NASA

Aerospace Medicine and Biology

A Continuing Bibliography with Indexes

NASA SP-7011 (185)
October 1978

National Aeronautics and Space Administration

Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology Aerospace Medicine & Biology

ACCESSION NUMBER RANGES

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

STAR (N-10000 Series)	N78-26047—N78-28042
IAA (A-10000 Series)	A78-39783—A78-43302

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

NASA SP-7011(185)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 185)

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 September 1978 in

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

NASA Scientific and Technical Information Branch 1978
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 from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price code E03 ($6.25 domestic, $12.50 foreign)

INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 187 reports, articles and other documents announced during September 1978 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)* The first issue of the bibliography was published in July 1964; since that time, monthly supplements have been issued.

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 in two major sections: *IAA Entries* and *STAR Entries*, in that order. 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. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes -- subject and personal author -- are included

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1978 Supplements.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A78-10000 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 $6 00 per document up to a maximum of 20 pages The charge for each additional page is $0 25 Microfiche[1] of documents announced in *IAA* are available at the rate of $2 50 per microfiche on demand, and at the rate of $1 10 per microfiche for standing orders for all *IAA* microfiche The price for the *IAA* microfiche by category is available at the rate of $1 25 per microfiche plus a $1 00 service charge per category per issue Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of $1 35 per microfiche

Minimum air-mail postage to foreign countries is $1 00 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 (N78-10000 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 followed by the letters HC or MF in the *STAR* citation Current values for the price codes are given in the tables on page vii

Microfiche is available regardless of age for those accessions followed by a # symbol

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 Unit

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, at the standard $3 00 price, for those documents identified by a # symbol)

(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 NASA Public Document Rooms Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents 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

Avail ERDA Depository Libraries Organizations in U S cities and abroad that maintain collections of Energy Research and Development Administration reports, usually in microfiche form, are listed in *Nuclear Science Abstracts* Services available from the ERDA and its depositories are described in a booklet, *Science Information Available from the Energy Research and Development Administration* (TID-4550), which may be obtained without charge from the ERDA 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 ZLDI Sold by the Zentralstelle fur Luftfahrtdokumentation und -Information, Munich, 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 Office Sold by Commissioner of Patents, U S Patent Office, at the standard price of 50 cents each, postage free

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

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS) The annual subscription rate for the monthly supplements, excluding the annual cumulative index, is $50 00 domestic, $100 00 foreign All questions relating to the subscriptions should be referred to NTIS

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
750 Third Ave
New York, N Y 10017

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

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

Energy Research and Development
Administration
Technical Information Center
P O Box 62
Oak Ridge, Tennessee 37830

ESA-Space Documentation Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

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 (NST-41)
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
1033 General Services Administration
Building
Washington, D C 20242

U S Geological Survey
601 E Cedar Avenue
Flagstaff, Arizona 86002

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

U S Geological Survey
Bldg 25, Denver Federal Center
Denver, Colorado 80225

Zentralstelle fur Luftfahrtdoku-
mentation und -Information
8 Munchen 86
Postfach 880
Federal Republic of Germany

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective October 1 1977)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 3 00	$ 4 50
A02	001 025	4 00	8 00
A03	026 050	4 50	9 00
A04	051-075	5 25	10 50
A05	076-100	6 00	12 00
A06	101-125	6 50	13 00
A07	126-150	7 25	14 50
A08	151-175	8 00	16 00
A09	176-200	9 00	18 00
A10	201-225	9 25	18 50
A11	226-250	9 50	19 00
A12	251 275	10 75	21 50
A13	276-300	11 00	22 00
A14	301-325	11 75	23 50
A15	326-350	12 00	24 00
A16	351-375	12 50	25 00
A17	376 400	13 00	26 00
A18	401 425	13 25	26 50
A19	426 450	14 00	28 00
A20	451 475	14 50	29 00
A21	476 500	15 00	30 00
A22	501 525	15 25	30 50
A23	526 550	15 50	31 00
A24	551 575	16 25	32 50
A25	576 600	16 50	33 00
A99	601 up	- 1/	-- 2/

1/ Add $2 50 for each additional 100 page increment from 601 pages up

2/ Add $5 00 for each additional 100 page increment from 601 pages up

Schedule E

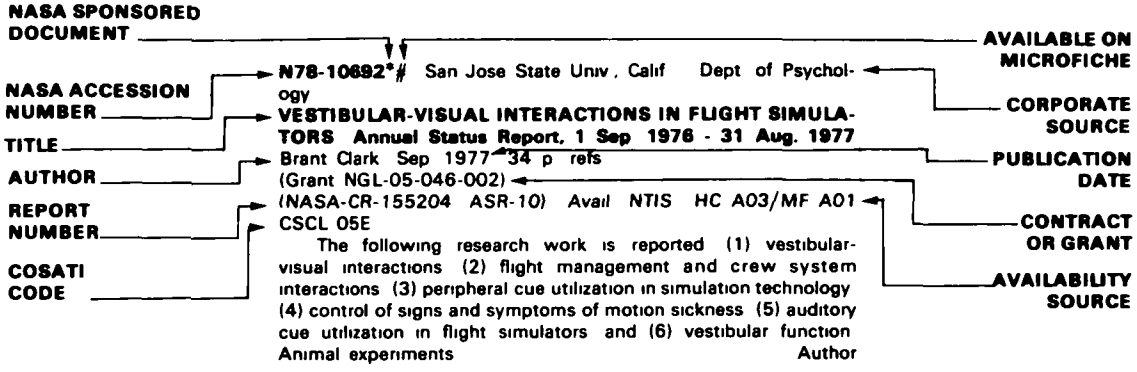
EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

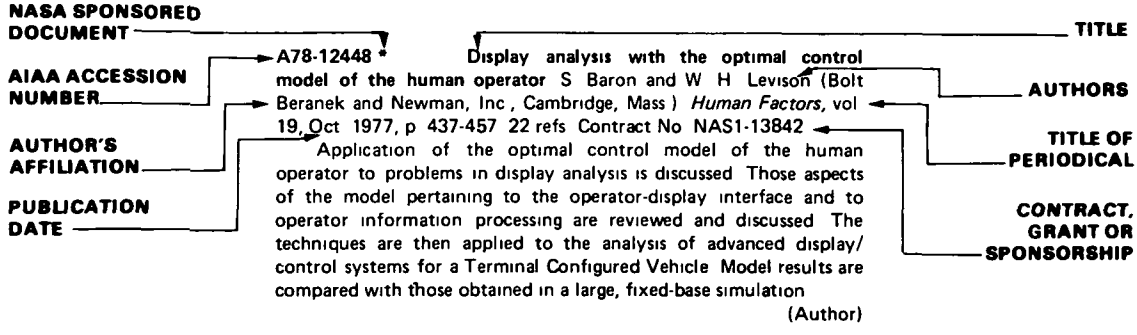
Price Code	North American Price	Foreign Price
E01	$ 3 25	$ 6 50
E02	4 75	9 50
E03	6 25	12 50
E04	7 50	15 00
E05	9 00	18 00
E06	10 50	21 00
E07	12 50	25 00
E08	15 00	30 00
E09	17 50	35 00
E10	20 00	40 00
E11	22 50	45 00
E12	25 00	50 00
E13	28 00	56 00
E14	31 00	62 00
E15	34 00	68 00
E16	37 00	74 00
E17	40 00	80 00
E18	45 00	90 00
E19	50 00	100 00
E20	60 00	120.00
E99 - Write for quote		
N01	28 00	40 00

TABLE OF CONTENTS

TYPICAL CITATION AND ABSTRACT FROM *STAR*



TYPICAL CITATION AND ABSTRACT FROM *IAA*



AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 185)

OCTOBER 1978

IAA ENTRIES

A78-40192 * **Are extreme halophiles actually 'bacteria'** L J Magrum, K R Luehrsen, and C R Woese (Illinois, University, Urbana, Ill.) *Journal of Molecular Evolution*, vol 11, May 12, 1978, p 1 8 25 refs Grant No NsG 7044

Comparative cataloging of the 16S rRNA of Halobacterium halobium indicates that the organism did not arise, as a halophilic adaptation, from some typical bacterium Rather, H halobium is a member of the Archaebacteria, an ancient group of organisms that are no more related to typical bacteria than they are to eucaryotes (Author)

A78-40218 **The real time reconnaissance problem** R W Fisher (McDonnell Douglas Corp., Electronics Engineering Technology Branch, St Louis, Mo.) In Airborne reconnaissance - Tactical/real time, Proceedings of the Seminar, Reston, Va., April 18 21, 1977 Bellingham, Wash., Society of Photo Optical Instrumentation Engineers, 1977, p 126-131

The paper quantifies the basic and simple relationships that limit the performance of real time reconnaissance from an airborne platform and shows that limitations imposed by human performance (the dynamic response of the observer) far exceed those of the state of the sensors and interpretation equipment It is suggested that the effectiveness in performing real time reconnaissance can be improved by reducing the area that must be searched One way to accomplish this is through the use of wide coverage sensors that are capable of detecting and establishing bearing to potential targets Then the operator only has to visually search an area dictated by the uncertainty in location accuracies of the cueing sensor with a narrow field imaging sensor as a FLIR or TV B J

A78-40576 **Selective chromatic adaptation at different spatial frequencies** C F Stromeyer, III, K Kranda, and C E Sternheim (Freiburg, Universitat, Freiburg im Breisgau, West Germany, Maryland, University, College Park, Md.) *Vision Research*, vol 18, no 4, 1978, p 427-437 34 refs Research supported by the Alexander von Humboldt-Stiftung, Deutsche Forschungsgemeinschaft Contract No SFB-70, Grants No NIH-1 R01-EY-00539-05, No NIH-EY-01808-01

Selective chromatic adaptation was studied as a function of test-grating spatial frequency and adapting field radiance, using Stiles's (1953) two-color threshold method Increment thresholds were measured for unitary-contrast red, green, and violet sine wave gratings produced by interference and displayed on equiluminance red and violet adapting fields Adapting levels that were sufficiently intense to produce selective chromatic adaptation for low spatial frequencies and long-duration flashes often produced considerably less adaptation for high spatial frequencies and brief flashes, suggesting that the magnitude of selective chromatic adaptation depends on the spatiotemporal properties of the test stimulus Additional measurements obtained with violet gratings on an orange field plus weak secondary fields suggest that the adaptive behavior of the blue-sensitive pi mechanisms changes when spatial frequency is varied (Author)

A78-40577 **Changing fixation in the transverse plane at eye level and Hering's law of equal innervation** H Ono and S Nakamizo (York University, Downsview, Ontario, Canada) *Vision Research*, vol 18, no 5, 1978, p 511-519 24 refs National Research Council of Canada Grant No A-0296

Binocular eye movements were recorded photoelectrically while observers looked from one target to a second, located in a different direction and at a different distance When the two targets were 'real' with no accommodation convergence mismatch, there was (a) eye movement which included symmetrical vergence and conjugate saccades or (b) accommodative vergence which is known to occur in J Muller's stimulus situation Hering's law concerning equal innervation for vergence and saccadic eye movements holds best in two special situations, one in which accomodation and convergence are dissociated and the stimulus configuration is far from the observer, and another which entails the limiting case for real targets where the near target occludes the far target for one eye (Author)

A78-40578 **Pattern thresholds for moving and stationary gratings during smooth eye movement** B J Murphy *Vision Research*, vol 18, no 5, 1978, p 521 530 21 refs Grant No NIH NEI-00325

Modern psychophysical and eye monitoring methodology is used to measure eye movements and contrast thresholds for seeing bright and dark bars of a sine grating under various viewing conditions It is found that smooth pursuit velocity does not match target velocity, that the contrast threshold for pattern during pursuit of a moving object is equal to the contrast threshold for pattern during maintained fixation when equal amounts of retinal image motion are present, that there is no visual suppression during smooth pursuit, that self imposed and externally imposed retinal image motions of equal velocity have equal effects on object visibility, and that improvements in dynamic visual acuity largely reflect improvement in oculomotor and not in sensory performance Retinal image motion alone is shown to be sufficient to explain dynamic visual acuity without reference to any direct influence of activities of the oculomotor machinery or differences in visual sensitivity to pattern within the fovea S D

A78 40579 **Binocular eye movements during accommodative vergence** R V Kenyon, K J Ciuffreda, and L Stark (California, University, Berkeley, Calif.) *Vision Research*, vol 18, no 5, 1978, p 545 555 18 refs Research supported by the American Optometric Association, Grant No NIH 5-T01-EY-00076-04

The photoelectric technique was used to monitor binocular eye position during accomodative urgence in relation to the viewing and

the covered eye Precision infrared photoelectric eye movement recordings revealed a disjunctive movement of the viewing eye in the direction predicted by Hering's law of equal innervation, but markedly attenuated with respect to the magnitudes of the move ments in the covered eye In addition, some saccadic movements during the vergence movement were likewise reduced in the viewing eye Contrary to previous reports describing human accomodative vergence as a uniocular phenomenon, it is found that the accomo dative vergence response is binocular in nature, as is true for other types of vergence, and that the binocular movements agree in direction, but not in amplitude, with movements predicted by Hering's law Important questions concerning accomodative vergence, Hering's law, and higher level control of eye movement are discussed S D

A78-40580 Error-correcting mechanisms in large saccades C Prablanc, J F Echallier (Institut National de la Sante et de la Recherche Medicale, Bron, Rhône, France), and D Masse (Com missariat a l'Energie Atomique, Laboratoire d'Electronique et de Technologie de l'Informatique, Grenoble, France) *Vision Research,* vol 18, no 5, 1978, p 557-560 7 refs

The initial saccade toward a very peripheral stimulus is generally hypometric and necessitates a corrective saccade In a first experi- ment the stimulus was cut off at the onset of the initial saccade If the hypometry was important a secondary saccade occurred reducing the error, but not truly corrective If the hypometry was normal (10 percent), almost no secondary saccade occurred In a second experiment the stimulus was cut off during the deceleration phase of the initial saccade Secondary saccades (which were truly corrective) occurred very often, provided the velocity of the eye at the time of cut off was inferior to about 100 deg/sec It is suggested that extraretinal signals for error detection are not very sensitive, and that in normal conditions reafferent visual feedback can be taken into account before the end of the saccade, to generate a secondary saccade encoded in absolute position, though the information is still available in retinal position (Author)

A78-40581 The effect of stimulus size on human cyclo- fusional response A E Kertesz and M J Sullivan (Northwestern University, Evanston, Ill) *Vision Research,* vol 18, no 5, 1978, p 567 571 10 refs Grants No NIH-EY-1055, No NIH GM 874, No NIH-EY 70887

Objective measurement of human cyclofusional response was carried out using a binocular eye movement monitoring device and a wide angle (50-deg field of view) tachistoscope The effect of stimulus size on the central and motor components of cyclofusional response was studied The results show a slight increase of cyclo- fusional thresholds corresponding to an increase in stimulus size from 10 to 50 deg The torsional disparity contained in the 50-deg stimulus evoked substantial cyclovergent eye movements and the response also contained a significant central (nonmotor) component Reducing the stimulus size from 50 to 10 deg diminishes the magnitude of the motor response to a 5-deg torsional disparity The data thus show the importance of wide field stimulation for evoking a significant motor component in cyclofusional response (Author)

A78-40582 Visual cells, daily rhythms, and vision re- search R W Young (California, University, Los Angeles, Calif) *Vision Research,* vol 18, no 5, 1978, p 573-578 70 refs Grants No NIH-EY 00095, No NIH-EY-00444

Recent experiments concerning the renewal of rod and cone outer segment membranes suggest that the metabolism of the visual cells proceeds according to a daily rhythm This conclusion is consistent with a substantial body of evidence which indicates that the chemical activities of all nucleated cells oscillate with a periodicity of twenty-four hours In the following report, a concept of daily rhythms is outlined, with emphasis on the role played by the visual cells in synchronizing the rhythms of the body with the daily fluctuation of light in the environment The variable, time of day, appears to be important for both basic and clinical aspects of vision research (Author)

A78-40583 Binocular summation A study of contrast sensitivity, visual acuity and recognition R Home (Royal Armament Research and Development Establishment, Sevenoaks, Kent, England) *Vision Research,* vol 18, no 5, 1978, p 579 585 17 refs

A78-40584 Velocity matching during smooth pursuit of different targets on different backgrounds E Knowler, R M Steinman (Maryland, University, College Park, Md), and B J Murphy *Vision Research,* vol 18, no 5, 1978, p 603 605 16 refs Grant No NIH-NEI 00325

Experiments were conducted to determine maximum average smooth pursuit gain under conditions designed to encourage the smooth pursuit subsystem to perform at its best Smooth pursuit gain was measured while an acuity target (two minimally separable bright points) was tracked against a lighted background by highly experienced subjects who had tracked this target almost daily for more than a month Optimal performance was also encouraged by requiring the subjects to track a simple predictable target motion, smooth pursuit gain was also measured while the subjects tracked a single point target against a dark and against a lighted background, and also the two point acuity target while it moved in an entirely dark environment These variations were introduced in order to assess the importance of target type and background on smooth pursuit gain It is shown that target type and background do not affect the velocity of smooth pursuit, which can match the target velocity, providing its velocity is low, its motion simple and predictable, and the subjects highly practiced S D

A78-40703 Simulation of heart structural changes upon adaptation to large loads A M Breger *(Avtomatika i Teleme- khanika,* Nov 1977, p 158-167) *Automation and Remote Control,* vol 38, no 11, Apr 20, 1978, pt 2, p 1707 1714 14 refs Translation

The analysis of the transient process of long-term heart adaptation to large loads is based on a mathematical model of an organism continuously synthesizing as many structures as are necessary to implement the function The mechanism of initial increase and further decrease of the ratio of short-term to long-term structures in the heart muscle cells following load rise is explained, this mechanism may result in structure dependent heart power alterations in the transient process of long-term adaptation The simulation results are in qualitative agreement with available experi- mental data and reproduce certain poorly studied features of the modeled process (Author)

A78-40875 * Survival and reversion of a stable L form in soil A H Horwitz and L E Casida, Jr (Pennsylvania State University, University Park, Pa) *Canadian Journal of Microbiology,* vol 24, no 1, 1978, p 50-55 14 refs Grant No NGR-39-009-180

The stable L form of Agromyces ramosus reverted to a bacterial form when incubated in sterilized soil The cellular and colonial morphology of this bacterial form resembled that of the original parent bacterial form The two forms differed, however, in that the revertant maintained its bacterial form when transferred onto a low-salt (NaCl) medium but was virtually completely induced into the L-form state on a high-salt medium The original parent bacterial form was not sensitive to salt The possibility is discussed that an L form bacterial-form cycle for this bacterium might occur naturally in soil This cycle would be mediated by fluctuations in local salt concentrations in the soil (Author)

A78-41001 **Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings (Perekhodnye protsessy v biologicheskikh sistemakh, Konferentsiia po Kinetika i Termodinamike Perekhodnykh Protsessov v Biologicheskikh Sistemakh, Moscow, USSR, September 12-14, 1977, Doklady)** Edited by A I Zotin Moscow, Institut Biologii Razvitiia AN SSSR, 1977 155 p In Russian

Living organisms are considered as examples of thermodynamic systems, and thermodynamic analysis is applied to biological processes Subjects discussed include the thermodynamics of non-equilibrium processes, the kinetics and thermodynamics of transient processes, and experimental analysis and mathematical modeling of transient processes in biological systems Topics include the statistical thermodynamics of nonlinear irreversible processes, analysis of the regulation of human respiration in transient and stable periods of muscle activity, and structural problems of biological thermodynamics M L

