President's Page

Colleagues and Friends;

As noted during our meeting in Boston, now almost 2 months ago, this is to be a year of change for AsMA. Let me briefly review a couple of these here.

Search for a new Executive Director (ED)

Dr. Bob McMeekin and his team interviewed potential candidates for the position whilst in Boston, and they continue to do so as you read this. Candidates selected by the Search Committee will be vetted by the Executive Committee at their meeting in September. They, in turn, will forward their recommendation for ED to the AsMA Council, which will then vote in this regard at their meeting in November. The milestones for these steps in the selection process are optimal, yet approximate; the ED selection process will not be a rushed affair. In the event that there may be some delay in the selection of a new ED, Dr. Rayman has graciously agreed to stay on for a limited time beyond his announced date of retirement in order to best ensure a smooth, seamless pass-down of duties and responsibilities. I will keep you informed as to the progress of this process.

Facilitation of Active Non-U.S. Member Participation.

You might recall from my first President's Page that one of my principle goals during the upcoming year will be to ensure that our non-U.S. membership remains strong and, most importantly, active. Almost 25% of the total current AsMA membership is represented by non-U.S. colleagues and the number of our non-U.S. Affiliates continues to grow. Some of our non-U.S. members have held some of the highest positions in AsMA senior leadership on Council and the Executive Committee. We have even had several international presidents. Indeed, we have become a truly international professional society. Yet, it occurs to me that perhaps there may be some critical cultural variables that may be keeping even more of our members from taking a more active part in AsMA activities. Indeed, this notion was born out by a number of discussions I had at our meeting in Boston with colleagues representing most of our global membership

For example, as a function of societal norms and practices, members from certain countries pursue participation in AsMA activities by proactively volunteering to do so. Others have the same desire to participate, but as a function of their cultural morays, are unable to do so unless first invited; doing otherwise would be considered inappropriate.

In order to ensure that non-U.S. participation in AsMA activities (especially senior leadership) may be pursued by all of our members, I therefore will be sending letters to the Presidents and/or Chairs of all our non-U.S. Affiliate organizations, inviting them not only to attend our 2009 meeting in Los Angeles, but also to participate actively on AsMA committees and to submit nominations for positions on Council and the Executive Committee.

Andrew H. Bellenkes, Ph.D.

I have also appointed Dr. Gabor Hardicsay as Chair of the International Activities Committee. I look forward to working with both Dr. Hardicsay and Dr. Warren Silberman, our new Vice President for International Services, to ensure that our non-U.S. membership continues to grow, and that all our members are invited to play central roles in AsMA activities and governance. I ask our Affiliate and Constituent Society Presidents as well as the Chairs of all our Committees to take a similar proactive approach in this regard.

A Few Requests

Although we are still experiencing the 'afterglow' of our wonderful meeting in Boston, it is not too early to start thinking about 2009; why, our Los Angeles meeting is but a mere 10 months or so from now! Let me therefore urge you now to:

- consider making a presentation, creating a poster, or forming a panel next May;
- submit your work as early as possible once the scientific meeting webpages have been posted;
- invite a colleague...perhaps someone who may not as yet be a member of AsMA...to consider attending the meeting in L.A;
- become a mentor, perhaps even a sponsor for a new member's first year. Doing so may not only make their attendance at the 2009 meeting a rewarding experience, but would greatly increase the likelihood of their remaining a member.
- Let me know how we can better serve you as your professional society, both in the short term and for years to come. Please always feel free to e-mail me at: andrew.bellenkes@usafa.edu.

Association News

Daedelus Celebrates 20th Anniversary

The Daedelus, a lightweight, human-powered airplane that set a pair of aviation records that still stand, recently celebrated its 20th anniversary. A project worked on by a team of MIT students, faculty, and alumni, it first flew on April 23, 1988, crossing the Mediterranean Sea from Crete to the shore of the island of Santorini. During this flight, it traveled 115 km (approx. 71.5 mi) before its tail spar broke from the buffeting of the wind and it crashed into the waves 7 m from shore.

The plane was named for a character from Greek mythology who escaped from King Minos of Crete using wings made of feathers and wax. The plane used bicycle pedals and a chain that transmitted power to a large, slow-moving propeller. It is made out of carbon-fiber composite and Mylar and weighs only 69 lb. Its flight set records for duration (3 h, 54 min) and distance of a human-powered flight and produced information that helped bring about new technology for high-altitude, long-endurance aircraft.

The wreckage of the Daedelus is in storage at the Smithsonian while an identical craft used in initial tests is on display at the Museum of Science in Boston.

—- Adapted from an article by David Chandler; one of the researchers that contributed to the article, Ethan Nadel, Ph.D., was the Armstrong Lecturer at AsMA's Annual Meeting in 1991.

Meetings Calendar 2008

July 24-26, 2008; The 6th International Syposium on Hyperbaric Oxygen Therapy (HBOT); Los Angeles, CA. For more information or to register, visit www.hbot2008.com/index.php

August 4-7, 2008; 27th Annual Cryogenic Engineering Training; Boulder, CO. Sponsored by the University of Colorado's Center for Advanced Engineering and Technology Education. For more information, visit www.cryoco.com or e-mail thomasmflynn@comcast.net.

August 14-17, 2008; Frontiers of Aerospace Medicine: Annual Conference of the Australasian Society of Aerospace Medicine; Crowne Plaze Hotel, Darwin, Northern Territory, Australia. For more information, please visit www.leishman-associates.com.au/asam2008.

August 20-23, 2008; EASST/4S Conference, "Acting with Science, Technology and Medicine"; Rotterdam. For more information, please visit http://www.easst.net/node/1646.

August 22-24, 2008; Annual Conference of the Aviation Medical Society-New Zealand; Wairekei Hotel, Taupo, New Zealand. Held in combination with ANZSOM. For more information, visit amsanz.org.nz/conference/confindex.htm.

August 26-28, 2008; 6th Asian Pacific Congress of Aerospace Medicine (APFAMA 2008) and 8th Chinese Conference of Aerospace Medicine; Xian, China. For more information, visit www.chinamed.com.cn/apfama2008.

September 7-11, 2008; 56th International Congress of Aviation and Space Medicine (ICASM 2008); Bangkok, Thailand. Meeting brochure and Call for Papers is available at www.icasm2008.org/download/2nd_Announcement_MIN.pdf. For more information, including registration, please visit www.icasm2008.org.

Aerospace Medical Association Seeks Executive Director

The Aerospace Medical Association (AsMA) is seeking applicants for the position of Executive Director. The Executive Director serves as the chief operating officer responsible for all management, administration and professional activities of the Association. Applicants should possess a doctoral degree and be familiar with the AsMA. Major responsibilities include membership services, planning and conducting an annual scientific meeting, publishing a scientific journal, and conducting liaison with related national and international organizations. Salary will be commensurate with these responsibilities and the experience of the applicant. Applications should include a 1- to 2-page narrative describing interest, professional qualifications, and vision for the Association. Also include a professional resume, salary history, and salary requirements. A position description may be obtained by calling (301) 469-5461 or visiting the Announcements section at www.asma.org. Mail applications to: Robert R. McMeekin, M.D, Chair, Search Committee, 7435 Arrowood Road, Bethesda, MD 20817-2822.

Journal CME/MOC

We have suspended publishing the CME/MOC questions in the journal until further notice due to insufficient participation in the program.

Thank You! Corporate and Sustaining Members of the Aerospace Medical Association

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Wyle Laboratories, Inc.

2008 Award Winners of the Aerospace Medical Association

Honors Night Ceremonies of the 79th Annual Scientific Meeting of the Aerospace Medical Association were held May 15, 2008, at the Sheraton Back Bay Hotel in Boston, MA. Fifteen awards for outstanding contributions in aviation and space medicine were presented. The presentations were made by Jack Hastings, M.D., president of the Aerospace Medical Association. The winners were recommended by the Awards Committee, chaired by Dr. Dwight Holland, and approved by the Executive Committee of the Aerospace Medical Association.

LOUIS H. BAUER FOUNDERS AWARD

Michael Bagshaw, M.B., B.Ch., MRCS, FFOM, D.Av.Med., DFFP, FRAeS

This award was established to honor Louis H. Bauer, M.D., founder of the Aerospace Medical Association. It is given annually for the most significant contribution in aerospace medicine. It is sponsored by the Mayo Clinic.

Michael Bagshaw, M.B., B.Ch., MRCS, FFOM, D.Av. Med., DFFP, FRAeS, was presented the 2008 Louis H. Bauer Founders Award for his substantial and significant contributions to the international aerospace community. He is an internationally recognized aeromedical expert and physician-pilot, qualified as a private, military (RAF), commercial, air transport, and instructor pilot. Additionally, he has served as a flight surgeon, family physician, and occupational medicine expert. Prof. Bagshaw is Director of Aviation Medicine at King's College London and visiting Professor at Cranfield University.

