystagmus p 460 A84-43797
- GUERBET, M.**
A comparative study in the animal of the toxicity of the combustion products of diverse materials p 469 N84-33015
- GUINAN, J. J.**
Communications biophysics p 470 N84-33362
- GURI, M.**
The effects of exposure duration and luminance on the 3-dot hyperacuity task p 463 A84-46436
- GUSSONI, M.**
Blood O₂ affinity and maximal O₂ consumption in elite bicycle racers p 460 A84-43820
- GWAZDAUSKAS, F. C.**
Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086
- GWIRTZ, P. A.**
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
- H**
- HADANI, I.**
The effects of exposure duration and luminance on the 3-dot hyperacuity task p 463 A84-46436
- HADLEY, A. T., III**
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935
- HAKKINEN, M. T.**
Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems p 471 A84-44093
- HALLENBECK, J. M.**
A model of spinal cord dysbarism to study delayed treatment. II - Effects of treatment p 452 A84-43726
- HALPERIN, W.**
Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
- HAMILTON, B.**
Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946
- HANPETER, D. E.**
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
- HANSON, C. L.**
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261
- HARRINGTON, J.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- HARRISON, D. C.**
Pharmacologic counter measures minimizing post-space flight orthostatic intolerance [NASA-CR-173861] p 466 N84-31936
- HATCH, G. E.**
Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010
- HAUCK, D.**
New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228
- HAYES, J. M.**
Precambrian organic geochemistry - Preservation of the record p 450 A84-43056
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058
Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063
Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066
- HEMMINGSEN, E. A.**
Bubble formation in crabs induced by limb motions after decompression p 453 A84-43821
- HERBERT, W. G.**
Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086
- HESS, J. L.**
Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086
- HEYNICK, L. N.**
USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912
- HIGENBOTTAM, C.**
The energy expenditure of helicopter pilots p 474 A84-43737
- HINMAN, D.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- HOCHSTEIN, L. I.**
The growth of *Paracoccus halodenitrificans* in a defined medium p 454 A84-45399
- HOFMANN, H. J.**
Early Proterozoic microfossils p 452 A84-43065
- HOGAN, M. C.**
Effect of varied lactate levels on bicycle ergometer performance p 462 A84-44089
- HOLCOMBE, G.**
Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946
- HOLTRUP, G.**
Evaluation and control of laser hazards p 470 N84-33018
- HORRIGAN, D. J., JR.**
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935
- HOWARD, J. H., JR.**
Auditory induction of discrete tones in signal detection tasks p 470 A84-43768
- HOWELL, W. C.**
The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941
- HUEY, L.**
A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
- HUMPELER, E.**
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004
- HURT, W. D.**
Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions [AD-A143570] p 468 N84-33007
- HYNES, A.**
Effects of endurance fitness on responses to cold water immersion p 459 A84-43732
- I**
- ILIN, E. A.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- ILIUSHKO, N. A.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- IMBERT, J. P.**
Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
- IMSHENETSKIY, A. A.**
Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001
- INAMA, K.**
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004
- IVANOV, K. P.**
Physiology of thermoregulation p 455 A84-45995
- J**
- JACKSON, R. M.**
The endotoxin-pretreated, oxygen-adapted rat model in hyperbaric hyperoxia p 452 A84-43731
- JACOBS, I.**
Effects of endurance fitness on responses to cold water immersion p 459 A84-43732
- JANOWSKY, D. S.**
A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
- JESSEN, K.**
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014
- JHAVERI, S.**
Physiology p 470 N84-33363
- JIANG, W.**
A study of physiological equivalent effect temperature p 458 A84-43352
- JOHNSON, J. M.**
Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825
- JOHNSON, J. T.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- JOYCE, G. F.**
Chiral selection in poly(C)-directed synthesis of oligo(G) p 477 A84-45119
- JUNGMANN, H.**
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres [RAE-TRANS-2118] p 468 N84-33004
- K**
- KAMENTSKY, L. A.**
Physiology p 470 N84-33363
- KAPLAN, I. R.**
Precambrian organic geochemistry - Preservation of the record p 450 A84-43056
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058
- KASATOV, A. P.**
Psychophysics of proprioceptive sensibility p 472 N84-31933
- KATES, R.**
Pharmacologic counter measures minimizing post-space flight orthostatic intolerance [NASA-CR-173861] p 466 N84-31936
- KEIL, L. C.**
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
- KEITHLEY, E. M.**
Communications biophysics p 470 N84-33362
- KELSO, T. B.**
Exercise-thermoregulatory stress and increased plasma beta-endorphin/beta-lipotropin in humans p 462 A84-44086
- KENNEDY, B.**
A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
- KERKAR, S. P.**
The effect of information display format on multiple-cue judgment [AD-A142884] p 472 N84-31941
- KHALYAVKO, P. M.**
Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002
- KHANDOV, M. Z.**
Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927
- KHUKHLAYEV, V. K.**
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919
- KIANG, N. Y. S.**
Communications biophysics p 470 N84-33362
- KIERSZENBAUM, F.**
Beta-interferon inhibits cell infection by *Trypanosoma cruzi* p 455 A84-45549
- KIRBY, R. H.**
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior [NASA-CR-173913] p 477 N84-33020
- KIRILJUK, A. P.**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
- KJAER, M.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- KOBLER, J. B.**
Communications biophysics p 470 N84-33362
- KOHN, P.**
The measurement of cockpit workload p 471 A84-44749
- KOUSHIMA, S.**
A novel cold-tolerant insect found in a Himalayan glacier p 452 A84-43790
- KOLODYNSKA, V. V.**
Psychophysiological aspects of monotonous human activity p 471 N84-31911

KOLODYSKIY, A. A.

- KOLODYSKIY, A. A.**
Psychophysiological aspects of monotonous human activity p 471 N84-31911
- KOLTOVER, V. K.**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
- KOMAR, V. E.**
Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956
- KONDO, N.**
Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817
- KONDRATIEV, I. I.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- KONEV, S. V.**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
- KONNOVA, L. A.**
Variation in the metabolic pool of free amino acids in the peripheral blood and the spleen following total-body uniform gamma irradiation p 449 A84-42956
- KOPKA, L.**
Relationship between the value of the Wenckebach point and +Gz tolerance p 459 A84-43729
- KOPYSTYANSKAYA, K. R.**
Realization of human work capacity: Interdisciplinary problems p 475 N84-31920
- KORDIUM, E. L.**
Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
- KORNEV, A. V.**
Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906
- KORYSTOV, I. U. N.**
A general scheme for the modification of reproductive cell death p 449 A84-42957
- KOSTYUCHENKO, A. L.**
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923
- KOTANI, M.**
Nonlinear dynamics in excitable nerve membranes p 467 N84-32037
- KOVESHNIKOVA, I. V.**
The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963
- KOZLOVA, T. M.**
Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001
- KRAUSE, J. R.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- KRAVIK, S. E.**
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
- KUDELKIN, S. A.**
Study of spatial asymmetry in human external electrical field p 466 N84-31932
- KUMAR, V.**
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573
- KURGUZOV, S.**
Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927
- KUTRYK, M. J. B.**
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
- KUZMENKO, V. A.**
Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930
- KWANT, G.**
Human whole-blood oxygen affinity - Effect of temperature p 462 A84-44085

L

- LANDOLT, J. P.**
An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016

- LANGHOLZ, G.**
An approach to control laws for arm motion p 475 A84-45160
- LAPAEV, E. V.**
Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision p 463 A84-46475
- LAVROVA, E. A.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- LAZAREV, A. V.**
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224
- LEITCH, D. R.**
A model of spinal cord dysbarism to study delayed treatment. II - Effects of treatment p 452 A84-43726
- LEMAIRE, C.**
Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
- LETTVIN, J. Y.**
Physiology p 470 N84-33363
- LIBURDY, R. P.**
Effects of microwaves on cell membrane permeability [AD-A142979] p 456 N84-31913
- LIKHACHEVA, O. A.**
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919
- LIROVA, S. A.**
Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998
- LOFBERG, M. S.**
Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
- LOMANOV, G.**
Hypokinesia experiment studies effects of weightlessness p 464 N84-31234
- LUST, J.**
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573
- LYSENKO, S. V.**
Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001
- LYSKOVA, T. I.**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913

