

Aerospace Medical Association

35th Annual Meeting, May 11-14, 1964

Americana Hotel, Miami Beach, Florida

For the 35th consecutive year the most current and timely papers will be presented by leading scientists and clinicians in the field of aviation and aerospace medicine and the allied sciences during this Annual Scientific Meeting.

Again this year more than 250 abstracts were submitted and the Scientific Program Committee has selected 162 outstanding papers that will assure a diversity of subjects sufficiently broad in scope and interest that all who attend will find a session in each period of significant interest. As in the past, simultaneous sessions have been arranged to assure a minimum of conflict.

Of unusual interest this year will be the Closed Circuit Color

Television Programs, scheduled for Monday, Tuesday, and Wednesday, and the special Thursday program on the theme "Aerospace Medicine and Bioengineering: A Test Pilot's Viewpoint," which will be co-sponsored with the Society of Experimental Test Pilots.

Among several other special programs one of particular interest will be that provided by the newly established Flight Nurse Section, which will have its First Annual Luncheon and Scientific Program Wednesday afternoon on the subject "Nursing Problems in the Aerospace Age."

Opening Ceremony

MAY 11, 1964

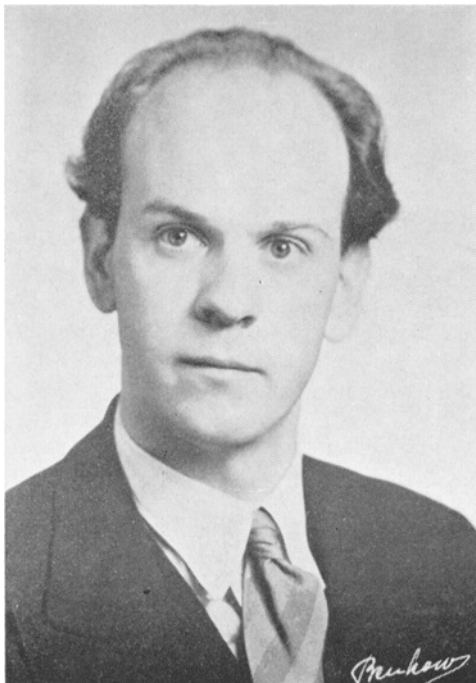
Monday 8:15 a.m. Grand Ballroom

8:15 a.m. 536th AIR FORCE BAND, PATRICK AFB
W. O. Herman W. Englert, USAF, Director

8:45 a.m. INVOCATION
Dr. Clare M. Cotton, Superintendent
Methodist Church, Miami District

WELCOMING ADDRESS
C. I. Barron, M.D.
President, Aerospace Medical Association

9:00 a.m.
THE LOUIS H. BAUER LECTURE
*"Integrative Research and
Aerospace Medicine"*



DR. CARL-JOHAN CLEMEDSON
Professor of Hygiene at the Medical Faculty
University of Gothenberg, Sweden

Scientific Sessions

MAY 11, 1964

Monday 10:15 a.m. Grand Ballroom

BEHAVIORAL SCIENCE AND AEROSPACE PSYCHOLOGY

Chairman: Ross A. McFarland, Ph.D., Boston, Massachusetts
Co-Chairman: Richard Trumbull, Ph.D., Washington, D. C.

10:15 a.m. **EFFECTS OF CORTICAL AND SUBCORTICAL
STIMULATION ON DELAYED RESPONSES IN
MONKEYS**
S. N. Cianci
Department of Psychology, University of
Michigan, Ann Arbor, Michigan

10:30 a.m. **INTER-SENSORY JUDGMENTS OF SIGNAL
DURATION**
Trieve A. Tanner, Jr.; R. Mark Patton; and
Richard C. Atkinson
NASA-Ames Research Center, Moffett Field,
California, and Department of Psychology,
Stanford University, Palo Alto, California

10:45 a.m. **SLEEP DEPRIVATION: NEUROLOGICAL AND
ELECTROENCEPHALOGRAPHIC EFFECTS**
D. R. Bennett; F. A. Ziter; E. A. Liske; R. H.
Mattson; J. R. Calverley; and K. L. Pratt
USAF School of Aerospace Medicine,
Brooks AFB, Texas, and Wilford Hall USAF
Hospital, Lackland AFB, Texas

11:00 a.m. **SCIENTIFIC RESPONSIBILITY FOR TESTING
NON-SENSORY MODALITIES**
Everett F. Dagle
Air Force Cambridge Research Laboratories,
Bedford, Massachusetts

11:15 a.m. **EFFECT OF PROLONGED ACCELERATION
ON EATING AND PERFORMANCE**
Julaine Beasley; and Barbara Seldeen
NASA-Ames Research Center, Moffett Field,
California

11:30 a.m. **THE ROLE OF PSYCHOLOGICALLY INDUCED
PASSIVE HYPERVENTILATION IN AERO-
SPACE SAFETY**
Manuel Copes
Missiles & Space Systems Division, Douglas
Aircraft Company, Santa Monica, California

MAY 11, 1964

Monday 10:15 a.m. Medallion Room

ENVIRONMENTAL PHYSIOLOGY I

Chairman: Robert C. Armstrong, M.D., San Diego, California
Co-Chairman: Eric R. Keirstead, Surgeon, LCdr., RCN, Washington, D. C.

- 10:15 a.m. **EFFECTS OF ZERO-G PARABOLIC FLIGHT ON CERTAIN HEMATOLOGICAL AND URINARY PARAMETERS IN NORMAL AND LABYRINTHINE DEFECTIVE SUBJECTS**
James K. Colehour
U. S. Naval School of Aviation Medicine, Pensacola, Florida
- 10:30 a.m. **METABOLIC RATES IN PRESSURIZED SUITS**
Thomas J. Harrington; David K. Edwards, and Edward C. Wortz
AiResearch Manufacturing Company, The Garrett Corporation, Los Angeles, California
- 10:45 a.m. **MOVEMENT OF RESPIRED GAS IN MANNED SPACE ENCLOSURES**
D. A. Keating
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio
- 11:00 a.m. **HEMATOLOGIC EFFECTS OF MICROWAVE IRRADIATION**
Sol. M. Michaelson; Roderick A. E. Thomson; M. Y. El Tamami; and Joe W. Howland
Department of Radiation Biology, University of Rochester School of Medicine and Dentistry, Rochester, New York, and Griffiss AFB, Rome, New York
- 11:15 a.m. **NUTRITIONAL ACCEPTABILITY OF A FREEZE-DEHYDRATED DIET**
John E. Vanderveen; Keith J. Smith; Elwood W. Speckmann; and Dorathea P. Wiltsie
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio
- 11:30 a.m. **METHOD FOR DETERMINING DRUG INDUCED ALTERATIONS IN RESISTANCE OF RATS TO HYPOXIA**
Robert Rosenstein
Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma

MAY 11, 1964

Monday 10:15 a.m. Bal Masque Room

AEROSPACE SAFETY AND SURVIVAL I

Chairman: Kenneth E. Pletcher, Brig. Gen., USAF, MC, Washington, D. C.
Co-Chairman: Henry C. Hunley, Jr., Captain, MC, USN, Washington, D. C.