Born in Formby, Lancashire, UK, Professor Bagshaw earned his medical degree at the Welsh National School of Medicine, followed by a 16-year career in the RAF as a medical officer, Hunter and Jaguar pilot, flying instructor at Cranwell, and test pilot at the RAF Institute of Aviation Medicine. He holds an Airline Transport Pilot licence, and is a flight instructor and flight examiner. For 12 years he led the team of Occupational and Aviation Medical Physicians at British Airways, retiring in December 2004. Prior to this he worked in the NHS as a Consultant in Neuro-otology at St. George's Hospital London and as a general practitioner in Berkshire, and then as Establishment Medical Officer at the Royal Aerospace Establishment Farnborough.

Away from medicine and flying, his main interest is music. He sings with the choir of the Royal Memorial Chapel at Sandhurst and was until recently leader of the Crowthorne Chamber Orchestra.

Past President and Fellow of the Aerospace Medical Association, Past President of the Airlines Medical Directors' Association, and past Chairman of the Association of Aviation Medical Examiners, Professor Bagshaw is the recipient of a number of honors and awards. These include the Buchanan Barbour Award from the Royal Aeronautical Society, the Award of Merit from the Guild of Air Pilots and Air Navigators, Honorary Member of the Slovenian Aerospace Medical Association, Fellow of the Faculty of Occupational Medicine, and the George J. Kidera Award from the Airlines Medical Directors Association. He is also Past President of the British Medical Pilots Association, an Academician and member of the scientific committee of the International Academy of Aviation and Space Medicine, a Vice Chairman of the Aviation Medicine Group and Fellow of the Royal Aeronautical Society, and a Fellow of the Royal Society of Medicine.

Professor Bagshaw has contributed to many textbooks of aviation and travel medicine and published more than 70 scientific papers. He also holds a number of advisory positions including Honorary Civilian Consultant Adviser in Aviation Medicine to the Army and Aeromedical Adviser to Airbus.

SIDNEY D. LEVERETT, JR. ENVIRONMENTAL SCIENCE AWARD

CAPT David A. Hiland, MC, USN

Established in memory of Sidney D. Leverett, Jr., Ph.D., this Environmental Science Award is presented annually to an individual who has made a significant contribution in the field of environmental medicine through a publication in Aviation, Space and Environmental Medicine*, or by activities conducted in support of aerospace systems operation. Sponsored by Environmental Tectonics Corporation.*

CAPT David A. Hiland, MC, USN, was the winner of the 2008 Sidney D. Leverett, Jr., Environmental Science Award. He was honored for his significant career accomplishments and leadership in the Naval Aerospace Crew Systems and Pilot-Physician community, and for his leadership as the Navy's responsible officer for the Environmental and Occupational Health Programs of its Forces Worldwide. He has served the military aviation and environmental medicine communities faithfully and has demonstrated strong leadership ability. He is currently serving as the Senior Medical Officer of the *USS George H. W. Bush* (CVN-77).

A native of Illinois, CAPT Hiland attended the University of Illinois as a Naval ROTC student. He earned his Bachelor of Engineering Degree and commission as an Ensign in 1969. Following flight training, he was selected for A-7E Corsair training and reported to VA-25 aboard *USS Ranger* (CV-61) in 1971. After completing two combat cruises to South East Asia, he was discharged from active duty in 1974.

CAPT Hiland attended the Chicago College of Osteopathic Medicine as a Naval Scholarship student and was awarded his Doctor of Osteopathic Medicine degree in 1984. He was designated as a Naval Flight Surgeon

See HILAND p. 720.

HILAND, from p. 719.

in 1985, and later reported to the Commander, Carrier Air Wing Eight, aboard *USS Nimitz* (CVN-68) where he served as Senior Air Wing Flight Surgeon. In 1989 he was awarded a Masters Degree in Public Health from Johns Hopkins School of Public Health. He completed Aerospace Medicine Residency training in 1991, followed by a tour of duty as Senior Medical Officer aboard the *USS Dwight D. Eisenhower* (CVN-69).

He reported to the Bureau of Medicine and Surgery in 1993 and in 1996 he became the Director of the Aerospace Medicine Division, the Aerospace Medicine Specialty Leader, and the Director for the Navy's Dual Designator Program. He reported to the Navy Environmental Health Center (NEHC) in 1998, where he served as Director of Plans and Operations and interim Executive Officer. In July 2000, he reported to the staff of Commander Naval Air Forces Atlantic where he oversaw 6 carrier medical departments. As Force Medical Officer, he led efforts to develop CBRE doctrine for the carrier medical departments and to implement advanced Biological Warfare identification capability. In June of 2003, Captain Hiland assumed duties as Deputy Chief, Bureau of Medicine and Surgery, Environmental Health (BUMED M11) and Commanding Officer, Navy Environmental Health Center, Portsmouth, VA.

CAPT Hiland is board certified in Aerospace Medicine, Occupational Medicine, and Family Practice. His military awards include the Legion of Merit, the Meritorious Service Medal, the Air Medal, and Vietnam Campaign and Service Medals. He is a Fellow of the Aerospace Medical Association and serves on the Scientific Program Committee. He is also a member of the Society of U.S. Naval Flight Surgeons and the International Association of Military Flight Surgeon Pilots (IAMFSP). He has served as President of the IAMFSP and is a dual designated flight surgeon/pilot.

BOOTHBY-EDWARDS AWARD

Robert Orford, M.S., M.P.H., M.D.

Established in memory of Walter M. Boothby, M.D., pioneer aviation medicine researcher, and Howard K. Edwards, M.D., clinical practitioner of aviation medicine, this award is presented annually for outstanding research and/or clinical practice directed at the promotion of health and prevention of disease in professional airline pilots. (The separate Boothby and Edwards Awards were given annually 1961–73, and then alternately until 1985.) Sponsored by Harvey W. Watt and Company.

Robert Orford, M.S., M.P.H., M.D., was the 2008 recipient of the Boothby-Edwards Awards for his service as a teacher, researcher, and clinician. He is currently practicing Aerospace Medicine at the Mayo Clinic in Scottsdale/Phoenix, AZ. He has been a medical director for Northwest Airlines and has provided in-flight emergency assistance to aircrew and their passengers in need when the concept of in-flight emergency assistance was still in its infancy. He serves the pilots by virtue of his talent and ability to guide complex aeromedical cases in their process of evaluation with the hope to get back to flying status. He has worked and continues to work with many governmental agencies and is a senior aviation examiner for the FAA as well as Air Transport Canada. He brings his qualifications as an Aerospace Medicine, Occupational Medicine, Public Health, and Internal Medicine board certified clinician to the bedside and can thus bring clarity to adjudications that would otherwise require multiple consultations.

Dr. Orford has been successful in the arena of health promotion and disease prevention in the many examinations he has carried out for corporate pilots, airline transport pilots, and insurance companies, always keeping the mantra of "the needs of the patient come first" at the forefront. In addition, he is an inspiring teacher for our residents, fellows, and students and a consistent contributor to the literature and the reference textbooks in Aerospace Medicine.

Dr. Orford earned a B.Sc. at McGill University in Montreal, Quebec, Canada, in 1968. He was awarded his M.D. degree, also from McGill University, in 1971. He received his M.S. in Medicine from the University of Minnesota, Mayo Graduate School of Medicine in Rochester, MN, in 1975 and his M.P.H. from the University of Washington in Seattle in 1976. He served an internship from 1971 to 1972 at St. Joseph's Hospital in London, Ontario, Canada, held a Fellowship in Internal Medicine at the Mayo Graduate School of Medicine from 1972-1975, and served a residency in Preventive Medicine at the University of Washington from 1975-1976.

In 1976, Dr. Orford accepted a position as Medical Officer at the Sarnia Division of Dow Chemical of Canada in Ontario. He left that position in 1977 to become Senior Medical Consultant at the Medical Service Branch of the Occupational Health and Safety Division of Alberta Labour in Edmonton, where he served until 1979. He then took a position as Director of the Medical Services Branch of Alberta Workers' Health, Safety and Compensation, also in Edmonton, where from 1980-1984, he served as Executive Director of Occupational Health Services. In 1985, he became Deputy Minister of the Community Health Division of Alberta Social Services and Community Health, and then in 1986 the Deputy Minister of Community and Occupational Health. In 1988, he served as Director of Occupational Health Services for the University of Alberta Hospitals in Edmonton, and then, in 1989, became Special Clinical Fellow at the Mayo Clinic in Rochester, MN.