M

- MACK, R.**
Prebiotic organic syntheses and the origin of life p 477 A84-43055
- MARACHEV, A. G.**
Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906
- MARKMAN, V. G.**
Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927
- MARLIN, J.**
Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242
- MARSHALL, S. V.**
Effects of radiofrequency radiation on differentiation of erythroleukemic cells [AD-A143038] p 456 N84-31914
- MARYANOVICH, A. T.**
Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931
- MARYENKO, B. S.**
Realization of human work capacity: Interdisciplinary problems p 475 N84-31920
- MASHINSKII, O. L.**
Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
- MCCREARY, J.**
Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991
- MCDONOUGH, P. M.**
Bubble formation in crabs induced by limb motions after decompression p 453 A84-43821
- MEIRI, A. Z.**
The effects of exposure duration and luminance on the 3-dot hyperacuity task p 463 A84-46436
- MENU, J. P.**
Visual perception in systems management in aeronautics p 470 N84-33017
- METELSKII, S. T.**
Passive transport of sodium into epithelial cells - Methods of study, properties, regulation, and role p 455 A84-46223
- METZ, K. F.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- MIKINES, K. J.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- MILES, D. S.**
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
- MILUTIN, A. A.**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
- MILLER, A. D.**
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
- MILLER, F. J.**
Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009
- MILLER, S. L.**
Prebiotic organic syntheses and the origin of life p 477 A84-43055
- MILYUSHENKO, V. A.**
Medical applications of lasers p 464 N84-31904
- MIROLYUBOV, A. V.**
Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909
Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929
- MOHR, G. C.**
Hydrazine toxicology: Impact on safety and health in military aviation p 469 N84-33013
- MONEY, K. E.**
An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016
- MONSON, C. B.**
Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989
- MONTGOMERY, L. D.**
Cardiovascular responses during orthostasis - Effect of an increase in maximal O₂ uptake p 459 A84-43730

N

- NATOCHIN, I. U. V.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- NIKOLAYEVA, I. P.**
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923
- NIXON, P. A.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- NOGUCHI, H.**
Nonlinear dynamics in excitable nerve membranes p 467 N84-32037
- NOSKIN, L. A.**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
- NOVICHKOVA, A. T.**
Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001
- NUGIS, V. I.**
Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
- NUMAZIRI, T.**
Nonlinear dynamics in excitable nerve membranes p 467 N84-32037

O

- OESEBURG, B.**
Human whole-blood oxygen affinity - Effect of temperature p 462 A84-44085
- OKUN, I. M.**
Structural-functional alterations in the synaptic membranes of the brain as a result of aging p 455 A84-45913
- OLEARY, D.**
Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825

- OLSON, B.**
Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548
- OMAN, C.**
Why do astronauts suffer space sickness?
p 462 A84-46256
- ORTEL, L. E.**
Chiral selection in poly(C)-directed synthesis of oligo(G) p 477 A84-45119
- OTOOLE, A. J.**
Auditory induction of discrete tones in signal detection tasks p 470 A84-43768
- OVERTON, J. H., JR.**
Dosimetry of ozone and nitrogen dioxide in man and animals [PB84-195304] p 469 N84-33009
- P**
- PANG, C.**
A study of physiological equivalent effect temperature p 458 A84-43352
- PARADISO, M. A.**
Correlation of afferent activity and binocular receptive field properties [AD-A143087] p 467 N84-31938
- PARASURAMAN, R.**
Auditory induction of discrete tones in signal detection tasks p 470 A84-43768
- PARK, M. K.**
Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825
- PATTI, P.**
Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242
- PAVLOV, A. S.**
Effect of body temperature on human work capacity p 476 N84-31926
- PAVLOVA, T. A.**
Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925
- PEAKE, W. T.**
Communications biophysics p 470 N84-33362
- PERDRIEL, G.**
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- PERLMAN, D.**
Physiology p 470 N84-33363
- PETROFSKY, J. S.**
Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736
- PHILLIPS, C. A.**
Cardiovascular responses to isometric neck muscle contractions - Results after dynamic exercise with various headgear loading configurations p 460 A84-43736
- PIATKIN, E. K.**
Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
- PIERCE, G. N.**
Biochemical alterations in heart after exhaustive swimming in rats p 453 A84-44080
- PISARELLO, J. B.**
The endotoxin-pretreated, oxygen-adapted rat model in hyperbaric hyperoxia p 452 A84-43731
- PISHCHIK, V.**
Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229
Medical research in first 100 days of Salyut-7 flight p 464 N84-31230
- PLEASANT, L. G.**
Publications of the NASA space biology program for 1980 - 1984 [NASA-TM-86857] p 457 N84-32990
- PLOTKIN, G. M.**
Physiology p 470 N84-33363
- POKROVSKAIA, V. N.**
Proliferative activity and frequency of chromosome aberrations in the first mitosis in 50-, 60-, and 70-hour cultures of irradiated lymphocytes and in mixed cultures of irradiated and nonirradiated cells p 449 A84-42955
- POLETAEV, R. V.**
Anomalies of joint tropism and spinal osteochondrosis in flight personnel p 461 A84-43924
- POLSON, P.**
USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature [AD-A142961] p 456 N84-31912

- POPOV, S. Y.**
Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909
Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929
- POPOVA, A. F.**
Ultrastructural organization of cells of *Chlorella vulgaris* Beijer, strain LARG-1, grown in autotrophic conditions on Salyut-6 p 454 A84-44484
- POROTIKOV, V. I.**
Current ideas on ion mechanisms for cardiac arrhythmias and possible mechanisms for the action of antiarrhythmic drugs p 455 A84-46224
- PORUCHIKOV, E. A.**
The phenomenon of 'infinite sound' as an indicator of the physical fitness of military personnel p 461 A84-43923
- POVAZHENKO, A. A.**
Relationship between certain immunological indicators and the subjective state of seamen during voyages p 461 A84-43925
- PROVINES, W. F.**
Sphere and cylinder distribution among the USAF rated population requiring spectacles p 460 A84-43738
- R**
- RAHE, A. J.**
Sphere and cylinder distribution among the USAF rated population requiring spectacles p 460 A84-43738
- RAYMOND, S. A.**
Physiology p 470 N84-33363
- REHMANN, J. T.**
The Flight Service Automation System p 475 A84-44751
- REVSKOI, I. U. K.**
Response of the auditory analyzer to the combined effect of noise, high temperature, and carbon monoxide p 453 A84-43796
- RICHARDS, R. D.**
Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
- RICHTER, E. A.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- RILEY, M. W.**
Dexterity performance and reduced ambient temperature p 474 A84-44095
- RINALDUCCI, E. J.**
Visual cueing effectiveness: Comparison of perception and flying performance [AD-P003458] p 473 N84-32235
- RISCH, S. C.**
A cholinomimetic model of motion sickness and space adaptation syndrome p 459 A84-43728
- RIZZUTO, A. P.**
Negative air ion effects on human performance and physiological condition [AFAMRL-TR-82-99] p 459 A84-43734
- ROBERTSON, R. J.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- ROBINETTE, K. M.**
Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
- ROCKWELL, T. H.**
Research on computer aided testing of pilot response to critical in-flight events [NASA-CR-173871] p 476 N84-31945
- ROMET, T.**
Effects of endurance fitness on responses to cold water immersion p 459 A84-43732
- ROSS, H.**
Dexterity is just a fumble in space p 475 A84-46258
- ROSTAIN, J. C.**
Effects of addition of nitrogen during rapid compression of baboons p 453 A84-44081
HPNS of baboons during helium-nitrogen-oxygen slow exponential compressions p 454 A84-44082
- ROUEN, A. J. P.**
Ophthalmological investigation among contact lens wearers in military service [REPT-AR/MHAM-1983-1] p 467 N84-31940
- RYBIN, I. A.**
Psychophysics of proprioceptive sensibility p 472 N84-31933