- 10:15 a.m. **EFFECTS OF ATMOSPHERIC OXYGEN ENRICHMENT ON IGNITION OF FABRICS**
Maria A. Chianta; and Alice M. Stoll
Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Pennsylvania
- 10:30 a.m. **EMERGENCY ESCAPE SYSTEMS FOR ARMY HELICOPTERS**
Manuel Weinstock
Propellant Actuated Devices Division, Frankford Arsenal, Philadelphia, Pennsylvania

10:45 a.m. **COMPARISON OF SEAT ESCAPE SYSTEMS USING THE LATEST PROPULSION CONCEPTS**

Clifford C. Woodward; and Marvin Schulman
Aerospace Crew Equipment Laboratory, Naval Air Engineering Center, Philadelphia, Pennsylvania

11:00 a.m. **EVALUATION OF THE DIVERS' WET SUIT AS CONSIDERED FOR USE BY PILOTS OF HELICOPTERS AND FIXED-WING AIRCRAFT**

Morris J. Damato; and Meredith H. Radliff
Aerospace Crew Equipment Laboratory, Naval Air Engineering Center, Philadelphia, Pennsylvania

11:15 a.m. **PHYSIOLOGICAL IMPLICATIONS AS TO SURVIVAL FROM IMMERSION IN 75° WATER**

E. L. Beckman; and E. Reeves
Naval Medical Research Institute, Bethesda, Maryland

11:30 a.m. **COMPARISON OF PHYSIOLOGICAL CHANGES DURING LONG TERM IMMERSION TO NECK LEVEL IN WATER AT 75°-85°-95° F WATER**

E. Reeves; J. J. Benjamin; J. W. Weaver; and H. Mann
Naval Medical Research Institute, Bethesda, Maryland

MAY 11, 1964

Monday 2:00 p.m. Grand Ballroom

CLINICAL AEROSPACE MEDICINE I

CLOSED CIRCUIT COLOR TELEVISION *

AEROSPACE MEDICAL TRAINING AND RESEARCH AT OHIO STATE UNIVERSITY

- MODERATOR** William F. Ashe, M.D., Professor and Chairman, Department of Preventive Medicine, Ohio State University, College of Medicine, Columbus, Ohio
- PANEL** Frederick H. Schillito, M.D., Professor, Department Preventive Medicine (Aviation)
Charles E. Billings, M.D., Assistant Professor, Department of Preventive Medicine (Aviation)
Lester B. Roberts, Research Associate, Department of Preventive Medicine
- DEMONSTRATORS** Joseph F. Tomashefski, M.D., Assistant Professor, Department of Preventive Medicine
John H. Dines, M.D., Assistant Professor, Department of Preventive Medicine
Charles R. Huie, Research Assistant, Department of Preventive Medicine
Mary F. Foley, R.N., Research Assistant, Department of Preventive Medicine
Edward J. Whitehead, Research Assistant, Department of Preventive Medicine
John Zieglschmid, M.D., Resident, Aerospace Medicine
Tulio Figarolo, M.D., Resident, Aerospace Medicine

The Ohio State University group will demonstrate the following:

1. Cardio-pulmonary patients flying as passengers
2. Altitude chamber and flying laboratory research
3. Research on vibration

* This program and other closed circuit color television presentations made during this Annual Meeting are produced and sponsored by Smith Kline & French Laboratories with the cooperation of JACKSON MEMORIAL HOSPITAL, Kermit Gates, M.D., Administrator.

MAY 11, 1964

Monday 2:00 p.m. Medallion Room

AEROSPACE MEDICINE I

Chairman: Hubertus Strughold, M.D., Brooks AFB, Texas
Co-Chairman: Clifford P. Phoebus, Captain, MC, USN, Pensacola, Florida

2:00 p.m. HEMATOLOGICAL PROBLEMS IN AEROSPACE PERSONNEL

John W. Foft; and Harry H. Malvin
USAF School of Aerospace Medicine,
Brooks AFB, Texas

2:15 p.m. EVOLUTION OF THE LIFE SCIENCES IN THE AEROSPACE INDUSTRY

Charles F. Gell
Ling-Temco Vought, Dallas, Texas

2:30 p.m. A COMPARISON OF U. S. AND U. S. S. R. BIOASTRONAUTICS

Duane E. Graveline; and Hubertus Strughold
Aerospace Medical Division, Brooks AFB,
Texas

2:45 p.m. SKIN TEMPERATURE RESPONSES TO OPTICALLY FILTERED INTENSE THERMAL RADIATION

W. C. Kaufman; and J. C. Pittman
Aerospace Medical Research Laboratories,
Wright-Patterson AFB, Ohio

MAY 11, 1964

Monday 2:00 p.m. Bal Masque Room

TOXICOLOGY

Chairman: Ludwig G. Lederer, M.D., Ph.D., New York, New York

Co-Chairman: Harold V. Ellingson, Colonel, USAF, MC, Brooks AFB, Texas

2:00 p.m. A PROPOSED UNIVERSAL SAFETY SYMBOL FOR DRUG HAZARDS IN AVIATION

Harold J. Rickard
University of Southern California, Los Angeles, California

2:15 p.m. ALTERATIONS IN INTERMEDIARY METABOLISM INDUCED BY HYDRAZINE AND HYDRAZINE DERIVATIVES

Abel M. Dominguez; Joseph S. Amenta; and Thaddeus J. Domanski
Armed Forces Institute of Pathology, Washington, D. C.

2:30 p.m. PROTECTIVE ACTION OF ALKALINIZING AGENTS AGAINST OXYGEN TOXICITY IN THE RAT

Philip Felig; and W. L. Lee, Jr.
Aerospace Medical Research Laboratories,
Wright-Patterson AFB, Ohio

2:45 p.m. OXYGEN TOXICITY AND VITAMIN E

Charles E. Mengel; Wirt Smith; and Betty Horton
Department of Medicine, Duke University Medical Center, Durham, North Carolina

MAY 11, 1964

Monday 3:45 p.m.

Grand Ballroom

CLINICAL PROBLEMS IN AEROSPACE MEDICINE

CLOSED CIRCUIT COLOR TELEVISION

MODERATOR Earl T. Carter, M.D., Ph.D., Consultant in Medicine, Mayo Clinic, Rochester, Minnesota

PANEL Brig. Gen. Archie A. Hoffman, Commander, USAF Hospital, Andrews AFB, Washington, D. C.
Ludwig G. Lederer, M.D., Ph.D., Medical Director, American Airlines, New York, New York
Andre Allard, M.D., Medical Director, Sabena Belgium Airlines, Brussels, Belgium

DEMONSTRATOR Jan H. Tillisch, M.D., Consultant in Medicine, Mayo Clinic, Rochester, Minnesota

Medical problems involving medical pathology in pilots will be approached through the use of history, physical examination, and laboratory data. These problems will involve those areas commonly encountered in professional pilot personnel and emphasis will be on problems of an unusual nature. Emphasis will also be placed on rehabilitation of the pilot and his return to pilot duties. Particular emphasis will be given to disorders of the cardiovascular and central nervous system.

MAY 11, 1964

Monday 3:30 p.m.

Medallion Room

AEROSPACE MEDICINE II

Chairman: Frank B. Voris, Capt., MC, USN, Washington, D. C.
Co-Chairman: George E. Schafer, Colonel, USAF, MC, Brooks AFB, Texas

3:30 p.m. HUMAN BEHAVIORAL, PHYSIOLOGICAL AND BIOCHEMICAL RESPONSES TO PROLONGED AVOIDANCE

Thomas W. Frazier
NASA Manned Spacecraft Center, Houston, Texas

3:45 p.m. BIOMEDICAL MEASUREMENTS REQUIRED FOR A MANNED EARTH ORBITING SPACE STATION

W. M. Helvey; G. A. Albright; and C. J. Martell
Lockheed Missiles & Space Company, Sunnyvale, California, Republic Aviation Corporation, Farmingdale, L. I., and Spacelabs, Inc., Van Nuys, California

4:00 p.m. AIRBORNE TRANSMISSION OF INFECTION IN LOW GRAVITATIONAL FIELDS

Robert G. Loudon
University of Texas Southwestern Medical School, Dallas, Texas

4:15 p.m. THE VALUE OF HEART RATE PATTERNS IN MEDICAL MONITORING

David G. Simons; and Robert L. Johnson
USAF School of Aerospace Medicine, Brooks AFB, Texas

- 4:30 p.m. **WATER POTABILITY PROBLEMS IN MANNED SPACECRAFT**
G. A. Lorenzen; and Nancy Whitecotton
NASA Manned Spacecraft Center, Houston, Texas
- 4:45 p.m. **THE PHYSIOLOGICAL STRESS OF COMPETITIVE ATHLETICS**
L. F. Dietlein; and Rita M. Rapp
NASA Manned Spacecraft Center, Houston, Texas