Dr. Orford is a Fellow of the Royal College of Physicians and Surgeons of Canada, a Fellow and past Director of the Alberta Occupational Health Society, and a member of the Canadian Occupational Health Society, the American Occupational Health Society, the Occupational Medical Association of Alberta, the Occupational Medical Association of Canada, the Canadian Public Health Association, the American Public Health Association, the Canadian Society of Aviation Medicine, and the Canadian Medical Association. He was awarded a National Health Fellowship from Canada from 1975-1976. He is a Diplomate of the National Board of Medical Examiners. He is also a Fellow of the Aerospace Medical Association and serves on its Scientific Program Committee.

KENT K. GILLINGHAM AWARD

Col. Peter B. Mapes, USAF, MC, CFS

This award was established and sponsored by the AMST Group of Companies in Austria and the United Kingdom to honor the memory of Kent K. Gillingham, M.D., Ph.D. The award is presented annually to an individual who has made a significant contribution in the field of spatial disorientation and situational awareness related to flight.

Col. Peter B. Mapes, USAF, MC, CFS, was the 2008 recipient of the Kent K. Gillingham Award. He was recognized for his many years of involvement in spatial disorientation and situtational awareness, especially for military aircraft. His diligence and commitment have enhanced the understanding of spatial disorientation and situtational awareness in rotary wing aircraft, where he turned his attention after being recognized for his work in tactical fighter aircraft. He has also provided convincing information and data to the USAF regarding prevention. He superintended a 21-year epidemiological review of U.S. Department of Defense Rotary Wing Mishaps, then catalogued the data and provided detailed recommendations to the USAF to reduce the accident rate. He also obtained funding for a demonstration/validation project design to improve situational awareness among rotary wing pilots.

Col. Mapes has contributed significantly to the FAA's Accident Prevention Program and has won acclaim as an Accident Prevention Counselor-of-the-Year for two FAA organizations. He also has a long history of contributing to aviation safety through his role as one of the first-ever USAF Bomber Pilot-Physicians, by defining a new in-flight visual illusion, and by contributing extensively to aviation safety research. He has been an international leader with regard to the issue of controlled flight into terrain (CFIT) mishaps. He has served on numerous USAF accident boards and chaired the Air Force Surgeon General's Human Performance Enhancement Functional Area Working Group. By recognizing the in-flight visual illusion called "cell-turning illusion" during formation flight, he has doubtlessly saved lives and aircraft.

Col. Mapes was born in The Dalles, OR, and hails from Oscoda, MI. He graduated from the U.S. Air Force Academy with a B.Sc. degree in Life Sciences and became a rated military pilot at Craig AFB, Selma, AL. He was an Outstanding Graduate of B-52 Combat Crew Training at Castle AFB, CA, and a Distinguished Graduate of Squadron Officer School at Maxwell AFB, AL. He has served the United States for over a third of a century, including duty as an Air Force Command Pilot in B-52s and as a T-37B Instructor Pilot with over 3000 military flying hours accrued.

A widely recognized operational physician, Col. Mapes was awarded the Malcolm Grow Award in 1993 for being the USAF Flight Surgeon of the Year by the Society of USAF Flight Surgeons. The National Aeronautic Association and the Secretary of the Air Force recognized him with the other four members of the B-52 crew of Griff 21 for the Most Outstanding Military Flight of the Year with the award of the Mackay Trophy in 1993. Serving in a pilot role, he and his crew saved a B-52 after multiple in-flight failures where some engines caught fire and eventually burned off of the wing, with a massive hydraulics failure as well. Remarkably, both plane and crew survived. He was also honored in 2006 with the Harry G. Moseley Award from the Aerospace Medical Association.

Col. Mapes holds both an Airline Transport Pilot Certificate from the Federal Aviation Administration and a Certified Instrument Flight Instructor Certificate. He has logged nearly 10,000 hours as a pilot including over 3000 hours of flight instruction given and voluntarily serves as an Aviation Medical Examiner. He graduated from the Uniformed Services University of the Health Sciences with both Doctor of Medicine and Master of Public Health Degrees. He is a Chief Flight Surgeon with 1000 military flight surgeon hours logged who is board-certified in both Aerospace and Occupational Medicine. He is a Fellow of the Aerospace Medical Association and has served as Chair of the Membership Committee and as Scientific Program Panels Chair. He is a Past President of the International Association of Military Flight Surgeon Pilots. He holds an adjunct faculty position in Military and Emergency Medicine at the Uniformed Services University of the Health Sciences, F. Edward Heber School of Medicine.

WON CHUEL KAY AWARD

Anthony D. B. Evans, M.B.Ch.B.

Established by the Korean Aerospace Medical Association in honor of Won Chuel Kay, M.D., the former Surgeon General of the Korean Air Force, founder and first Medical Director of Korean Airlines and first President of the Korean Aerospace Medical Association. This Award is presented annually to a member who has made outstanding contributions to international aerospace medicine. The award was established and is sponsored by the Korean Aerospace Medical Association.

Anthony D. B. Evans, M.B.Ch.B., was the 2008 recipient of the Won Chuel Kay Award for outstanding contributions to international aerospace medicine. Dr. Evans has devoted much of his career to developing international civil aviation first with the UK Civil Aviation Authority and then with the International Civil Aviation Organization. Dr. Evans is currently Chief of the Aviation Medical Section for the ICAO in Montreal, Canada. He introduced innovative changes to the European Joint Aviation requirements, implemented the change to the International Civil Aviation Organization (ICAO) upper age limit for pilots to 65 yr, and successfully coordinated several international organizations to improve pandemic preparedness. Dr. Evans has contributed to international study groups and strongly promotes evidence-based decision making. Additionally, he promoted the introduction of safety management principles in aviation medicine and updated the ICAO guidance concerning on-board medical supplies.

See EVANS, p. 722.

EVANS, from p. 721.

In 1975, Dr. Evans earned a commercial pilot's license from British Airways College of Air Training in Hamble. Due to the airline recession at the time, he was not offered employment and thus changed his career direction, attending Liverpool Polytechnic, where he earned a B.Sc. in Sports Science in 1978. He then attended Kings College at London University, earning an M.Sc. in Human and Applied Physiology in 1979. After that, he attended Glasgow University, where he earned his medical degree in 1984. Until 1987, he worked in Glasgow and Nottingham in hospital and general practice as a junior doctor. In 1987, he joined the UK Civil Aviation Authority (CAA) as a medical officer and eventually became its Chief Medical Officer. In 1989, Dr. Evans earned a Diploma in Aviation Medicine from the Royal College of Physicians and in 1997, he became a member of the Faculty of Occupational Medicine there. From 1989 to 2004, he flew part-time as a pilot for a number of airlines as part of his CAA duties. He joined ICAO in 2005 as the Chief of the Aviation Medical Section. In 2008, he was awarded an Honorary Doctor of Science degree by City University, London, for his services to aviation safety and optometry.

During his career, Dr. Evans combined his academic qualifications in physiology and medicine with experience as an airline pilot. When he joined the CAA, he concentrated on promoting and developing evidence-based aeromedical decision-making, firstly in the UK and later in Europe, through the Joint Aviation Requirements. He contributed to three international study groups organized by the International Civil Aviation Organization, which modernized ICAO Standards and Recommended Practices and improved safety concerning the use of lasers near airports. After he joined the ICAO, he convened the second ICAO Medical Provisions Study Group which challenged current thinking concerning the frequency and content of the routine medical assessment in younger professional pilots, promoted the introduction of safety management principles in aviation medicine, and updated the ICAO guidance concerning on-board medical supplies. The proposals endorsed by the MPSG have important long-term effects in the field of regulatory aviation medicine. In the area of pandemic planning, he established an international working group that has written guidelines for States, airports, and airlines, combining expertise from a variety of organizations such as the World Health Organization, Centers for Disease Control and Prevention, International Air Transport Association, and Airports Council International.

MARY T. KLINKER AWARD

LCdr.(Ret.) Christine Cloutier, CF

Established by the Flight Nurse Section in 1968, this award became an official AsMA award in 1972. In 1978 it was renamed in memory of Mary T. Klinker, who was killed in a C-5A crash while performing a humanitarian mission. The award is given annually to recognize significant contributions to, or achievements in, the field of aeromedical evacuation. Sponsored by Impact Instrumentation.

LCdr.(Ret.) Christine Cloutier was the recipient of the 2008 Mary T. Klinker Award for her tireless work with receiving units, civilian agencies, Air Force counterparts, foreign military, and international medical and transportation facilities to ensure multidisciplinary collaboration. She has served as the Canadian Aeromedical Evacuation Liaison Officer in Germany for nearly 2 years and has overseen the largest air movement of injured Canadian Forces (CF) personnel since the Korean War. Her dedication and exceptional efforts have played a pivotal role in the repeated successful aeromedical evacuation of Canadian troops injured abroad.