- S**
- SALZMAN, G. C.**
Rapid microbial identification by circular intensity differential scattering [DE84-013894] p 457 N84-32993
- SAMAJA, M.**
Blood O₂ affinity and maximal O₂ consumption in elite bicycle racers p 460 A84-43820
- SANTUCCI, G.**
Visual perception in systems management in aeronautics p 470 N84-33017
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019
- SAPOV, I. A.**
Relationship between certain immunological indicators and the subjective state of seamen during voyages p 461 A84-43925
- SAPOVA, N. I.**
Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925
- SAWKA, M. N.**
Central hemodynamics during progressive upper- and lower-body exercise and recovery p 461 A84-44083
- SCHIDLowski, M.**
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058
- SCHMIDT, D. K.**
Time series modeling of human operator dynamics in manual control tasks [AIAA PAPER 84-1899] p 474 A84-43446
- SCHOPF, J. W.**
Earth's earliest biosphere: Its origin and evolution p 450 A84-43051
Biochemical evolution of anaerobic energy conversion - The transition from fermentation to anoxygenic photosynthesis p 450 A84-43057
Archean microfossils - New evidence of ancient microbes p 451 A84-43060
Biological and biochemical effects of the development of an aerobic environment p 451 A84-43064
Early Proterozoic microfossils p 452 A84-43065
Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066
- SELIVANOV, V. A.**
A quantitative analysis of radiation damage to thrombocytopoiesis p 449 A84-42958
- SERGEYEVA, A. N.**
Psychophysics of proprioceptive sensibility p 472 N84-31933
- SHAGINOVA, S. M.**
Informative value of the category 4-4 of the Minnesota code as an early sign of ischemic heart disease p 459 A84-43518
- SHAKHMATOVA, E. I.**
Fluid-electrolyte metabolism and renal function of white rats in experiments aboard Cosmos biosatellites p 452 A84-43727
- SHIBATA, S.**
Calcium source for excitation-contraction coupling in myocardium of nonhibernating and hibernating chipmunks p 453 A84-43817
- SHPARK, M. B.**
Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908
- SHULMAN, Y. I.**
Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908
- SHVARTS, E. I.**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
- SIEBERT, W. M.**
Communications biophysics p 470 N84-33362
- SILVER, J. E.**
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
- SINGH, A. K.**
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds [AD-A142705] p 468 N84-33005
- SKRINAR, G. S.**
Hemoglobin concentration and aerobic work capacity in women following induced erythrocythemia p 462 A84-44090
- SLONIM, A.**
Stability of physiological and psychological human functions under extreme environmental conditions p 465 N84-31910
- SMIALOWICZ, R. J.**
Immunologic effects of electromagnetic fields (1981 - 1983) [PB84-190602] p 468 N84-33008
- SMIRNOV, K. M.**
Stress in work p 475 N84-31921

- SMITH, A. B.**
Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
- SMITH, P. J.**
Research on computer aided testing of pilot response to critical in-flight events [NASA-CR-173871] p 476 N84-31945
- SNOW, C. C.**
Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939
- SOKOLOV, A. N.**
Effect of stimulation parameters on the visual detection of oscillatory motion p 462 A84-45925
- SOKOLOV, D. P.**
Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998
- SOKOLOVA, Y. A.**
Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts p 458 N84-32998
- SOLBERG, J. L.**
Publications of the NASA space biology program for 1980 - 1984 [NASA-TM-86857] p 457 N84-32990
- SOLOMIN, I. L.**
Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909
- SONNE, B.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- SONNENFELD, G.**
Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549
Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573
- SOWDERS, L.**
Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991
- SPAUL, W. A.**
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
- SPOFFORD, J. R.**
Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station [AIAA PAPER 84-1890] p 474 A84-43440
- STAINSBY, W. N.**
Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079
- STEIN, E.**
The measurement of cockpit workload p 471 A84-44749
- STEPANOVA, L. P.**
Results of psychophysiological study of Videoton terminal operators p 475 N84-31919
- STERMAN, M. B.**
Measurement and modification of sensorimotor system function during visual-motor performance [AD-A142919] p 476 N84-31947
- STONE, H. L.**
Coronary vascular response to adrenergic stimulation in exercise-conditioned dogs p 453 A84-44078
- STRATHEARN, G. E.**
Prebiotic organic syntheses and the origin of life p 477 A84-43055
- STUCHLY, M. A.**
Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies [AD-A143507] p 457 N84-32992
- STUCHLY, S. S.**
Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies [AD-A143507] p 457 N84-32992
- SUMNERS, C.**
Plasma catecholamines and their effect on blood lactate and muscle lactate output p 453 A84-44079
- SURVANSKI, S.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- SUTKOVOY, D. A.**
Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons p 458 N84-33002
- SUTTER-DUB, M. TH.**
Effects of constant magnetic fields on rats and mice - A study of weight p 452 A84-43733
- SUTTER, B. CH. J.**
Effects of constant magnetic fields on rats and mice - A study of weight p 452 A84-43733
- SUVOROV, N. N.**
Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965
- SWANSON, A.**
Langley experience with ADABAS/NATURAL p 470 N84-33272
- T**
- TABAK, V. Y.**
Modeling of lethal electric shock p 468 N84-33000
- TANAKA, S.**
Correlates of ocular and somatic symptoms among video display terminal users p 474 A84-44091
- TATULYAN, S. A.**
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923
- TAW, R. L.**
Cardiac hypertrophy and function in master endurance runners and sprinters p 461 A84-43824
- TAYLOR, W. F.**
Effect of high local temperature on reflex cutaneous vasodilation p 461 A84-43825
- TESLENKO, V. M.**
An investigation of the absorbing capacity of the gastrointestinal tract of irradiated animals treated with radioprotective agents p 450 A84-42964
- THOMAS, L. B.**
Morphological and physiological responses of the lungs of dogs to acute decompression p 454 A84-44088
- THORNTON, R.**
The energy expenditure of helicopter pilots p 474 A84-43737
- TIAZHELOVA, V. G.**
A quantitative analysis of radiation damage to thrombocytopenia p 449 A84-42958
- TIMCHENKO, O. I.**
The effect of microwaves of nonthermal intensity on the number of aberrant hepatocytes in rats p 450 A84-42962
The role of the thyroid gland in the development of genetic effects of microwaves of nonthermal intensity p 450 A84-42963
- TITOVA, N. A.**
Realization of human work capacity: Interdisciplinary problems p 475 N84-31920
- TOBIAS, C. A.**
Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995
- TOMLINSON, G. A.**
The growth of Paracoccus halodentificans in a defined medium p 454 A84-45399
- TORNUEYEV, Y. V.**
Study of spatial asymmetry in human external electrical field p 466 N84-31922
- TRACCIS, S.**
Audio-ocular response - Saccadic programming p 474 A84-43735
- TRAUTNER, S.**
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014
- TREDICI, T. J.**
Sphere and cylinder distribution among the USAF rated population requiring spectacles p 460 A84-43738
- TRELIJKOV, A. N.**
A determination of the level of DNA damage in human and mammalian cells p 449 A84-42954
- TRONIER, B.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- TSCHOPP, A.**
Low gravity lowers immunity to disease p 456 A84-46260
- TULUPOV, A. N.**
Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923
- TURNER, R. S. E.**
Stability of phase recognition in complex spatial waveforms p 463 A84-46435
- V**
- VAN BOECKEL, C. A. A.**
Chiral selection in poly(C)-directed synthesis of oligo(G) p 477 A84-45119
- VAN BOOM, J. H.**
Chiral selection in poly(C)-directed synthesis of oligo(G) p 477 A84-45119
- VAN WESTRENE, J.**
Chiral selection in poly(C)-directed synthesis of oligo(G) p 477 A84-45119
- VASIN, M. V.**
Characterization of the role of the serotonin hydroxyl group in the pharmacological and radioprotective action of serotonin p 450 A84-42965
- VEICSTEINAS, A.**
Blood O2 affinity and maximal O2 consumption in elite bicycle racers p 460 A84-43820
- VERSTEGEN, M.**
New concepts in aircrew training using computer generated imagery: A study report [AD-P003451] p 473 N84-32228
- VINTEN, J.**
Glucose turnover and hormonal changes during insulin-induced hypoglycemia in trained humans p 460 A84-43819
- VISSER, G. M.**
Chiral selection in poly(C)-directed synthesis of oligo(G) p 477 A84-45119
- VOROBEV, O. A.**
Human susceptibility to motion disease under conditions of combined vestibular and optokinetic stimulation and reduced field of vision p 463 A84-46475
- VOSTRIKOV, V. A.**
Modeling of lethal electric shock p 468 N84-33000
- VYKUKAL, H. C.**
Shoulder and hip joint for hard space suits and the like [NASA-CASE-ARC-11534-1] p 477 N84-33021
- W**
- WALIGORA, J. M.**
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel [NASA-TM-58262] p 466 N84-31935
- WALLQUIST, D. L.**
Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006
- WALTER, M. R.**
Archean stromatolites - Evidence of the earth's earliest biosphere p 451 A84-43059
Archean microfossils - New evidence of ancient microbes p 451 A84-43060
Evolution of earth's earliest ecosystems - Recent progress and unsolved problems p 452 A84-43066
- WARD, F.**
Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006
- WEDEKING, K. W.**
Precambrian organic geochemistry - Preservation of the record p 450 A84-43056
- WEISS, T. F.**
Communications biophysics p 470 N84-33362
- WELCH, H. G.**
Effect of varied lactate levels on bicycle ergometer performance p 462 A84-44089
- WELSH, R. M.**
Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550
- WHITE, R. H.**
Hydrolytic stability of biomolecules at high temperatures and its implication for life at 250 C p 454 A84-45106
- WIENER, E. L.**
Vigilance and task load - In search of the inverted U p 471 A84-44096
- WIESNER, S.**
Physiology p 470 N84-33363
- WILKINSON, R. T.**
Disturbance of sleep by noise - Individual differences p 471 A84-45659
- WILLIGES, B. H.**
Synthesized warning messages - Effects of an alerting cue in single- and multiple-function voice synthesis systems p 471 A84-44093
- WILSON, D.**
Development of color criteria for advanced displays [AD-A143246] p 468 N84-33006
- WILSON, V. J.**
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665
- WINTER, T. P.**
Variability of practice and the transfer of training of motor skills [AD-A142896] p 472 N84-31942
- WOESSNER, W. M.**
Sphere and cylinder distribution among the USAF rated population requiring spectacles p 460 A84-43738
- WONG, N.**
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
- WRISBERG, C. A.**
Variability of practice and the transfer of training of motor skills [AD-A142896] p 472 N84-31942