MAY 11, 1964

Monday 3:30 p.m. Bal Masque Room

AEROSPACE SAFETY AND SURVIVAL II

Chairman: Anthony P. Rush, Captain, MC, USN, FPO New York, New York

Co-Chairman: Alonzo A. Towner, Brig. Gen., USAF, MC, Offutt AFB, Nebraska

- 3:30 p.m. **DEVELOPMENT OF A TRITIUM SELF-LUMINOUS LIFE RAFT LIGHT SOURCE**
Ernest B. McFadden; J. D. Garner; and R. A. Masler
Civil Aeromedical Research Institute, FAA, Oklahoma City, Oklahoma, and United States Radium Corp., Morristown, New Jersey
- 3:45 p.m. **VENTILATION EFFECTIVENESS OF THE APOLLO PROTOTYPE SPACE SUIT**
G. A. Albright; M. Kuby; Fred B. Benjamin; A. Beck; and G. G. Frankel
Space Environment and Life Sciences Laboratory, Republic Aviation Corporation, Farmingdale, L. I., N. Y.
- 4:00 p.m. **CORRELATION OF PARACHUTE LANDING INJURIES AND SURFACE WIND VELOCITY**
Richard M. Chubb; Emmert C. Lentz; and Robert H. Shannon
Life Sciences Group, Directorate of Aerospace Safety, Norton AFB, California
- 4:15 p.m. **CO₂ MEASURING SYSTEMS FOR MANNED SPACECRAFT**
William B. Bush
NASA Manned Spacecraft Center, Houston, Texas
- 4:30 p.m. **CRASH INJURY ANALYSIS OF X-15 INVERTED IMPACT**
Stanley R. Mohler; Albert H. Schwichtenberg; and E. Blick
Civil Aeromedical Research Institute, FAA, Oklahoma City, Oklahoma; Lovelace Foundation, Albuquerque, New Mexico; and University of Oklahoma, Norman, Oklahoma
- 4:45 p.m. **STRUCTURAL AND MEDICAL ANALYSIS OF A CIVIL AIRCRAFT ACCIDENT**
A. Howard Hasbrook; and J. Robert Dille
Civil Aeromedical Research Institute, FAA, Oklahoma City, Oklahoma

MAY 12, 1964

Tuesday 8:30 a.m. Grand Ballroom

CIVIL AVIATION MEDICINE I

CLOSED CIRCUIT COLOR TELEVISION

MODERATOR

M. Samuel White, M.D., Federal Air Surgeon, Federal Aviation Agency, Washington, D. C.

PANEL

William R. Albers, M.D., Chief, Aeromedical Standards Division
Romney H. Lowry, M.D., Director of Research and Education, Office of Aviation Medicine
Stanley R. Mohler, M.D., Director, Civil Aeromedical Research Institute
Homer L. Reighard, M.D., Acting Deputy Federal Air Surgeon
Peter V. Siegel, M.D., Chief, Aeromedical Certification Division
Arthur E. Wentz, M.D., Director, Georgetown Clinical Research Institute

PILOT AGING

CHAIRMEN

Stanley R. Mohler, M.D., Director, Civil Aeromedical Research Institute, Oklahoma City, Oklahoma
Arthur E. Wentz, M.D., Director, Georgetown Clinical Research Institute, Washington, D. C.

DEMONSTRATORS

From Civil Aeromedical Research Institute, Oklahoma City, Oklahoma:
J. Robert Dille, M.D., Program Advisory Officer
From Georgetown Clinical Research Institute, Washington, D. C.:
Richard Feinberg, Ph.D., Chief, Vision and Auditory Laboratory
Kenneth M. Moser, M.D., Chief, Pulmonary Laboratory
Donald Knowlan, M.D., Chief, Cardiovascular Laboratory
Edward Podolak, Chief, Biophysics and Electronics
Gregg Rhodes, M.D., Pulmonary Function Laboratory
John H. Seipel, M.D., Ph.D., Chief, Neurological Laboratory
Walter Spieth, Ph.D., Chief, Behavioral Sciences Laboratory

TECHNICIANS

Earl Butler
George Durall, Supervisor of Laboratories
Ruth Weinmann

The Office of Aviation Medicine conducts a specifically oriented program of research with respect to the development of a physiological aging rating for pilots. Recently developed instrumentation will be utilized and actual physiological age measurements will be demonstrated. In addition, a case history of a fatal accident involving an aging pilot (71 years old) will be presented illustrating the significance of the aging process in aviators.

MAY 12, 1964

Tuesday 8:15 a.m.

Floridian Room

ENVIRONMENTAL PHYSIOLOGY II

Chairman: Karl E. Schaefer, M.D., Groton, Connecticut
Co-Chairman: Albert W. Hetherington, Ph.D., Andrews AFB, Maryland

8:15 a.m. **FIELD EVALUATION OF FULL PRESSURE SUITS IN ARCTIC ENVIRONMENTS**

James H. Veghte
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

8:30 a.m. **SOME EFFECTS OF HYPERVENTILATION UPON BLOOD CHEMISTRY**

R. L. McLaughlin
Missile and Space Systems Division, Douglas Aircraft Company, Inc., Santa Monica, California

8:45 a.m. **SURVIVAL AFTER DECOMPRESSION TO A VACUUM**

John Billingham
NASA Manned Spacecraft Center, Houston, Texas

9:00 a.m. **EXPERIMENTAL ANIMAL DECOMPRESSIONS TO LESS THAN 2 MM. HG ABSOLUTE (GENERAL RESPONSES, RECOVERY, AND MORTALITY)**

Richard W. Bancroft; James E. Dunn; and William D. Habluetzel
USAF School of Aerospace Medicine, Brooks AFB, Texas

9:15 a.m. **EXPERIMENTAL ANIMAL DECOMPRESSIONS TO LESS THAN 2 MM. HG ABSOLUTE (PATHOLOGIC EFFECTS)**

James E. Dunn; Richard W. Bancroft; and Webb Haymaker
USAF School of Aerospace Medicine, Brooks AFB, Texas, and NASA-Ames Research Center, Moffett Field, California

9:30 a.m. **LEARNING ABILITY OF THE SQUIRREL MONKEY AFTER EXPOSURE TO A NEAR VACUUM**

Duane M. Rumbaugh
San Diego State College, San Diego, California

MAY 12, 1964

Tuesday 8:15 a.m. Bal Masque Room

ACCELERATION I

Chairman: Ashton Graybiel, Captain, MC, USN, Pensacola, Florida

Co-Chairman: J. P. Meehan, Jr., M.D., Los Angeles, California

8:15 a.m. **HUMAN VESTIBULAR RESPONSES TO REPEATED UNIDIRECTIONAL ANGULAR ACCELERATIONS IN TOTAL DARKNESS**

William E. Collins
Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma

8:30 a.m. **SEMICIRCULAR CANAL DYNAMICS COMPARED IN YAW, PITCH AND ROLL**

W. Barry; N. Kowalski; and G. M. Jones
Department of Physiology, McGill University, Montreal, Canada

8:45 a.m. **OTOLITH ORGAN ACTIVITY WITHIN EARTH STANDARD, ONE-HALF STANDARD AND ZERO GRAVITY ENVIRONMENTS**

Earl F. Miller, II; Ashton Graybiel; and Robert S. Kellogg
U. S. Naval School of Aviation Medicine, Pensacola, Florida, and Aerospace Medical Division, AFSC, USAF, Wright-Patterson AFB, Ohio

9:00 a.m. **DOMINANCE OF ANTI-COMPENSATORY OCULOMOTOR RESPONSE DURING RAPID HEAD ROTATION**

G. Melvill Jones
Department of Physiology, McGill University, Montreal, Canada

9:15 a.m. **CORIOLIS EFFECTS DURING PITCH AND ROLL MANEUVERS IN A PILOTED FLIGHT SIMULATOR**

John D. Stewart and Brant Clark
NASA-Ames Research Center, Moffett Field, California, and Department of Psychology, San Jose State College, San Jose, California

9:30 a.m. **URINARY CHANGES IN MAN INDUCED BY ROTATION**

G. J. Goble; and Bernard D. Newsom
Life Sciences Laboratory, General Dynamics/Astronautics, San Diego, California

MAY 12, 1964

Tuesday 10:30 a.m. Grand Ballroom

CIVIL AVIATION MEDICINE II

CLOSED CIRCUIT COLOR TELEVISION

F.A.A. AEROMEDICAL STANDARDS, CERTIFICATION, AND ACCIDENT INVESTIGATION SYMPOSIUM

MODERATOR M. Samuel White, M.D., Federal Air Surgeon, Federal Aviation Agency, Washington, D. C.