LCdr. Cloutier graduated with a nursing diploma from College Limoilou, Quebec City, in 1982 and subsequently joined the CF in 1984. Following the completion of Basic Officer training in Chilliwack, BC, she was stationed in Victoria, British Columbia. In 1987, she completed the Aeromedical Evacuation (AE) Training in Trenton, Ontario. From 1991 to 1994, she served on a Flight Nurse Exchange tour at Scott Air Force Base, IL. Upon her return to Canada, she accepted the Chief Flight Nurse Instructor position at 426 Squadron in Trenton, Ontario. While responsible for the AE Training of Nurses and Medical Assistants for the CF, she also envisioned and promoted an expanded role for the CF AE School, which led to the AE training of NATO partners, a program that is still ongoing to this day.

In 1998, LCdr. Cloutier became Chief of Standards and Evaluation at the Air Transport Group in Trenton. That same year, she was selected for sponsored university training. In 2000, she graduated with honors with a Baccalaureate degree of Science in Nursing at the University of Ottawa, Ontario. Promoted to the rank of Lieutenant Commander, she was assigned to the 1 Canadian Air Division Headquarters, in Winnipeg. As Division Nurse, she became responsible for the overall management of all the aspects of the course loading, training, and standards of the CF Aeromedical Evacuation Program. She also oversaw the provision of Flight Nursing services on the 10 Wings of the CF Air Force. She became Deputy Commander and Chief of Medical Operations, standing up the 2 Health Services Group Headquarters in Winnipeg following a CF Medical Services reorganization in 2001. She was accountable for the day-to-day operations of the group and for the operational readiness of medical members stationed on Air Force Wings.

LCdr. Cloutier retired from active duty in 2004 and transferred to the Supplementary Reserve Force. She moved to Belgium and married Belgian Flight Surgeon LCol Filiep Callewaert. In 2006, she joined the CF Medical Primary Reserve List (PRL) to take on a Reserve contract of 16 months in Landstuhl, Germany, in the role of Aeromedical Evacuation Nurse Liaison Officer (AENLO) in support of Operation Athena in Afghanistan. She streamlined existing evacuation procedures, coordinated multinational services, and was responsible for the repatriation of sick and wounded Canadians soldiers through Germany, the largest mission of evacuation of Canadian casualties since the Korean War.

Throughout her career, LCdr. (Ret.) Cloutier has remained active within the military and civilian AE community. She has been a member of the Canadian Air

See , CLOUTIER, p. 723.

CLOUTIER, from p. 722.

Medical and Transport Association (CAMATA). She is a member and repeat lecturer at the Annual meeting of the Aerospace Medical Association (ASMA) since 1992. She also participates in annual NATO/ Pfp AE Seminars. She recently presented on the mission of evacuation of casualties from Germany at the CF Operational Medicine (OPMED) in Ottawa in October 2007.

ERIC LILJENCRANTZ AWARD

Andrew A. Pilmanis, Ph.D.

The Eric Liljencrantz award was established in memory of CDR Eric Liljencrantz, MC, USN, whose brilliant career in aviation medicine was cut short by his death in an airplane accident in 1942. It is given annually to honor excellence as an educator in aerospace medicine, or basic research into the problems of acceleration, altitude, or weightlessness. Sponsored by the Aerospace Medical Association.

Andrew A. Pilmanis, Ph.D., was awarded the 2008 Eric Liljencrantz Award for his research and leadership on the risk, prediction, and prevention of altitude decompression sickness at Brooks Air Force Base, TX, for over 15 years, leading to over 200 publications. He initiated efforts to mathematically and statistically predict DCS incidence under variable conditions. His team's research provided data in support of returning aircrew to duty following serious DCS, clarified the role of activity during exposure for NASA astronauts, and provided an Altitude DCS Risk Assessment Computer (ADRAC) now in current USAF use for operational planning. He has greatly advanced the knowledge of altitude DCS risk, prevention, and prediction.

Dr. Pilmanis was selected to head the High Altitude Protection Research group at Brooks Air Force Base in 1989 after a distinguished career as Director of the University of Southern California's Hyperbaric Program. He brought an appreciation for the value of peer-reviewed publication as a culmination of research effort and a desire to develop a means of predicting altitude decompression sickness (DCS) risk for the U.S. Air Force. During his tenure at the School of Aerospace Medicine, the Armstrong Laboratory, and the Air Force Research Laboratory at Brooks from 1989 until his retirement in 2005, he provided leadership for a program that produced over 200 publications on the subject of altitude DCS risk, prediction, and prevention. These works, many which dispelled DCS conventional wisdom, involved highly standardized procedures, allowed both basic and applied data acquisition, and provided the means to compare results between studies. The findings included definition of DCS risk at altitudes from 15,000 to 40,000 ft with 0 to 4 hours of prebreathe, with and without exercise-enhanced prebreathe, with variable ascent rates, with several types of physical activity during or after exposure, with different breathing mixtures, and with breaks in prebreathe. Dr. Pilmanis initiated efforts to mathematically and statistically predict DCS incidence under variable conditions. His group of scientists, mathematicians, and statisticians succeeded in developing an Altitude DCS Risk Assessment Computer (ADRAC) program which uses altitude, time at altitude, level of activity, and prebreathe time to predict DCS over a wide range of these parameters. That program is in current use in the USAF for operational planning. The overall effect of Dr. Pilmanis's efforts was to greatly advance the knowledge of altitude DCS risk, prevention, and prediction.

Born in Riga, Latvia, Dr. Pilmanis received both his undergraduate (A.B. in zoology 1964) and graduate (M.S. in physiology 1967 and Ph.D. in physiology 1970) training at the University of Southern California, Los Angeles, CA. In 1970, he accepted an appointment to the faculty of the Department of Physiology at the University of Southern California School of Medicine. In addition to his teaching duties, he actively pursued his research interest in diving physiology, including projects in cardiovascular effects of microgravity, DCS, and intravascular gas emboli detection in diving, thermal stress, CO2 retention and underwater exercise, cardiovascular effects of diving in the California sea lion, and development of underwater physiological data acquisition systems. In addition, he was one of three participants in two 7-day air saturation dives in the NOAA sponsored Hydrolab habitat located in 50 feet of water off Grand Bahama Island. He was the principal investigator on this project to study physiological responses to saturation diving including thermal, EEG, cardiovascular, and biochemical effects. In 1974, he was appointed Senior Research Scientist and Associate Director of the USC Catalina Marine Science Center. For 15 years he served as the Program Director for this research/clinical/teaching hyperbaric facility. In 1980, Dr. Pilmanis initiated and directed the USC/NOAA National Undersea Research Program. This program designed, engineered, and constructed the Aquarius (currently still operated by NOAA), an underwater habitat/saturation diving system operated as a national facility for marine research.

In 1999, Dr. Pilmanis was elected Fellow of the Aerospace Medical Association. He is on the Faculty of the USAF School of Aerospace Medicine, is a past Vice President of the Undersea and Hyperbaric Medical Society, and has served as past President of the Life Sciences and Biomedical Engineering Branch of the Aerospace Medical Association. He has been honored repeatedly for his research, including the AFRL Harry G. Armstrong Scientific Excellence Award, the Aerospace Physiologist Society Fred Hitchcock Award, the Air Force Association Texas Scientist of the Year Award, the Undersea Medical Society Craig Hoffman Memorial Award, the Research and Development Innovation Award, Life Sciences and Biomedical Engineering Branch of the Aerospace Medical Association, the NASA Group Achievement Award, National Facility Study Task Team, and five USAF Performance Awards. He was also honored with the Sidney D. Leverett, Jr., Environmental Science Award in 2003 by the Aerospace Medical Association for his lead authorship of "Effect of Repeated Altitude Exposure on the Incidence of Decompression Sickness" (Aviat Space Environ Med 2002; 73:525-31).

RAYMOND F. LONGACRE AWARD

Peter Hancock, Ph.D.

Established to honor the memory of MAJ Raymond F. Longacre, MC, USA. It is given annually for outstanding accomplishment in the psychological and psychiatric aspects of aerospace medicine. Sponsored by PricewaterhouseCoopers LLP.

Peter Hancock, Ph.D., is the 2008 winner of the Raymond F. Longacre Award for his seminal contributions concerning the assessment of pilot mental workload and for multiple research advancements in the understanding of the relationship between stress and human performance. He is also cited for his pioneering efforts in the area of pilot decision-making in self-separation environments through conflict detection and resolution and for the development of the theory concerning and practical establishment of adaptive function allocation in advanced aviation systems.