A78-41007 # **Examination of transient processes in the circulatory system in the framework of the theory of dynamic systems (Rassmotrenie perekhodnykh protsessov v sisteme krovoobrashcheniia v ramkakh teorii dinamicheskikh sistem)** E Z Rabinovich In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 40 43 In Russian

Some analytic approaches to characterizing circulatory system processes are described It is suggested that a biologically useful equation for describing transient changes in any physiological parameter must take into account the dynamics of the interaction of this parameter with other parameters of the system A treatment of phenomenological equations provides a dynamic equation which describes the process of changes in pulse frequency M L

A78-41008 # **Thermodynamic criteria for the optimality of control functions of a dynamic system during transient processes in the organism (Termodinamicheskii kriterii optimal'nosti upravliaiushchei funktsii dinamicheskoi sistemy pri perekhodnykh protsessakh v organizme)** E Z Rabinovich In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12 14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 43-47 5 refs In Russian

An analytic treatment which relates metabolic parameters to the free energy is presented The theory of dynamic systems is applied to the expansion of a functional expressed in terms of a control function It is suggested that transient processes involving stimulus-response adaptation can be described in the framework of a proposed nonlinear dynamic system by application of the variation principle M L

A78-41009 # **Multichambered self-oscillating models of biological systems with nonspecific inhibition of active transport (Mnogokamernye avtokolebatel'nye modeli biologicheskikh sistem s nespetsificheskim ingibirovaniem aktivnogo transporta)** N V Fentsov, V A Vasil'ev, L L Litinskaia, and Iu M Romanovskii In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 52 57 In Russian

A78-41010 # **Analysis of the regulation of human respiration in transient and stable periods of muscle activity (Analiz reguliatsii dykhaniia cheloveka v perekhodnom i ustoichivom periodakh myshechnoi deiatel'nosti)** I S Breslav, G G Isaev, and A M Shmeleva In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 66-69 In Russian

Summarized experimental results suggest that the respiration rate during a certain stage of muscular activity is dependent on the sum of two factors, one of which is the standard expression involving the partial pressure of CO2 while the other is a factor directly dependent on the muscular work load The evidence is that the respiration rate increases before the partial pressure of CO2 changes The relation of this second factor to the feedback system of respiration rate control is considered M L

A78-41011 # **Dynamic characteristics of heat exchange and moisture exchange in the human body (Dinamicheskie kharakteristiki teplo,-vlagoobmena organizma cheloveka)** A A Glushko In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 76-80 In Russian

Sweating by males at rest or performing quantifiable muscular activity was measured at 20, 35, and 50 C at a relative humidity of 60-70% Data on the relation between sweating and muscular activity as well as sweating and temperature indicate that the sum of three exponential terms can represent the rate of sweating Information on the relation of heat conductivity of the body surface and temperature between 10 and 45 C is reported The apparatus used could distinguish sweating from three parts of the body torso, upper extremities, and lower extremities M L

A78-41012 # **Study of transient processes in the visceral analyzer (Issledovanie perekhodnykh protsessov v vistseral'nom analizatore)** S S Musiashchikova, M S Siniaia, and A A Mokrushin In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 85-88 In Russian

The visceral afferent system of cats was studied with respect to the dynamics of invoked potentials and the impulse activity of neurons of maximum activity focus of the first somatosensory region of the brain Celiac and mesenteric nerves were subjected to prolonged stimulation with rectangular impulses of 0 3 msec, a frequency of 1 or 2/sec, and an intensity twice that of the threshold The gradual extinction of the response is described Experiments with additional stimuli are considered, and the mechanism of accomodation is discussed M L

A78-41013 # **Characteristics of electrical parameters of human skin during adaptation to high-altitude conditions (Kharakteristiki elektricheskikh parametrov kozhi cheloveka pri adaptatsii k usloviiam vysokogor'ia)** D M Seksenbaev and I Iu Tashmatov In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 91-94 In Russian

Male subjects were separated with respect to nerve processes into a high mobility group and a low-mobility group, and the changes in skin active resistance, total resistance, and capacitance during a 45-day stay at 3200 meters were monitored and compared with the skin characteristics of people at 920 meters The high-mobility group skin characteristics showed larger and longer deviations from low-altitude values than did the skin characteristics of the low-mobility group Several criteria were used to separate people into the high mobility and low mobility groups M L

A78-41014 # **Mathematical modeling of arterial pressure transient processes during the action of vasoactive substances (Matematicheskoe modelirovanie perekhodnykh protsessov arterial'nogo davleniia pri deistvii vazoaktivnykh veshchestv)** V Ia Gel'man, A D Dolgushina, G N Il'iutkin, E V Maistrakh, and V I Tarabukin In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 112-115 In Russian

A78-41015 # **Energy characteristics of nerve cell adaptation (Energeticheskie kharakteristiki adaptatsii nervnoi kletki)** S L Zaguskin and S N Grinchenko In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12 14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 115 119 In Russian

Energy dissipation in nerve cells is related to the frequency of calcium ion movements in nerve cells and the size of Nissl particles The movement of calcium ions is considered with reference to the regulation of the energy charge of the nerve cells The analysis, while realizing the complexity of the cell environment, seeks to determine the conditions that would occur if all the cell processes were coordinated so that a maximum or minimum value could be obtained M L

A78-41016 # **Concerning the modeling of the critical periods of plant ontogenesis as transient processes in the organism (O modelirovanii kriticheskikh periodov ontogeneza rastenii kak *perekhodnykh protsessov v organizme*)** L I *Lishchitovich and* A B Khatset In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12 14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 126-129 In Russian

Catastrophe theory is applied in an analysis of plant growth, morphogenesis, and development Ontogenesis is considered as a chain of events which can be examined by a topological procedure Transient processes are represented as potential functions corresponding to links in the chain of events which are organized in a hierarchical order M L

A78-41017 # **Concerning structural problems of biological thermodynamics (O strukturnykh voprosakh biologicheskoi termodinamiki)** M I Shterenberg In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12-14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 139-142 In Russian

The organism is considered in the framework of thermodynamics, information, and energy transformation The role of structures and invariant structures in this viewpoint is examined Attention is directed to signal elements which determine expenditure and formation of resources By representing living organisms and automatic systems as accumulations of signal elements thermodynamic analysis can be applied Metastability is taken into account M L

A78-41018 # **Dynamics of structural transformations in physiological systems receiving stresses of various intensities and lengths (Dinamika strukturnykh preobrazovanii v fiziologicheskikh sistemakh pri nagruzkakh razlichnoi intensivnosti i dlitel'nosti)** V I Fedorov In Transient processes in biological systems, Conference on the Kinetics and Thermodynamics of Transient Processes in Biological Systems, Moscow, USSR, September 12 14, 1977, Proceedings Moscow, Institut Biologii Razvitiia AN SSSR, 1977, p 142-145 In Russian

A78-41158 **Effects of high ambient temperature on sleep in young men** I Karacan, J I Thornby, A M Anch, R L Williams, and H M Perkins (Baylor University, U S Veterans Administration Hospital, Houston, Tex) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 855 860 32 refs Research supported by the U S Veterans Administration and Baylor University, Grant No PHS-MH 15508 04

Each of 10 normal subjects had 4 nights of laboratory monitored sleep, consisting of adjustment, baseline, high blanket temperature (HBT), and recovery nights EEG EOG recordings were made on each night, rectal temperature, heart rate, body weight, and ambient temperatures were monitored throughout the last 2 nights On the HBT night, subjects had less total sleep time, more frequent and longer awakenings, greater shifting among sleep stages, decreased amounts of stage 1 REM and stages 3 + 4, and delayed onset of deep sleep (stages 3 and 4) Body temperature was elevated to a relatively constant level of 37 C on the HBT night, but gradually decreased from 36 C to 34 5 C across the recovery night Heart rate decreased at a linear rate on both the HBT and recovery nights, but was 15 beats/min faster on the former Subjects experienced liquid loss of 1 25 kg on the HBT night, but had a full recovery by the following evening (Author)

A78-41159 **Persistence of lateral hypothalamic-mediated behaviors after a supralethal dose of ionizing radiation** G A Mickley and H Teitelbaum (U S Armed Forces Radiobiology Research Institute, Bethesda, Md) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 868-873 15 refs

After exposure to 10 krad of high-energy electrons, rats experience an early transient incapacitation characterized by symptoms similar to those associated with lateral hypothalamic lesions akinesia and decrements in various motivated behaviors Experimenter-imposed electrical stimulation of the lateral hypothalamus in akinetic, irradiated animals produced a locomotor response similar to that seen in unexposed rats Furthermore, when allowed to self-stimulate, the irradiated subjects persisted in vigorous self-stimulation of the lateral hypothalamus while self stimulation rates of other subcortical sites showed marked attenuation The lateral hypothalamus is apparently less sensitive to ionizing radiation than are the other subcortical structures sampled (Author)

A78-41160 **Influence of a GABA transaminase inhibitor on central nervous system oxygen toxicity** D Harel, N Raday-Bitterman, and D Kerem (Carmel Hospital, Technion - Israel Institute of Technology, Haifa, Israel) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 877-879 17 refs

A78-41161 **Linear model for visual-vestibular interaction** C G Y Lau, V Honrubia, H A Jenkins, R W Baloh, and R D Yee (California, University, Los Angeles, Calif) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 880-885 23 refs Research supported by the Deafness Research Foundation, Grant No NIH NS-09823

The results of experiments are evaluated in terms of a simple model for the interaction of eye movement responses to simultaneous optokinetic and vestibular stimuli The model predictions agree with the results of these experiments and explain many clinical observations concerning the effect of vision on nystagmus The model accounts for the dominance of the visual system's response over the vestibular system's response at low frequencies It also accounts for the inability of patients with decreased smooth pursuit system response to suppress the vestibulo ocular reflex during simultaneous optokinetic and vestibular stimulations The model provides useful information for the design of combined optokinetic and vestibular stimuli to test vestibulo ocular reflexes (Author)

A78-41162 * Hormonal indices of tolerance to +Gz acceleration in female subjects J Vernikos-Danellis, M F Dallman, P Forsham, A L Goodwin, and C S Leach (NASA, Ames Research Center, Biomedical Research Div , Moffett Field, California, University, San Francisco, Calif , NASA, Johnson Space Center, Biomedical Research Div , Houston, Tex) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 886 889 17 refs

As a possible predictive test for screening Space Shuttle passengers, the secretions of the pituitary adrenal system and the adrenal medulla have been studied in conjunction with exposure to gravitational acceleration three times the normal level The 12 female subjects in the test were divided into ambulatory and bedrest groups Before bedrest, a high tolerance to centrifugation appeared to be linked to increases in plasma ACTH and cortisol This relationship did not hold after bedrest The correlation between tolerance to centrifugation and 24-hour urinary epinephrine-to norepinephrine ratios was not significant J M B

A78-41163 Body fluid compartments in rabbits on exposure to acute hypobaric hypoxia S C Jain, A Grover, J Bardhan, B Krishna, and M S Malhotra (Defence Institute of Physiology and Allied Sciences, Delhi, India) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 895-897 16 refs

Body fluid compartments were studied in rabbits divided into three groups control, exposed to acute hypoxia, and exposed to hypoxia after treatment with 2 mg frusemide intramuscularly Total body water, extracellular body water, and plasma space were determined using the triple radiotracer technique Total body water decreased insignificantly with no change in extracellular body space on exposure to hypoxia Plasma volume and blood volume showed a significant decrease with a significant increase in haematocrit In rabbits pretreated with frusemide, total body water, extracellular body water, plasma volume, blood volume, and interstitial fluid space decreased significantly on hypoxic exposure This study suggested hypohydration on acute hypoxic exposure with a loss of intracellular water, while pretreatment with frusemide resulted in further hypohydration with a loss from both intracellular and extracellular compartments The results have been discussed in relation to suggested use of diuretics on induction to high altitude (Author)

A78-41164 * Space colonization - Some physiological perspectives L H Winkler (NASA, Ames Research Center, Moffett Field, Calif) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 898-901 15 refs

Physiological criteria determining the design of the habitat for a space colony with 10,000 people are discussed Centrifugally generated earth normal gravity, maximum ionizing radiation dose standards less than or equal to 0 5 rem/year (obtained with passive shielding), and an atmosphere with reduced nitrogen partial pressures were established as design requirements for the habitat However, further research is needed to determine whether humans experience complete adaptation to weightlessness and whether there are long-term effects of breathing various atmospheric mixtures and pressures J M B

A78-41165 Current status of space medicine and exobiology W R Douglas (Council for Tobacco Research, Inc , New York, N Y) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 902-904 10 refs

Several topics in space medicine and exobiology are reviewed, attention is given to the episodes of arrhythmia observed in the lunar module pilot during the Apollo-15 mission, the selection of the pig as an animal model for extrapolation to human space medical problems, and life-detection experiments on board the Viking spacecraft Adaptation of astronauts to weightlessness during Skylab missions and the development of simulated space habitats for terrestrial testing programs are also considered J M B

A78-41167 Prevention of motion sickness in flight maneuvers, aided by transfer of adaptation effects acquired in the laboratory Ten consecutive referrals A Graybiel and J Knepton (U S Naval Aerospace Medical Center, Aerospace Medical Research Laboratory, Pensacola, Fla) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 914-919 9 refs Navy Project F51524,ZF51524005

Ten flyers, grounded because of nausea and vomiting, were referred as potential candidates for adaptation to cross-coupled angular accelerations in a slow-rotation room, such adaptation has been shown to 'transfer' to flight maneuvers There was no opportunity to attempt treatment in two candidates Among the remaining eight, five regained flight status (62 5%), follow-up periods of those five candidates ranged from 10 to 27 months In one of the three remaining candidates, a satisfactory level of adaptation was achieved but more than 4 months elapsed before his assignment to a duty squadron After becoming sick in his first flight (F 104), he submitted a request to be removed from duty involving flying In the remaining two candidates, the rate of their acquisition of adaptation not only was very slow but also, after leveling off, actually declined In other words, poor as well as good performance is demonstrable in the slow-rotation room (Author)

A78-41168 Evaluation method of mental workload under flight conditions C Sekiguchi, Y Handa, M Gotoh, Y Kurihara, A Nagasawa, and I Kuroda (Jikei University, Tokyo, Japan Air Self-Defense Force, Aeromedical Laboratory, Tachikawa, Japan) *Aviation, Space, and Environmental Medicine,* vol 49, July 1978, p 920-925 17 refs

In order to analyze the relationship between heart rate variability (HRV) and the flight tasks of pilots, HRV of various mental and physical work stresses were investigated For the physical stress on the treadmill, S D of heart rate sequence showed a minimum value at medium stresses and remained there until the maximum stress However, the centrifuge acceleration test presupposed special physical stresses, and S D was almost same as the resting findings In the tracking tasks, which presupposed maximum interpretative actions, the increase in the mean heart rate (MHR) was small with the S D increased a greater amount than for resting results Consequently, preflight checks and level flight phases presupposed medium interpretative actions and mental stress with reserve capacity Takeoff and landing phases were considered as both high interpretative action and high emotional stress situations Acrobatic and gunnery training flight phases were considered physical load, strong interpretative actions, and emotional stress tasks (Author)

A78-41214 Blood volume and body haematocrit of rats native to a simulated altitude of 3500 m Z Turek, R Claessens, B E M Ringnalda, and F Kreuzer (Nijmegen, Katholieke Universiteit, Nijmegen, Netherlands) *Pflugers Archiv,* vol 374, June 1978, p 285-288 12 refs

A78-41216 Neural organization and evolution of thermal regulation in mammals E Satinoff (Illinois, University, Urbana, Ill) *Science,* vol 201, July 7, 1978, p 16 22 57 refs NSF Grant No BNS-77-03151, Grant No NIH-NS-12033, Contract No N00014-77-C-0465

A78-41220 * Peptide formation in the prebiotic era - Thermal condensation of glycine in fluctuating clay environments N Lahav (Jerusalem, Hebrew University, Rehovot, Israel), D White (Santa Clara, University, Santa Clara, Calif), and S Chang (NASA, Ames Research Center, Extraterrestrial Biology Div , Moffett Field, Calif) *Science,* vol 201, July 7, 1978, p 67-69 10 refs Grant No NCA2 OR685-702

As geologically relevant models of prebiotic environments, systems consisting of clay, water, and amino acids were subjected to cyclic variations in temperature and water content Fluctuations of both variables produced longer oligopeptides in higher yields than were produced by temperature fluctuations alone The results suggest that fluctuating environments provided a favorable geological setting in which the rate and extent of chemical evolution would have been determined by the number and frequency of cycles (Author)

A78-41323 **Is binocular vision always monocular** R Blake and J Camisa (Northwestern University, Evanston, Ill) *Science,* vol 200, June 30, 1978, p 1497 1499 21 refs NSF Grant No BNS 77 15858

Visual sensitivity of one eye was determined under binocular stimulus conditions yielding apparent fusion, stereopsis, monocular dominance, and monocular suppression Marked losses in sensitivity accompanied monocular suppression but were not evident during stable single vision The results are inconsistent with the hypothesis that suppression alone mediates binocular single vision (Author)

A78-41368 # **Engineering-psychological analysis of information display systems (Inzhenerno-psikhologicheskoe issledovanie sistemy otobrazheniia informatsii)** I P Meshcheriakov, V P Sal'nitskii, and A P Nechaev *Kosmicheskie Issledovaniia,* vol 16, May-June 1978, p 453-455 In Russian

The development of an information model of control processes for manned spacecraft is an important feature of designing the overall system of control In the present paper, the results are analyzed of a study of the manual control of a docking maneuver, conducted to evaluate various means of obtaining information on the attitude and relative-motion parameters and means of displaying this information to the human operator V P

A78-41411 # **On a hypothesis in Luneburg's theory of binocular visual space** M Shimbo and T Yamanoi (Hokkaido University, Sapporo, Japan) *Hokkaido University, Faculty of Engineering, Bulletin,* June 1978, p 169 173 12 refs In Japanese, with abstract in English

A non-Riemannian geometrical treatment of visual space is presented with reference to Luneburg's theory of Riemannian binocular vision A non Euclidian torsion tensor due to the rotational characteristics of space elements is introduced together with another non Euclidian concept of the Riemann-Christoffel curvature tensor in an attempt to explain parallel and distance alley curves as geodesics under the restriction of teleparallelism and Riemannian configurations, respectively The twisted chord illusion is presented as experimental evidence of the torsion tensor D M W

A78-41419 **Measurement of forces on aircraft rudders (Mesure d'efforts sur palonniers d'avions)** M Portat (ONERA, Châtillon-sous-Bagneux, Hauts de-Seine, France) *(Mesures, Régulation, Automatisme,* vol 43, Feb 1978, p 45-52) *ONERA, TP* no 1978-34, 1978 (p 45-52) 9 p In French Research supported by the Direction Technique des Constructions Aeronautiques

The paper describes a dynamometric setup designed for in flight measurements of the forces exerted on an aircraft rudder during various stages of flight The dynamometer measures simultaneously two orthogonal forces, and the signals are processed in such a way that, regardless of the point of application of the force and its direction in a reference plane, the absolute value and direction of the force can measured The dynamometer is attached to the petals P T H

A78-41528 # **Cardiovascular responses to the simulated diving in man and rat** T -F Huang, Y I Peng (National Taiwan University, Taipei, Nationalist China), and Y -C Yu (Taipei Medical College, Taipei, Nationalist China) *National Science Council Proceedings,* vol 2, Apr 1, 1978, p 135-139 24 refs Research supported by the National Science Council of Nationalist China