CHAIRMEN William R. Albers, M.D., Chief, Aeromedical Standards Division, Washington, D. C.
Peter V. Siegel, M.D., Chief, Aeromedical Certification Division, Oklahoma City, Oklahoma

11:30 a.m.

QUESTION AND ANSWER PERIOD

Although the audience may ask questions at any time throughout the color television demonstrations, this period has been scheduled for additional audience participation. Questions may be directed to the panel members at the Americana Hotel or to the television demonstrators at the Jackson Memorial Hospital.

MAY 12, 1964

Tuesday 10:15 a.m. Floridian Room

ENVIRONMENTAL PHYSIOLOGY III

Chairman: Hans-Georg Clamann, M.D., Brooks AFB, Texas
Co-Chairman: James N. Waggoner, M.D., Los Angeles, California

10:15 a.m. **NORMAL FECAL FLORA OF MAN AND ITS ALTERATIONS UNDER SIMULATED SPACE FLIGHT**

L. S. Gall; P. E. Riely; and R. R. Cardenas, Jr.
Republic Aviation Corporation, Farmingdale, L. I., New York

10:30 a.m. **BIOLOGICAL AND INSTRUMENTATION DESIGNS FOR LIVING HUMAN CELL STUDIES IN ORBITING SATELLITES**

P. O'B. Montgomery; and James E. Cook
University of Texas Southwestern Medical School and Woodlawn Hospital, Dallas, Texas

- 10:45 a.m. **VISUAL CHANGES OBSERVED IN THE MANNED REVOLVING SPACE STATION SIMULATOR AT HIGH ROTATIONAL SPEEDS**
J. M. Lagerwerff; and Bernard D. Newsom
General Dynamics/Astronautics, San Diego, California
- 11:00 a.m. **CARDIOVASCULAR ASPECTS OF HYPOGRAVICS**
Perry B. Miller; Bryce O. Hartman; and Robert L. Johnson
USAF School of Aerospace Medicine, Brooks AFB, Texas
- 11:15 a.m. **COLLECTION OF BIOLOGICAL INFORMATION DURING PROLONGED FLIGHT MISSIONS WITH "YES AND NO" DATA REDUCTION ANALYSIS**
C. W. Sem-Jacobsen; E. Kaiser; and I. E. Sem-Jacobsen
EEG Laboratory, Gaustad Sukehus, Oslo, Norway
- 11:30 a.m. **EFFECTS OF TOTAL BODY WATER IMMERSION ON WEIGHT DISCRIMINATION**
Thomas D. Hanna
Aerospace Crew Equipment Laboratory, Naval Air Engineering Center, Philadelphia, Pa.

MAY 12, 1964

Tuesday 10:15 a.m. Bal Masque Room

VISION

Chairman: Henry G. Wagner, Captain, MC, USN, Bethesda, Maryland
Co-Chairman: Henry A. Imus, Ph.D., Pensacola, Florida

- 10:15 a.m. **TARGET VELOCITY, EXPOSURE TIME AND ANTICIPATORY TRACING TIME AS DETERMINANTS OF DYNAMIC VISUAL ACUITY**
Edwin H. Elkin
Dunlap and Associates, Inc., Washington, D. C.
- 10:30 a.m. **OCULAR MOTILITY AND FLYING SAFETY**
W. L. Erdbrink; and H. S. Trostle
U. S. Naval Hospital, Philadelphia, Pennsylvania
- 10:45 a.m. **ZERO-GRAVITY—THE EFFECT OF TRANSIENT WEIGHTLESSNESS ON BINOCULAR DEPTH PERCEPTION**
Edwin H. Sasaki
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio
- 11:00 a.m. **VISUAL STUDIES OF INDIRECT VIEWING AND VIGILANCE UNDER NORMAL ATMOSPHERIC CONDITIONS**
Norman H. Mackworth; and Ross A. McFarland
The Guggenheim Center, Aerospace Health and Safety, Harvard School of Public Health, Boston, Massachusetts
- 11:15 a.m. **HUMAN CHORIORETINAL BURNS FOLLOWING HIGH ALTITUDE NUCLEAR DETONATION**
James F. Culver; Norris L. Newton; Robert Penner; and Robert Neidlinger
USAF School of Aerospace Medicine, Brooks AFB, Texas

- 11:30 a.m. **EGOCENTRIC VISUAL LOCALIZATION OF THE HORIZONTAL AS A FUNCTION OF LATERAL BODY TILT**
Alfred R. Fregly; Earl F. Miller, II; Gert van den Brink; and Ashton Graybiel
U. S. Naval Aviation Medical Center, Pensacola, Florida, and R. V. Groningen, The Netherlands

MAY 12, 1964

Tuesday 2:00 p.m. Grand Ballroom

CLINICAL AEROSPACE MEDICINE II

Chairman: Andre Allard, M.D., Brussels, Belgium
Co-Chairman: John E. Smith, M.D., Washington, D. C.

- 2:00 p.m. **STUDY OF MASSIVE GASTROINTESTINAL HEMORRHAGE IN FLYING PERSONNEL**
Dudley B. Houle; Howard R. Unger; Paull R. Hanson; and Alonzo A. Towner
Headquarters, USAF, Strategic Air Command, Offutt AFB, Nebraska
- 2:15 p.m. **THE INFLUENCE OF THE AFTEREFFECTS OF ALCOHOL COMBINED WITH HYPOXIA ON PSYCHOMOTOR PERFORMANCE**
James A. Carroll
Pan American World Airways, Jamaica, New York
- 2:30 p.m. **PHYSIOLOGIC RESPONSE TO INCREASED OXYGEN PARTIAL PRESSURE: CLINICAL OBSERVATIONS**
James E. Herlocher; David G. Quigley; E. G. Shaw; and Billy E. Welch
USAF School of Aerospace Medicine, Brooks AFB, Texas
- 2:45 p.m. **THE TELEMETERED ELECTROCARDIOGRAM IN CLINICAL CARDIAC DIAGNOSIS**
Robert L. Johnson
USAF School of Aerospace Medicine, Brooks AFB, Texas

MAY 12, 1964

Tuesday 2:00 p.m. Floridian Room

MAGNETIC FIELDS

Chairman: Dietrich E. Beischer, Ph.D., Pensacola, Florida
Co-Chairman: Benjamin D. Fremming, Pittsburgh, Pa.

- 2:00 p.m. **EFFECTS OF STATIC MAGNETIC FIELDS ON BASIC MICROBIOLOGICAL PHYSIOLOGICAL PROCESSES**
Martha D. Berliner; and Peter W. Neurath
AVCO Corporation, Wilmington, Massachusetts
- 2:15 p.m. **EFFECTS OF VERY HIGH MAGNETIC FIELDS OF LIVING ORGANISMS**
James C. Knepton; and Dietrich E. Beischer
U. S. Naval School of Aviation Medicine, Pensacola, Florida

- 2:30 p.m. **EFFECT OF MAGNETIC FIELDS ON THE GROWTH OF ALGAE**
Myron H. Halpern; and John J. Konikoff
Space Sciences Laboratory, General Electric Company, Philadelphia, Pa.
- 2:45 p.m. **EFFECTS OF A HORIZONTAL HOMOGENEOUS VERSUS INHOMOGENEOUS MAGNETIC FIELD ON MICE**
B. D. Fremming; F. L. Bellino; J. D. DeLeo; R. J. Blinzley; and A. Zervins
Westinghouse Research and Development Center, Pittsburgh, Pa.