For three decades, Peter Hancock has contributed to the human factors understanding of stress effects on the performance of complex systems operators. He has generated fundamental empirical insights into the performance effects, especially in the area of thermal stress. He has shown how an understanding of physiological adaptation and the limits to such capabilities are directly related to change in performance efficiency at extremes of demand. These concerns lead naturally to the investigation and assessment of pilot mental workload in unusually taxing situations. In this latter area, Dr. Hancock's pioneering efforts have encompassed evaluations of primary task performance, subjective report, secondary task measures, and physiological assessments in order to promote safe and successful flight. In defining human factors solutions to the problems of pilots under extremes of mental demand, Dr. Hancock has used fundamental theoretical and empirical insights to help develop a new area of design and operation: that of adaptive function allocation. The fundamental principle behind adaptive function allocation is homeostasis in which now mental workload is the function to be regulated and the linked computer system acts as the regulator. Signals as to current and expected levels of mental demand are passed between human and machine where the latter regulates input task requirements by selectively performing some functions itself, under automation, while filtering and balancing the demand presented to the pilot. This form of feed-forward and feedback control permits task elements to be ordered such that certain non-critical tasks can be performed in low demand epochs such as during straight and level flight, thus augmenting underload and reducing problems of vigilance decrement. This work has been used by the U.S. Air Force, Army, and Navy as well as the Royal Navy of Great Britain in developing design guidelines for a number of advanced automated systems.

Professor Hancock is currently Provost Distinguished Research Professor in the Department of Psychology and the Institute for Simulation and Training, as well as in the Department of Civil and Environmental Engineering at the University of Central Florida. In his previous appointment, he founded and was the Director of the Human Factors Research Laboratory at the University of Minnesota where he held appointments as Professor in the Departments of Computer Science and Electrical Engineering, Mechanical Engineering, Psychology, and Kinesiology as well as at the Cognitive Science Center and the Center on Aging Research. He continues to hold an appointment as a Clinical Adjunct Professor in the Department of Psychology at Minnesota. He is also an Adjunct Senior Research Scientist at the Transportation Institute of the University of Michigan and an affiliated Scientist for the Humans and Automation Laboratory at MIT. In 2001 he earned a Doctor of Science (D.Sc.) degree from Loughborough University in England.

Professor Hancock is the author of over 500 refereed scientific articles and publications and has written and edited 15 books including Human Performance and Ergonomics in the Handbook of Perception and Cognition series; Stress, Workload, and Fatigue; and the forthcoming Performance Under Stress. He is the author of "Essays on the Future of Human-Machine Systems" and the forthcoming "Mind, Machine and Morality."

In 1999 Professor Hancock was the Arnold Small Lecturer of the Human Factors and Ergonomics Society and in 2000 he was awarded the Sir Frederic Bartlett Medal by the Ergonomics Society of Great Britain for lifetime scientific achievement. He was the Keynote Speaker for the combined meeting of the International Ergonomics Association and the Human Factors and Ergonomics Society in 2000. In 2001 he received the Franklin V. Taylor Award of the American Psychological Association as well as the Liberty Mutual Prize for Occupational Safety and Ergonomics from the International Ergonomics Association.

In 2002, he was awarded the Jastrzebowski Medal of the Polish Ergonomics Society for contributions to world ergonomics. In 2003 he won the Liberty Mutual Medal of the International Ergonomics Association, a worldwide competition for innovative advances in occupational safety and ergonomics. In 2006 he won the Norbert Wiener Award of the Systems, Man and Cybernetics Society of the Institute of Electrical and Electronic Engineers (IEEE). In late 2007 he was the recipient of the John C. Flanagan Award of the Society of Military Psychologists of the American Psychological Association for lifetime achievement and he was also the 2007 recipient of the A.R. Lauer Award of the Human Factors and Ergonomics Society for lifetime contributions to safety.

Professor Hancock is a multiple-term Member of the National Academy of Sciences, National Research Council's Committee on Human Factors, and in that capacity has served as Chair and Organizer for a number of sub-committees. He is a Fellow and past President of the Human Factors and Ergonomics Society, a Fellow of the Ergonomics Society of Great Britain, and a member of the Aerospace Medical Association.

Nominate a Colleague for an AsMA Award!

The nomination form and rules are on our website at: www.asma.org, under "About AsMA", Downloadable materials as well as with the Awards Committee information. You can contact the Chair, Dwight Holland at dwightholl@aol.com

THEODORE C. LYSTER AWARD

Jeffrey R. Davis, M.D., M.S.

This award was established to honor the memory of Brig. Gen. Theodore C. Lyster, the first Chief Surgeon, Aviation Section, United States Signal Corps. It is given annually for outstanding achievement in the general field of aerospace medicine. Sponsored by Lockheed-Martin Space Operations.

Jeffrey R. Davis, M.D., M.S., is the 2008 recipient of the Theodore C. Lyster Award for his career devoted to the advancement of aerospace medicine. His contributions have significantly influenced both aviation and space medicine. During his career of over 20 years with NASA he has contributed to the development of advances in medical operations and spaceflight physiologic research. He has guided the research at NASA concerning medical intervention capabilities and countermeasures.

Dr. Davis' NASA responsibilities include leading the Space Life Sciences Directorate, providing the research and technology development required for exploration as well as all biomedical support to spaceflight operations of the Space Shuttle and International Space Station. The technical disciplines in the directorate include space medicine; research into the physiological changes induced by human exposure to reduced gravity and countermeasures to those changes; environmental monitoring including radiation; and habitability and human factors. He has made significant advances in the development of risk management for spaceflight using an evidence-based approach and guiding the research at NASA toward operational deliverables such as medical intervention capabilities and countermeasures that will enable successful exploration missions to the Moon and Mars. Dr. Davis uses his hands-on operational space medicine experience, his educational and academic background, as well as experience gained in the commercial environment to produce exemplary results in his leadership of NASA's space medicine and human research program. He developed an overall strategy (Bioastronautics Strategy), providing an organizational infrastructure to carry out the strategy (Space Life Sciences organizational realignment), and to respond to major changes in NASA's biomedical program. He manages the biomedical trades that must be made in the Flight Readiness Process, which is NASA's decision process for medically committing humans for each spaceflight mission. Dr. Davis balances this major operational responsibility with the responsibility to also conduct the biomedical research necessary to understand the risks and mitigation approaches to ensure the health, safety, and performance of flight crews.

Born in California, Dr. Davis received his B.S. degree in Biology from Stanford University in 1976 and an M.D. degree from the University of California at San Diego in 1980. He subsequently served his residency training in internal medicine and aerospace medicine, and is certified by the American Board of Preventive Medicine. He received an M.S. in 1983 from Wright Space University. He joined NASA as a flight surgeon in 1984 and from 1986-1987, he was Chief of the Flight Medicine Clinic at NASA Johnson Space Center (NASA-JSC). In 1987, he became Chief of the Medical Operations Branch at NASA-JSC, a position he left in 1991 to become Corporate Medical Director for American Airlines, Inc.

His national board participation has included service as the chair of the American Board of Preventive Medicine; chair of the Residency Review Committee for Preventive Medicine; president of the Aerospace Medical Association, and an executive committee member of the American Board of Medical Specialties. He is the senior editor of the text "Fundamentals of Aerospace Medicine, 4th edition." His awards include Outstanding Perfor-mance awards from NASA-JSC, several Group Achieve-ment awards from NASA-JSC, the Silver Snoopy award from the Astronaut Office, and a C. Everett Koop National Health Award Nomination. He is the recipient of AsMA's Julian E. Ward Award in 1985 and its Louis H. Bauer Founders Award in 1992 and also won the Harold B. Ellingson Literary Award in 1989 from AsMA's Associate Fellows Group.

Dr. Davis is currently a Professor of Clinical Preventive Medicine in the Department of Preventive Medicine and Community Health at UTMB. Under an Intergovernmental Personnel Act (IPA) agreement with NASA, he serves as Director, Space Life Sciences, NASA-JSC. Dr. Davis also serves as the Chief Medical Officer for JSC in support of the Health and Medical Technical Authority. He is a Fellow of the American College of Preventive Medicine and a member of the American Medical Association, the American College of Occupational and Environmental Medicine, the International Academy of Aviation and Space Medicine, the Airlines Medical Directors Association, and the Aircraft Owners and Pilots Association. He is also a Fellow of the AsMA and has served on its Executive Committee, as a Council Member, as President of the Space Medicine Association, as Chair of the Program Committee, as Chair of the Associate Fellows Group, and as a member of the Air Transport Committee.

MARIE MARVINGT AWARD

Robert Dille, M.D., M.I.H.

Established and sponsored by the French Aerospace Medical Association in memory of Marie Marvingt (1875-1963), a pioneer French pilot and surgical nurse who, for more than 50 years, actively and untiringly involved herself in the conception and development of air ambulance services and in the education of the general public regarding their use and benefits. The award is presented annually to honor excellence and innovation in aerospace medicine.