Photoelectric plethysmogram of the finger tip, the ear lobe and the toe in response to face immersion in water was studied in twenty healthy male subjects During face immersion in water, heart rate slowed down, and amplitude of the plethysmogram decreased markedly in the finger tip, but not in the ear lobe or the toe The responses were more pronounced during face immersion than during breath-holding During Valsalva maneuver, amplitude of finger plethysmogram decreased markedly, but heart rate did not Bradycardia developed and amplitude of tail plethysmogram decreased during head immersion in rats Either atropine i v or sinus nerve section eliminated the responses, while propranolol had no effect These data support the concept that the chemoreceptor plays a role in the cardiovascular responses to diving (Author)

A78-41539 * **Autoradiographic image intensification - Applications in medical radiography** B S Askins (NASA, Marshall Space Flight Center, Space Sciences Laboratory, Huntsville, Ala) *Science,* vol 199, Feb 10, 1978, p 684 686 11 refs

The image of an 80 to 90 percent underexposed medical radiograph can be increased to readable density and contrast by autoradiographic image intensification The technique consists of combining the image silver of the radiograph with a radioactive compound, thiourea labeled with sulfur-35, and then making an autoradiograph from the activated negative (Author)

A78-41810 * **A temporary threshold shift for self-motion detection following sustained, oscillating linear acceleration** D E Parker, W L Gulledge, R L Tubbs, and V M Littlefield (Miami University, Oxford, Ohio) *Perception and Psychophysics,* vol 23, no 6, June 1978, p 461 467 17 refs Research supported by Miami University, Contracts No F33615-75-C-5029, No NAS9 14538

Thresholds for detecting linear motion (self motion) increased following exposure of human observers to sustained linear oscillation (fatiguing stimulus) at 0 26 Hz and approximately 0 5 G peak to-peak for durations up to 30 min Recovery to preexposure levels took place over a period of 10 to 15 min following the sustained oscillation termination Differences in threshold shift magnitudes following sustained oscillation in various orientations support the interpretation that the observed threshold shifts resulted from fatigue of the utricular otolith receptors Threshold shifts were not obtained following exposure of the human observers to sustained, unidirectional linear acceleration (2G) for durations up to 10 min with a centrifuge The results of this study suggest a previously unobserved response property of the otolith organs, namely, that these organs can be fatigued in a manner analogous to other receptor systems (Author)

A78-41811 **The effect of background familiarity in visual search - An analysis of underlying factors** J T Richards and G M Reicher (Oregon, University, Eugene, Ore) *Perception and Psychophysics,* vol 23, no 6, June 1978, p 499 505 7 refs Contract No F44620 73 C 0056

The speed and accuracy of visual target search are strongly dependent on the familiarity of the background through which the search proceeds Search through unfamiliar elements is much more difficult than search through familiar ones This effect of background familiarity is examined in a series of three experiments Experiment 1 suggests that the effect is not attributable to an inherently slow classification of individually unfamiliar nontargets Experiments 2 and 3 investigate three aspects of multicharacter processing potentially sensitive to background familiarity The results suggest that the background familiarity effect is most parsimoniously viewed as the results of slow or inaccurate segmentation of features extracted from adjacent characters Mechanisms linking the familiarity of the background with the efficiency of character segregation are discussed in closing (Author)

A78-41823 * **Germination-defective mutant of Neurospora crassa that responds to siderophores** G Charlang and N P Williams (California Institute of Technology, Pasadena, Calif) *Journal of Bacteriology*, vol 132, Dec 1977, p 1042 1044 5 refs Grants No NGR-05-002 121, No NIH RR-07003

A conditionally germination-defective mutant of Neurospora crassa has been found to be partially curable by ferricrocin and other siderophores The mutant conidia rapidly lose their membrane bound siderophores when suspended in buffer or growth media Germination is consequently delayed unless large numbers of conidia are present (positive population effect) This indicates that the mutant has a membrane defect involving the siderophore attachment site (Author)

A78 42004 **Mechanics of the human diaphragm during voluntary contraction I - Statics II - Dynamics** A Grassino, M D Goldman, J Mead, and T A Sears (Harvard University, Boston, Mass , McGill University, Montreal, Universite, Montreal, Canada, London, University, London, England) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 44, June 1978, p 829-848 34 refs

A78-42005 **Indices of thermoregulatory strain for moderate exercise in the heat** R R Gonzalez, L G Berglund, and-A P Gagge (John B Pierce Foundation Laboratory, Yale University, New Haven, Conn) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 44, June 1978, p 889 899 35 refs Grant No NIH ES 00354

A78-42006 **Effects of exercise on sleep** J M Walker, T C Floyd, G Fein, C Cavness, R Lualhati, and I Feinberg (U S Veterans Administration Hospital, California, University, San Francisco, Calif) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 44, June 1978, p 945-951 46 refs Research supported by the U S Veterans Administration, NIDA Grant No DA4RG012

The effects of either acute or chronic exercise on the EEG slow-wave sleep stages were studied The investigation dealt with distance runners and nonrunning subjects, both groups either undertook exercise before sleep or abstained from exercise Hypothesized increases in the EEG slow wave sleep stages following exercise were not confirmed However, the runners did show less rapid-eye movement during sleep than the nonrunners J M B

A78-42007 **Optimal rate of work for mountaineers** P K Nag, R N Sen, and U S Ray (Calcutta, University, Calcutta, Physiology Research Cell, Darjeeling, India) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 44, June 1978, p 952-955 25 refs Research supported by the Council of Scientific and Industrial Research of India

The physiological responses of Sherpa highlanders were monitored at high altitudes as they carried various loads Work rates based on speed of movement and gross weight (body weight plus loads) were calculated In general, the oxygen consumption per excess unit of load carried or per unit of work performed was constant up to the maximum experimental load of 55 kg It is suggested that daily operations not involve more than 30 to 40% of the maximum work capacity J M B

A78-42459 **Alterations in the surface properties of cells responsive to nerve growth factor** D Schubert, M LaCorbiere, W Stallcup (Salk Institute for Biological Studies, San Diego, Calif), and C Whitlock (California, University, Irvine, Calif) *Nature*, vol 273, June 29, 1978, p 718-723 30 refs Research supported by the Muscular Dystrophy Association

The effect of nerve growth factor (NGF) on PC12 cells, a clonal line which serves as a model for cultures of dissociated sympathetic ganglion neurons, is described Experimental data indicate that NGF induces an increase in the intracellular level of cyclic AMP, which causes an increase in calcium mobilization, which in turn produces a structural change in the limiting cell membrane The membrane alteration enhances cell-substratum adhesion and neurite extension in the PC12 cell line Since NGF and cAMP cause parallel effects, it seems likely that cAMP is a mediator of the NGF-induced responses The effect of NGF and membrane depolarization on lectin agglutination was investigated M L

A78-42473 **Perimetry of contrast detection thresholds of moving spatial sine wave patterns I - The near peripheral visual field /eccentricity 0-8 deg/ II - The far peripheral visual field /eccentricity 0-50 deg/ III - The target extent as a sensitivity controlling parameter IV - The influence of the mean retinal illuminance** J J Koenderink, M A Bouman, A E Bueno de Mesquita, and S Slappendel (Utrecht, Rijksuniversiteit, Utrecht, Netherlands) *Optical Society of America, Journal*, vol 68, June 1978, p 845 865 92 refs Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek

Contrast detection thresholds have been determined for moving sine wave gratings at the fovea and at several eccentricities on the nasal horizontal meridian, considering both the near (0 8 deg eccentricity) and far (0 50 deg eccentricity) peripheral visual field The values are discussed in terms of the spatial frequency and velocity for which the thresholds are at a minimum, acuity, and critical eccentricity as a function of the spatial frequency of the grating The dependence of contrast detection thresholds on the extent of the target field is considered along with the influence of the mean retinal illuminance S C S

A78-42576 **The experimental simulation of elastic model of artery system - Some behaviour of vascular substitute under repeated internal stress** A T Yokobori, T Yokobori, H Ouchi, and H Sasaki (Tohoku University, Sendai, Japan) In International Conference on Fracture Mechanics and Technology, Hong Kong, March 21-25, 1977, Proceedings Volume 1
Alphen aan den Rijn, Netherlands, Sijthoff and Noordhoff International Publishers, 1977, p 623 638

A78-42635 # **Specific characteristics of the effect of UV laser radiation on the survival of microorganisms (O spetsifike deistviia lazernogo U -F izlucheniia na vyzhivaemost' mikroorganizmov)** A G Gavrilov, T N Men'shonkova, N F Piskunkova, M E Pospelov, G Ia Fraikin, and L B Rubin (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Akademiia Nauk SSSR, Doklady*, vol 239, Apr 11, 1978, p 1238 1240 11 refs In Russian

Several types of microorganisms (chlorella, Candida guilliermondii, and the tobacco mosaic virus) were subjected to irradiation from two types of UV sources a solid state pulsed laser with an emission wavelength of 265 nm and a lamp source of incoherent monochromatic CW radiation at a wavelength of 253 7 nm At threshold output power densities, the laser source was found to have a significantly greater destructive effect on the microorganisms than the incoherent CW source The destructive efficiency of laser radiation was studied as a function of power density B J

A78-42654 # **The electrocardiogram and cardiac rhythm in healthy young persons (Elektrokardiogramma i ritm serdtsa zdorovykh molodykh liudei)** A G Dembo, E V Zemtsovskii, E N Surov, M V Villem, and B A Frolov (Leningradskii Gosudarstvennyi Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 387-393 11 refs In Russian

12-lead EKGs of 366 untrained healthy young (17-22 yr) male subjects are analyzed in order to develop norms relative to EKG wave amplitude and to study cardiac rhythm -and reveal disorders in cardiac rhythm and conduction A major disorder disclosed is sinus arrhythmia Norms for the amplitudes of the EKG waves (P, Q, R, S, T) in the 12 leads for normal young persons are presented in tabular form S D

A78-42655 # **Chronoinotropic reserves of the myocardium (O khronoinotropnom rezerve miokarda)** V D Churin (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 394 399 15 refs In Russian

The paper studies the character of the response of the cardiovascular system to graded physical work on a bicycle ergometer in healthy subjects and patients with ischemic heart disease (IHD) The quantitative characteristic of the cardiovascular-system response to physical stress is determined by using a quantity called the coefficient of myocardial-reserves expenditure (EC) defined as the increment of chronoinotropic myocardial reserves per unit work done It is shown that the increase of EC in some IHD patient may be attributed to the appearance of early (preclinical) symptoms of contractile insufficiency of the myocardium S D

A78-42656 # **Phase structure of the diastole of trained heart (Fazovaia struktura diastoly trenirovannogo serdtsa)** R D Dibner and A B Taits (Leningradskii Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 400-404 21 refs In Russian

Apex cardiography and polycardiography are used to assess the phase structure of cardiac diastole in 243 trained athletes and 30 untrained subjects It is found that changes in the phase structure of the diastole of a trained heart depend to a certain extent on the character of muscular activity involved The most pronounced changes in diastolic phase structure and the close correlations between the separate phases of diastole and systole are observed during systematic physical training directed primarily at development of endurance S D

A78-42657 # **Possibility of voluntary regulation of the heart rate (Vozmozhnosti proizvol'noi reguliatsii chastoty serdechnykh sokrashchenii)** A N Timofeeva (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 405-411 14 refs In Russian

Results are presented for an experimental study on the possibility of voluntarily changing the heart rate (EKG lead II) in 9 healthy subjects and 11 neurotic patients The healthy and sick subjects had to perform the task of maintaining the magnitude of the parameter studied within a certain range acceleration of the heart rate (HR) by the healthy subjects, and reduction of HR by the neurotic patients The task is performed with an artificial visual feedback through communication of changes in HR The results exclude the possibility of voluntary control of HR through the use of artificial feedback S D

A78-42658 # **Resistance of the myocardium to loads under high-altitude conditions (Vynoslivost' miokarda k nagruzkam v usloviiakh vysokogor'ia)** S B Daniiarov and N E Tiurekanova (Kirgizskii Gosudarstvennyi Meditsinskii Institut, Frunze, Kirgiz SSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 412 418 33 refs In Russian

Experiments were conducted on white male rats (150-300 g) under high-altitude (3200 m above sea level) conditions on the 3rd, 15th, 30th, and 45th day of adaptation, while the control group was tested at Frunze, USSR The objective was to evaluate the influence of high-altitude factors on the reserves of the contractile function of the right ventricle and on the maximal contractile force developed by the myocardium of the right ventricle subjected to additional resistive loading by complete shut off of the pulmonary artery with a clamp It is shown that during high-altitude adaptation the results of hypertension of pulmonary circulation and hypoxic conditions are myocardial hypertrophy and alteration of contractile activity In particular, the additional resistive lead is best endured on the 30th day of high altitude adaptation S D

A78-42659 # **Rhythm of heart contractions in different stages of sleep and during wakefulness (Ritm serdechnykh sokrashchenii v razlichnykh stadiiakh sna i pri bodrstvovanii)** N V Sukhanova (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimii, Leningrad, USSR) and L A Mamontova (Leningradskii Elektrotekhnicheskii Institut, Leningrad, USSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 419-425 28 refs In Russian

The paper illustrates the possibility of applying the Walsh transform to the analysis of the spectral structure of the cardiac rhythm in different EEG-stages of sleep The approach used permits evaluating the dynamics of periodic components of sleep as well as tracing the interrelationship between cardiac-rhythm fluctuations and bioelectric correlates of changes in wakefulness level S D

A78-42660 # **The problem of tension and tonus in health and disease as related to circulation (Problema tenzii i tonii v norme i patologii krovoobrashchenia)** N I Arinchin (Akademiia Nauk Belorusskoi SSR, Institut Fiziologii, Minsk, Belorussian SSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 426-435 31 refs In Russian

Long-term studies on tension/tonus relationships and various types of circulatory self-regulation are discussed An attempt is made to determine the dynamics of prepathological states, their conversion to pathological states of circulation (cardiovascular system) and their return to normal condition under the action of therapy The use of comparable blood-supply and peripheral-resistance indices makes it possible to classify the normal state of the cardiovascular system in healthy subjects, to discriminate three types of circulatory self regulation, and to reveal six pre-, hyper-, and hypotensive prepathological states and six pathogenetic forms of hyper- and hypotension (cardiac, vascular, mixed) S D

A78-42661 # **Significance of supraspinal mechanisms in adaptive responses of the cardiovascular system during postural change (Znachenie suprasninal'nykh mekhanizmov v prisposobitel'nykh reaktsiiakh serdechno-sosudistoi sistemy pri peremene polozheniia tela)** K A Sergeeva, E D Trakovskaia, L I Dukhieva, and V A Moiseev (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 436 442 12 refs In Russian

A78-42662 # **Characteristics of pressor response during voluntary and induced contraction of skeletal muscles (Osobennosti pressornoi reaktsii pri proizvol'nom i vyzvannom sokrashchenii skeletnykh myshts)** A V Vitols, I P Kukulis, Ia Ia Popens, and Ia V Skards (Latviiskii Nauchno-Issledovatel'skii Institut Eksperimental'noi i Klinicheskoi Meditsiny, Respublikanskaia Klinicheskaia Bol'nitsa, Riga, Latvian SSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 443 447 14 refs In Russian

A comparative analysis is made of the dynamics of arterial pressure, heart rate and eye pupil area during commensurate (in force and in duration) contractions of forearm and wrist muscles performing voluntary (till exhaustion) and electrostimulated static contractions It is shown that the structure of the pressor response is different for these two types of muscle activation The results obtained demonstrate a difference in the mechanisms triggering the pressor response, depending on whether or not contraction occurs as a result of activation of corticospinal systems S D

A78-42663 # **Respiratory-hemodynamic correlations in individuals of different age (Respiratorno-gemodinamicheskie sootnosheniia u liudei raznogo vozrasta)** A D Valtneris and E V Aboltin'-Abolinia (Rizhskii Meditsinskii Institut, Riga, Latvian SSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 448-455 8 refs In Russian

Results are presented for a study of the influence of respiratory movements and duration of breath holding on the shape of sphygmograms recorded for central and peripheral vessels in individuals of different age children aged 11 12 yr, 105 young adults aged 17-24 yr, and 28 middle aged subjects aged 40-50 yr Close correlation is revealed between the changes in the shape of sphygmograms for arteries and the phases of the respiratory cycle, as well as changes in the sphygmograms during breath holding In the former case, the changes are most pronounced for the age group 17-24 yr, and in the latter case they are least pronounced for the age group 40-50 yr S D

A78-42664 # **Hemodynamic mechanisms for maintaining maximal oxygen transport in the human organism (Gemodinamicheskie mekhanizmy obespecheniia maksimal'nogo transporta kisloroda v organizme)** V L Karpman, G A Koidinova, and B G Liubina (Tsentral'nyi Institut Fizicheskoi Kul'tury, Moscow, USSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 456 462 19 refs In Russian

A78-42665 # **Characteristics of variation of hemodynamics during high-altitude hypoxia (Osobennosti izmeneniia gemodinamiki pri vysokogornoi gipoksii)** M M Mirrakhimov, R O Khamzamulin, and T M Murataliev (Kirgizskii Gosudarstvennyi Meditsinskii Institut, Frunze, Kirgiz SSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 469 474 23 refs In Russian

Polycardiography is applied to 15 healthy male volunteers (20-25 yr) during a 30-day adaptation to a high altitude of 3200 m The objective was a comprehensive evaluation of circulatory reactions in man under the action of short-term high-altitude hypoxia It is shown that hypoxia is a factor which severely effects the state of the cardiovascular system The results suggest that two types of primary high-altitude pulmonary arterial hypertension be distinguished acute and chronic S D

A78-42666 # **Variation of the reactivity of resistive and capacitive organ vessels during adaptation to highland conditions (Izmenenie reaktivnosti organnykh rezistivnykh i emkostnykh sosudov v protsesse adaptatsii k usloviiam vysokogor'ia)** S A Polenov, G V Cherniavskaia, S B Daniiarov, and B I Tkachenko (Akademiia Meditsinskikh Nauk SSSR, Leningrad, USSR, Kirgizskii Meditsinskii Institut, Frunze, Kirgiz SSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 475-480 11 refs In Russian

A78-42667 # **Adaptation of circulation to exertion (Adaptatsiia krovoobrashcheniia k naturzhivaniiu)** P P Ozolin', I A Revin, and K E Strelis (Latviiskii Nauchno-issledovatel'skii Institut Eksperimental'noi i Klinicheskoi Meditsiny, Rizhskii Politekhnicheskii Institut, Riga, Latvian SSR) *Fiziologiia Cheloveka*, vol 4, May-June 1978, p 558-561 7 refs In Russian

Experiments were carried out on 12 qualified weight lifters of different classes and on 18 poorly trained students in order to assess changes in response to exertion consisting of unforced inhalation and forced exhalation of air through a mouthpiece with a rubber tube at a pressure of 40 mm Hg and holding that pressure for 20 sec Exertion was performed twice at a 2-min interval The study revealed changes in the basic indicators of the cardiovascular system It is suggested that adaptation of the circulatory system to exertion is reflected primarily in reduced reflex responses induced by increased pressure in the thoracic cavity In particular, in poorly trained subjects, the triggering of pressor reflexes maintains the minute volume of blood at a high level due to a sharp increase in myocardial tension and augmentation of the heart work S D