MAY 12, 1964

Tuesday 2:00 p.m. Bal Masque Room

AEROSPACE EQUIPMENT

Chairman: Roland A. Bosee, Captain, MSC, USN, Philadelphia, Pennsylvania
Co-Chairman: Edward L. Hays, Houston, Texas

- 2:00 p.m. **NEW TECHNIQUES IN PRESSURE SUIT COOLING**
Edward C. Wortz; David K. Edwards, III; and Thomas J. Harrington
Garrett Corporation, Los Angeles, California
- 2:15 p.m. **THE INTEGRATED ANTHROPOMETRIC DEVICE IN NAVAL AEROSPACE RESEARCH**
Joseph R. Provost; and Roland A. Bosee
Aerospace Crew Equipment Laboratory, Naval Air Engineering Center, Philadelphia, Pennsylvania
- 2:30 p.m. **HEAD VENTILATION FOR AIRCREW PERSONNEL**
Louis J. SantaMaria; Donald W. Dery; and Neil Miller
Aerospace Crew Equipment Laboratory, Naval Air Engineering Center, Philadelphia, Pennsylvania
- 2:45 p.m. **USAF ROCKET EJECTION SEAT EXPERIENCE**
Samuel P. Chunn; and Robert H. Shannon
Life Sciences Group, Directorate of Aerospace Safety, Norton AFB, California

MAY 12, 1964

Tuesday 3:45 p.m. Grand Ballroom

CLINICAL AEROSPACE MEDICINE III

Chairman: George B. McNeely, Bloomington, Illinois
Co-Chairman: Colvern D. Henry, M.D., San Antonio, Texas

- 3:45 p.m. **VALUE OF RADIOELECTROCARDIOGRAPHY DURING THE DOUBLE MASTER 2-STEP TEST COMPARED WITH THE STANDARD POST-EXERCISE ELECTROCARDIOGRAM**
Donald M. Knowlan; Ruth A. Weinmann; and Irwin H. Ardam
Federal Aviation Agency's Georgetown Clinical Research Institute, and Department of Medicine, Georgetown University Hospital, Washington, D. C.
- 4:00 p.m. **NEUROLOGICAL ABNORMALITIES IN A POPULATION REQUIRING AVIATION MEDICAL CERTIFICATION**
John H. Seipel
Georgetown Clinical Research Institute, Federal Aviation Agency, Office of Aviation Medicine, Washington, D. C.

- 4:15 p.m. **PRINCIPLES AND METHODS FOR USING ELECTROENCEPHALOGRAPHY IN AVIATION MEDICINE**
Claude J. Blanc; Eugene LaFontaine; and Robert LaPlane
Central Medical Service of the Compagnie Nationale Air France, Paris, France

- 4:30 p.m. **EARLY DIAGNOSIS OF CARDIOVASCULAR DISEASE AMONGST AIR-CREW**
H. W. Kirchhoff; and E. A. Lauschner
Institute of Aviation Medicine, German Air Force, Furstenfeldbruck, Germany

- 4:45 p.m. **THE VASCULAR HYPERREACTOR: A CONTINUING AEROMEDICAL PROBLEM**
Joseph J. Combs, Jr.
USAF School of Aerospace Medicine, Brooks AFB, Texas

MAY 12, 1964

Tuesday 3:30 p.m. Floridian Room

BIOTECHNOLOGY I

Chairman: Robert F. Trapp, Washington, D. C.
Co-Chairman: Alfred M. Mayo, Dallas, Texas

- 3:30 p.m. **METABOLISM AND X-RAY SENSITIVITY OF CHICK EMBRYOS INCUBATED IN A HELIUM-OXYGEN ATMOSPHERE**
R. A. Wright; M. A. Lesser; and H. S. Weiss
Department of Physiology, Ohio State University, Columbus, Ohio
- 3:45 p.m. **ELECTRONIC BLOOD PRESSURE SAMPLER AND PRINTER**
Victor W. Bolie; Richard J. Gowen; Jerry R. Tennant; and Duane E. Sander
Oregon State University, Corvallis, Oregon, United States Air Force Academy, Colorado, and Iowa State University, Ames, Iowa
- 4:00 p.m. **PROPOSED INSTRUMENT SYSTEM FOR THE DETECTION AND ANALYSIS OF POSSIBLE LIFE FORMS, ATMOSPHERES, AND SOILS OF EXTRATERRESTRIAL BODIES**
E. A. Botan; J. Phaneuf; and J. Lambert
AVCO Corporation, Wilmington, Massachusetts
- 4:15 p.m. **LARGE EXCURSION ROTARY TRACKING OF TRAGEN AND TARGET LIGHT IN A SPACE STATION SIMULATOR REVOLVING AT 7.5, 10.0, and 12.0 RPM**
James F. Brady; Robert E. Urmston; and Bernard D. Newson
Life Sciences Laboratory, General Dynamics/Astronautics, San Diego, California
- 4:30 p.m. **AN INSTRUMENT FOR THE TOTALIZATION OF HEARTBEATS AND RESULTS OF ITS APPLICATION**
A. E. Brown; M. Friedman; and R. H. Rosenman
Lockheed Missiles and Space Company, Palo Alto, California, and Mt. Zion Hospital, San Francisco, California
- 4:45 p.m. **CHEMICAL ANALYSIS OF PERMANENT AND ORGANIC GASES IN A 30-DAY MANNED EXPERIMENT**
Melvin L. Morris; and William H. Toliver
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

MAY 12, 1964

Tuesday 3:30 p.m. Bal Masque Room

AEROSPACE SIMULATION

Chairman: Andres I. Karstens, Colonel, USAF, MC, Wright-Patterson AFB, Ohio

Co-Chairman: Joseph P. Pollard, Captain, MC, USN, Washington, D. C.

3:30 p.m. ZERO GRAVITY, MOTION PERFORMANCE OF PRESSURE SUITED SUBJECTS UNDER ZERO AND LUNAR GRAVITY CONDITIONS
John C. Simons
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

3:45 p.m. VESTIBULAR (CANAL) SICKNESS PRECIPITATED IN THE WEIGHTLESS PHASE OF ZERO-G PARABOLAS BY CORIOLIS FORCE
Ashton Graybiel; Robert S. Kennedy; and Robert S. Kellogg
U. S. Naval School of Aviation Medicine, Pensacola, Florida, and Wright-Patterson AFB, Ohio

4:00 p.m. FOUR-MAN INTERNAL ENVIRONMENTAL SIMULATOR
R. A. Bambenek; R. A. Landes; J. Hargreaves; and B. E. Welch
General American Transportation Corp., Niles, Illinois, and USAF School of Aerospace Medicine, Brooks AFB, Texas

4:15 p.m. MAINTAINING CARDIOVASCULAR REFLEXES DURING SIMULATION OF A ZERO GRAVITY EFFECT: AN EXPERIMENTAL STUDY
C. Grave; J. E. Mabry; and D. H. Stuhling
The Boeing Company, Seattle, Washington

4:30 p.m. ZERO GRAVITY FLIGHT TEST OF AN INSTRUMENTED PHOTOSYNTHETIC GAS EXCHANGER
Robert D. Gafford; Robert V. Bailey; and Frank Z. Brill
Beckman Instruments, Inc., Fullerton, California, Martin Company, Denver, Colorado, and AF SSD(AFSC) Los Angeles, California

4:45 p.m. MINIMUM CREW SPACE HABITABILITY FOR LUNAR MISSION
Terence A. Rogers; and George A. Rathert
Pacific Biomedical Research Center, University of Hawaii, Honolulu, Hawaii, and Ames Research Center, Moffett Field, Calif.