PERSONAL AUTHOR INDEX

Y

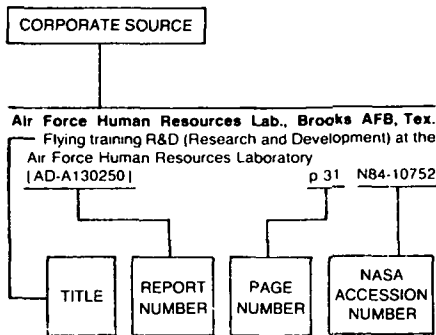
- YAFFE, L.**
Morphological and physiological responses of the lungs
of dogs to acute decompression p 454 A84-44088
- YANG, T. C.**
Roles of ionizing radiation in cell transformation
[DE84-013397] p 458 N84-32995
- YARTSEV, P. M.**
Dynamics of functional status and subjective sensations
in process of heat adaptation p 466 N84-31931
- YOUNG, J.**
Uniform mass distribution properties and body size
appropriate for the 50 percentile male aircrewmember,
1980 - 1990
[AD-A142946] p 477 N84-31948
- YOUNG, J. W.**
Anthropometric and mass distribution characteristics of
the adult female, revised
[AD-A143096] p 467 N84-31939
- YOUNG, L.**
Tilted astronauts reveal the brain's balancing act
p 463 A84-46257

Z

- ZAGAIKOVA, N. S.**
Vascular permeability in patients with nasal bleeding on
the background of atherosclerosis and hypertension
disease, and its relationship to solar and geomagnetic
disturbances p 460 A84-43799
- ZAICHIK, V. E.**
Thyroid gland hyperfunction as a result of the separate
and combined effects of radiation and heat
p 450 A84-42961
- ZEHNER, G. F.**
Anthropometric and mass distribution characteristics of
the adult female, revised
[AD-A143096] p 467 N84-31939
- ZHENG, Y. F.**
Modeling, control and simulation of three-dimensional
robotic systems with application to biped locomotion
p 476 N84-31943
- ZHERDEV, G. M.**
Response of the auditory analyzer to the combined effect
of noise, high temperature, and carbon monoxide
p 453 A84-43796
- ZIEGLER, M.**
A cholinomimetic model of motion sickness and space
adaptation syndrome p 459 A84-43728
- ZIJLSTRA, W. G.**
Human whole-blood oxygen affinity - Effect of
temperature p 462 A84-44085
- ZUIDEMA, H.**
Review of occupational medicine relevant to aviation
medicine p 469 N84-33012
- ZWART, A.**
Human whole-blood oxygen affinity - Effect of
temperature p 462 A84-44085

CORPORATE SOURCE INDEX

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

Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
Occupational Medicine Relevant to Aviation Medicine [AGARD-CP-341] p 469 N84-33011

Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
Hydrazine toxicology: Impact on safety and health in military aviation p 469 N84-33013

Air Force Human Resources Lab., Williams AFB, Ariz.
Pilot oriented performance measurement [AD-P003450] p 472 N84-32227
Visual cueing effectiveness: Comparison of perception and flying performance [AD-P003458] p 473 N84-32235
Training the multiple-aircraft combat environment [AD-P003495] p 473 N84-32261

Arizona Univ., Tucson.
Cardiovascular responses during orthostasis - Effect of an increase in maximal O₂ uptake p 459 A84-43730

Army Research Inst. of Environmental Medicine, Natick, Mass.
Correlation between plasma fibronectin level and mortality following experimental rate heat stress [AD-A143383] p 457 N84-32991

B

Brown Univ., Providence, R. I.
Correlation of afferent activity and binocular receptive field properties [AD-A143087] p 467 N84-31938

Bundesministerium der Verteidigung, Bonn (West Germany).
Evaluation and control of laser hazards p 470 N84-33018

C

California Univ., Berkeley. Lawrence Berkeley Lab.
Roles of ionizing radiation in cell transformation [DE84-013397] p 458 N84-32995

California Univ., Davis.
Mechanisms of thermoregulation of rats exposed to hypergravic fields p 457 N84-32989

California Univ., La Jolla.
Prebiotic organic syntheses and the origin of life p 477 N84-43055

California Univ., Los Angeles.
Prebiotic organic syntheses and the origin of life p 477 N84-43055

Precambrian organic geochemistry - Preservation of the record p 450 A84-43056

Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058

Measurement and modification of sensorimotor system function during visual-motor performance [AD-A142919] p 476 N84-31947

California Univ., Santa Barbara.
Sensitivity to hypoxia in humans p 466 N84-31934

Centre d'Etudes et de Recherches de Medecine Aerospatiale, Paris (France).
Visual perception in systems management in aeronautics p 470 N84-33017

Centre de Recherches du Service de Sante des Armees, Clamart (France).
Visual function and the definition of thresholds for exposure to laser radiation p 470 N84-33019

Civil Aeromedical Inst., Oklahoma City, Okla.
Anthropometric and mass distribution characteristics of the adult female, revised [AD-A143096] p 467 N84-31939

D

Danish Defence Command, Copenhagen.
Handling of hydrazine in the Royal Danish Air Force p 469 N84-33014

Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario).
An unusual toxicological property of alcohol: The density effect on the organ of balance p 469 N84-33016

F

Falcon Research and Development Co., Buffalo, N. Y.
Marine Corps ground simulator training needs in the 1985-1995 time frame [AD-P003465] p 473 N84-32242

G

George Washington Univ., Washington, D.C.
Publications of the NASA space biology program for 1980 - 1984 [NASA-TM-86857] p 457 N84-32990

H

Harvard Univ., Cambridge, Mass.
Unraveling photosystems [DE84-013812] p 457 N84-32994

Health Effects Research Lab., Research Triangle Park, N. C.
Immunologic effects of electromagnetic fields (1981 - 1983) [PB84-190602] p 468 N84-33008

Integration of species sensitivity and dosimetry data in the extrapolation of ozone and nitrogen dioxide health data from animals to man [PB84-195312] p 469 N84-33010

I

Indiana Univ., Bloomington.
Precambrian organic geochemistry - Preservation of the record p 450 A84-43056

Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058

Geochemical evidence bearing on the origin of aerobiosis, a speculative hypothesis p 451 A84-43063

Inflation Systems International, Canyon Country, Calif.
Development, test and delivery of solid propellant generators for inflation of PFD's [AD-A1300477] p 476 N84-31946

J

Joint Publications Research Service, Arlington, Va.
Innovations in cosmonaut medical monitoring, physical conditioning p 463 N84-31229

Medical research in first 100 days of Salyut-7 flight p 464 N84-31230

Hypokinesia experiment studies effects of weightlessness p 464 N84-31234

USSR report: Life sciences. Effects of nonionizing electromagnetic radiation [JPRS-UNE-84-001] p 456 N84-31903

Medical applications of lasers p 464 N84-31904

Age-related responses to de- and hyperhydration p 464 N84-31905

Effects of whole-body cold exposure on erythrocyte morphology p 464 N84-31906

Effects of climate on kininogen levels in healthy human subjects p 464 N84-31907

Heart rhythm changes in response to sensorimotor load of varying complexity p 465 N84-31908

Correlation between individual alpha-rhythm parameters and operator's performance while subjected to maximum information input p 465 N84-31909

Stability of physiological and psychological human functions under extreme environmental conditions p 465 N84-31910

Psychophysiological aspects of monotonous human activity p 471 N84-31911

USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-012] p 456 N84-31916

First mixed crew in space p 475 N84-31917

Ergonomic analysis of human operation of video terminal p 475 N84-31918

Results of psychophysiological study of Videoton terminal operators p 475 N84-31919