A78-42668 # **Dynamics of thermoregulation during adaptation to strenuous muscular activity with respiratory changes (Dinamika termoreguliatsii pri adaptatsii k napriazhennoi myshechnoi deiatel'nosti s dykhatel'nymi perekliucheniiami)** L V Kiselev (Sibirskii Tekhnologicheskii Institut, Krasnoyarsk, USSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 561-563 8 refs In Russian

A78-42669 # **Methodological approach to the analysis of the 'semantic' information in the human EEG (Metodicheskii podkhod k analizu 'semanticheskoi' informatsii v EEG cheloveka)** O G Choraian and V N Kiroi (Rostovskii Gosudarstvennyi Universitet, Rostov, USSR) *Fiziologiia Cheloveka*, vol 4, May June 1978, p 564-567 17 refs In Russian

EEG experiments were performed on 10 matriculated students assigned to construct separate meaningful sentences from a set of words and to draw a logical inference from given sentences Four stages were distinguished during the solution of a given problem background, solution, moment of solution, and aftereffect An algorithm for analysis of the semantic information in EEG is proposed, based on the method of determining the useful information (Kharkevich, 1960) as increment of probability of reaching goal, and on the Bayes method of calculating a posteriori probabilities S D

A78-42817 * **Physiologic regulation of body energy storage** G C Pitts (Virginia, University, Charlottesville, Va) *Metabolism*, vol 27, Apr 1978, p 469-478 57 refs Grants No NGR 47-005-213, No NsG-2225

Both new and published data (rats, mice, and human beings) on three parameters fat mass, fat-free body mass (FFBM), and total body mass in some cases - are evaluated Steady state values of the parameters are analyzed for changes in response to specific perturbing agents and for their frequency distributions Temporal sequences of values on individuals are examined for evidence of regulatory responses The results lead to the hypothesis that the FFBM is regulated, but probably not as a unit, and that mass of fat is regulated with a high priority near the range extremes but with a much lower priority in the mid-range Properties and advantages of such a mechanism are discussed (Author)

A78-42822 * **Complementary laminar terminations of afferents to area 17 originating in area 18 and in the lateral geniculate nucleus in squirrel monkey** J Tigges, M Tigges, and A A Perachio (Yerkes Regional Primate Research Center, Emory University, Atlanta, Ga) *Journal of Comparative Neurology*, vol 176, Nov 1, 1977, p 87-100 42 refs NSF Grant No GB 42740, Grants No NIH-RR-00165, No NIH-EY 00638, No NGR 11-001-45

A78-42828 # **Intramyocardial micropump activity during rhythmic stretching of the myocardium (Vnutrimiokardial'naia mikronasosnaia deiatel'nost' pri ritmicheskom rastiazhenii miokarda)** G D Nedvetskaia and N I Arinchin (Akademiia Nauk Belorusskoi SSR, Institut Fiziologii, Minsk, Belorussian SSR) *Akademiia Nauk BSSR, Doklady*, vol 22, May 1978, p 471-473 11 refs In Russian

Experiments with isolated perfused dog hearts were performed to study the supply of blood to the heart during rhythmic stretching of the ventricular myocardium Right and left ventricles were stretched separately by means of an inserted balloon attached to an air pump Data on pressure in the aorta and in the coronary sinus during stretching of the left ventricle are compared with pressures in control situations The hemodynamic effects of stretching skeletal and myocardial muscles are compared M L

A78-42845 **Amino acid-directed nucleic acid synthesis - A possible mechanism in the origin of life** G L Nelsestuen (Minnesota, University, St Paul, Minn) *Journal of Molecular Evolution*, vol 11, June 20, 1978, p 109-120 15 refs

It is suggested that copolymerization of amino acids and ribonucleotides in the prebiotic environment is responsible for certain protein features, including the fact that proteins contain only alpha amino acids and that protein structure is determined by ribonucleotides linked 3' to 5' The basic unit of copolymerization in this model is a nucleotide substituted with an amino acid at the 2' position Topics examined include first protein synthesis, amino acyl nucleotide structure, and origin of the genetic code It is suggested that all characteristics of the code can be accounted for by the copolymerization hypothesis M L

A78-42846 * **Codons and nearest-neighbor nucleotide pairs in mammalian messenger RNA** T H Jukes (California, University, Berkeley, Calif) *Journal of Molecular Evolution*, vol 11, June 20, 1978, p 121-127 15 refs Grant No NGR-05-003-460

A78-42847 **Rapid changes in left ventricular dimensions and mass in response to physical conditioning and deconditioning** A A Ehsani, J M Hagberg (Washington University, St Louis, Mo), and R C Hickson *American Journal of Cardiology,* vol 42, July 1978, p 52-56 19 refs Grant No NIH-HL-17646

Echocardiographic estimates of left ventricular indices were obtained in two groups of young healthy volunteer subjects (1) training group of seven male and one female members (17-19 yr) of a swimming team, and (2) detraining group of six male cross-country runners (18-22 yr) who stopped training for a three-week period Left ventricular dimensions and wall thickness were measured, and left ventricular end-diastolic volume, mass, stroke volume and ejection fraction were estimated in both groups before and serially during training and detraining The results of this study, in which each subject served as his own control, indicate that (1) exercise training-induced adaptive changes in left ventricular dimensions occur rapidly and mimic the pattern of chronic volume overload, and (2) modest degrees of exercise-induced left ventricular enlargement are reversible after cessation of training S D

A78-42874 # **Propagation of pulsed wave in arterial vessels with allowance for preliminary stresses and muscular activity (Rasprostranenie pul'sovoi volny v arterial'nykh sosudakh s uchetom predvaritel'nykh napriazhenii i myshechnoi aktivnosti)** A I Rachev (B'lgarska Akademiia na Naukite, Tsentralna Laboratoriia po Biomekhanika, Sofia, Bulgaria) *Mekhanika Polimerov,* Mar Apr 1978, p 301-311 25 refs In Russian

A mathematical model is proposed which takes more accurate account of the influence of initial stresses and muscle contraction on the propagation of pulsed waves along arterial vessels under specified assumptions including the assumption that the circulating blood is an incompressible Newtonian fluid in a laminar flow The arterial vessel is considered to be a membrane when determining the stress and strain states of the vessel under the action of mean blood pressure In addition, muscle stimulation is caused by external factors such that there is no feedback between deformation and muscular activity The equations of membrane movement are derived using the theory of small deformations superimposed on large deformations for elastic membranes S D

A78-42875 # **Determination of the optical density of the walls of coronary arteries in man (Opredelenie opticheskoi plotnosti stenok koronarnykh arterii cheloveka)** B A Purinia and I L Ozolanta (Akademiia Nauk Latviiskoi SSR, Institut Mekhaniki Polimerov, Riga, Latvian SSR) *Mekhanika Polimerov,* Mar Apr 1978, p 312 318 5 refs In Russian

Optical densitometry is used to determine the density distribution of elastic and conjunctive tissues in separate layers of the walls of left and right coronary arteries in persons of different ages The objective was to shed light on the mechanisms of unequal aging of both heart arteries Major conclusions are that (1) the optical density of the conjunctive tissue in the walls of the left coronary artery increases with age, especially in its distal end, whereas that of the right coronary artery decreases with age, and (2) the optical density of the elastic tissue in the walls of the coronary arteries reaches a maximum at 30-40 years of age and diminishes after age 40 (especially in the distal end of the left coronary artery) Arterial wall thickness variations are also assessed S D

A78-42898 # **Functional state of the cardiovascular system with regard to the longterm effect of low acceleration (Funktsional'noe sostoianie serdechno sosudistoi sistemy pri dlitel'nom vozdeistvii uskorenii malykh velichin)** V A Maksimov and V V Pchelin *Voenno-Meditsinskii Zhurnal,* Apr 1978, p 42 45 In Russian

The cardiovascular effects of 1 3-1 35 g centrifugal force on men whose work normally subjects them to acceleration was studied The men were divided into two groups, depending on whether they had worked less than or more than two years at the job Subjects sitting in an aircraft seat were accelerated for periods of time during five consecutive days EKG and heart beat data are presented, and it is suggested that the cardiovascular changes are caused by a change in parasympathetic regulation Reduction of the R and T peak heights is considered M L

A78 42899 # **Biological significance of nuclear fission product radionuclides (Biologicheskoe znachenie radionuklidov produktov iadernogo deleniia)** I Ia Vasilenko *Voenno-Meditsinskii Zhurnal,* Apr 1978, p 46-49 13 refs In Russian

The effects of radioactive fission products on living organisms are considered The relative hazards posed by different ions and the comparative susceptibility of physiological systems to damage are discussed Inhalation of radionuclides is considered to be the greatest danger, but other modes of entry of radionuclides into the body are surveyed Topics include radionuclides that affect bone, thyroid, or other organs, the persistence of radionuclides in the body, and the local effects of radionuclides M L

A78-42900 # **Disturbances of fat metabolism in flight crew personnel (Narusheniia zhirovogo obmena u letnogo sostava)** I R Grishin and P G Kozacha *Voenno Meditsinskii Zhurnal,* Apr 1978, p 50, 51 In Russian

The tendency of pilots and on-board technicians to be heavy (up to 10% over appropriate norm) or overweight (over 10% over norm) was studied An individual's weight during each year of aviation school (4 years) and each year of work (8 years) in a flight crew was considered, and data on the number of heavy and overweight people for each of these years are presented About half the people are heavy or overweight, and the relation between above normal weight and the risk of cardiovascular disorder is considered M L

A78 42925 # **Different prognostic value of exercise electrocardiogram in men and women** C Manca, L Dei Cas, D Albertini, G Baldi, and O Visioli (Parma, Universita, Parma, Italy) *Cardiology,* vol 63, no 5, 1978, p 312 319 25 refs

In 1,455 subjects (947 men and 508 women) who underwent a bicycle ergometer stress test for evaluation of atypical chest pain, the incidence of coronary events (definite myocardial infarction or sudden death) was assessed by the life table method The follow up period ranged from 3 to 7 years (mean 5 2 years) In men with positive exercise test (ischemic ST depression no less than 1 mm), the 5 year incidence of coronary events was 18 3 percent, compared with 1 9 percent in negative responders In women with positive response, the 5 year incidence of coronary events was 4 6 percent, in negative responders, it was 0 3 percent The poor predictive value of ischemic ST responses to exercise in women is emphasized (Author)

A78 42951 # **On extraterrestrial causes of the earth's dynamic processes and extinction of life** S J Poborski (Alaska, University, Fairbanks, Alaska) *Acta Geophysica Polonica,* vol 25, no 4, 1977, p 255 272 55 refs

The paper reviews various extraterrestrial sources which influence the earth's dynamic processes Particular attention is given to solar and cosmic radiation, comets, asteroids and planetoids, meteorite and asteroid impacts, processes of crater tectonics, gravitational pulsations and seismic activity, primary tectogenesis and exogenic sources (pseudoshocks, central collisions, grazing collisions), and the migration of palaeomagnetic poles It is noted that exogenic gravitational phenomena may cause changes in earth's rotation, the angular velocity of rotation, and the angular change of the rotational axis Various historical accounts regarding the origin of Venus are outlined and the periodic extinction of forms of life on earth is discussed with reference to the influence of exogenic phenomena S C S

A78-43040 **The concepts of a proficiency advancement model for basic flight training programs** R H Foglesong In Modeling and simulation Volume 8 Proceedings of the Eighth Annual Pittsburgh Conference, Pittsburgh, Pa , April 21, 22, 1977 Part 1 Pittsburgh, Pa , Instrument Society of America, 1977, p 263-265

The concept of proficiency advancement in learning, aimed at creating an atmosphere in which students able to acquire a skill more rapidly than their peers would not be thwarted in their efforts to proceed at their own rate, was put into action in the USAF T-41 Pilot Indoctrination Program The instruction syllabus was designed so that a student would be allowed to advance to a new block of instruction on the basis of his performance at various stages of his present block It was possible for an above-average student to eliminate several training missions from the program by proficiency-advancing at an early stage of training in each block The motivational aspects for the above average student improved since his needs for self esteem and rivalry were better satisfied P T H

A78-43182 Movement parallax - An asymptotic function of amplitude and velocity of head motion W Hell (Konstanz, Universitat, Konstanz, West Germany) *Vision Research*, vol 18, no 6, 1978, p 629 635 20 refs Research supported by the Universitat Konstanz

Ten subjects having normal or corrected visual acuity in the dominant eye of at least 20/20 were used to evaluate monocular movement parallax as a cue to depth perception The effectiveness of movement parallax was measured by the matched width of the variable object Three experimental conditions were studied (1) head fixed, position parallax, and movement parallax, (2) four different maximal velocities of head movement, and (3) five different amounts of head movement In all three cases a three way analysis of variance was performed It was concluded that successively disparate images are not sufficient to produce depth impressions when compared to movement parallax When velocity and the amount of head movement are varied, it was found that at 5 10 times threshold, depth perception by movement parallax reaches half its maximal

A78-43183 Implications of spatial summation models for processes of contour perception - A geometric perspective T M Caelli (Melbourne, University, Melbourne, Australia), G A N Preston (Gas and Fuel Corp , Victoria, Australia), and E R Howell (National Vision Research Institute, Victoria, Australia) *Vision Research*, vol 18, no 6, 1978, p 723 734 34 refs

Current models of how the visual system extracts contours from an image are based on its ability to encode relative position, element interactions, and some form of spatial summation The interactive process is usually interpreted as a weighting function inversely proportional to interelement distances In this paper two particular weighting functions were experimentally compared an exponential decay process (EDP) and the sinc function Results indicated that the EDP decay parameter predicted local contour extraction better than the sinc function The problem of contour extraction is phrased in terms of how the visual system extracts tangent vectors, curvature vectors, and invariant vector fields from the stimulus However it is contended that the underlying processes for these geometric operators reside in the cortical network dynamics that include summation Results support this process and some considerations are given to the neurophysiological bases for these general functions which not only result in contour extraction but also produce orientation tuning curves and illusions (Author)

A78-43184 Nonadditivity of vergence and saccadic eye movement H Ono, S Nakamizo, and M J Steinbach (York University, Downsview, Ontario, Canada) *Vision Research*, vol 18, no 6, 1978, p 735-739 17 refs National Research Council of Canada Grants No A-0296, No A-7664

We measured durations, peak velocities and magnitudes of the eye movements consisting of saccadic and vergence components While duration and direction of the combined eye movements were the same for both eyes, we found reliable differences between the magnitudes and peak velocities of the two which were too large to be understood by an additivity hypothesis (Author)

A78-43185 The influence of colour and contour rivalry on the magnitude of the tilt after-effect N J Wade (Dundee, University, Dundee, Scotland) and P Wenderoth (Sydney, University, Sydney, Australia) *Vision Research*, vol 18, no 7, 1978, p 827 835 28 refs Medical Research Council Grant No G 974/911/N, Australian Research Grants Committee Grant No A74/15177

A78-43186 Visual fixation points and depth perception N Kawabata, K Yamagami (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan), and M Noaki (Tokyo University of Science, Tokyo, Japan) *Vision Research*, vol 18, no 7, 1978, p 853, 854

Relationships between depth perception and visual fixation points are studied using figures including the Necker cube and the Schroder staircase Seven subjects were used for two types of experiments long-period and short exposure of the stimulus figures The results suggest that depth perception is closely associated with the visual fixation point on the figure and that the interpretation of the local structure of the figure is crucial S C S

A78-43187 Interocular light adaptation effect on the Lie 'specific threshold' A M Prestrude, L Watkins, and J Watkins (Virginia Polytechnic Institute and State University, Blacksburg, Va) *Vision Research*, vol 18, no 7, 1978, p 855-857 13 refs

The influence of the dichoptic preadaptation procedure of the interocular light adaptation effect on the occurrence of the Lie specific threshold is evaluated The study is conducted using a Marietta adaptometer, LDC chart recorder, and a dichoptic preadapting unit Four observers are studied for sixteen conditions consisting of monocular and dichoptic preadapting conditions, achromatic and green ipsilateral preadapting colors, absolute and specific thresholds, and replications of all color combinations The primary conclusion is that the occurrence of the Lie specific threshold may be enhanced to the same degree as the absolute threshold by the dichoptic preadaptation of the interocular light adaptation effect S C S

Page Intentionally Left Blank

STAR ENTRIES

N78-26055# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt Brunswick (West Germany) Inst Fuer Flugfuehrung

FLIGHT PERFORMANCE AND PILOT WORKLOAD IN HELICOPTER FLIGHT UNDER SIMULATED IMC EMPLOYING A FORWARD LOOKING SENSOR

R Beyer *In* AGARD Guidance and Control Design Considerations for Low-Altitude and Terminal-Area Flight Apr 1978 9 p refs

Avail NTIS HC A14/MF A01

A study was made giving particular emphasis to flight performance and pilot workload in flights under simulated IMC employing a forward looking sensor as well as to the layout of the display and the sensor system The experiments were flown in a Bell UH-ID helicopter The technical approach and some results are presented J A M

N78-26056# Forschungsinstitut fuer Anthropotechnik Meckenheim (West Germany)

HUMAN ENGINEERING EVALUATION OF A COCKPIT DISPLAY/INPUT DEVICE USING A TOUCH SENSITIVE SCREEN

Klaus-P Gaertner *In* AGARD Guidance and Control Design Considerations for Low-Altitude and Terminal-Area Flight Apr 1978 13 p refs

Avail NTIS HC A14/MF A01

A cockpit touch input/output system is described which integrates and combines several control and display functions of airborne systems into one space which can be located in the primary control and display areas of the cockpit This integration is accomplished by the use of touch sensitive virtual switching arrays on a CRT driven by sophisticated computer software Various technical approaches to the touch sensitive aspect of this system are described The touch input control device and its possible application to airborne systems are discussed in terms of its advantages and reliability requirements Several unique ergonomic problems associated with these devices are identified A case history application for selected airborne systems involving use of menu-select hierarchies of virtual keyboards is presented J A M

N78-26715*# National Aeronautics and Space Administration National Space Technology Labs, Bay Saint Louis, Miss

COMPILED DATA ON THE VASCULAR AQUATIC PLANT PROGRAM, 1975 - 1977

B C Wolverton and R McDonald [1977] 149 p refs

(NASA-TM-79511) Avail NTIS HC A07/MF A01 CSCL 06C

The performance of a single cell facultative sewage lagoon was significantly improved with the introduction of vascular aquatic plants Water hyacinth (Eichhornia crassipes) was the dominant plant from April to November duckweed (Lemna spp) and (Spirodela spp) flourished from December to March This 2 ha lagoon received approximately 475 cu m/day of untreated sewage and has a variable COD sub 5 loading rate of 22-30 kg/ha/day During the first 14 months of operation with aquatic plants the average influent BOD sub 5 was reduced by 95% from 110 mg/l to an average of 5 mg/l in the effluent The average influent suspended solids were reduced by 90% from 97 mg/l to 10 mg/l in the effluent Significant reductions in nitrogen and phosphorus were effected The monthly kjeldahl nitrogen for influent and effluent averaged 12 0 and 3 4 mg/l, respectively a reduction of 72% The total phosphorus was reduced on an average of 56% from 3 7 mg/l influent to 1 6 mg/l effluent Author

N78-26716*# National Aeronautics and Space Administration, Washington, D C

CONDITIONED REFLEX ACTIVITY OF RATS AT LATER PERIODS AFTER THE END OF FLIGHT ABOARD THE KOSMOS-605 BIOSATELLITE

N N Livshits, Ye S Meyzerov Z I Apanasenko, and M A Kuznetsova Jul 1978 13 p refs Transl into ENGLISH from Zh Vyssh Nerv Deyateln im I P Paulova (USSR), v 28, no 1, 1978 p 107-114 Transl by Scientific Translation Service, Santa Barbara, Calif