MAY 13, 1964

Wednesday 8:15 a.m. Grand Ballroom

ACOUSTICS AND VIBRATION

Chairman: Henning E. von Gierke, Dr. Eng., Wright-Patterson AFB, Ohio

Co-Chairman: John J. Dreher, Ph.D., Burbank, California

8:15 a.m. PROBLEMS ASSOCIATED WITH MEASUREMENT OF ACOUSTIC TRANSIENTS
George J. Harbold; and Raymond L. Tapie
Bio-Acoustics Division, Life Sciences Department, U. S. Naval Missile Center, Point Mugu, California

8:30 a.m. HUMAN RESPONSES TO SONIC BOOM
Charles W. Nixon
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

8:45 a.m. HEARING SENSATIONS IN ELECTRIC FIELDS
H. C. Sommer; and H. E. von Gierke
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

9:00 a.m. INFLUENCE OF BODY SUPPORT AND RESTRAINT ON SUBJECTIVE RESPONSE TO VIBRATION
William E. Temple; Neville P. Clarke; James W. Brinkley; and Morris J. Mandel
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

9:15 a.m. STUDY OF SPEECH DISCRIMINATION IN NOISE OF NAVAL AVIATORS AND NAVAL AVIATION CANDIDATES
Vernon C. Bragg; and James W. Greene
U. S. Naval School of Aviation Medicine, Pensacola, Florida

9:30 a.m. MODULATED RADIO FREQUENCY ENERGY USED TO STIMULATE AUDITION IN TOTALLY DEAF HUMANS
Henry K. Puharich; and Joseph L. Lawrence
Inteletron Corporation, New York, New York

MAY 13, 1964

Wednesday 8:15 a.m. Medallion Room

BIOTECHNOLOGY II

Chairman: Richard L. Johnson, Maj., USAF, MC, Brooks AFB, Texas

Co-Chairman: Thomas O. Nevison, Jr., M.D., Albuquerque, New Mexico

8:15 a.m. CRYOGENIC SYSTEMS FOR USE IN WEIGHTLESS ENVIRONMENTS
William J. Evon
Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio

8:30 a.m. A SEMI-PERMEABLE MEMBRANE SYSTEM FOR CARBON DIOXIDE CONTROL
Robert Gafford; and Daniel Lucero
Space Engineering Department, Beckman Instruments, Inc., Fullerton, California

8:45 a.m. THE RELIABILITY OF THE ELECTRICAL IMPEDANCE PNEUMOGRAPH FOR LONG TERM MONITORING OF RESPIRATORY FUNCTION
Gale H. Kaplan
Holloman AFB, New Mexico

9:00 a.m. UTILIZATION OF URINARY NITROGEN COMPOUNDS BY CHLORELLA PYRENOIDOSA
Victoria H. Lynch; Elizabeth C. Ammann; and Rogene M. Godding
Lockheed Missiles and Space Company, Palo Alto, California

9:15 a.m. FULL PRESSURE SUIT CHECKOUT CONSOLE
J. A. Ferro; and R. N. Prince
MRD Division, General American Transportation Corporation, Niles, Illinois, and NASA Manned Spacecraft Center, Houston, Texas

9:30 a.m. SOME NOTES ON THE USE OF SUPEROXIDES IN NON-REGENERATIVE AIR REVITALIZATION SYSTEMS
A. W. Petrocelli; and A. Capotosto, Jr.
General Dynamics/Electric Boat, Groton, Connecticut

MAY 13, 1964

Wednesday 8:15 a.m. Bal Masque Room

FATIGUE AND STRESS

Chairman: J. Gordon Wells, Ph.D., Inglewood, California
Co-Chairman: Stanley R. Mohler, M.D., Oklahoma City, Oklahoma

- 8:15 a.m. **COMPUTER ANALYZED ECG WAVEFORM ALTERATIONS UNDER STRESS**
M. E. Fitzwater; and D. J. Corkhill
Bioastronautics Department, Philco, Western Development Laboratories, Palo Alto, California
- 8:30 a.m. **CORONARY FLOW RESPONSE TO HYPOCAPNIA INDUCED BY HYPERVENTILATION**
William J. McArthur
Department of Physiology, University of British Columbia, Canada.
- 8:45 a.m. **EFFECTS OF GUST-INDUCED AND MANEUVERING ACCELERATION STRESS ON PILOT-VEHICLE PERFORMANCE**
Thomas E. Wempe
NASA-Ames Research Center, Moffett Field, California
- 9:00 a.m. **COUNTERACTING EFFECTS OF TRAINING IN GEOMETRICAL CONSTRUCTIONS ON STRESS PRODUCED BY MAXIMAL SENSORY ISOLATION IN WATER IMMERSION**
Karl E. Schaefer
USN Medical Research Laboratory, New London, Connecticut
- 9:15 a.m. **STRESS FACTORS AND WEAPONS ACCURACY DELIVERY IN HIGH PERFORMANCE AIRCRAFT**
John C. Duffy; and Henry B. Hale
Mayo Clinic, Rochester, Minnesota, and USAF School of Aerospace Medicine, Brooks AFB, Texas
- 9:30 a.m. **THE ROLE OF FEEDBACK IN ADAPTIVE PERCEPTUAL PROCESS**
R. A. Kinchla; and R. C. Atkinson
NASA-Ames Research Center, Moffett Field, California, and Stanford University, Palo Alto, California
- 9:45 a.m. **CIRCULATORY AND METABOLIC EFFECTS OF PROLONGED INACTIVITY**
N. C. Birkhead; B. Issekutz, Jr.; J. J. Blizzard; G. J. Haupt; R. N. Myers; P. A. Lachance; and K. Rodahl
Division of Research, Lanckenau Hospital, Philadelphia, Pennsylvania

MAY 13, 1964

Wednesday 10:15 a.m. Grand Ballroom

PERSONNEL SELECTION AND TRAINING

Chairman: Stanley C. White, Lt. Col., USAF, MC, Brooks AFB, Texas
Co-Chairman: Stanley Deutsch, Ph.D., Washington, D. C.

- 10:15 a.m. **IDENTIFICATION AND POTENTIAL OF APETITUDE TEST MEASURES FOR SELECTION OF TOWER AIR TRAFFIC CONTROLLER TRAINEES**
Bart B. Cobb
Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma

- 10:30 a.m. **SELECTION AND TRAINING REQUIREMENTS SPECIFIC TO BIO-MEDICAL AND HUMAN FACTORS RESEARCH IN EARTH ORBITING STATIONS**

Carol C. Couchman; and Elsie M. Cole
Space & Information Systems Division, North American Aviation, Los Angeles, California

- 10:45 a.m. **AGE DIFFERENCES IN SEQUENTIAL DECISIONS AND CARDIOVASCULAR STATUS AMONG PILOTS**

Jacek Szafran
Department of Experimental Psychology, The Lovelace Foundation, Albuquerque, New Mexico

- 11:00 a.m. **THE DECISION TO EJECT**

Anchard F. Zeller
Life Sciences Group, Directorate of Aerospace Safety, Norton AFB, California

- 11:15 a.m. **PERSONAL HABITS AMONG USAF AIRCREW MEMBERS: A SURVEY**

Jefferson C. Davis; and David H. Beyer
USAF School of Aerospace Medicine, Brooks AFB, Texas

- 11:30 a.m. **INTERACTION OF TRAINING-ENTRY AGE WITH INTELLECTUAL AND PERSONALITY CHARACTERISTICS OF AIR TRAFFIC CONTROL SPECIALISTS**

David K. Trites
Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma

MAY 13, 1964

Wednesday 10:15 a.m. Medallion Room

BIOTECHNOLOGY III

Chairman: Seymour N. Stein, M.D., Point Mugu, California
Co-Chairman: Edward L. Beckman, Captain, MC, USN, Bethesda, Maryland

- 10:15 a.m. **MYOELECTRIC SERVO CONTROL**
George H. Sullivan; Charles J. Martell; and Gershon Weltman
Spacelabs, Inc., Van Nuys, California, and University of California, Los Angeles, California
- 10:30 a.m. **SPACECRAFT ENVIRONMENTAL CONTROL SYSTEM CHECKOUT**
Max Sussman; and Donald F. Price
MRD Division, General American Transportation Corporation, Niles, Illinois, and NASA Manned Spacecraft Center, Houston, Texas
- 10:45 a.m. **THE CORNUCOPIA TWO-GAS ATMOSPHERE SYSTEM FOR MAN IN SPACE**
R. G. Bartlett, Jr.; and C. J. Swet
Johns Hopkins Applied Physics Laboratory, Silver Spring, Maryland
- 11:00 a.m. **WATER RECLAMATION SUBSYSTEMS FOR SPACE STATIONS**
H. Wallman
General Dynamics/Electric Boat, Groton, Connecticut
- 11:15 a.m. **OXYGEN REGENERATION TEST UNIT FOR ZERO GRAVITY OPERATION**
Andrew D. Babinsky
Thompson-Ramo Wooldridge Inc., Cleveland, Ohio

11:30 a.m. A MULTI-STAGE CRYOGENIC TRAPPING SYSTEM

James P. Conkle; James W. Register; and Gordon L. Worth
USAF School of Aerospace Medicine, Brooks AFB, Texas

MAY 13, 1964

Wednesday 10:30 a.m. Bal Masque Room

PATHOLOGY

Chairman: Joseph M. Blumberg, Brig. Gen., MC, USA, Washington, D. C.