Robert Dille, M.D., M.I.H., was the 2008 recipient of the Marie Marvingt Award in recognition of his lifetime of innovation and excellence in Aerospace Medicine. His knowledge, teaching skills, and boundless enthusiasm have helped form generations of students into a

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cadre of leadership. He has contributed to the mechanisms installed in civil aviation medicine during his service at the FAA's Civil Aeromedical Institute. His work as the State Surgeon for the Oklahoma National Guard led to one of the best-trained groups of operational flight surgeons in the Guard, and his later work as Assistant Professor at Oklahoma University and as Director of the Residency in Aerospace Medicine was unfailingly outstanding. He has fostered a love of history and helped produce many of the current crop of aeromedical historians who were influenced by his enthusiasm and spirit.

Born in Waynesburg, PA, Dr. Dille earned a B.S. from Waynesburg College in 1952, then his M.D. degree from the University of Pittsburgh in 1956. He graduated from the USAF Primary Course in Aviation Medicine at Randolph AFB, TX, in 1957. He spent the next 2 years as Chief of the Aviation Medicine Section at the USAF Hospital in Loring AFB, ME. From 1959-1961, he attended Harvard University, where he earned an M.I.H. degree in 1960, and received training to become a USAF Flight Surgeon. He became Program Advisory Officer at the Civil Aeromedical Research Institute, OK, in 1961. Until 1965, he also served as Acting Chief of the Aeromedical Clinical Services Division, Acting Director of the Aeronautical Center Medical Clinic, and Regional Flight Surgeon for the FAA's Western Region. He was then recalled to become Manager of the FAA's Civil Aeromedical Institute. He retired from the FAA in 1987 and was Associate Professor at the University of Oklahoma from 1961-1998, Director of Residency in Aerospace Medicine from 1967-1972, Medical Director of the Oklahoma Department of Corrections from 1990-1993, a part-time clinician there from 1993-2002, a Physician at the Cleveland Co. Jail in Norman, OK, from 1994-2002, and a Surveyor for the National Commission on Correctional Health Care from 2000-2004.

Dr. Dille is Board-Certified in Aviation Medicine by the ABPM, and his honors include the USAF Commendation Medal, the U.S. Army Meritorious Service Medal, the Oklahoma Distinguished Service Medal, and the Army National Guard Flight Surgeon of the Year award. He is a member of the International Academy of Aviation and Space Medicine, and a Fellow of both the American College of Preventive Medicine and of the Aerospace Medical Association (AsMA). He has been awarded AsMA's 1978 Theodore C. Lyster Award and 1987 Harry G. Moseley Award, and has served as Chairman of AsMA's History and Archives Committee, as President of AsMA (1992-1993), and gave the Harry G. Armstrong Lecture in 1997. He has also been awarded the Society of Flight Surgeons Order of Aeromedical Merit.

Dr. Dille has published over 225 papers, book chapters, and articles, including the history chapter in "Fundamentals of Aerospace Medicine." For over two decades, he lectured regularly to airmen, flight instructors, accident investigators, and aviation medical examiners on the subjects of aircraft accident investigations, aviation toxicology, and aviation physiology. He was involved in establishing physiological training programs for civilian pilots at the FAA, U.S. Air Force, U.S. Army, U.S. Navy, and NASA and has also developed and built 85 portable Barany-type chairs and trained accident prevention specialists in their use.

JOHN PAUL STAPP AWARD

Dana B. Rogers, Ph.D.

This award was established and sponsored by Environmental Tectonics Corporation to honor Col. John Paul Stapp, USAF(Ret.). The award is given annually to recognize outstanding contributions in the field of aerospace biomechanics and to promote progress in protection from injury resulting from ejection, vibration, or impact.

Dana B. Rogers, Ph.D., is the 2008 recipient of the John Paul Stapp Award for advancing the understanding of the cause and effect relationships of the cardiovascular system under acceleration forces. He has long been a proponent of the use of piecewise linear systems analysis to evaluate pilot tracking and physiological behavior. He changed the direction of acceleration studies with his presentation at the 1975 AsMA meeting describing acceleration-induced changes in blood pressure by using linear systems modeling. He also initiated the design of an integrated multi-mainframe system, which provided the backbone of the fully integrated computer network used for machine control including experimental data collection and analysis. The theme of his latest paper details the dynamic nature of human response to maneuvering Gz(t) as G(t)LOC.

Dr. Rogers graduated from Bridgewater High School, Bridgewater, MA, in 1952. He attended Northeastern University and later Arizona State University while in the U.S. Air Force, where he earned a Bachelor of Science in Electrical Engineering in 1962. He then was assigned duty tours as a Strategic Air Command Communications officer and then Chief of specialized Minuteman Missile maintenance teams. Following that, he was assigned in 1967 to the Air Force Institute of Technology, where he earned a Masters Degree in Engineering. He requested assignment to the Air Force Medical Research Lab (AFMRL) at Wright Patterson AFB, where he became Branch Chief of the Dynamic Environmental Simulator (DES) Branch. During his tenure at AFMRL, he supervised initial operation and man rating of the DES and then ran a series of experiments in human performance in various flight conditions, including flat spin recovery, seat angle modifications, and various control methods. The results of this series of experiments were presented at a meeting of NATO (AGARD) in Brussels, Belgium.

At retirement, Dr. Rogers returned to graduate school at the University of Dayton to complete requirements for the Doctoral Degree in electrical engineering which was awarded in 1978. After graduation he entered academia as a professor at the University of New Hampshire and then at the University of Dayton. He returned to the AFMRL for a 3-year period from 1980-

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1983 to establish new programs in acceleration. He has done consulting and product development in manufacturing methods, laser optical inspection, gravure printing methods, predictive physiological models for aircraft flight maneuvering, and analysis of energetic amusement rides. He has directed several Doctoral Candidates who have become engineering leaders in business and academia.

Dr. Rogers is currently an Emeritus Professor of Electrical Engineering at the University of Dayton and Adjunct Professor of Biomedical Engineering at Wright State University. He is a Life Member of the IEEE and Emeritus Member of the Aerospace Medical Association.

JOHN A. TAMISIEA AWARD

Prof. Dr. Med. Uwe Stüben

This award was established and sponsored by the Civil Aviation Medical Association in memory of John A. Tamisiea, M.D. The award is given annually to an aviation medical examiner or other individual who has made an outstanding contribution to the art and science of aviation medicine in its application to the general aviation field.

Prof. Dr. Med. Uwe Stüben was the recipient of the 2008 John A. Tamisea Award for his invaluable contributions to the health and safety of countless aircrew and passengers. He has won worldwide acclaim for his numerous publications, professional assignments, and support of aeromedical education. His is one of the world's most highly recognized and respected practitioners of Aviation Medicine and has made wide-ranging contributions to the art and science of civil and commercial aviation medicine across an international spectrum. He also used his own financial resources to create a prize awarded for outstanding research conducted by young scientists and physicians that is now presented annually at the meeting of the German Society of Aerospace Medicine.

An experienced pilot and Aviation Medical Examiner for both the FAA and JAA, Dr. Stueben has contributed widely to the literature regarding sport aviation, especially regarding cardiovascular stress amongst glider pilots and students. This important body of work has vastly expanded the awareness of this critical problem amongst sport aviators and in doing so has certainly helped save lives.

Born in Meldorf, Germany, Prof. Stüben joined the German Navy in 1968 and attended the Naval Academy in Flensburg until 1971. In 1971, he became a medical student at the University of Frankfurt and earned his M.D. in 1979. From 1978-1979, he served as a Medical Officer in the German Navy with the rank of Captain. During this time, from 1971 until 1981, he was Chief of the Naval Medical Center in List. In 1981, he joined Internal Medicine and Surgery at the German Armed Forces Hospital in Hamburg.

When Prof. Stüben left the Navy in 1983 with the rank of Lieutenant Colonel, he became a General Practitioner in Aviation Medicine in Kaltenkirchen until 1989. In 1989, he joined Lufthansa's Medical Service and became Head of the Department of Aviation Medicine and Tropical Diseases, a position he still holds. In 1990, he founded the German Academy of Aviation Medicine in Frankfurt, where he was the Medical Director until 2002. This academy educated more than 300 AMEs in Germany, gave 25 scientific awards to young scientific researchers in the field of aviation and travel medicine, and sponsored important scientific research in aviation medicine and man-machine interface projects.