(Contract NASw-2791)

(NASA-TM-75523) Avail NTIS HC A02/MF A01 CSCL 06S

The aftereffects of spaceflight on the higher nervous activity of rats were studied A five lane maze with a feeding terminal was used to check such factors as transfer of experience, the habit and speed of reaching the goal in the maze, long term memory, and the dynamics of errors During the 3rd-7th postflight week functional disturbances in the rat HNA were manifested in the deterioration of the capacity for the transfer of experience and for locating the feeding compartment in the maze, thus indicating a general decrease of work capacity The increased number of errors and failures pointed to exhaustion of higher nervous processes and to the weakened functional activity of the brain G G

N78-26717*# National Aeronautics and Space Administration, Washington D C

STRUCTURAL AND FUNCTIONAL ORGANIZATION OF THE VESTIBULAR APPARATUS IN RATS SUBJECTED TO WEIGHTLESSNESS FOR 19 5 DAYS ABOARD THE KOSMOS-782 SATELLITE

Ya A Vinnikov O G Gazenko L K Titova, A A Bronshteyn, V I Govardovskiy, R A Pevzner G G Gribakin, M Z Aronova, T A Kharkeyevich, and T P Tsirulis Jul 1978 11 p refs Transl into ENGLISH from Arkh Anat Gistol Embriol (USSR), no 1 1978 p 27-28 Transl by Scientific Translation Service Santa Barbara Calif

(Contract NASw-2791)

(NASA-TM-75529) Avail NTIS HC A02/MF A01 CSCL 06S

The vestibular apparatus was investigated in rats subjected to weightlessness for 19 5 days The vestibular apparatus was removed and its sections were fixed in a glutaraldehyde solution for investigation by light and electron microscopes Structural and functional charges were noted in the otolith portions of the ear with the otolith particles clinging to the utricular receptor surface and with the peripheral arrangement of the nucleolus in the nuclei of the receptor cells It is possible that increased edema of the vestibular tissue resulted in the destruction of some receptor cells and in changes in the form and structure of the otolith In the horizontal crista the capula was separated G G

N78-26718# Rochester Univ, N Y School of Medicine and Dentistry

BIOLOGICAL EFFECTS OF IONIZING RADIATION AT THE MOLECULAR, CELLULAR, AND ORGANISMAL LEVELS Triannual Progress Report, 15 Jul 1974 - 14 Oct 1977

Christopher S Lange 1977 16 p refs

(Contract EY-76-S-02-3501)

(TID-28055) Avail NTIS HC A02/MF A01

Progress is reported on the following studies organization and repair of DNA size measurement of DNA by means of the ultracentrifuge effects of hydroxyurea cycloheximide and methylmercury on cell cycle progression absence of an effect of photoreactivation on sublethal damage repair in a photoreactivating Wallaby cell line, and the control of differentiation and tissue polarity in planarians ERA

N78-26719# Stanford Linear Accelerator Center Calif
BIOMAGNETISM A REVIEW
S J StLorant Jul 1977 9 p refs Presented at 6th Intern Conf on Magnet Technol, Bratislava, Czechoslovakia, 29 Aug 1977
(Contract EY-76-S-03-0326)
(SLAC-PUB-1984 Conf 770842-18) Avail NTIS HC A02/MF A01

Biological effects of static and low frequency magnetic fields are reviewed and the potential hazards associated with human exposure are discussed It is concluded that the magnetic effects are fully reversible once the organism is permitted to return to its original environment ERA

N78-26720 New York Univ, N Y
THE INFLUENCE OF TRACE METALS IN DISPERSE AEROSOLS ON THE HUMAN BODY BURDEN OF TRACE METALS Ph D Thesis
David Maier Bernstein 1977 329 p
Avail Univ Microfilms Order No 7808506

A direct relationship was shown between the concentrations of trace metals in urban and other disperse aerosols and the concentrations of trace metals in human respiratory tissues To obtain these results a size selective particle sampler was developed for continuous sampling of the urban aerosol over periods ranging from hours to weeks The system used a parallel array of four two stage samplers with cyclone first stage collectors Undersize particles which passed through the cyclones were captured on glass fiber filters Mass balances of the suspended particulates and trace elements collected on the cyclones and filters were obtained Typical mass size distributions for summer and winter aerosols in New York City were determined
Dissert Abstr

N78-26721 Kansas State Univ, Manhattan
COMPARISON OF AUDITORY CRITICAL BANDS MEASURED BY LOUDNESS SUMMATION AND ACOUSTIC REFLEXES Ph.D Thesis
Galen Walter Berry 1977 63 p
Avail Univ Microfilms Order No 7809332

The purpose was to examine the hypothesis that the critical band demonstrated at the threshold of the acoustic reflex is determined by loudness The experiment examined the critical bandwidth in four normal hearing listeners, using two different psychophysical methods Loudness balances and acoustic reflex measures were made to a two tone stimulus when the components comprising the complex were adjusted to an equal intensity level or an equal reflex level Measurements following these adjustments facilitated the comparison of two tone loudness summation with two tone acoustic reflex threshold, as a function of sound pressure level Measurements were made for various bandwidth spacings of the two tone complex ranging from 100 Hz to 3434 Hz Dissert Abstr

N78-26722 New York Univ N Y
EFFECTS OF STIMULUS REPETITION RATE AND SENSATION LEVEL UPON THE EEG FOLLOWING RESPONSE OF AWAKE HUMAN SUBJECTS Ph D Thesis
Manuel M Cohen 1977 201 p
Avail Univ Microfilms Order No 78-08456

The effects of stimulus repetition rate (RR) and sensation level (SL) upon the EEG Following Response (FR) evoked by monotic periodic clicks in 20 normal hearing awake adult human subjects were studied Discussion of the effects of RR centered around the model of temporal overlapping of middle AER components to rapidly repeated click stimuli The sinusoidal appearance of the FR and its waveform consistency across SLs were discussed in terms of a visual template approach to scoring AER records for the determination of auditory threshold Differences between mean FR period and predicted period were interpreted in terms of middle AER waveform irregularities and their contribution to Following Response waveforms It was suggested that deviations of mean FR period about the predicted period, for any particular RR be converted to deviations of frequency of the FR waveforms Dissert Abstr

N78-26723 Kansas Univ, Lawrence
COMPARISONS AMONG AUDITORY REACTION TIME, LOUDNESS AND CERTAIN CHARACTERISTICS OF THE ACOUSTIC REFLEX Ph D Thesis
Lynne Marshall 1977 48 p
Avail Univ Microfilms Order No 7809363

Loudness, auditory reaction time and certain characteristics of the acoustic reflex (peak amplitude, latency rise time, and fall time) were measured in ten normal-hearing listeners Auditory reaction time and the acoustic reflex were measured concurrently, and loudness judgments by the method of direct magnitude estimation were made at a later time The stimuli were pure tones ranging from 250-4000 Hz in octave intervals and broadband noise at intensities ranging from 35-115 db SPL Equal loudness contours were in good agreement with those obtained by previous researchers and the equal magnitude curves for reaction time were in good agreement with the equal loudness contours For equal sound pressures, low frequency stimuli resulted in larger acoustic reflex contractions, shorter reflex latency, and faster rise time than did high frequency stimuli Dissert Abstr

N78-26724*# National Aeronautics and Space Administration, Washington, D C
PATHOPHYSIOLOGICAL ASPECTS OF THE PROBLEM OF PROLONGED HYPOKINESIA
Ye A Kovalenko Jun 1978 32 p refs Transl into ENGLISH from Patol Fiziol Eksp Ter (USSR) no 3, May-Jun 1975 p 11-24 Transl by Kanner (Leo) Associates, Redwood City Calif
(Contract NASw-2790)
(NASA-TM-75112) Avail NTIS HC A03/MF A01 CSCL 06S

The changes in man s acitivity due to modern life with automation and sedentary activities and man's exploration of space in a state of weightlessness have accentuated the importance of hypokinesia The pathogenesis of hypokinesia is discussed Experiments and results made on man and animals are included G G

N78-26725*# National Aeronautics and Space Administration, Washington, D C
SOME CLINICAL ASPECTS OF PROLONGED CLINOSTATIC HYPOKINESIA
A Ya Tizul, Ye I Sokolov, Yu S Mdinaradze, and L M Filatova Jun 1978 8 p refs Transl into ENGLISH from Sov Med (USSR), Jul 1972 p 147-148 Transl by Kanner (Leo) Associates, Redwood City Calif Original document prepared by Ministry of Public Health of the USSR, Moscow
(Contract NASw-2790)
(NASA-TM-75114) Avail NTIS HC A02/MF A01 CSCL 06S

Attendant problems which arise with prolonged confinement of patients to bed are discussed These disorders are of a hyperkinesic nature, and the symptoms are treated with pharmacological substances G G

N78-26726*# National Aeronautics and Space Administration, Washington, D C
CONTRACTILE FUNCTION OF THE MYOCARDIUM WITH PROLONGED HYPOKINESIA IN PATIENTS WITH SURGICAL TUBERCULOSIS
V P Zakutayeva and N I Matiks Jun 1978 10 p Transl into ENGLISH from Zdravookhr Kirgizii (USSR), no 5, Sep - Oct 1976 p 8-12 Transl by Kanner (Leo) Associates, Redwood City Calif Original document prepared by Kirgiz Scientific Research Inst of Tuberculosis, USSR
(Contract NASw-2790)
(NASA-TM-75115) Avail NTIS HC A02/MF A01 CSCL 06S

The changes in the myocardial contractile function with hypokinesia in surgical tuberculosis patients are discussed The phase nature of the changes is noted specifically the changes

in the various systoles diastole, and other parts of the cardiac cycle The data compare these changes during confinement in bed with no motor activity to and with a return to motor activity after leaving the in-bed regimen Author

N78-26727*# National Aeronautics and Space Administration, Washington D C
SOME FEATURES OF THE BIOELECTRIC ACTIVITY OF THE MUSCLES WITH PROLONGED HYPOKINESIA
N A Belaya R Z Amirov Ye A Shaposhnikov, I P Lebedeva and B S Sologub Jun 1978 10 p refs Transl into ENGLISH from Vop Kurortol , Fizioter Lech Fiz Kult (USSR) no 3 May-Jun 1975 p 238-241 Transl by Kanner (Leo) Associates Redwood City, Calif
(Contract NASw-2790)
(NASA-TM-75116) Avail NTIS HC A02/MF A01 CSCL 06S

The effects of prolonged hypokinesia brought on by confinement to bed and the attendant lack of motor activity on the bioelectric activity of muscles are studied Electromyographic measurements of amplitude and frequency indicators of muscular bioelectric activity were analyzed G G

N78-26728# Connecticut Univ Farmington School of Medicine
TOXICOLOGY AND METABOLISM OF NICKEL COMPOUNDS Progress Report, 1 Dec 1976 - 30 Nov 1977
F William Sunderman Jr 15 Aug 1977 35 p refs
(Contract EY-76-S-02-3140)
(COO-3140-36) Avail NTIS HC A03/MF A01

The toxicology and metabolism of Nickel compounds (NICL2 NI3S2, NIS NI powder and NI(CO)4) were investigated for their toxicological and metabolic effects in rats ERA

N78-26729# Purdue Univ Lafayette, Ind School of Electrical Engineering
SOME OBSERVATIONS ON THE HUMAN VISUAL PERCEPTION SYSTEM AND THEIR RELEVANCE TO COMPUTER VISION RESEARCH
R A Jarvis Dec 1977 81 p refs
(Grant NSF ENG-76-18567)
(PB-277938/7 TR-EE77-46) Avail NTIS HC A05/MF A01 CSCL 06D

Properties of the human visual perception system considered to be of relevance in designing computer vision systems were observed Sources of puzzlement and ambiguity of a number of well known optical illusions as well as decriptions and interpretations of psychological experiments which explore particular facets of the visual system organization were analyzed GRA

N78-26730# National Technical Information Service, Springfield Va
TOXICITY OF VINYL CHLORIDE A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1969 - Apr 1978
Pernell W Crockett May 1978 86 p Supersedes NTIS/PS-77/0365 NTIS/PS-76/0197
(NTIS/PS-78/0442/6, NTIS/PS-77-0365 NTIS/PS-76/0197) Avail NTIS HC $28 00/MF $28 00 CSCL 06T

Research is cited on the health hazards from exposure to vinyl chloride and vinyl chloride resins Studies are included on the epidemiology of industrial and public exposures to the compound as well as its degradation and combustion products (This updated bibliography contains 79 abstracts, 10 of which are new entries to the previous edition) GRA

N78-26731# California Univ Santa Barbara Inst of Environmental Stress
THE EFFECT OF NITROGEN DIOXIDE ON LUNG FUNCTION IN NORMAL SUBJECTS Final Report
Steven M Horvath and Lawrence J Folinsbee Jan 1978 82 p refs
(Contract EPA-68-02-1757)
(PB-277671/4 EPA-600/1-78-006) Avail NTIS HC A05/MF A01 CSCL 06S

Cardiopulmonary and metabolic responses of three groups, each consisting of five adult males (age 19-29) were determined before during, and after a 2 hour exposure to 0 062 plus or minus 0 12 ppm NO2 at 25 C and 45%RH The three groups exercised during exposure at 40% of VO2 max for either 12 30, or 60 min for groups C A and B respectively During the exercise periods the ventilation was about 33 liters/min a four-fold increase over the resting level There were no physiologically significant cardiovascular metabolic or pulmonary function changes which could be attributed to exposure to this level of NO2 (0 62 ppm) There were no differences between the groups in their response despite the fact that groups A and B received more NO2 as a result of 28% and 84% greater ventilations respectively GRA

N78-26732# Calspan Corp Buffalo N Y
INTERFACIAL BIOPHYSICS OF MATERIALS IN CONTACT WITH BLOOD Annual Report, 16 Dec 1976 - 15 Dec 1977
V A DePalma R E Baier and V L Gott 15 Dec 1977 289 p refs Prepared in cooperation with Johns Hopkins Univ , Baltimore, School of Medicine
(Contract N01-HV-3-2953)
(PB-277928/8 CALSPAN-W06-EB-5307-M-5, NIH/NHLI-N01-HV-3-2953) Avail NTIS HC A13/MF A01 CSCL 06L

The spontaneous adsorption of a protein film on solid surface is studied The deciding factor for the degrees of adhesion is related to the nature of the conditioning protein film which first forms on the surface Measures of the original electrical properties of solid substrates (e g surface potential difference zeta potential, rest potential) are correlated to cell adhesion by determining the influence of such properties on the initial adsorptive events Experimental characterization of substrate surfaces before and after exposure to fibrinogen dissolved in flowing buffered electrolytes deals chiefly with the changed electrical properties of the surfaces GRA

N78-26733# Institute for Perception RVO-TNO Soesterberg (Netherlands)
ACTH FRAGMENTS AND VERBAL LEARNING
W A Wagenaar 1977 7 p refs Partly sponsored by N V Organon
(IZF-1977-15 TDCK-69955) Avail NTIS HC A02/MF A01

The results of three experiments previously reported separately are pooled The total number of subjects amounts to 84, 42 in placebo and experimental groups The total results reveal no effect of ACTH 4-10 on paired associate learning
Author (ESA)

N78-26734# Institute for Perception RVO-TNO Soesterberg (Netherlands)
SOME EFFECTS OF ORG 2766 ON VARIOUS PERFORMANCE TASKS
A W K Gaillard and C A Varey 1977 21 p refs Sponsored by N V Organon
(IZF-1977-18, TDCK-69957) Avail NTIS HC A02/MF A01

The effects of the ACTH 4-9 analog Org 2766 were investigated on a range of performance tasks consisting of skill learning (a self-paced reaction task) running memory span verbal learning, and two nonverbal mental ability tests (closure flexibility and non verbal abstraction) Subjective ratings on feelings were taken and heart rate was also measured Only the 30 min reaction task produced significant drug effects In this task performance tends to deteriorate as a function of time on task This might be caused by boredom affecting the subject The deterioration is counteracted by the ACTH 4-9 analog These effects are very similar to those found in a previous study using ACTH 4-10 (Org 0163) Both studies suggest that these drugs act on the motivational processes which are involved in continuous performance Author (ESA)

N78-26735# Institute for Perception RVO-TNO Soesterberg (Netherlands)
VOWEL SEGMENTS IN CONSONANTAL CONTEXTS A SPECTRAL STUDY OF COARTICULATION
M E H Schouten and L C W Pols 1977 36 p refs Submitted

for publication Sponsored by Neth Organ for the Advan of Pure Res (ZWO)
(IZF-1977-14, TDCK-69959) Avail NTIS HC A03/MF A01

Five speakers read a list of 120 CVC words containing all possible combinations of six initial consonants four vowels and five final consonants and a story in which those words occurred as stressed syllables Each speaker did this five times For each speaker and for each of the two conditions (isolated words and text words) the average trajectory in the spectral vowel space of every CV and VC transition and of the stationary part of the vowel was calculated With a few exceptions, the stationary part of the vowel was found not to vary systematically with consonantal context but the CV and, to a lesser extent, the VC transitions turned out to combine into a pattern that was quite consistent over speakers and conditions Extrapolation of these transitions resulted in estimated consonant locus areas in the vowel space for the majority of consonants investigated

Author (ESA)

N78-26736# Institute for Perception RVO-TNO Soesterberg (Netherlands)
ACTH 4-10 AND ADAPTIVE LEARNING
W A Wagenaar H Timmers, and H Frowein 1977 16 p refs Sponsored by N V Organon
(IZF-1977-13 TDCK-69960) Avail NTIS HC A02/MF A01

In three successive experiments the effect of ACTH 4-10 on the performance of human subjects in a shift learning task was studied In the first experiment some facilitating effects were observed, but this result was not replicated in the second experiment In a third experiment designed to provide a surplus of observations it was finally shown that ACTH 4-10 had no effect on this kind of adaptive learning The study concludes with a short discussion of sample sizes in drug experiments

Author (ESA)

N78-26737# National Aerospace Lab Amsterdam (Netherlands) Flight Div
HUMAN MONITORING AND CONTROL BEHAVIOR MODELS AND EXPERIMENTS
P H Wewerinke 22 Oct 1976 64 p refs
(NLR-TR-77010-U) Avail NTIS HC A04/MF A01

The object of the study was to describe human monitoring behavior and to determine how it is affected by performing other, interfering (control) tasks A model for automatic multivariable monitoring was tested against experimental data Apart from monitoring simultaneously monitoring and manual flight director control was studied to determine the interference between (interacting) subtasks Combined monitoring and auditory tracking was also included The results demonstrate that the multivariable monitor model adequately describes human monitor behavior in the tasks A multivariable workload model was developed where computer workload proved to agree excellently with subjective ratings

Author (ESA)

N78-26738# Loyola Univ Chicago Ill Fire and Human Behavior Research Center
***A MODEL OF HUMAN BEHAVIOR IN A FIRE EMERGENCY* Final Report**
Leonard Bickman Perry Edelman and Michael A McDaniel Dec 1977 33 p refs Sponsored in part by HEW
(Contract NBS-6-9015)
(PB-277773/8 NBS-GCR-78-120) Avail NTIS HC A03/MF A01 CSCL 05J

A conceptual model which describes some of the significant factors thought to influence human behavior in a fire emergency *is reported The model attempts to integrate previous research* on fire and human behavior with relevant findings from the field of social psychology The model involves three stages (1) detection of cues, (2) definition of the situation, and (3) coping behavior These stages describe the logical flow of behavior during a fire Six categories are presented which are hypothesized to affect behavior at each stage in the model (1) physiological/physical (2) intrapersonal (3) education/preparation (4) social (5) fire characteristics and (6) physical environment The potential value of the model in explaining behavior in actual fires and in formulating future research is demonstrated with specific *examples*