Co-Chairman: W. R. Franks, M.D., Toronto, Canada

10:30 a.m. PATHOLOGY AND PHYSIOLOGY OF GUINEA PIGS UNDER SELECTED CONDITIONS OF IMPACT

Charles F. Lombard; S. Davis Bronson; Frederick C. Thiede; and Perry Close
Northrop Space Laboratories, Hawthorne, California

10:45 a.m. MECHANISMS OF HEMOLYSIS INDUCED BY HYPEROXIA

Herbert E. Kann; Charles E. Mengel; Alvin M. Lewis; and Betty Horton
Department of Medicine, Duke University, Durham, North Carolina

11:00 a.m. OBSERVATIONS ON ACUTE AND CHRONIC OXYGEN POISONING

George H. Kydd; and Louis H. Betz
Aviation Medical Acceleration Laboratory, U. S. Naval Air Development Center, Johnsville, Pennsylvania

11:15 a.m. EFFECTS OF TOPISCHEMIA, A TEMPORARY AND LOCALIZED CEREBRAL ISCHEMIA

Stanley A. Radvan Ziemnowicz
Georgetown University Medical Center, Washington, D. C.

11:30 a.m. POST-MORTEM PULMONARY CHANGES OCCURRING IN MICE EXPOSED TO 100 PER CENT OXYGEN AT 740 MM. HG

John Q. Durfey
Memorial Sloan-Kettering Cancer Center, New York, New York

MAY 13, 1964

Wednesday 2:00 p.m. Grand Ballroom

MEDICAL SUPPORT—PROJECT GEMINI

CLOSED CIRCUIT COLOR TELEVISION

MODERATOR Charles A. Berry, M.D., Chief, Center Medical Operations Office, NASA Manned Spacecraft Center, Houston, Texas

PANEL Col. Raymond A. Yerg, USAF, MC, Deputy for Bioastronautics, AFMTC, Patrick AFB, Florida
Cdr. David P. Morris, MC, USN, Assistant Chief for Launch Site Medical Support, NASA Manned Spacecraft Center, Atlantic Missile Range Operations, Cape Kennedy, Florida

From NASA Manned Spacecraft Center, Houston, Texas:

Maj. George B. Smith, USAF, MC, Assistant Chief for Flight Medicine, Center Medical Operations Office
John Billingham, M.D., Head, Environmental Physiology Branch, Crew Systems Division
Matthew Radnofsky, Head, Crew Equipment Branch, Crew Systems Division
Ed Michaels, Head, Life Support Section, Crew Systems Division
Allen D. Catterson, M.D., Associate Chief, Center Medical Operations Office
Cdr. John Gordon, MC, USN, Head, Operational Support Branch, Center Medical Operations Office

The medical aspects of supporting a Gemini mission will be presented. Problems of managing the support effort will be discussed and the scope of mission support shown. Significant aspects of the preflight evaluation of a Gemini crew will be presented, and the placement of biomedical sensors shown. The act of assisting a crew member into a Gemini suit will be shown and physiological aspects of the suit-man relationship discussed.

Provisions for inflight eating and drinking will be demonstrated, along with a discussion of concepts of maintenance of personal hygiene and waste disposal.

The general discussion will include concepts of ground monitoring of the crew during flights, and of recovery and post-flight debriefing provisions. Operational experience in monitoring man in space flight will be presented.

The general area of the relationship and contribution of space medicine in the development of applications to general medicine will be discussed during these various presentations.

MAY 13, 1964

Wednesday 2:00 p.m. Medallion Room

GENERAL AEROSPACE PHYSIOLOGY

Chairman: George J. Kidera, M.D., Chicago, Illinois
Co-Chairman: Richard W. Lawton, M.D., Hatboro, Pa.

2:00 p.m. STUDY OF ELECTROENCEPHALOGRAPHIC CHANGES AMONGST EGYPTIAN AIR PILOTS
Mahmoud Hassanein, M.D.
Cairo, Egypt

2:15 p.m. COMPLEX COORDINATION PERFORMANCE AND TIME OF USEFUL CONSCIOUSNESS
James Scow; William F. O'Connor; Ernest B. McFadden; and George E. Pendergrass
Civil Aeromedical Research Institute, Oklahoma City, Oklahoma

2:30 p.m. CHANGES IN LUNG VOLUMES OF EMPHYSEMA PATIENTS UPON SHORT EXPOSURES TO ALTITUDES OF 18,000 FEET (CHAMBER)
R. L. Yanda; and H. L. Herschensohn
Hospital of the Good Samaritan, Los Angeles, California, and Douglas Aircraft Company, Santa Monica, California

2:45 p.m. CONTINUOUS RAPID PLOTTING OF OXYHEMOGLOBIN DISSOCIATION CURVES
James R. Neville; and John J. Sasner
USAF School of Aerospace Medicine, Brooks AFB, Texas

MAY 13, 1964

Cdr. John Gordon, MC, USN, Head,
Operational Support Branch Center
Medical Operations Office

Wednesday 2:00 p.m. Bal Masque Room

ACCELERATION II

Chairman: Russell D. Squires, M.D., Johnsville, Pennsylvania
Co-Chairman: Richard G. Snyder, Ph.D., Oklahoma City, Oklahoma

- 2:00 p.m. **ACCELERATION (+ Gx) INDUCED HYPOXEMIA AND CREW PERFORMANCE**
W. C. Alexander; R. J. Sever; W. E. Feddersen; and F. G. Hoppin
NASA Manned Spacecraft Center, Houston, Texas
- 2:15 p.m. **X-RAY CINEMATOGRAPHIC OBSERVATIONS OF THE MOTION OF ANIMALS EXPOSED TO MECHANICAL VIBRATION**
J. B. Boorstin; and David E. Goldman;
Naval Medical Research Institute, Bethesda, Maryland
- 2:30 p.m. **SHIFT OF THE CENTER OF MASS OF A MAN-SEAT SYSTEM DURING TRANSIENT ACCELERATION**
James W. Brinkley; Edmund B. Weis; Paul J. Martin; and Neville P. Clarke
Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio
- 2:45 p.m. **OPERATOR PERFORMANCE IN SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT**
Stanley M. Soliday
Human Factors Group, North American Aviation, Inc., Columbus, Ohio

MAY 13, 1964

Wednesday 3:45 p.m. Grand Ballroom

MEDICAL SUPPORT-PROJECT GEMINI (CONTINUED)

CLOSED CIRCUIT COLOR TELEVISION

- MODERATOR** Charles A. Berry, M.D., Chief, Center Medical Operations Office, NASA Manned Spacecraft Center, Houston, Texas
- PANEL** Col. Raymond A. Yerg, USAF, MC, Deputy for Bioastronautics, AFMTC, Patrick AFB, Florida
Cdr. David P. Morris, MC, USN, Assistant Chief for Launch Site Medical Support, NASA Manned Spacecraft Center, Atlantic Missile Range Operations, Cape Kennedy, Florida
From NASA Manned Spacecraft Center, Houston, Texas:
Maj. George B. Smith, USAF, MC, Assistant Chief for Flight Medicine, Center Medical Operations Office
John Billingham, M.D., Head, Environmental Physiology Branch, Crew Systems Division
Matthew Radnofsky, Head, Crew Equipment Branch, Crew Systems Division
Ed Michaels, Head, Life Support Section, Crew Systems Command
Allen D. Catterson, M.D., Associate Chief, Center Medical Operations Office

This program is a continuation of the two o'clock panel and TV presentation on the medical aspects of supporting a Gemini mission. Problems of managing the support effort will be discussed and the scope of mission support shown. Significant aspects of the preflight evaluation of a Gemini crew will be presented, and the placement of biomedical sensors shown. The act of assisting a crew member into a Gemini suit will be shown and physiological aspects of the suit-man relationship discussed.