In 1996, Prof. Stüben became a professor at the Technical University of Braunschweig, where he teaches aviation medicine, ergonomics, and man-machine interface. From 2003 until the present, he serves as Medical Director of Lufthansa German Airlines and Head of the Aeromedical Center in Frankfurt. He has written 25 papers and has given hundreds of oral presentations in Germany and all over the world. Dr. Stueben has also fostered contacts between German and International Societies of Aerospace Medicine. He was instrumental in laying the common groundwork between the German Academy of Aviation and Tropical Medicine and the recently created European Society of Aviation Medicine. Dr. Stueben also leads efforts to standardize international aeromedical education and training of flight surgeons. In 2006 he organized the first FAA refresher seminar specifically designed for non-U.S. Aeromedical Examiners. This seminar has proven extremely popular and is to be presented again in 2008.

HARRY G. MOSELEY AWARD

Col. David "Lex"Brown, USAF, MC

Established in memory of Col. Harry G. Moseley, USAF, MC, in recognition of his material contributions to flight safety. It is given annually for the most outstanding contribution to flight safety. Sponsored by Lockheed-Martin Corporation.

Col. David "Lex"Brown, USAF, MC, is the 2008 recipient of the Harry G. Moseley Award in recognition for his work in forming the Human Systems Integration (HSI) Directorate at Brooks City-Base, TX, and for setting the standard for human performance doctrine in the USAF. He championed the enhanced G-suit and aviator mask, ensuring adequate acceleration protection in the Joint Strike Fighter. He provided critical expertise to operationally based vision assessment, leading to critically needed, evidence-based, visual assessment standards for aircrew. He supports the USAF AIRPRINT program at all levels and leads a dozen major contributors to Aerospace Medicine as Program Director of the USAF Pilot Physician Program.

Col. Brown is Director, Performance Enhancement Directorate, 311 Human Systems Wing, Air Force

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Materiel Command, Brooks City-Base, TX. He is responsible for Human Performance and Human Systems Integration for the USAF and leads a team that develops execution strategy for human integration in acquisition and analysis of human performance gaps in fielded weapon systems. Starting with 5 people and no budget, Col. Lex Brown forged the first USAF HSI Directorate of 32 positions with a budget of $2.4M. His handpicked team includes physiology and psychology doctorates, aerospace medicine specialists, program managers, human factors engineers, and safety specialists who designed and implemented an HSI program for the acquisition of USAF weapon systems. He recognized the lack of HSI in unmanned aerial systems. He committed money and manpower to analyzing the Predator system in the midst of Operation Iraqi Freedom and Operation Enduring Freedom. His deficiency findings in aircrew shift scheduling, ground control station interface, and manpower selection led to solution sets accepted by Air Combat Command, dramatically improving system safety. Additionally, a desktop Predator simulator was developed and research on novel head-up display symbology was conducted to allow all-weather aircraft recovery and landing.

Col. Brown bridged a gap in the human performance capability requirement, resulting in a web-based process accessible by all field units with assignable offices of responsibility, visibility of gap solutions, and a search engine to discover documents related to specific problems. Recognizing that the USAF lacked a unified human performance doctrine, his team, through extensive professional reading and analysis of existent AF guidance, wrote a doctrinal vision incorporating human performance sustainment, optimization, and enhancement to ensure that Airmen perform at their peak from selection to retirement. As the director of the USAF Pilot-Physician Program, he placed pilot-physicians at three major commands and the Office of the Secretary of Defense to lead HSI offices and advocate for human performance doctrine. Col. Brown drove the concept of operations for an HSI division in the proposed Human Performance Wing at Wright-Patterson AFB, culminating his dream of a human performance center of excellence and improving aerospace safety from the instant a capability is conceived until the system providing it is retired.

A 1971 graduate of Texas Christian University with a B.S. in biology, Col. Brown attended Undergraduate Pilot Training at Reese AFB, TX, earning his wings in April 1972. From then until 1980, he flew the A-7D Corsair II, the OV-10 Bronco, and the A-10 Thunderbolt II. In 1980, he separated from the Air Force to attend medical school at Texas Tech University Health Sciences Center, Lubbock, TX. He earned a Doctor of Medicine degree in 1984, was board certified in family practice in 1987, and practiced family medicine until 1992. He also earned a Diploma in Aviation Medicine from the Royal College of Physicians.

Col. Brown rejoined the USAF in 1992 as a flight surgeon and became a pilot-physician in 1993, flying the F-117A Nighthawk stealth fighter. From 1997-1999 Col. Brown was a researcher with the Air Force Research Laboratory, and from 1999-2002 he was the Senior Medical Officer Pilot with the RAF Centre of Aviation Medicine, RAF Henlow, UK, flying the Hawk T Mk 1.

He is a Fellow of the Aerospace Medical Association, Fellow of the American Academy of Family Physicians, and Fellow of the Royal Aeronautical Society. He is a Diplomate in the American Board of Family Practice and a member of the Society of U.S. Air Force Flight Surgeons and the International Association of Military Flight Surgeon Pilots. His awards include the Meritorious Service Medal with three oak leaf clusters, the National Defense Service Medal with one oak leaf cluster, the Global War on Terrorism Service Medal, the Korean Defense Service Medal, the AF Longevity Service with five oak leaf clusters, and the Air Force Achievement Medal.

ARNOLD D. TUTTLE AWARD

James Ross M.B.B.S., M.P.H.

Established in memory of Col. Arnold D. Tuttle, USAF, MC. Awarded annually for original research that has made the most significant contribution toward the solution of a challenging problem in aerospace medicine and which was published in Aviation, Space, and Environmental Medicine. *Sponsored by Wyle Laboratories.*

James Ross, M.B.B.S., M.P.H., received the 2008 Arnold D. Tuttle Award for his role as lead author of "Antidepressant use and safety in civil aviation: a case-control study of 10 years of Australian data" (ASEM 2007; 78:749-55). This article explored safety-related outcomes related to the use of antidepressant medication in pilots and air traffic controllers, which was allowed by the Australian aviation medical certification authorities starting in 1987. The study used a matched cohort of holders of Australian aviation medical certificates who had been prescribed antidepressants and a matched comparison group. They found no significant differences between the two groups, and thus no evidence of adverse safety outcomes.

Dr. Ross has published several other papers, including "A case of G-LOC in a propeller aircraft" (ASEM 1990; 61:567-8). Born in Australia, he earned an M.B.B.S. from Monash University, an M.P.H. from Adelaide University, and is board-certified in Australia in Occupational Medicine. He was an exchange officer at USAF HQ Air Combat Command at Langley AFB, VA, in 1995. He has been a member of the Aerospace Medical Association since 1995. He has served as President of the Australian Military Medicine Association from 1991-1995, and is a member of the Aviation Medical Society of Australia and New Zealand, ACOEM, and the Wilderness Medical Society. He has also received a commendation medal for brave conduct.

Dr. Ross holds post-graduate qualifications as a specialist in Occupational Medicine and Public Health Medicine. In addition, he has a Masters degree in Sports Medicine and a post-graduate certificate in e-healthcare. He has extensive experience in Aviation Medicine and

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Medical Administration, policy development, accident investigation, disaster medicine, program management, and human factors.

Dr. Ross spent 26 years with the Australian Defence Force (Royal Australian Air Force), from 1980 to early 2007, including clinical, command, and policy roles. Since then he has continued in the RAAF reserve. His research in the ADF has been involved with F111 fuel tank de-seal-reseal program health effects, a program of studies investigating the health impact of deployments to Iraq, Afghanistan, East Timor, Bougainville, and the Solomon Islands, an innovative approach to a revision of anthropometry standards for aircrew, and an alignment of physical recruitment standards to the physical demands of various employment categories.

In addition to his long connection with the military, Dr. Ross provided consultancy to the Civil Aviation Safety Authority from 2001 to 2006, both in assessing aircrew fitness and in developing health standards for aircrew. In this capacity, he led the research project reviewing the impact of permitting certificated aircrew to fly whilst using antidepressant medication. In 2002, as Aero-medical Evacuation Operations Officer for the United Nations, he was part of the Peacekeeping Force based in Dili, East Timor. He was also deployed to Iraq in 2006.

Dr. Ross is an Associate Professor at both the University of Queensland and the University of South Australia. He is a senior Occupational Physician, a fellow of the faculty of Occupational Medicine (RACP) since 1989, Public Health Physician, and a fellow of the faculty of Public Health Medicine since 1993. He also established and was the founding president of the Australian Military Medicine Association. Since January 2007 he has been the Regional Medical Director, Australasia, for International SOS.

JULIAN A. WARD AWARD

Lt. Col. Lisa K. Snyder, USAF, MC

Established and sponsored by the Society of U.S. Air Force Flight Surgeons in memory of its first member to lose his life in an aircraft accident, and to honor all flight surgeons whose lives are lost in the pursuit of flying activities relating to the practice of aerospace medicine. The award is given annually for superior performance and/or outstanding achievement in the art and science of aerospace medicine during residency training.