GRA

N78-26739 Stanford Univ Calif
DEVELOPMENT OF PREDICTION MODELS FOR EFFORT LEVELS IN MANUAL JOBS Ph D Thesis
Temilola Kehinde 1978 143 p
Avail Univ Microfilms Order No 7808804

Experiments were designed to investigate possible relationships between effort input and the frequency distribution of cycle times produced by subjects engaged in different types of manual industrial jobs The subjects used were industrial workers from an electronics plant in San Carlos, California Five different *jobs were studied and the workers used as subjects could be* classified as typical industrial workers Each subject was suitably motivated to work for specified periods of time at four different predefined effort or motivational levels--slow comfortable, incentive, and very fast (maximum) Series of successive cycle times were collected at each of the four levels These cycle times were later used to make up the relevant frequency distributions The jobs used for this study had different mean cycle times and different degrees of complexity Dissert Abstr

N78-26740*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
SPACE ECOSYNTHESIS AN APPROACH TO THE DESIGN OF CLOSED ECOSYSTEMS FOR USE IN SPACE
R D MacElroy and M M Averner (California Univ at Berkeley) Jun 1978 41 p refs
(NASA-TM-78491) Avail NTIS HC A03/MF A01 CSCL 06K

The use of closed ecological systems for the regeneration of wastes, air, and water is discussed It is concluded that such systems, if they are to be used for the support of humans in space, will require extensive mechanical and physico-chemical support The reason for this is that the buffering capacity available in small systems is inadequate and that natural biological *and physical regulatory mechanisms rapidly become inoperative* It is proposed that mathematical models of the dynamics of a closed ecological system may provide the best means of studying *the initial problems of ecosystem closure* A *conceptual and* mathematical model of a closed ecosystem is described which treats the biological components as a farm calculates the rates of flow of elements through the system by mass-balance techniques and control theory postulates, and can evaluate the requirements for mechanical buffering activities It is suggested that study of the closure of ecosystems can significantly aid in the establishment of general principles of ecological systems

Author

N78-26741*# National Aeronautics and Space Administration Ames Research Center, Moffett Field Calif
G-SEAT SYSTEM STEP INPUT AND SINUSOIDAL RESPONSE CHARACTERISTICS
Thomas W Showalter and Robert J Miller Jun 1978 11 p
(NASA-TM-78478 A-7393) Avail NTIS HC A02/MF A01 CSCL 05H

The step input and sinusoidal response characteristics of a pneumatically driven computer controlled G set are examined in this study The response data show that this system can be modeled as a first order system with an 0 08 sec time lag and a 0 53 sec time constant

Author

N78-26742# Royal Aircraft Establishment Farnborough (England)
***HUMAN ENGINEERING EVALUATION OF A MAN-MACHINE SYSTEM FOR SYSTEM OPTIMIZATION* ILLUSTRATED BY A COCKPIT EVALUATION**
H Denkscherz and R M Taylor ed Dec 1977 38 p refs Transl into ENGLISH of Rept MBB-UFE-1351 Messerschmitt-Boelkow-Blohm, West-Germany, 9 Sep 1977 37 p

(RAE-Lib-Trans-1952 BR62774, MBB-UFE-1351) Avail NTIS HC A03/MF A01

Operator performance hardware, software and operating procedures were evaluated The evaluation situation was represented by a cockpit simulator Data were acquired by observing and questioning the operators The object of the evaluation is system optimization J A M

N78-26743# Cincinnati Univ, Ohio Dept of Engineering Science

MULTI-RIGID-BODY SYSTEM DYNAMICS WITH APPLICATIONS TO HUMAN-BODY MODELS AND FINITE-SEGMENT CABLE MODELS Final Technical Report, 1 Jan 1975 - 30 Sep 1976

Ronald L Houston and Chris E Passerello 1 Aug 1977 70 p refs

(Contract N00014-75-C-1164)

(AD-A052868 UC-ES-080177-4-ONR) Avail NTIS HC A04/MF A01 CSCL 12/1

A computer-oriented method for obtaining dynamical equations of motion for large mechanical systems or chain systems is presented A chain system is defined as an arbitrarily assembled set of rigid bodies such that adjoining bodies have at least one common point and such that closed loops are not formed The equations of motion are developed through the use of Lagrange s form of d Alembert s principle The method is illustrated and applied with human-body models and finite-segment cable models The human-body models are configured to simulate a crash-victim Results with several applied deceleration profiles agree very well with available experimental data The cable model is configured to simulate an off-shore oil rig or ship's crane with a partially submerged towing cable Author (GRA)

N78-26744# Chemical Lab RVO-TNO Rijswijk (Netherlands)

DETERMINATION OF THE CONCENTRATION OF CADMIUM AEROSOL AND OF SOME OTHER CONTAMINANTS PRESENT IN THE ATMOSPHERE OF A SUBMARINE OF THE ROYAL DUTCH NAVY

F Oeseburg Dec 1976 29 p refs

(Contract A74/KM/033)

(CL-1976-23, TDCK-68819) Avail NTIS HC A03/MF A01

Cadmium aerosol concentrations in the atmosphere originating from operating sonar equipment on board a three-cylinder submarine of the Royal Dutch Navy were measured to check the possible health risk to the different members of the crew It turned out that these concentrations met the Dutch standard value Additional measurements were carried out to get a more complete picture of the contaminants present in the atmosphere of the submarine From these the conclusion was drawn that the concentrations of the number of metal aerosols other than cadmium also met the Dutch standard value In all cases the concentration dust exceeded the norm Author (ESA)

N78-26745# National Aerospace Lab, Amsterdam (Netherlands) Flight Div

A THEORETICAL FRAMEWORK TO STUDY THE EFFECT OF COCKPIT INFORMATION

P H Wewerinke 3 Jan 1978 7 p refs Presented at the AGARD ASMP-Specialists Meeting, Athens 20-24 Sep 1976 (NLR-MP-76014-U) Avail NTIS HC A02/MF A01

A theoretical framework describing human operator s participation in manned vehicle systems is developed The human operator is described in terms commensurate with those used for other system elements, because of the complex interaction between human functioning and his task environment (e g cockpit information) The result is an integrated model of the man-machine situation serving as a diagnostic tool and allowing the extrapolation to new situations The theoretical framework deals with manned vehicle systems involving the human operator performing continuous control and/or decision making tasks It is shown how the effect of cockpit information (e g type quality and interference of displayed information both visual and auditory) on human functioning and mission success can be operationalized and straightforwardly investigated Author (ESA)

N78-26746# National Inst for Occupational Safety and Health, Morgantown W Va Testing and Certification Branch

SILICA DUST TEST FOR RESPIRATORY PROTECTIVE DEVICES

Warren R Myers Jul 1977 40 p

(PB-278019/5 NIOSH/TC/R-009) Avail NTIS HC A03/MF A01 CSCL 06Q

The silica dust test evaluates the performance of air-purifying respirators against dusts of materials having a TWA not less than 0 05 mg/cu m or 2 mppcf This test also evaluates the resistance performance of pesticide respirators and filters to be used against materials having a TWA less than 05 mg/cu m or 2 mppcf The dust test procedure is designed to determine whether a respirator meets test performance requirements for maximum allowable penetration and for maximum allowable breathing resistances GRA

N78-27732 California Univ San Francisco

ELECTROPHYSIOLOGIC AND PHARMACOLOGIC PROPERTIES OF MAMMALIAN SENSORY NEURONS Ph D Thesis

Richard Andrew Jaffe 1977 221 p

Avail Univ Microfilms Order No 7809195

Passive and active electrical properties of the soma membrane of neurons in nodose ganglia removed from cats and rabbits were studied The ganglia were maintained in vitro and were superfused at 37 C with a solution formulated to approximate the extracellular fluid of each species The pharmacologic actions of a variety of drugs were tested on neurons in cat and rabbit nodose ganglia Results suggest that the cell bodies possess receptors for drugs and that drug induced effects may result in the initiation of action potentials or the modification of pre-existing activity Thus the nodose ganglion may be an important site of action for the autonomic effects of some drugs Dissert Abstr

N78-27733* National Aeronautics and Space Administration Ames Research Center Moffett Field Calif

TREAD DRUM FOR ANIMALS Patent

Wayne H Howard inventor (to NASA) Issued 9 May 1978 7 p Filed 31 Mar 1976 Supersedes N76 20185 (14 11 p 1394)

(NASA-Case-ARC-10917 1 US Patent-4 088 094

US-Patent-Appl-SN-672223 US-Patent-Class 119-29) Avail US Patent Office CSCL 06B

A device for exercising animals such as primates is described which includes a cylindrical housing mounted for rotation about a horizontal axis of revolution and has a cylindrical treadway portion on which the animal treads while the drum is rotated by means of a motorized drive The treadway portion of the drum includes an electrode structure with sectors being independently energizable by means of a commutator and source of potential so that an electrical shock station is created behind a running in place station on the moving treadway In this manner if the animal should fall behind its running in place station it may be shocked by treading on the energized electrode structure One end of the tread drum comprises a transparent wall for unobstructed viewing of the animal being exercised

Official Gazette of the U S Patent Office

N78-27734*# National Aeronautics and Space Administration Washington D C

PLANTS FOR SPACE PLANTATIONS

T I Nikishanova Jun 1978 22 p refs Transl into ENGLISH from Priroda (USSR) no 10 1977 p 105-117 Transl by Kanner (Leo) Associates Redwood City Calif

(Contract NASw-2790)

(NASA-TM-75314) Copyright Avail NTIS HC A02/MF A01 CSCL 06C

Criteria for selection of candidate crops for closed life support systems are presented and discussed and desired characteristics of candidate higher plant crops are given Carbohydrate crops which are most suitable grown worldwide

are listed and discussed The sweet potato Ipomoea batatas Poir is shown to meet the criteria to the greatest degree and the criteria are recommended as suitable for initial evaluation of candidate higher plant crops for such systems Author

N78-27735*# National Aeronautics and Space Administration Washington D C
VESTIBULAR REACTIONS TO LONG-TERM CALORIC STIMULATION OF THE RABBIT LABYRINTH
G I Gorgiladze Jul 1978 7 p refs Transl into ENGLISH from Zh Vyssh Nervn Deyateln im I P Pavlova (USSR) v 28 no 1 Jan-Feb 1978 p 192-194 Transl by Sci Transl Serv Santa Barbara Calif
(Contract NASw 2791)
(NASA-TM-75528) Avail NTIS HC A02/MF A01 CSCL 06S

Long-term periodically repeated caloric stimulation of the labyrinth receptors of the internal ear was studied on eight rabbits with immobilzed heads Warm (20 C) water was used as a stimulus in a dose of 40 ml per min injected into the auditory meatus Author

N78-27736*# National Aeronautics and Space Administration Ames Research Center Moffett Field Calif
CV 990 INTERFACE TEST AND PROCEDURE ANALYSIS OF THE MONKEY RESTRAINT, SUPPORT EQUIPMENT, AND TELEMETRY ELECTRONICS PROPOSED FOR SPACELAB
Bernard D Newsom Jun 1978 85 p refs
(NASA-TM-78484 A-7417) Avail NTIS HC A05/MF A01 CSCL 06C

A biological system proposed to restrain a monkey in the Spacelab was tested under operational conditions using typical metabolic and telemetered cardiovascular instrumentation Instrumentation interfaced with other electronics and data gathering during a very active operational mission were analyzed for adequacy of procedure and success of data handling by the onboard computer G G

N78-27737*# State Univ of New York at Buffalo Amherst
ASSESSMENT OF PANCREAS CELLS Final Report
C VanOss 5 Jun 1978 11 p refs
(Contract NAS9-15365)
(NASA-CR 151744) Avail NTIS HC A02/MF A01 CSCL 06C

Pancreatic islets were obtained from guinea pig pancreas by the collagenase method and kept alive in tissue culture prior to further studies Pancreas cell morphology was studied by standard histochemical techniques using light microscopy Preparative vertical electrophoresis-levitation of dispersed fetal guinea pig pancreas cells was conducted in phosphate buffer containing a heavy water (D20) gradient which does not cause clumping of cells or alter the osmolarity of the buffers The faster migrating fractions tended to be enriched in beta-cell content Alpha and delta cells were found to some degree in most fractions A histogram showing the cell count distribution is included P R A

N78-27738*# National Aeronautics and Space Administration Washington D C
THE MATCHING OF BIOLOGICAL AND TECHNICAL ELEMENTS AND SYSTEMS
Yu I Zozulya Jun 1978 12 p refs Transl into ENGLISH from Probl Bioniki (USSR) no 14 1975 p 12-19 A76-13911 Transl by Kanner (Leo) Associates Redwood City Calif
(NASA-TM 75313) Avail NTIS HC A02/MF A01 CSCL 06C

The conditions necessary for matching the input-output relationships of nonlinear dynamic systems without memory and with image memory are discussed A structural representation is provided for the input-output relationships of matched elements and systems with distributed kernels G G

N78-27739# Purdue Univ Lafayette Ind Joint Highway Research Project
EVALUATION OF SEVERAL METHODS OF ESTABLISHING PLANT COVER BY SEEDING ON THE ROADSIDE Interim Report
P L Carpenter David Hensley and Deborah Newbill Nov 1977 36 p refs
(PB-278275/3 JHRP-76-34) Avail NTIS HC A03/MF A01 CSCL 13B

Several woody plant species were direct seeded on a roadside slope Of the species that germinated seeding survival declined over time Cercis canadensis and Robinia pseudoacacia appeared to provide some cover however natural seeding of these native plants also occurred in unseeded plots and buffers Mixtures of grasses and herbaceous legumes were used for erosion control Avena sativa provided rapid cover and held the seeds of more desirable species in the bottom of the existing gullies Coronilla varia established permanent cover and halted erosion by the second season Wheat straw shredded hardwood bark and shredded rubber tires were evaluated as mulch materials for newly seeded slopes Shredded bark and wheat straw gave excellent results however shredded rubber was inferior even to the check GRA

N78-27740 Duke Univ Durham N C
DETERMINING THE NUMBER AND POSITIONS OF MEASURING LOCATIONS FOR BODY SURFACE POTENTIAL MAPPING Ph D Thesis
Robert Burton Warren 1977 458 p
Avail Univ Microfilms Order No 7807640

Body surface potential distributions (maps) were obtained from a large patient population and represented a wide variation in age time in the cardiac cycle and cardiac condition These maps were split into two groups an analysis group for deriving lead systems and a test group for evaluating the results The geometric relationships were obtained by direct measurement from heart and torso models The electrical activity of the heart was represented in terms of fundamental patterns set up on the body surface by hypothetical spatially fixed equivalent cardiac generators The results demonstrate that the fundamental patterns derived from measured maps embody geometric information about the relationship between heart activity and body surface effects Dissert Abstr

N78-27741 Utah Univ Salt Lake City
PROCESSING OF ECHOCARDIOGRAPHIC DATA FOR AUTOMATIC DETECTION OF MOVING HEART STRUCTURES Ph D Thesis
Dominic Julius Heuscher 1978 168 p
Avail Univ Microfilms Order No 7808325

A border detection system was developed which uses pattern matching and dynamic search techniques designed to recognize and isolate a designated structure from others within the same time-motion segment then find the best path, based upon a given merit function describing the motion for that structure These techniques allow known information regarding the shape location relative intensity etc to be effectively incorporated into the search for the correct border This system has demonstrated that borders can be detected quickly and correctly for a scan throughout the left ventricle The shape and location of these borders compared favorably with hand traced borders obtained from the same data In addition borders were obtained for selected positions of the transducer to demonstrate the ability to detect a variety of structures throughout the heart Dissert Abstr

N78-27742 Nebraska Univ Lincoln
DEVELOPMENT OF A SINGLE UNIT, MULTIOUTPUT SENSING ELEMENT IN A FORCE PLATFORM FOR USE IN BIOMECHANICS APPLICATIONS Ph D Thesis
William Edward Handy 1977 289 p
Avail Univ Microfilms Order No 7809155

The platform can be used to determine the three orthogonal components of a force applied to it the two dimensional location of the force and the torque about the vertical axis Force components are directly proportional to strain outputs Position and torque must be calculated from measured quantities The sensing element was constructed from a 24 inch square by 1 5-inch thick aluminum plate Slots in the plate form four sensing

beams and a torque sensing cross A top walk plate is attached at the center of the element The element is supported at the four outside corners A load applied to the top plate is transferred through the torque sensing cross to each of the two pairs of opposed load-sensing beams in sequence Sixty four strain gages are mounted on the four load sensing beams and the torque sensing cross to form the six multi-gage arm bridges
Dissert Abstr

N78-27743 Case Western Reserve Univ Cleveland Ohio
IMPLANTABLE TELEMETRY SYSTEM FOR INTRACRANIAL PRESSURE MONITORING AND ITS APPLICATION FOR ACETAZOLAMIDE STUDY Ph D Thesis
Edward Man-Yau Cheng 1978 129 p
Avail Univ Microfilms Order No 7809273

A single channel and two-channel intracranial pressure - temperature telemetry systems were designed and constructed These systems are capable of being powered by external radio frequency (RF - 3 5 MHz) and the ICP signal is transmitted at another frequency (RF 120 MHz) A total of seventeen implants were evaluated in dog experiments with satisfactory results Application of the telemetry system has also been extended to the evaluation of acetazolamide effect on intracranial pressure of awake animals Five prototype two channel units are being constructed for clinical evaluation
Dissert Abstr

N78-27744 Texas Univ at Austin
THE DESIGN AND EVALUATION OF MULTIMEMBRANE ULTRAFILTRATION HEMO-SEPARATING SYSTEMS Ph D Thesis
Glen Delbert Antwiler 1977 197 p
Avail Univ Microfilms Order No 78-07255

The concept of using a multimembrane ultrafiltration system to separate plasma from whole blood followed by a secondary separation of a smaller fraction of solutes was studied This work included mathematical models of ultrafiltration systems and in vitro and in vivo experiments with emphasis on separating plasma from blood It was shown that with the proper choice of membrane and flow geometry plasma can be separated from whole blood with minimum hemolysis and destruction of white cells and platelets Also none of the dogs used showed any abnormal effects after the experiments
Dissert Abstr

N78 27745 New York Univ N Y
LEARNED VOLUNTARY CONTROL OF SYSTOLIC BLOOD PRESSURE BY SPINAL CORD INJURY PATIENTS Ph D Thesis
Bernard S Brucker 1977 134 p
Avail Univ Microfilms Order No 7808452

The training consisted of 25 one hour sessions Each session consisted of four 4-minute training periods each preceded and followed by a 4-minute rest period On three of the training periods the participant was asked to increase his blood pressure and as a control for the effort of paying attention to a task on the fourth trial which randomly appeared in different parts of the sequence on different days was asked to try to keep his blood pressure from increasing The participant was instructed not to tense muscle or change respiratory rate throughout the training sessions Blood pressure heart rate respiratory rate and EMG were continuously measured and recorded on an eight channel polygraph Analysis of the results revealed that nine of the ten participants learned to make reliable and large voluntary increases in blood pressure with and without the feedback present that were specific to command and not mediated through voluntary muscle mechanisms
Dissert Abstr

N78-27746 State Univ of New York at Buffalo Amherst
THE INTERACTION OF THROMBIN AND PLATELETS Ph D Thesis
Bernice Michaelene Martin 1976 146 p
Avail Univ Microfilms Order No 7806882