Realization of human work capacity: Interdisciplinary problems p 475 N84-31920

Stress in work p 475 N84-31921

Immediate effects of hyperbaric oxygenation on body oxygen supply p 465 N84-31923

USSR report: Life sciences. Biomedical and behavioral sciences [JPRS-UBB-84-017] p 457 N84-31924

Link between indexes for mental work capacity and parameters in circulatory system before and after physical stress p 465 N84-31925

Effect of body temperature on human work capacity p 476 N84-31926

Link between characteristics of EEG rhythms in biofeedback control and indexes for operator activity p 472 N84-31927

Quantitative assessment of role of spatial frequencies of images in visual recognition of numbers p 472 N84-31928

Link between blood catecholamine levels and individual features in dynamics of operator error p 465 N84-31929

Changes in arterial pressure in static work as function of time of day and degree of disturbance in Earth's magnetic field p 466 N84-31930

Dynamics of functional status and subjective sensations in process of heat adaptation p 466 N84-31931

Study of spatial asymmetry in human external electrical field p 466 N84-31932

SOURCE

Psychophysics of proprioceptive sensibility
p 472 N84-31933

USSR report: Life sciences. Biomedical and behavioral sciences
[JPRS-UBB-84-018] p 458 N84-32996

Pilot jet lag experiments described
p 467 N84-32997

Effect of cyclic changes in cultivation conditions of growth kinetics and physiological properties of yeasts
p 458 N84-32998

Microbiology and food program p 458 N84-32999

Modeling of lethal electric shock p 468 N84-33000

Resistance of microorganisms from mesosphere to periodic freezing-thawing p 458 N84-33001

Effects of insulin and hydrocortisone on energy metabolism in rats irradiated with fast, 60 MeV neutrons
p 458 N84-33002

L

Laboratoire Central de Biologie Aerospatiale, Paris (France).
A comparative study in the animal of the toxicity of the combustion products of diverse materials
p 469 N84-33015

Leiden Univ. (Netherlands).
Chiral selection in poly(C)-directed synthesis of oligo(G)
p 477 A84-45119

Los Alamos Scientific Lab., N. Mex.
Rapid microbial identification by circular intensity differential scattering
[DE84-013894] p 457 N84-32993

Louisville Univ., Ky.
Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549
Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573

M

Martin Marietta Corp., Denver, Colo.
Teleoperator human factors study
[NASA-CR-171120] p 476 N84-31944
Teleoperator human factors study
[NASA-CR-173890] p 477 N84-33022

Massachusetts Inst. of Tech., Cambridge.
Results of the M.I.T. Beam Assembly Teleoperator and Integrated Control Station
[AIAA PAPER 84-1890] p 474 A84-43440
Communications biophysics p 470 N84-33362
Physiology p 470 N84-33363

Massachusetts Univ., Worcester.
Interferon induces natural killer cell blastogenesis in vivo p 455 A84-45550

Max-Planck-Inst. fuer Chemie, Mainz (West Germany).
Isotopic inferences of ancient biochemistries - Carbon, sulfur, hydrogen, and nitrogen p 451 A84-43058

McDonnell-Douglas Electronics Co., St. Charles, Mo.
New concepts in aircrew training using computer generated imagery: A study report
[AD-PO03451] p 473 N84-32228

Miami Univ., Coral Gables, Fla.
Vigilance and task load - In search of the inverted U
p 471 A84-44096

Michigan State Univ., East Lansing.
Beta-interferon inhibits cell infection by Trypanosoma cruzi p 455 A84-45549

Militair Hospitaal Dr. A. Mathijssen, Utrecht (Netherlands).
Ophthalmological investigation among contact lens wearers in military service
[REPT-AR/MHAM-1983-1] p 467 N84-31940

Minnesota Univ., Duluth.
Cerebral metabolism and blood brain transport: Toxicity of organophosphorous compounds
[AD-A142705] p 468 N84-33005

Missouri Univ., Rolla.
Effects of radiofrequency radiation on differentiation of erythroleukemic cells
[AD-A143038] p 456 N84-31914

Monroey (Mike) Aeronautical Center, Oklahoma City, Okla.
Uniform mass distribution properties and body size appropriate for the 50 percentile male aircrewmember, 1980 - 1990
[AD-A142946] p 477 N84-31948

N

Narco Scientific, Houston, Tex.
Development of engineering prototype of Life Support Module (LSM)
[NASA-CR-171806] p 477 N84-33023

National Aeronautics and Space Administration, Washington, D. C.
Publications of the NASA space biology program for 1980 - 1984
[NASA-TM-86857] p 457 N84-32990
Aerospace Medicine and Biology: A continuing bibliography with indexes
[NASA-SP-7011(262)] p 468 N84-33003

National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Prebiotic organic syntheses and the origin of life
p 477 A84-43055
Cardiovascular responses during orthostasis - Effect of an increase in maximal O2 uptake p 459 A84-43730
Immersion diuresis without expected suppression of vasopressin p 461 A84-43822
Vigilance and task load - In search of the inverted U
p 471 A84-44096
The growth of Paracoccus halodentrificans in a defined medium p 454 A84-45399
Shoulder and hip joint for hard space suits and the like
[NASA-CASE-ARC-11534-1] p 477 N84-33021

National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Pulmonary artery location during microgravity activity: Potential impact for chest-mounted Doppler during space travel
[NASA-TM-58262] p 466 N84-31935

National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
Langley experience with ADABAS/NATURAL
p 470 N84-33272

New York Univ. Medical Center.
Effects of microwaves on cell membrane permeability
[AD-A142979] p 456 N84-31913

Northrop Services, Inc., Research Triangle Park, N. C.
Dosimetry of ozone and nitrogen dioxide in man and animals
[PB84-195304] p 469 N84-33009

Norwegian Defence Research Establishment, Kjeller.
Modulation of the cholinergic mechanisms in the bronchial smooth muscle
[NDRE/PUBL-84-1001] p 467 N84-31937

O

Ohio State Univ., Columbus.
Modeling, control and simulation of three-dimensional robotic systems with application to biped locomotion
p 476 N84-31943
Research on computer aided testing of pilot response to critical in-flight events
[NASA-CR-173871] p 476 N84-31945

Old Dominion Univ., Norfolk, Va.
Visual information transfer. 1: Assessment of specific information needs. 2: The effects of degraded motion feedback. 3: Parameters of appropriate instrument scanning behavior
[NASA-CR-173913] p 477 N84-33020

Ottawa Univ. (Ontario).
Studies of the electric field distribution in biological bodies: Experimental dosimetry at radio frequencies
[AD-A143507] p 457 N84-32992

P

Phillips Medical Service, Eindhoven (Netherlands).
Review of occupational medicine relevant to aviation medicine p 469 N84-33012

Purdue Univ., Lafayette, Ind.
Time series modeling of human operator dynamics in manual control tasks
[AIAA PAPER 84-1899] p 474 A84-43446

R

Rice Univ., Houston, Tex.
The effect of information display format on multiple-cue judgment
[AD-A142884] p 472 N84-31941

Rockefeller Univ., New York.
Vestibular-induced vomiting after vestibulocerebellar lesions p 462 A84-45665

Rose-Hulman Inst. of Tech., Terre Haute, Ind.
Conference Grant for 2nd World Congress on Biomaterials
[AD-A143129] p 456 N84-31915

Royal Aircraft Establishment, Farnborough (England).
Oxygen affinity of hemoglobin, 3 hours after passive increase in altitude from 400 to 1800 metres
[RAE-TRANS-2118] p 468 N84-33004

S

Salk Institute for Biological Studies, San Diego, Calif.
Chiral selection in poly(C)-directed synthesis of oligo(G)
p 477 A84-45119

San Jose State Univ., Calif.
Vigilance and task load - In search of the inverted U
p 471 A84-44096

Santa Clara Univ., Calif.
The growth of Paracoccus halodentrificans in a defined medium p 454 A84-45399

School of Aerospace Medicine, Brooks AFB, Tex.
Measurement of specific absorption rate in human phantoms exposed to simulated Air Force radar emissions
[AD-A143570] p 468 N84-33007

Science Applications, Inc., Dayton, Ohio.
Development of color criteria for advanced displays
[AD-A143246] p 468 N84-33006

SRI International Corp., Menlo Park, Calif.
USAFSAM (USAF School of Aerospace Medicine) review and analysis of radiofrequency radiation bioeffects literature
[AD-A142961] p 456 N84-31912

Stanford Univ., Calif.
Pharmacologic counter measures minimizing post-space flight orthostatic intolerance
[NASA-CR-173861] p 466 N84-31936

T

Tennessee Univ., Knoxville.
Variability of practice and the transfer of training of motor skills
[AD-A142896] p 472 N84-31942

Texas Univ., Austin.
Lack of correlation between mycoplasma induced IFN-gamma production in vitro and natural killer cell activity against FLD-3 cells p 455 A84-45573

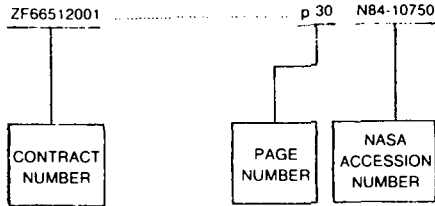
Tokyo Denki Univ. (Japan).
Nonlinear dynamics in excitable nerve membranes
p 467 N84-32037

Y

Yale Univ., New Haven, Conn.
Rapid diagnostic methods for influenza virus in clinical specimens - A comparative study p 462 A84-45548

CONTRACT NUMBER INDEX

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.