Provisions for inflight eating and drinking will be demonstrated, along with a discussion of concepts of maintenance of personal hygiene and waste disposal.

Operational experience in monitoring man in space flight will be presented. The general discussion will include concepts of ground monitoring of the crew during flights and of recovery and post-flight debriefing provisions.

The general area of the relationship and contribution of space medicine in the development of applications to general medicine will be discussed during these various presentations.

MAY 13, 1964

Wednesday 3:30 p.m. Medallion Room

RADIOBIOLOGY

- Chairman:* Hermann J. Schaefer, Pensacola, Florida
Co-Chairman: John E. Pickering, Colonel, USAF, Brooks AFB, Texas
- 3:30 p.m. **RADIATION MONITORING IN PROJECT MERCURY: RESULTS AND IMPLICATIONS**
Hermann J. Schaeffer
U. S. Naval School of Aviation Medicine, Pensacola, Florida
- 3:45 p.m. **MANNED OPERATIONS IN NUCLEAR SPACE SYSTEMS**
John T. Celentano; D. Amorelli; and B. B. Adams
Space and Information Systems Division, North American Aviation, Downey, California
- 4:00 p.m. **METABOLISM OF SOME SNAP RADIONUCLIDES IN MINIATURE SWINE**
R. O. McClellan; and L. K. Bustad
Hanford Laboratories, General Electric Company, Richland, Washington
- 4:15 p.m. **RADIOBIOLOGICAL EFFECTS OF INCOMPLETELY PENETRATING ELECTRON RADIATION**
O. M. Meredith; E. G. Bowers; and J. T. Heintzelman
Lockheed Missiles and Space Company, Palo Alto, California
- 4:30 p.m. **SUBCELLULAR MECHANISMS AND BIOPHYSICAL INDICATORS OF RADIATION INDUCED INJURY**
Philip B. Hollander
Astro-Electronics Division, Radio Corporation of America, Princeton, New Jersey
- 4:45 p.m. **NUCLEAR MEDICAL METHODS IN AEROSPACE MEDICAL RESEARCH**
E. H. Graul
Department of Radiobiology and Isotope Research, University of Marburg, Marburg/Lahn, Germany

MAY 13, 1964

Wednesday 3:30 p.m. Bal Masque Room

ACCELERATION III

Chairman: Rufus R. Hessberg, Jr., Colonel, USAF, MC, Houston, Texas

Co-Chairman: Charles F. Gell, M.D., Dallas, Texas

- 3:30 p.m. **MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION**
Edmund B. Weis, Jr.; Neville P. Clarke; James W. Brinkley; and Paul J. Martin
Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio
- 3:45 p.m. **IDENTIFICATION OF VARIABLES IN ACCELERATION PHYSIOLOGY**
Kenneth R. Coburn
Aerospace Crew Equipment Laboratory, Naval Air Engineering Center, Philadelphia, Pennsylvania
- 4:00 p.m. **PHYSIOLOGICAL ADAPTATION OF THE HUMAN TO SHORT RADIUS CENTRIFUGATION**
Douglas R. Collier, Jr.
Douglas Aircraft, Santa Monica, California
- 4:15 p.m. **EFFECTS OF IMPACT ACCELERATION ON GUINEA PIGS PROTECTED BY A FLUID-FILLED BLADDER DEVICE AND BY TOTAL WATER IMMERSION**
Frederick C. Thiede; Charles F. Lombard; and S. David Bronson
Northrop Space Laboratories, Hawthorne, California
- 4:30 p.m. **BLOOD OXYGEN CHANGES INDUCED BY FORWARD (+ G) ACCELERATION**
Natalio Banchemo; Lucille Cronin; A. Clark Nolan; and Earl H. Wood
Department of Physiology, Mayo Clinic, Rochester, Minnesota
- 4:45 p.m. **BIOCHEMICAL MEASURE OF IMPACT STRESS IN CHIMPANZEES**
E. J. Hawrylewicz; and W. H. Blair
IIT Research Institute (formerly Armour Research Foundation of Illinois), Chicago, Illinois

Special Conference

MAY 14, 1964

AEROSPACE MEDICINE AND BIOENGINEERING: A TEST PILOT'S VIEWPOINT

Jointly Sponsored by the Aerospace Medical Association and the Society of Experimental Test Pilots

PANEL CHAIRMEN:

- Eugene B. Konecni, Ph.D.
Chairman, Scientific Program Committee, Aerospace Medical Association, Washington, D. C.
- William M. Magruder
Chairman, Relations and Consulting Committee, Society of Experimental Test Pilots, Lancaster, California

Thursday 9:00 a.m.

Grand Ballroom

Moderator: Charles I. Barron, M.D., Medical Director, Lockheed-California Company, Burbank, California

PANEL AND AREAS OF PRESENTATION

APOLLO PROGRAM

- A. Scott Crossfield
Quality Assurance, Space and Information Systems Division, North American Aviation, Inc., Downey, California

SPACE FLIGHT TRAINERS

- Jack Woodman
Engineering Test Pilot, Lockheed-California Company, Burbank, California

M-1 RE-ENTRY VEHICLE

- Milton O. Thompson
Engineering Test Pilot, M-1 Program, National Aeronautics and Space Administration, Edwards AFB, California

GEMINI FLIGHT PROGRAM

- Maj. Frank Borman, USAF
Astronaut Program, NASA Manned Spacecraft Center, Houston, Texas

FLIGHT SURGEON'S VIEWPOINT

- Cdr. Frank H. Austin, Jr., MC, USN
USS Enterprise

LIFE SCIENCE REQUIREMENTS FOR DYNA-SOAR AND SIMILAR PROGRAMS

- Maj. James W. Wood, USAF
Engineering Test Pilot, Dyna-Soar, Edwards AFB, California

LIGHT ATTACK AIRCRAFT

- LCdr. Robert R. King, Jr., USN
Operations Officer, Test Pilots School, Patuxent River, Maryland

SPECIAL PROGRAM FLIGHT NURSE SECTION AEROSPACE MEDICAL ASSOCIATION

MAY 13, 1964

Wednesday 2:00 p.m. Pan American Room

NURSING PROBLEMS IN THE AEROSPACE AGE

Chairman: Ellen M. Respini, Lt. Col., USAF, NC, Brooks AFB, Texas

Co-Chairman: Claretta Evans, Colonel, USAF, NC, Randolph AFB, Texas

- 2:00 p.m. **PROJECT "STRONG BONES"**
Colonel Earl W. Brannon, Jr., USAF, MC
Wilford Hall USAF Hospital, San Antonio, Texas
- 2:30 p.m. **THE MISSILE NURSING PROGRAM**
Lt. Col. Marjorie Beakes, USAF, NC; and Major Meta Mills, USAF, NC
Brooks AFB, Texas, and Patrick AFB, Florida
- 3:00 p.m. **PROPOSED COURSE IN AEROSPACE NURSING**
Capt. Pearl Tucker, USAF, NC
Patrick AFB, Florida
- 3:30 p.m. **THE AIR FORCE NURSE IN RESEARCH**
Major Sarah H. Beard, USAF, NC
USAF School of Aerospace Medicine, Brooks AFB, Texas