To investigate the role of thrombin in the in vitro stimulation of platelets both the kinetics of the secretion of Ca^{2+} and ATP and the direct binding of 125I-thrombin were studied The results indicated that while catalytically active thrombin is required for platelet stimulation catalytic activity is not required for binding Studies of binding in correlation with secretion showed that saturation of the secretion reaction occurred at thrombin levels well below that required for saturation of binding indicating that not all binding sites are required for stimulation of the secretion reaction At thrombin levels below saturation of the secretion reaction most (75-85%) of the thrombin was not bound to platelets Furthermore the unbound thrombin was found to behave identically to native thrombin in molecular sieve chromatography and on SDS gels and was fully reactive when challenged by additional platelets
Dissert Abstr

N78-27748 Stanford Univ Calif
A MINIATURE INTEGRATED CIRCUIT ACCELEROMETER FOR BIOMEDICAL APPLICATIONS Ph D Thesis
Lynn Michelle Roylance 1978 207 p
Avail Univ Microfilms Order No 7808836

Integrated circuit fabrication technology has permitted the development of an accelerometer weighing less than 0 02 gm in a 2x3x0 6 mm package The accelerometer is intended for biomedical applications such as measurement of heart wall motion and intrauterine motion where extremely small mass is necessary to avoid measurement artifact In addition such applications require a transducer which will detect accelerations down to 0 01 g over a 100 Hertz bandwidth with an upper acceleration limit of 50 g Experimental results agree closely with the theoretically derived dependence of output on acceleration The observed resistance change is proportional to the applied acceleration and depends on the length thickness and width of the beam and on the magnitude and placement of the mass The dependence on beam geometry allows the sensitivity to be readily varied over several orders of magnitude yet remain tightly controlled
Dissert Abstr

N78-27749 Stanford Univ Calif
A SILICON ABSOLUTE PRESSURE TRANSDUCER FOR BIOMEDICAL APPLICATIONS Ph D Thesis
Timothy Alan Nunn 1978 106 p
Avail Univ Microfilms Order No 78-08820

The miniature transducer (1 0 mm x 1 25 mm x 0 4 mm) can be totally batch fabricated using integrated circuit processing techniques thus yielding a low cost device The pressure transducer consists of a silicon chip containing a silicon diaphragm with p-type resistors diffused into it, which is hermetically sealed to a glass cap An anodic bonding process is used for this sealing and results in a very stable bond The use of inherently stable materials resulted in a pressure transducer that was very stable with time The long term drift has been measured as being less than 1 torr per month Analysis of the stress patterns on the silicon diaphragm combined with analysis of the piezoresistive effect resulted in positioning and orienting the p-type resistors so as to maximize the transducer pressure sensitivity
Dissert Abstr

N78-27750*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
URINE COLLECTION DEVICE Patent Application
Roger B Michaud inventor (to NASA) (Martin Marietta Corp Denver Colo) Filed 30 May 1978 27 p
(Contract NAS9-14796)
(NASA-Case-MSC-16433-1 US-Patent-Appl-SN-910992) Avail NTIS HC A03/MF A01 CSCL 06B

The invention relates to a urine collection device particularly adapted to the female anatomy The device is designed for use primarily by incontinent women but also has application in those circumstances which preclude access to normal bathroom facilities for example where the woman is bed-ridden or is in an occupation which demands long periods at a duty station or in protective clothing (pilots or astronauts) The device successfully overcomes many of the problems associated with present devices such as absorbent garments (akin to diapers or sanitary napkins) external receptacles strapped to the body and catheters which problems usually include leakage urine contact with the body discomfort infection interference with freedom of movement and limitations on choice of clothing
NASA

N78-27751*# National Aeronautics and Space Administration Langley Research Center Langley Station Va
HYPERTHERMIA AS AN ANTINEOPLASTIC TREATMENT MODALITY
Sheila Ann T Long ed James Shaeffer ed (Eastern Va Med School) and Anas M El-Mahdi ed 1978 98 p refs Symp held at Norfolk Va 28 Jan 1978
(NASA-CP-2051 L-12082) Avail NTIS HC A05/MF A01 CSCL 06E

Improved methods of treating tumorous cancers with hyperthermia are discussed Conceptual and technical problems that relate to the fabrication and utilization of therapeutic radio frequency heating equipment and thermal measuring equipment are outlined G G

N78-27752*# National Aeronautics and Space Administration Washington D C
EFFECT OF PROLONGED HYPOKINESIA ON THE WATER AND FAT CONTENT OF THE HUMAN BODY
V P Krotov Ye A Kovalenko, and Z P Katuntsev Jul 1978 7 p refs Transl into ENGLISH from Byull Eksp Biol Med (USSR) vol 8 no 3 Mar 1976 p 279-281 Transl by SCITRAN Santa Barbara Calif
(Contract NASw-2791)
(NASA-TM-75522) Avail NTIS HC A02/MF A01 CSCL 06S

The combined action is studied of prolonged hypokinesia (30-49 days) and different position in relation to the vector of gravitation on body composition of healthy men In an antiorthostatic position of the subject the run-off of water occurs mainly in the first several days As a result of prolonged hypokinesia the lean body weight is reduced and the water content in it is decreased The latter is rapidly restored during resumption of motor activity G G

N78-27753*# National Aeronautics and Space Administration Washington D C
EFFECT OF 6-DAY HYPOKINESIA ON OXYGEN METABOLISM INDICES IN ELDERLY AND SENILE SUBJECTS
L A Ivanov and P A Orlov Jul 1978 6 p refs Transl into ENGLISH from Byull Eksp Biol Med (USSR) v 76 no 7 Jul 1973 p 35-37 Transl by Scientific Transl Service Santa Barbara Calif
(Contract NASw-2791)
(NASA-TM-75521) Avail NTIS HC A02/MF A01 CSCL 06S

After a strict 6 day confinement to bed of elderly and senile subjects the oxygen supply of the subcutaneous cellular tissue was impaired and the intensity of its tissue respiration was somewhat reduced The vacat-oxygen of the blood and urine the coefficient of incomplete oxidation and the oxygen deficiency in the organism were increased Author

N78-27754*# National Aeronautics and Space Administration Washington D C
CHANGES IN THE HUMAN BLOOD COAGULATING SYSTEM DURING PROLONGED HYPOKINESIA
L M Filatova and O D Anashkin Jun 1978 9 p refs Transl into ENGLISH from Byull Eksp Biol Med (USSR) v 65 no 6 1968 p 36-39 Transl by Kanner (Leo) Associates Redwood City Calif Original doc prep by Inst of Med and Biol Probl of the Min of Public Health USSR Moscow
(Contract NASw-2790)
(NASA-TM-75520) Avail NTIS HC A02/MF A01 CSCL 06S

Changes in the coagulating system of the blood were studied in six subjects during prolonged hypokinesia Thrombogenic properties of the blood rose in all cases on the 8th day These changes are explained by stress reaction due to unusual conditions for a healthy person Changes in the blood coagulating system in the group subjected to physical exercise and without it ran a practically parallel course Apparently physical exercise is insufficient to prevent such changes that appear in the coagulating system of the blood during prolonged hypokinesia Author

N78-27755# Civil Aeromedical Inst Oklahoma City, Okla
SPATIAL DISORIENTATION IN GENERAL AVIATION ACCIDENTS
William R Kirkham William E Collins Paula M Grape James M Simpson and Terry F Wallace Mar 1978 15 p refs
(AD-A053230 FAA-AM-78-13) Avail NTIS HC A02/MF A01 CSCL 05/10

Spatial disorientation (SD) refers to an incorrect self-appraisal of the attitude or motion of the pilot and his aircraft with respect to the earth This paper defines elements of SD problems as encountered in general civil aviation Accident reports made by the National Transportation Safety Board for a recent 6 year period were reviewed Statistical computations were made relating SD to fatal accidents SD was involved in 2 5 percent of all general aviation accidents nonfatal and fatal However SD ranked as the third highest cause in fatal small fixed-wing aircraft accidents and is closely related to the second highest cause continued VFR flight into adverse weather Inclement weather was associated with 42 percent of all fatal accidents and SD was a cause or factor in 35 6 percent of these cases Fog (56 8 percent) and rain (41 8 percent) were the most prevalent adverse weather conditions - Non-instrument-related pilots were involved in 84 7 percent of SD weather-involved accidents These and other data attest to the importance of this psychophysiological phenomenon (SD) in flight safety Suggestions are made of ways to improve pilots awareness and understanding of this problem Author

N78-27756# Civil Aeromedical Inst Oklahoma City Okla
RADIOBIOLOGICAL ASPECTS OF HIGH ALTITUDE FLIGHT RELATIVE BIOLOGICAL EFFECTIVENESS OF FAST NEUTRONS IN SUPPRESSING IMMUNE CAPACITY TO AN INFECTIVE AGENT
Wallace Friedberg Barbara R Neas Donald N Faulkner Gerald D Hanneman and E B Darden Jr (ORNL) Feb 1978 7 p refs
(AD-A053204 FAA-AM-78-8) Avail NTIS HC A02/MF A01 CSCL 06R

The relative biological effectiveness (RBE) of fast neutrons is compared with that of X-rays in impeding development of immunity to an infective agent the intestinal cestode Hymenolepis nana Mice were irradiated with neutrons or X-rays and 2 days later given an immunizing dose of H nana eggs After another 2 days the mice received a challenge dose of the eggs Challenge egg doses were also given to sham-irradiated unimmunized and immunized controls All mice were killed 90 to 92 hours after challenge and the H nana larvae (cysticercoids) that developed in the intestinal tissue were counted An increased cysticercoid count in the irradiated mice as compared with the count in unirradiated immunized controls reflects suppression of immune capacity by the radiation The results indicate a neutron RBE of 4 at 50 and 101 rad G G

N78-27757# Bureau of Mines Pittsburgh Pa
SIMULATION OF MAN'S RESPIRATORY AND METABOLIC FUNCTIONS BY THE AUTOMATED BREATHING METABOLIC SIMULATOR
Maria I DeRosa and Roy Levin 1978 23 p
(PB-278544/2 BM-IC-8766) Avail NTIS HC A02/MF A01 CSCL 06P

The Automated Breathing Metabolic Simulator and its hardware and software systems are described Emphasis is given to the role exerted by the software program subroutines in controlling the hardware mechanisms during the simulation of man s respiratory and metabolic functions GRA

N78-27758# Technology Inc San Antonio Tex Life Sciences Div
OCULAR HAZARDS OF PICOSECOND AND REPETITIVE-PULSED LASERS VOLUME 1 Nd YAG LASER (1064 NM) Final Report, 16 Feb 1973 - 15 Feb 1976
H W Hemstreet Jr J S Connolly and D E Egbert Apr 1978 47 p refs
(Contract F41609-73-C-0016)
(AD-A053765 TI-77-0564-03-Vol-1 SAM-TR-78-20) Avail NTIS HC A03/MF A01 CSCL 06/18

Retinal damage thresholds are discussed for exposure of rhesus maculae to continuous wave and repetitive-pulse trains

of 1064 nm Nd YAG laser radiation For all single-pulse exposures and for repetitive pulses contained within a 0 05 sec train retinal damage appears to be induced primarily by thermal mechanisms For the longer pulse-train durations a cumulative effect is apparent when the repetition frequencies are in the range of 1 to 100 Hz Experiments were conducted in such a way that direct comparisons could be made with previous data and that accumulated results could be compiled into a self-consistent empirical model

Author (GRA)

N78-27759# Technology Inc San Antonio Tex Life Sciences Div

OCULAR HAZARDS OF PICOSECOND AND REPETITIVE-PULSED LASERS VOLUME 2 ARGON-ION LASER (514 5 NM) Final Report, 16 Feb 1973 - 15 Feb 1976

J S Connolly H W Hemstreet Jr and D E Egbert Apr 1978 84 p refs

(Contract F41609-73-C-0016)

(AD-A053766 TI-77-0564-03-Vol-2 SAM-TR 78-21) Avail NTIS HC A05/MF A01 CSCL 06/18

Retinal damage thresholds were determined for exposures of the maculae of rhesus monkeys to CW and repetitive-pulse trains of argon-ion laser radiation at 514 5 nm in the *TEM00* mode Single-pulse exposures were made at pulsewidths of 2 10 40 and 100 microsec and 1 10 100 and 500 msec Repetitive-pulse exposures were made for 27 different combinations train durations of 05 0 5 5, and 30 sec pulse repetition frequencies from 0 10 Hz to 10 KHz and pulsewidths of 10 40 and 100 microsec and 1 msec Damage thresholds for mode-locked argon laser pulses at 104 MHz and 250 psec pulsewidth for pulse trains of 9 9 sec 10 msec and 10 microsec duration were also measured For pulsewidths of 10 microsec there is an apparent cumulative effect provided the repetition frequencies are in the range of approximately 0 1 to approximately 10 Hz The retina is more sensitive to double-pulse exposures by a factor of 2 to 3 relative to single-pulse thresholds when the interpulse spacing is approximately 2 5 sec Nonthermal damage mechanisms involving a two-step two-threshold process may explain our results Specifically for double-pulse configurations the first acts as a reversible photo-trigger which sensitizes the retina in preparation for the subsequent pulse The elements of an empirical model have been assembled and appear to account satisfactorily for the observed double-pulse threshold data

Author (GRA)

N78-27760# Pennsylvania State Univ University Park Applied Research Lab

DETECTION OF AN OCTAVE BAND OF NOISE AS A FUNCTION OF STIMULUS PRESENTATION M S Thesis

Paul T Cornell 4 Nov 1977 128 p refs

(Contract N00017-73-C-1418)

(AD-A053756 ARL/PSU/TM-77-311) Avail NTIS HC A07/MF A01 CSCL 06/16

Two experimental methods were developed to examine the effects of time uncertainty and other variables on the detection of a 500 Hz centered octave band of noise presented in noise In one method denoted the fixed presentation method the signal was presented at a fixed SNR following a specified interval of time after the onset of an ambient noise stimulus The other method the modified threshold-forced response method presented the signal with the noise at the start of the trial at a low SNR During the trial the SNR increased at a constant rate of one-half DB per two seconds Upon attaining a specified SNR the stimulus was gated Six levels of ending SNR were examined with each method Four subjects responded on a six-point confidence rating sale Results indicated that with the variable SNR method performance was much worse than in the fixed SNR method Not only were confidences lower but the probability correct was likewise lower Results also indicated that subjects could maintain a fairly consistent set of criteria throughout the experiment as rank ordered correlations of responses to identical tapes were generally high Consistency was found to increase with SNR GRA

N78-27761# Army Test and Evaluation Command Aberdeen Proving Ground, Md

RECURRENT HEAT EXPOSURE EFFECTS ON HORMONAL RESPONSES IN RESTING AND EXERCISING MEN

R P Francesconi J T Maher J W Mason (Walter Reed Army Inst of Research Washington D C) and G D Bynum 14 Feb 1977 25 p refs

(AD-A050539, USARIEM-M-9/77) Avail NTIS HC A02/MF A01 CSCL 06/19

Heat acclimatization was induced in a group of healthy young men by walking on a treadmill (5 6 km/hr 49 C/27 C dry/wet bulb, 90 min/ day 7 days) and confirmed by recording significantly reduced final rectal temperatures and heart rates on the 7th day of exercise in the heat A 2d group paired for maximal O2 consumption and body weight remained sedentary under identical conditions After correcting for minor changes in hematocrit both groups demonstrated significant reductions in plasma cortisol on the control day, indicating a strong anticipatory response Heat exposure reduced plasma cortisol levels in the sedentary men but the mild exercise program neutralized these effects in the exercising group Patterns of alteration of growth hormone indicated a significant response even to the mild exercise program described here while heat stress pre- and post-acclimatization seemed to have no effect upon plasma levels *Plasma total T4 levels demonstrated several randomized changes* which however did not reflect decreased output under the environmental conditions described here for either the walking or sedentary group The mild exercise program elicited significantly reduced levels of plasma insulin which were not affected by the recurrent heat exposure While recurrent heat exposure effected hormonal responses among both exercising and sedentary groups these alterations were not correlated with the process of heat acclimatization GRA

N78-27762# Army Test and Evaluation Command Aberdeen Proving Ground Md

MECHANISM OF THE ATTENUATED CARDIAC RESPONSE TO BETA-ADRENERGIC STIMULATION IN CHRONIC HYPOXIA

John T Maher Joseph C Denniston Danney L Wolfe and Allen Cymerman 14 Oct 1977 22 p refs

(AD-A050147 USARIEM-M-2/78) Avail NTIS HC A02/MF A01 CSCL 06/19

A bluntiung of the chronotropic and inotropic responses of the heart to beta-adrenergic stimulatin occurs following chronic exposure to hypobaric hypoxia To pursue the mechanism(s) involved observations were made in 6 intact conscious goats at sea level and in another 6 goats maintained in a decompression chamber at 445 torr (approximately 4 300 m) for 10 days No significant group differences in cardiac frequency and various indices of myocardial performance were demonstrable either before or after cholinergic blockade with intravenous atropine methyl bromide 1 mg/kg Following hemodynamic studies thoracotomies were performed and full-thickness biopsies were obtained from the free wall of each of the cardiac chambers Neither monoamine oxidase activity nor norepinephrine level of any region of the heart was altered by chronic hypoxia However a twofold increase (P - 001) in catechol O-methyltransferase activity above sea-level values was found in both the atria and ventricles of the hypoxic animals Thus attenuation in cardiac responsiveness to beta-adrenoceptor stimulation in chronic hypoxia appears unrelated to the level of vagal activity but may be attributable to enhanced enzymatic inactivation of catecholamines GRA

N78-27763# Army Research Inst of Environmental Medicine Natick Mass

INTERACTION OF CARDIORESPIRATORY PHYSICAL FITNESS AND HEAT TOLERANCE

Kent B Pandolf Jan 1978 15 p refs

(AD-A050149 USARIEM-M-11/78) Avail NTIS HC A02/MF A01 CSCL 06/16

Most authors agree that physical training in a cool environment improves tolerance to work in the heat and heat acclimatization but the extent or degree of improvement remains controversial The major benefits of physical training appear to involve exposure durations (heat) of less than two hours The best improvement in heat tolerance is associated with intensive interval or continuous training at a training intensity greater than 50% of

the maximal oxygen uptake for 8 to 12 weeks the maximal oxygen uptake should be increased 15-20% Generally individuals with high maximal oxygen uptake values previously trained and endurance athletes are at an advantage in the heat utilization of proper physical training appears to produce about 50% of the total adjustment resulting from heat acclimatizaton while increased fitness is associated with greater retention of acclimatization in cool environments Author (GRA)

N78-27764# Indiana Univ Bloomington Inst for Research in Public Safety

DRIVER VISUAL LIMITATIONS DIAGNOSIS AND TREATMENT Final Report, 1 Jul 1975 - 30 Oct 1977

David Shinar 6 May 1977 307 p refs

(Contract DOT-HS-5-01275)

(PB-278884/2 DOT/HS-803-260) Avail NTIS HC A14/MF A01 CSCL 06P

The role of vision in driving is reviewed Reliability and validity of the Mark 2 a prototype battery of eight driving-related vision tests and the relationship between poor performance on the Mark 2 and clinically diagnosed visual impairments were evaluated A total of 890 subjects were tested on the Mark 2 The most reliable tests are the tests for static acuity (under conditions of glare normal illumination and reducted illumination) dynamic visual acuity and detection-acquisition-interpretation (a measure of visual search efficiency) Tests considered less reliable and in need of modifications were those designed to measure threshold for angular movement and movement in-depth and angular extent of the visual field in the horizontal axis GRA