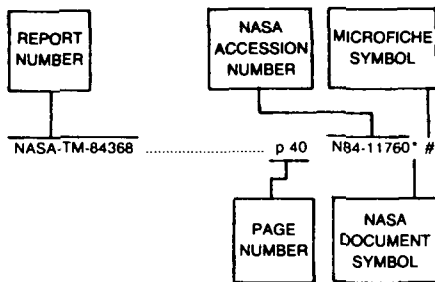
NIH-HL-31144-01	.....	p 453	A84-44078
NIH-MH-30914	.....	p 459	A84-43728
NIH-NS-02619	.....	p 462	A84-45665
NIH-1-R01-OH-0129-02	.....	p 474	A84-44095
NR PROJ. 201484	.....	p 467	N84-31938
NR PROJECT SRC-101	.....	p 471	A84-44093
NR TASK-M0099.PN001.1170	.....	p 454	A84-44088
NSF GB-42461	.....	p 451	A84-43064
NSF PCM-78-25852	.....	p 451	A84-43064
NSF PCM-79-10747	.....	p 450	A84-43057
NSF PCM-82-17072	.....	p 454	A84-45106
NSG-2185	.....	p 462	A84-45548
NSG-2380	.....	p 462	A84-45665
N00014-81-K-0136	.....	p 467	N84-31938
N00014-81-K-0143	.....	p 471	A84-44093
N00014-81-K-0669	.....	p 456	N84-31913
N00014-82-C-0001	.....	p 472	N84-31941
N00014-82-G-0011	.....	p 457	N84-32992
N00014-84-G-0041	.....	p 456	N84-31915
PHS-AI-00432	.....	p 455	A84-45550
PHS-AI-17672	.....	p 455	A84-45550
SERC-GR/B/14401	.....	p 463	A84-46435
SLF-12-1611	.....	p 460	A84-43819
SLF-12-3817	.....	p 460	A84-43819
SLF-160-2.5	.....	p 460	A84-43819
USVA-MRIS-4576	.....	p 459	A84-43728
W-7405-ENG-36	.....	p 457	N84-32993
199-99-00-00-72	.....	p 466	N84-31935

AF PROJ. 775-7	.....	p 468	N84-33007
AF-AFOSR-0335-82	.....	p 476	N84-31947
A82/K/100	.....	p 467	N84-31940
DA PROJ. 2Q1-61101-B-74-F	.....	p 472	N84-31942
DA PROJ. 3M1-61102-BS-10	.....	p 468	N84-33005
DAMD17-80-C-0089	.....	p 460	A84-43736
DAMD17-82-C-2136	.....	p 468	N84-33005
DAMD17-84-G-4005	.....	p 456	N84-31915
DE-AC02-82ER-12085	.....	p 457	N84-32994
DE-AC03-76SF-00098	.....	p 458	N84-32995
DFG-SFB-73	.....	p 451	A84-43058
DTCG-23-80-C-20031	.....	p 476	N84-31946
F33615-82-C-0500	.....	p 468	N84-33006
F33615-82-C-0610	.....	p 456	N84-31912
F33615-82-K-0634	.....	p 456	N84-31914
F49620-79-C-0038	.....	p 459	A84-43734
MDA903-81-C-0216	.....	p 472	N84-31942
NAG-2164	.....	p 462	A84-45665
NAGW-20	.....	p 477	A84-43055
NAGW-21	.....	p 474	A84-43440
NAG1-451	.....	p 477	N84-33020
NAG2-112	.....	p 476	N84-31945
NAG4-1	.....	p 474	A84-43446
NASW-3165	.....	p 457	N84-32990
NAS8-35184	.....	p 476	N84-31944
	.....	p 477	N84-33022
NAS9-16723	.....	p 477	N84-33023
NAS9-17200	.....	p 466	N84-31935
NAVY TASK M0099,PN001,1151	.....	p 452	A84-43726
NCA2-OR-180-703	.....	p 459	A84-43730
NCA2-OR-685-902	.....	p 454	A84-45399
NCC2-213	.....	p 455	A84-45549
	.....	p 455	A84-45550
	.....	p 455	A84-45573
NCC2-232	.....	p 466	N84-31936
NGR-05-007-221	.....	p 450	A84-43056
	.....	p 451	A84-43058
NGR-15-003-118	.....	p 450	A84-43056
	.....	p 451	A84-43058
	.....	p 451	A84-43063
NIH-AI-14848	.....	p 455	A84-45549
NIH-AI-17041	.....	p 455	A84-45549
NIH-AI-18811	.....	p 455	A84-45573
NIH-AM-29888	.....	p 462	A84-44089
NIH-AM-30187	.....	p 453	A84-44079
NIH-CA-31792	.....	p 455	A84-45573
NIH-CA-33058	.....	p 455	A84-45573
NIH-HL-15469	.....	p 454	A84-44084
NIH-HL-16855	.....	p 453	A84-43821
NIH-HL-20663	.....	p 461	A84-43825
NIH-HL-22154-01	.....	p 453	A84-44078

CONTRACT

REPORT NUMBER INDEX

Typical Report Number Index Listing

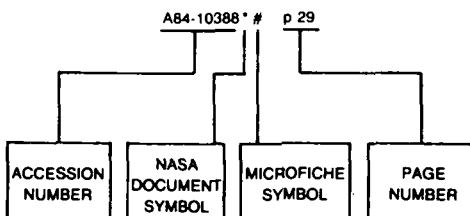


Listings in this index are arranged alphanumerically by report number. The page number indicates the page on which the citation is located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates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