N78-27765# National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research Bethesda Md

TRANSCRIPT OF THE MEETING PROCEEDINGS OF NATIONAL COMMISSION FOR THE PROTECTION OF HUMAN SUBJECTS OF BIOMEDICAL AND BEHAVIORAL RESEARCH

1978 286 p Meeting held at Bethesda Md 10 Feb 1978 sponsored in part by HEW

(PB-279639/9, NCPHS/M-78/02) Avail NTIS HC A13/MF A01 CSCL 06E

The following topics are discussed institutional review boards ethical principles and guidelines for research and proposed sterilization regulations GRA

N78-27766# National Jewish Hospital and Research Center Denver Colo

POSSIBLE DESIGNS OF MEDICATION MONITORS Final Report

Thomas S Moulding Apr 1978 88 p refs Sponsored in part by American Lung Association New York

(PB-278973/3 Moulding-78/01) Avail NTIS HC A05/MF A01 CSCL 06B

A medication monitor is a device which utilizes radioactive material and photographic film to determine when patients remove medication from a dispenser Mechanical ideas for making this type of dispenser so it can be used for a wide range of medication regimens are presented The description includes using the idea of a digital clock and memory chips for the time recording system Also included are details on some of the following (1) choice of radioactive source and method of sealing source (2) methods of locking or sealing medication monitors (3) detailed instructions for using existing devices (4) a simplified film development system and (5) a mechanical and electronic means for creating a dispenser to reduce the chance of suicidal overdosage . GRA

N78-27767# National Technical Information Service Springfield Va

UNDERWATER MEDICINE AND PHYSIOLOGY, VOLUME 2 A BIBLIOGRAPHY WITH ABSTRACTS Report, 1975 - Mar 1978

Pernell W Crockett May 1978 151 p Supersedes NTIS/PS-77/0338 NTIS/PS-76/0264 NTIS/PS-75/278

(NTIS/PS-78/0414/9 NTIS/PS-77/0338 NTIS/PS-76/0264, NTIS/PS-75/278) Avail NTIS HC $28 00/MF $28 00 CSCL 06S

The physiological effects of decompression hyperbaric atmospheres gas mixtures, inert gases saturation diving and low temperature in underwater environments are covered in the bibliography Other related topics included are decompression schedules and safety measures Reports on underwater clothing and equipment are excluded GRA

N78-27768 Texas Univ , Austin

INVESTIGATION OF AN ALTERNATIVE RESPONSE TASK FOR SYNTHETIC SENTENCE INDEX Ph D Thesis

Martha Joe Hall Wofford 1977 104 p

Avail Univ Microfilms Order No 7807410

Three studies were designed in the development of an alternative response task for the Synthetic Sentence index (SSI) In Study 1 five trained normal hearing judges ranked the vocal stress patterns in the tape recorded SSI with an inter-judge reliability of 0 947 In Study 2 ten normal hearing persons listened to the SSI under seven increasing message-to-competition ratios from -30 to 0 db identifying those words they could hear in each sentence Spearman s Rank-Order Correlation indicated that word position rather than vocal stress was more influential in providing cue words for listeners The four most commonly identified words in each sentence formed the basis for construction of additional printed sentence alternatives in Study 3 The SSI requires modification either in the form of development of percent correction factor values or redesign with attention to the consistency of its competing message Dissert Abstr

N78-27769# Civil Aeromedical Inst Oklahoma City Okla

A COMPARISON OF THE VIGILANCE PERFORMANCE OF MEN AND WOMEN USING A SIMULATED RADAR TASK

Richard I Thackray R Mark Touchstone, and J Powell Bailey Mar 1978 11 p refs

(AD-A053674 FAA-AM-78-11) Avail NTIS HC A02/MF A01 CSCL 05/10

Possible sex differences are considered in the ability to sustain attention to a complex monitoring task requiring only a detection response to critical stimulus changes The visual display was designed to approximate a futuristic, highly automated air traffic control radar display containing computer-generated alphanumeric symbols Twenty-six men and an equal number of women were each tested over a 2 hour session Sixteen targets appeared on the screen at all times, with 10 signals (a designated change in the alphanumerics) randomly presented during each half hour of the test session Detection latency to the signals increased significantly during the session, but there was no evidence of any significant difference between the sexes in the magnitude or pattern of this increase The results are discussed in terms of a general decline in alertness that was apparently equal for both sexes G G

N78-27770# California Univ Los Angeles Brain Research Inst

DEVELOPMENT OF NEUROPHYSIOLOGICAL AND BEHAVIORAL METRICS OF HUMAN PERFORMANCE Annual Scientific Report, 1 Oct 1976 - 30 Sep 1977

Samuel L Moise Jr 30 Nov 1977 62 p refs

(Grant AF-AFOSR-3184-77)

(AD-A053018 AFOSR-78-0618TR) Avail NTIS HC A04/MF A01 CSCL 05/10

The purpose of this program is to develop metrics derived from multidimensional behavioral and neurophysiological indices which may ultimately be applied across a wide range of tasks to describe and predict human performance This year s effort represented two different approaches to this problem the development of a methodology for examining clutter factors that affect target identification, and the evaluation of Catastrophe Theory as a potential metric for describing discontinuities in human behavior Initial analysis of the behavioral data has been computed and is reported here It is clear that the system provides a powerful flexible tool for study of visual clutter A large representative bibliography of application of Catastrophe Theory has been compiled and is part of this report Evaluation of the usefulness of Catastrophe Theory as a metric for predicting

human performance is clear at this time The theory allows qualitative construction of models which reflect the behavior of systems in which discontinuities are observed but at present does not allow quantative, predictive modeling of such systems At present, then Catastrophe Theory would not seem to be suitable for generating predictive metrics of human performance GRA

N78-27771# Sandia Labs Albuquerque N Mex
HUMAN RELIABILITY ANALYSIS OF DEPENDENT EVENTS
A D Swain and H E Guttmann 23 Aug 1977 12 p refs Presented at Probabilitic Analysis of Nuclear Reactor Safety Los Angeles 8 May 1978
(Contract EY-76-C-04-0789)
(SAND-77-1396C Conf-780507-3) Avail NTIS HC A02/MF A01

In the human reliability analysis in WASH-1400 the continuous variable of degree of interaction among human events was approximated by selecting four points on this continuum to represent the entire continuum The four points selected were identified as zero coupling (i e zero dependence) complete coupling (i e complete dependence) and two intermediate points-loose coupling (a moderate level of dependence) and tight coupling (a high level of dependence) The paper expands the WASH-1400 treatment of common mode failure due to the interaction of human activities Mathematical expressions for the above four levels of dependence are derived for parallel and series systems The psychological meaning of each level of dependence is illustrated by examples with probability tree diagrams to illustrate the use of conditional probabilities resulting from the interaction of human actions in nuclear power plant tasks ERA

N78-27772# National Technical Information Service Springfield Va
HUMAN MEMORY A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Apr 1978
Mary E Young Apr 1978 270 p Supersedes NTIS/PS-77/0352 NTIS/PS-76/0352, and NTIS/PS-75/297
(NTIS/PS-78/0348/9 NTIS/PS-77/0352 NTIS/PS-76/0352 NTIS/PS-75/297) Avail NTIS HC $28 00/MF $28 00 CSCL 05J

This updated bibliography contains 265 abstracts on the abilities and functions of human memory and recall Memory and learning methods such as semantics mnemonics and visual and acoustic aids are included GRA

N78-27773# Civil Aeromedical Inst Oklahoma City Okla
HUMAN RESPIRATORY CONSIDERATIONS FOR CIVIL TRANSPORT AIRCRAFT OXYGEN SYSTEM
E B McFadden Mar 1978 21 p refs
(AD A053223 FAA-AM-78-9) Avail NTIS HC A02/MF A01 CSCL 01/3

Information is given to acquaint personnel involved in the design inspection and maintenance of civil transport oxygen systems with the human respiratory requirements and oxygen system design considerations necessary to effect an interface and provide acceptable high-altitude life support Simplified explanations and language and references are given to sources of more detailed information The oxygen system designer is directed to applicable Federal Aviation Regulations pertaining to oxygen systems and where regulatory guidance does not exist directs the reader to applicable oxygen equipment industry practices standards and information reports D L G

N78-27774# Civil Aeromedical Inst Oklahoma City Okla
CHILD RESTRAINT SYSTEMS FOR CIVIL AIRCRAFT
Richard F Chandler and Edwin M Trout Mar 1978 42 p refs
(AD-A053565 FAA-AM-78-12) Avail NTIS HC A03/MF A01 CSCL 01/3

Child restraint systems were developed to provide protection to children involved in automobile crashes Six typical systems were exposed to controlled impacts on a test sled to simulate aircraft crash conditions these systems were inverted to simulate turbulence A special test seat was developed to represent an aircraft passenger seat for these tests The results of the tests and characteristics of the child restraint systems that are critical for civil aircraft applications are discussed G G

N78-27775# Qei Inc Bedford Mass
RESEARCH IN SUPPORT OF JOINT ARMY-NAVY AIR CREW IMPACT INJURY PREVENTION PROGRAM *Final Report*, 1 Nov 1969 - 1 Nov 1977
Rodney W Thorpe and Harvey E Sbisa 31 Dec 1977 55 p refs
(Contract N00014-70-C-0082)
(AD-A053437 QEI-7C31) Avail NTIS HC A04/MF A01 CSCL 13/12

The research described in this paper falls into two separate categories First research was performed to develop and apply mathematical models which would accurately simulate the dynamic response of the living human over a wide range of impact-accelerative forces applied to the human along various vectors This research would hopefully lead to the specification of a manikin to simulate human response to impact acceleration Reserach was also performed to determine the physiological response of the human to impact acceleration or the effect of impact-accelerative forces on cardiac and pulmonary functions skeletal integrity and organ tissue integrity Second research was performed and a computer model called MEDCON was developed to determine the requirements in medical personnel and facilities of Navy bumed at different times and locations before and during a precisely-specified contingency
Author (GRA)

N78-27776# General Accounting Office Washington D C Procurement and Systems Acquisition Div
FEDERAL HUMAN NUTRITION RESEARCH NEEDS A COORDINATED APPROACH TO ADVANCE NUTRITION KNOWLEDGE, VOLUME 1 Report to the Congress
28 Mar 1978 137 p refs 2 Vol
(PB 278850/3 PSAD-77-156-Vol-1) Avail NTIS HC A07/MF A01 CSCL 06H

Several Federal departments and agencies support human nutrition research However comprehensive consolidated information on Federal human nutrition research activities is limited and some barriers to human nutrition research persist GAO recommends steps for the executive branch to help overcome these barriers Information needs to be developed concerning human nutrition requirements food composition and nutrient biological availability diet disease causation and food safety and food consumption and nutritional status GRA

N78-27777# General Accounting Office Washington D C Procurement and Systems Acquisition Div
FEDERAL HUMAN NUTRITION RESEARCH NEEDS A COORDINATED APPROACH TO ADVANCE NUTRITION KNOWLEDGE, VOLUME 2 Report to the Congress
28 Mar 1978 148 p 2 Vol
(PB-278851/1 PSAD-77-156-A-Vol-2) Avail NTIS HC A07/MF A01 CSCL 06H

This second volume of a two volume report contains the observations and views of 32 individuals active in research training or clinical practice of human nutrition The topics addressed were human nutrition gaps and needs GRA

N78-27778# California Univ Los Angeles School of Engineering and Applied Science
DEVELOPMENT OF A VISIBILITY RESEARCH CAPABILITY Final Report, 30 Jul 1976 - 5 Aug 1977
Albert Burg, Jinx Beer and Mayer E Brenner Aug 1977 192 p refs
(Contract DOT-HS-6-01451)
(PB-278152/4 UCLA-ENG-7754 DOT-HS-803-261) Avail NTIS HC A09/MF A01 CSCL 05E

Driver visibility research is considered that provided realistic stimulus situations to the driver and accurately measured relevant aspects of his performance in response to these situations Through

a review of the literature discussions with resource people and visits to facilities at which relevant equipment and/or activities could be seen a number of alternative approaches were comparatively evaluated The study recommendations were that simulation employing motion picture displays be considered as a short-term means for conducting the desired research and that on a long term basis consideration be given to the use of simulation with computer-generated imagery possibly in combination with other visual display techniques GRA

N78-27779# Ohio State Univ Columbus Dept of Industrial and Systems Engineering

THE UTILITY OF PERIPHERAL VISION TO MOTOR VEHICLE DRIVERS Final Technical Report, 23 Jun 1975 - 1 Aug 1977

Thomas H Rockwell K N Balasubramanian Tom Kretovics and Eileen J Wilfong 1 Aug 1977 252 p refs
(Contract DOT-HS-5-01203)
(PB-278157/3 DOT-HS-803-244) Avail NTIS HC A12/MF A01 CSCL 05E

The following topics are considered (1) determination of the frequency of mirror usage by subjects in traffic maneuvers using their own cars and the associated extent of head turn during mirror usage (2) the measurement of peripheral detection angles as a function of target contrast target speed foveal attentional load eye and head position and subject age in a laboratory simulation, and (3) field validation studies Greater head movement was associated with the left mirror compared to the inside mirror The percent head turn was 65% for the outside mirror versus 50% for the inside mirror Age differences were significant with older subjects exhibiting greater head movement for both mirrors GRA

N78-27780# Michigan Univ Ann Arbor Highway Safety Research Inst

STUDY OF IMPACT TOLERANCE THROUGH FREE-FALL INVESTIGATIONS Final Report, 15 May 1975 - 15 Dec 1977

Richard G Snyder David R Foust and Bruce M Bowman 15 Dec 1977 313 p refs
(Contract IIHS-6604)
(PB-277537/7 UM-HSRI-77-8) Avail NTIS HC A14/MF A01 CSCL 13L

Selected human free-fall impacts and computer simulation of representative falls are studied in order to expand knowledge of human impact tolerance Of 2100 falls occuring in the U S and Canada 110 cases were selected for on-site investigation of biomedical and biophysical factors Seven head-first two side-first and three feet-first falls were then simulated using the MVMA 2-D Crash Victim Simulator Children were generally injured less severely than adults under similar fall circumstances and tended to land on their heads a greater proportion of the time It was found that survival limits for children may be higher than previously believed Body position at impact was a major factor in resulting injuries GRA

N78-28038# Joint Publications Research Service Arlington Va

SPACE SUIT USED ABOARD SALYUT-6 DESCRIBED

G Ilin and I Pavlov *In its* Transl on USSR Sci and Technol (JPRS-71393) 30 Jun 1978 p 34-37 Transl into ENGLISH from Aviats Kosmonavt (Moscow) no 5 1978 p 38

Copyright Avail NTIS HC A05/MF A01

The organic semirigid pressure suit used aboard the Salyut-6 is described with emphasis on its use for extravehicular activity The thermoregulation system life support system and the multilayered thermal insulation are among the factors considered J M S

N78-28040# Joint Publications Research Service Arlington Va

COSMONAUTS UNDERGO MEDICAL GROUND TRAINING

N N Gurovskiy and A D Yegorov *In its* Transl on USSR Sci and Technol (JPRS-71393) 30 Jun 1978 p 42-49 Transl into ENGLISH from Zemlya Vselennaya (Moscow) no 2 1978 p 11-15

Copyright Avail NTIS HC A05/MF A01

Cosmonaut selection criteria and the medical training system developed to guarantee maintenance of health and working ability under space flight conditions are described Endurance tests to increase tolerance to accelerations weightlessness and psychoneural stresses and to improve overall fitness are included J M S

N78-28042# Joint Publications Research Service Arlington Va

SPACECRAFT CREW GROUND TRAINING DESCRIBED

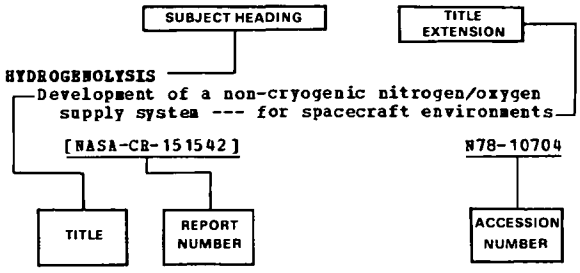
A G Nikolyev *In its* Transl on USSR Sci and Technol (JPRS-71393) 30 Jun 1978 p 56-65 Transl into ENGLISH from Zemlya Vselennaya (Moscow), no 2 1978 p 5-10

Copyright Avail NTIS HC A05/MF A01

Various aspects of the cosmonaut training program are outlined Specific topics discussed include (1) flight and parachute training (2) cosmonaut study of the spacecraft, the station and their systems (3) flight simulation trainer and (4) preparation for conduct of scientific technical and biomedical experiments and studies J M S

SUBJECT INDEX

Typical Subject Index Listing



The title is used to provide a description of the subject matter When the title is insufficiently descriptive of the document content a title extension is added separated from the title by three hyphens The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement If applicable a report number is also included as an aid in identifying the document

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

R

S

T

U

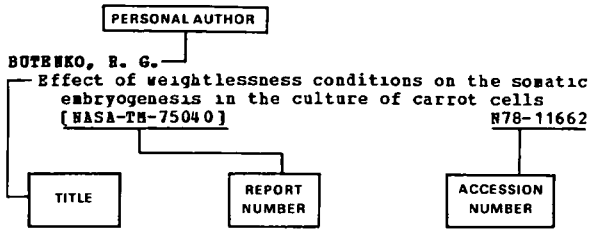
V

W

X

PERSONAL AUTHOR INDEX

Typical Personal Author Index Listing



The title of the document is used to provide the user with a brief description of the subject matter The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement If applicable a report number is also included as an aid in identifying the document

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

R

S

T

V

W

Y

Z

1. Report No	2. Government Accession No	3 Recipient's Catalog No.
NASA SP-7011 (185)		

4. Title and Subtitle	5 Report Date
AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography (Supplement 185)	October 1978
	6 Performing Organization Code
7 Author(s)	8 Performing Organization Report No
	10 Work Unit No
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	11. Contract or Grant No
	13 Type of Report and Period Covered
12 Sponsoring Agency Name and Address	14 Sponsoring Agency Code

15 Supplementary Notes

16 Abstract

This bibliography lists 187 reports, articles, and other documents introduced into the NASA scientific and technical information system in September 1978.

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

19 Security Classif. (of this report)	20 Security Classif (of this page)	21 No. of Pages	22 Price*
Unclassified	Unclassified	62	$6.25 HC

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

NASA-Langley, 1978

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

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

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

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

CALIFORNIA
Los Angeles Public Library
San Diego Public Library
COLORADO
Denver Public Library
CONNECTICUT
Hartford Public Library
MARYLAND
Enoch Pratt Free Library, Baltimore
MASSACHUSETTS
Boston Public Library
MICHIGAN
Detroit Public Library
MINNESOTA
Minneapolis Public Library
MISSOURI
Kansas City Public Library
St Louis Public Library
NEW JERSEY
Trenton Public Library
NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library
OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library
OKLAHOMA
Oklahoma County Libraries, Oklahoma City
TENNESSEE
Memphis Public Library
TEXAS
Dallas Public Library
Fort Worth Public Library
WASHINGTON
Seattle Public Library
WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR* European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from ESRO/ELDO Space Documentation Service, European Space Research Organization, 114, av Charles de Gaulle, 92-Neuilly-sur-Seine, France

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP–7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP–7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP–7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP–7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP–7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP–7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546