NASA-TM-84368	p 40	N84-11760	#
FR-3	p 456	N84-31913	#
ISBN-92-835-0354-6	p 469	N84-33011	#
ISSN-0800-4412	p 467	N84-31937	#
JPRS-UBB-84-012	p 456	N84-31916	#
JPRS-UBB-84-017	p 457	N84-31924	#
JPRS-UBB-84-018	p 458	N84-32996	#
JPRS-UNE-84-001	p 456	N84-31903	#
LA-UR-84-1796	p 457	N84-32993	#
LBL-17448	p 458	N84-32995	#
MCR-83-607	p 476	N84-31944	* #
MCR-83-607	p 477	N84-33022	* #
NAS 1.15:58262	p 466	N84-31935	* #
NAS 1.15:86857	p 457	N84-32990	* #
NAS 1.21:7011(262)	p 468	N84-33003	* #
NAS 1.26:171120	p 476	N84-31944	* #
NAS 1.26:171806	p 477	N84-33023	* #
NAS 1.26:173861	p 466	N84-31936	* #
NAS 1.26:173871	p 476	N84-31945	* #
NAS 1.26:173890	p 477	N84-33022	* #
NAS 1.26:173913	p 477	N84-33020	* #
NAS 1.71:ARC-11534-1	p 477	N84-33021	* #
AAC-119-81-4	p 477	N84-31948	#
AD-A1300477	p 476	N84-31946	#
AD-A142705	p 468	N84-33005	#
AD-A142884	p 472	N84-31941	#
AD-A142896	p 472	N84-31942	#
AD-A142919	p 476	N84-31947	#
AD-A142946	p 477	N84-31948	#
AD-A142961	p 456	N84-31912	#
AD-A142979	p 456	N84-31913	#
AD-A143038	p 456	N84-31914	#
AD-A143087	p 467	N84-31938	#
AD-A143096	p 467	N84-31939	#
AD-A143129	p 456	N84-31915	#
AD-A143246	p 468	N84-33006	#
AD-A143383	p 457	N84-32991	#
AD-A143507	p 457	N84-32992	#
AD-A143570	p 468	N84-33007	#
AD-P003450	p 472	N84-32227	#
AD-P003451	p 473	N84-32228	#
AD-P003458	p 473	N84-32235	#
AD-P003465	p 473	N84-32242	#
AD-P003495	p 473	N84-32261	#
AFAMRL-TR-82-99	p 459	A84-43734	#
AFAMRL-TR-84-023	p 468	N84-33006	#
AFOSR-84-0520TR	p 476	N84-31947	#
AGARD-CP-341	p 469	N84-33011	#
AIAA PAPER 84-1890	p 474	A84-43440	* #
AIAA PAPER 84-1899	p 474	A84-43446	* #
ARI-TR-596	p 472	N84-31942	#
ASR-1	p 468	N84-33005	#
BR92722	p 468	N84-33004	#
CONF-8307122-2	p 458	N84-32995	#
CONF-8406148-1	p 457	N84-32993	#
DE84-013397	p 458	N84-32995	#
DE84-013812	p 457	N84-32994	#
DE84-013894	p 457	N84-32993	#
DOE/ER-12085/1	p 457	N84-32994	#
EPA-600/D-84-124	p 468	N84-33008	#
EPA-600/D-84-126	p 469	N84-33009	#
EPA-600/E-84-125	p 469	N84-33010	#
FAA-AM-83-16-REV	p 467	N84-31939	#
NASA-CASE-ARC-11534-1	p 477	N84-33021	* #
NASA-CR-171120	p 476	N84-31944	* #
NASA-CR-171806	p 477	N84-33023	* #
NASA-CR-173861	p 466	N84-31936	* #
NASA-CR-173871	p 476	N84-31945	* #
NASA-CR-173890	p 477	N84-33022	* #
NASA-CR-173913	p 477	N84-33020	* #
NASA-SP-7011(262)	p 468	N84-33003	* #
NASA-TM-58262	p 466	N84-31935	* #
NASA-TM-86857	p 457	N84-32990	* #
NDRE/PUBL-84-1001	p 467	N84-31937	#
PAL-84-32	p 477	N84-33020	* #
PB84-190602	p 468	N84-33008	#
PB84-195304	p 469	N84-33009	#
PB84-195312	p 469	N84-33010	#
RAE-TRANS-2118	p 468	N84-33004	#
REPT-AR/MHAM-1983-1	p 467	N84-31940	#
REPT-4	p 456	N84-31912	#
S-538	p 466	N84-31935	* #
SAI-84-02-157	p 468	N84-33006	#
TDCK-78936	p 467	N84-31940	#
TR-15	p 467	N84-31938	#
TR-84-2	p 472	N84-31941	#
US-PATENT-APPL-SN-642602	p 477	N84-33021	* #
USAFSAM-TR-84-12	p 456	N84-31914	#
USAFSAM-TR-84-16	p 468	N84-33007	#
USAFSAM-TR-84-17	p 456	N84-31912	#
USARIEM-M-29/84	p 457	N84-32991	#
USCG-D-31-82	p 476	N84-31946	#

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.

A84-42954 #	p 449	A84-43923 #	p 461	N84-31904 #	p 464	N84-33022 * #	p 477
A84-42955 #	p 449	A84-43924 #	p 461	N84-31905 #	p 464	N84-33023 * #	p 477
A84-42956 #	p 449	A84-43925 #	p 461	N84-31906 #	p 464	N84-33272 * #	p 470
A84-42957 #	p 449	A84-44078 #	p 453	N84-31907 #	p 464	N84-33362 #	p 470
A84-42958 #	p 449	A84-44079 #	p 453	N84-31908 #	p 465	N84-33363 #	p 470
A84-42959 #	p 449	A84-44080 #	p 453	N84-31909 #	p 465		
A84-42960 #	p 449	A84-44081 #	p 453	N84-31910 #	p 465		
A84-42961 #	p 450	A84-44082 #	p 454	N84-31911 #	p 471		
A84-42962 #	p 450	A84-44083 #	p 461	N84-31912 #	p 456		
A84-42963 #	p 450	A84-44084 #	p 454	N84-31913 #	p 456		
A84-42964 #	p 450	A84-44085 #	p 462	N84-31914 #	p 456		
A84-42965 #	p 450	A84-44086 #	p 462	N84-31915 #	p 456		
A84-43051 #	p 450	A84-44087 #	p 462	N84-31916 #	p 456		
A84-43052 #	p 450	A84-44088 #	p 454	N84-31917 #	p 475		
A84-43055 * #	p 477	A84-44089 #	p 462	N84-31918 #	p 475		
A84-43056 * #	p 450	A84-44090 #	p 462	N84-31919 #	p 475		
A84-43057 #	p 450	A84-44091 #	p 474	N84-31920 #	p 475		
A84-43058 * #	p 451	A84-44093 #	p 471	N84-31921 #	p 475		
A84-43059 #	p 451	A84-44094 #	p 471	N84-31923 #	p 465		
A84-43060 #	p 451	A84-44095 #	p 474	N84-31924 #	p 457		
A84-43063 * #	p 451	A84-44096 #	p 471	N84-31925 #	p 465		
A84-43064 #	p 451	A84-44484 #	p 454	N84-31926 #	p 476		
A84-43065 #	p 452	A84-44488 #	p 454	N84-31927 #	p 472		
A84-43066 #	p 452	A84-44498 #	p 454	N84-31928 #	p 472		
A84-43352 #	p 458	A84-44749 #	p 471	N84-31929 #	p 465		
A84-43440 * #	p 474	A84-44751 #	p 475	N84-31930 #	p 466		
A84-43446 * #	p 474	A84-45106 #	p 454	N84-31931 #	p 466		
A84-43518 #	p 459	A84-45119 * #	p 477	N84-31932 #	p 466		
A84-43726 #	p 452	A84-45160 #	p 475	N84-31933 #	p 472		
A84-43727 #	p 452	A84-45399 #	p 454	N84-31934 #	p 466		
A84-43728 #	p 459	A84-45548 * #	p 462	N84-31935 * #	p 466		
A84-43729 #	p 459	A84-45549 * #	p 455	N84-31936 * #	p 466		
A84-43730 * #	p 459	A84-45550 * #	p 456	N84-31937 #	p 467		
A84-43731 #	p 452	A84-45573 #	p 455	N84-31938 #	p 467		
A84-43732 #	p 459	A84-45659 #	p 471	N84-31939 #	p 467		
A84-43733 #	p 452	A84-45665 * #	p 462	N84-31940 #	p 467		
A84-43734 #	p 459	A84-45913 #	p 455	N84-31941 #	p 472		
A84-43735 #	p 474	A84-45924 #	p 471	N84-31942 #	p 472		
A84-43736 #	p 460	A84-45925 #	p 462	N84-31943 #	p 476		
A84-43737 #	p 474	A84-45995 #	p 455	N84-31944 * #	p 476		
A84-43738 #	p 460	A84-46223 #	p 455	N84-31945 #	p 476		
A84-43768 #	p 470	A84-46224 #	p 455	N84-31946 #	p 476		
A84-43790 #	p 452	A84-46225 #	p 455	N84-31947 #	p 476		
A84-43796 #	p 453	A84-46256 #	p 462	N84-31948 #	p 477		
A84-43797 #	p 460	A84-46257 #	p 463	N84-32037 #	p 467		
A84-43798 #	p 460	A84-46258 #	p 475	N84-32227 #	p 472		
A84-43799 #	p 460	A84-46259 #	p 463	N84-32228 #	p 473		
A84-43817 #	p 453	A84-46260 #	p 456	N84-32235 #	p 473		
A84-43819 #	p 460	A84-46435 #	p 463	N84-32242 #	p 473		
A84-43820 #	p 460	A84-46436 #	p 463	N84-32261 #	p 473		
A84-43821 #	p 453	A84-46475 #	p 463	N84-32989 #	p 457		
A84-43822 * #	p 461			N84-32990 * #	p 457		
A84-43823 #	p 461	N84-31229 #	p 463	N84-32991 #	p 457		
A84-43824 #	p 461	N84-31230 #	p 464	N84-32992 #	p 457		
A84-43825 #	p 461	N84-31234 #	p 464	N84-32993 #	p 457		
		N84-31903 #	p 456	N84-32994 #	p 457		
				N84-32995 #	p 458		
				N84-32996 #	p 458		
				N84-32997 #	p 467		
				N84-32998 #	p 458		
				N84-32999 #	p 458		
				N84-33000 #	p 468		
				N84-33001 #	p 458		
				N84-33002 #	p 458		
				N84-33003 * #	p 468		
				N84-33004 #	p 468		
				N84-33005 #	p 468		
				N84-33006 #	p 468		
				N84-33007 #	p 468		
				N84-33008 #	p 468		
				N84-33009 #	p 469		
				N84-33010 #	p 469		
				N84-33011 #	p 469		
				N84-33012 #	p 469		
				N84-33013 #	p 469		
				N84-33014 #	p 469		
				N84-33015 #	p 469		
				N84-33016 #	p 469		
				N84-33017 #	p 470		
				N84-33018 #	p 470		
				N84-33019 #	p 470		
				N84-33020 * #	p 477		
				N84-33021 * #	p 477		

1. Report No. NASA SP-7011(265)	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Aerospace Medicine and Biology Continuing Bibliography (Supplement 265)		5. Report Date December 1984	6. Performing Organization Code
		8. Performing Organization Report No.	
7. Author(s)		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 197 reports, articles and other documents introduced into the NASA scientific and technical information system in November 1984.			
17. Key Words (Suggested by Author(s)) Aerospace Medicine Bibliographies Biological Effects		18. Distribution Statement Unclassified - Unlimited	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 70	22. Price* \$7.00 HC

FEDERAL DEPOSITORY LIBRARY PROGRAM

The Federal Depository Library Program provides Government publications to designated libraries throughout the United States. The Regional Depository Libraries listed below receive and retain at least one copy of nearly every Federal Government publication, either in printed or microfilm form, for use by the general public. These libraries provide reference services and inter-library loans; however, they are *not* sales outlets. You may wish to ask your local library to contact a Regional Depository to help you locate specific publications, or you may contact the Regional Depository yourself.

ARKANSAS STATE LIBRARY

One Capitol Mall
Little Rock, AR 72201
(501) 371-2326

AUBURN UNIV. AT MONTGOMERY LIBRARY

Documents Department
Montgomery, AL 36193
(205) 279-9110, ext. 253

UNIV. OF ALABAMA LIBRARY

Documents Dept.—Box S
University, AL 35486
(205) 348-7369

DEPT. OF LIBRARY, ARCHIVES AND PUBLIC RECORDS

Third Floor—State Cap.
1700 West Washington
Phoenix, AZ 85007
(602) 255-4121

UNIVERSITY OF ARIZONA LIB.

Government Documents Dept.
Tucson, AZ 85721
(602) 626-5233

CALIFORNIA STATE LIBRARY

Govt. Publications Section
P.O. Box 2037
Sacramento, CA 95809
(916) 322-4572

UNIV. OF COLORADO LIB.

Government Pub. Division
Campus Box 184
Boulder, CO 80309
(303) 492-8834

DENVER PUBLIC LIBRARY

Govt. Pub. Department
1357 Broadway
Denver, CO 80203
(303) 571-2131

CONNECTICUT STATE LIBRARY

Government Documents Unit
231 Capitol Avenue
Hartford, CT 06106
(203) 566-4971

UNIV. OF FLORIDA LIBRARIES

Library West
Documents Department
Gainesville, FL 32611
(904) 392-0367

UNIV. OF GEORGIA LIBRARIES

Government Reference Dept.
Athens, Ga 30602
(404) 542-8951

UNIV. OF HAWAII LIBRARY

Govt. Documents Collection
2550 The Mall
Honolulu, HI 96822
(808) 948-8230

UNIV. OF IDAHO LIBRARY

Documents Section
Moscow, ID 83843
(208) 885-6344

ILLINOIS STATE LIBRARY

Information Services Branch
Centennial Building
Springfield, IL 62706
(217) 782-5185

INDIANA STATE LIBRARY

Serials Documents Section
140 North Senate Avenue
Indianapolis, IN 46204
(317) 232-3686

UNIV. OF IOWA LIBRARIES

Govt. Documents Department
Iowa City, IA 52242
(319) 353-3318

UNIVERSITY OF KANSAS

Doc. Collect.—Spencer Lib.
Lawrence, KS 66045
(913) 864-4662

UNIV. OF KENTUCKY LIBRARIES

Govt. Pub. Department
Lexington, KY 40506
(606) 257-3139

LOUISIANA STATE UNIVERSITY

Middleton Library
Govt. Docs. Dept.
Baton Rouge, LA 70803
(504) 388-2570

LOUISIANA TECHNICAL UNIV. LIBRARY

Documents Department
Ruston, LA 71272
(318) 257-4962

UNIVERSITY OF MAINE

Raymond H. Fogler Library
Tri-State Regional Documents
Depository
Orono, ME 04469
(207) 581-1680

UNIVERSITY OF MARYLAND

McKeldin Lib.—Doc. Div.
College Park, MD 20742
(301) 454-3034

BOSTON PUBLIC LIBRARY

Government Docs. Dept.
Boston, MA 02117
(617) 536-5400 ext. 226

DETROIT PUBLIC LIBRARY

Sociology Department
5201 Woodward Avenue
Detroit, MI 48202
(313) 833-1409

MICHIGAN STATE LIBRARY

P.O. Box 30007
Lansing, MI 48909
(517) 373-0640

UNIVERSITY OF MINNESOTA

Government Pubs. Division
409 Wilson Library
309 19th Avenue South
Minneapolis, MN 55455
(612) 373-7813

UNIV. OF MISSISSIPPI LIB.

Documents Department
University, MS 38677
(601) 232-5857

UNIV. OF MONTANA

Mansfield Library
Documents Division
Missoula, MT 59812
(406) 243-6700

NEBRASKA LIBRARY COMM.

Federal Documents
1420 P Street
Lincoln, NE 68508
(402) 471-2045
In cooperation with University of
Nebraska-Lincoln

UNIVERSITY OF NEVADA LIB.

Govt. Pub. Department
Reno, NV 89557
(702) 784-6579

NEWARK PUBLIC LIBRARY

5 Washington Street
Newark, NJ 07101
(201) 733-7812

UNIVERSITY OF NEW MEXICO

Zimmerman Library
Government Pub. Dept.
Albuquerque, NM 87131
(505) 277-5441

NEW MEXICO STATE LIBRARY

Reference Department
325 Don Gaspar Avenue
Santa Fe, NM 87501
(505) 827-2033, ext. 22

NEW YORK STATE LIBRARY

Empire State Plaza
Albany, NY 12230
(518) 474-5563

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Wilson Library
BA/SS Documents Division
Chapel Hill, NC 27515
(919) 962-1321

UNIVERSITY OF NORTH DAKOTA

Chester Fritz Library
Documents Department
Grand Forks, ND 58202
(701) 777-2617, ext. 27
(In cooperation with North
Dakota State Univ. Library)

STATE LIBRARY OF OHIO

Documents Department
65 South Front Street
Columbus, OH 43215
(614) 462-7051

OKLAHOMA DEPT. OF LIB.

Government Documents
200 NE 18th Street
Oklahoma City, OK 73105
(405) 521-2502

OKLAHOMA STATE UNIV. LIB.

Documents Department
Stillwater, OK 74078
(405) 624-6546

PORTLAND STATE UNIV. LIB.

Documents Department
P.O. Box 1151
Portland, OR 97207
(503) 229-3673

STATE LIBRARY OF PENN.

Government Pub. Section
P.O. Box 1601
Harrisburg, PA 17105
(717) 787-3752

TEXAS STATE LIBRARY

Public Services Department
P.O. Box 12927—Cap. Sta.
Austin, TX 78753
(512) 471-2996

TEXAS TECH UNIV. LIBRARY

Govt. Documents Department
Lubbock, TX 79409
(806) 742-2268

UTAH STATE UNIVERSITY

Merrill Library, U.M.C. 30
Logan, UT 84322
(801) 750-2682

UNIVERSITY OF VIRGINIA

Alderman Lib.—Public Doc.
Charlottesville, VA 22901
(804) 924-3133

WASHINGTON STATE LIBRARY

Documents Section
Olympia, WA 98504
(206) 753-4027

WEST VIRGINIA UNIV. LIB.

Documents Department
Morgantown, WV 26506
(304) 293-3640

MILWAUKEE PUBLIC LIBRARY

814 West Wisconsin Avenue
Milwaukee, WI 53233
(414) 278-3000

ST. HIST. LIB. OF WISCONSIN

Government Pub. Section
816 State Street
Madison, WI 53706
(608) 262-4347

WYOMING STATE LIBRARY

Supreme Ct. & Library Bld.
Cheyenne, WY 82002
(307) 777-6344

National Aeronautics and
Space Administration

Washington, D.C.
20546

Official Business

Penalty for Private Use, \$300

THIRD-CLASS BULK RATE

Postage and Fees Paid
National Aeronautics and
Space Administration
NASA-451



NASA

POSTMASTER: If Undeliverable (Section 158
Postal Manual) Do Not Return