Lt.Col. Lisa K. Snyder received the 2008 Julian E. Ward Award in recognition of her commitment to developing the art and science of Aerospace Medicine during her residency. Her projects have advanced the education of flight surgeons in primary training, in aerospace medicine residency, and in the field. She has presented cases at an international meeting, has prepared clinical papers for publication that spanned many topics, and brings energy and curiosity to all projects, enriching the art and science of Aerospace Medicine through publication and teaching.

Lt.Col. Snyder was the only one of her classmates who designed and gathered her own data for her research project: the first formal and comprehensive survey of flight surgeons in the Air National Guard and Air Force Reserves. She presented her project to three general officers, who in turn will use the results to re-orient aerospace medicine policy in the ANG and AF Reserves. In addition, she re-wrote the Occupational Health chapter of the "Chief of Aerospace Medicine Tactics Guide" and developed a distance learning module on toxicology that is already used by hundreds of young flight surgeons. She also re-designed the Chief of Aerospace Medicine course to increase its applicability for reserve physicians. She prepared two cases for the journal *Aviation, Space, and Environmental Medicine*, one on thrombocytopenia and the other on posterior subcapsular cataracts. She also presented two different cases at the AsMA Meeting in May 2007 on neurologic decompression sickness and cardiac arrhythmia.

Lt.Col. Snyder is currently assigned to the Air National Guard (ANG) Readiness Center, Andrews AFB, MD. She completed the Residency of Aerospace Medicine Course in 2007 and serves as Chief, Aerospace Medicine Division and is the Medical Waiver Authority for the ANG. A native of Berkeley Springs, WV, she earned a B.S. in Biology at Old Dominion University in Norfolk, VA, in 1990. From 1990-1991, she did post-graduate coursework in biochemistry and Histology at that institution. She earned an M.D. degree in 1995 from Eastern Virginia Medical School in Norfolk and served a transitional internship at the Eastern Virginia Graduate School of Medicine from 1995-1996. She was an Emergency Medicine Resident there from 1996-1999. From 1999-2001, she held a Toxi-cology Fellowship at Methodist Hospital in Indianapolis, IN, and earned an M.P.H. in 2006 from Indiana University/Purdue University.

Lt.Col. Snyder was commissioned into the ANG in Terre Haute, IN, in 2001. Until 2003, she was the Chief of Aerospace Medicine at 181 MDG in Terre Haute and from 2003-2006, she was Assigned Squadron Medical Element acting as Chief of Aerospace Medicine. She took part in a humanitarian mission to Guatemala in 2002, was a member of a Safety Investigation Board in Houston, TX, in 2004, a member of an Accident Investigation Board, High Profile Incident, at Andrews AFB, MD, a flight surgeon for Operation Deep Freeze in 2005 at McMurdo Station, Antarctica, and a Squadron Medical Element during AEF deployment in 2005 for the 181st Fighter Wing, 113th Fighter Squadron, at Kadena AB in Okinawa, Japan. Her civilian experience includes being Medical Manager, Urban Search and Rescue Teams supporting VA Task Force II and Indiana Task Force I; Aeromedical Transport Physician with 140+ flights; Team Physician on-scene support for FBI and State Police SWAT Teams; Staff Physician, Emergency Medicine, at Methodist Hospital; and Assistant Professor and Staff Emergency Medicine Physician at seven hospitals and at the University of Virginia in Charlottesville.

Lt.Col. Snyder's awards include the 2004 Command Operational Flight Surgeon Safety Award from the Society of U.S. Flight Surgeons; the Air Force Meritorious Service Medal; the Air Force Achievement Medal; the Antarctica Service Medal; and the John P. McDade, M.D., Award for Research in the field of Emergency Medical Care from the Virginia College of Emergency Physicians.

This Month in Aerospace Medicine History-- July 2008

By Walter Dalitsch III, M.D., M.P.H.

Seventy-five Years Ago

First round-the-world solo flight: Two years after a round-the-world flight with navigator Harold Gatty, Wiley Post repeated his flight solo. Taking off in his Lockheed Vega Winnie Mae from New York's Floyd Bennett Field on July 15, 1933, Post made the 15,596 mile journey in seven days, nineteen hours. The northern hemisphere route included a new record on the New York to Berlin leg of twenty-six hours, and 50,000 people ultimately greeted him back to Bennett Field at 11:50 p.m. on July 22. The plane was equipped with an autopilot by Sperry Gyroscope Company, as well as a radio direction finder (6).

Visual findings in pilot physical examinations (Corvallis, OR): "Acting as medical examiner for the Aeronautics branch of the Department of Commerce, I have data on 121 examinations. My consideration of them has been colored by my course of study under the Army School of Aviation Medicine. While these examinations are all too few to permit generalization, yet a recounting of my observations may be useful, for comments similar to those that I wish to make have not appeared within the limited extent of my reading. For what it may be worth, I present the following observations concerning visual acuity and depth perception.

"Of the 121 examinees only two were rejected because of defect in depth perception. One was so myopic as to be unable to see the apparatus clearly and one with a seriously defective left eye had a perception varying from 23 to 200 mm. These were so far off that I have given them no further consideration and have not included them in my averages. Of course I was not dealing with the ordinary run of young men but only with those who knew something of the physical requirements and who would not come in for examination if they thought they had a defect.

"Of those examined[:}

"90 had vision normal or better and the same in both eyes

"19 had vision normal or better but not equally good in both eyes…

"10 had vision not quite normal

"2 were rejected for very poor vision…

"One transport pilot following a prolonged mild alcoholic spree had seemingly entirely recovered and vision was excellent, but he had a very slight tremor, and depth perception was so bad that I could not pass him. I urged him to keep out of the air and two weeks later he had improved to 15 mm. but on two previous examinations he had made 9 mm. and 11 mm. I have not seen him again and am curious to know if this damage is permanent. I was surprised to note the damage done to this sense by apparently minor disturbances" (3).

Fifty Years Ago

Space: The New Frontier": In the introduction to this symposium I would like to point out that when the final history of space travel is written, the year 1957-1958 will stand out among the most important milestones. This will be true, first, because of the incontrovertible demonstration this year that the orbiting of vehicles above the drag of the atmosphere is possible and feasible; second, that they operate in general according to past calculations; third, that there are no particular 'bogey men' up there which have not been suspected, pretty well assessed and properly taken into consideration; fourth, because public interest and support of the space travel effort has caught up with and possibly is now running ahead of programs for its accomplishment.

"That which is true of space travel is similarly true of space medicine. Certainly, we of this organization have been among the leaders and pioneers and have done more than our part in pointing to the path and the problems. This service has been performed in a dignified manner which has always appeared logical, reasonable, and digestible to the scientific community and the public" (1).

Recycling urine for drinking water in space: "The one way in which we may sustain the intrepid space adventurer in a state of homeostasis for prolonged periods of many weeks, or months, without a severe weight penalty for such items as water, food, oxygen storage, and carbon dioxide absorbers, will be to reutilize all body wastes – solids, liquids, and gases. Of course, this is precisely what nature normally does but there is usually a relatively prolonged period of time between excretion and reutilization. The critical point is the flight duration beyond which weight penalties of cycling equipment are less than weight penalties of extra food, water, and waste storage containers.

"Under such extraterrestrial conditions, the human urine will be the chief source of water supply, ranging from 1000 to 1600 ml. per day. To this will be added water vapor from the air, waste water used for washing, and the water content of the algae or other biological culture media. For the purpose of this paper, however, the discussion will be directed toward the treatment of urine in a closed ecological system…

"[I]t becomes apparent that on a weight basis, the distillation-recondensation method is feasible after four weeks, the solar still, after two to three days, and the ion exchange, freezing and electro-osmosis methods, after one week. On a volume basis the solar still is feasible only after four months, while the distillation and ion exchange method is feasible after two weeks and the freezing and electro-osmosis methods again, after one week…

"Storage batteries were assumed to be the most reliable source of energy supply. Solar energy, of course, would be most feasible. However, no efficient, high output method has yet been developed to harness this power… Because of the weightless state any system would have to be enclosed and under suction or some driving force" (5).

Twenty-five Years Ago

Helping the alcoholic pilot (United Airlines, Chicago, IL): "The rehabilitation program at United Airlines strives for early identification of alcoholics, with constant monitoring by an educated team consisting of the flight surgeon, flight manager, and union representative. Confidentiality is essential and great caution and planning are required before confronting a suspected alcoholic pilot. UAL now has over 120 recovering pilots with an average rehabilitation time of 4 months and remission time of 3 years, by which time the probability of relapse has returned to baseline…

"Less than 10 years ago, the alcoholic pilot was dismissed or medically retired, often with a different diagnosis or, if enough seniority had accumulated, was allowed to take early normal retirement. Management, peers, and physicians seemed to take the quietest and easiest avenue in disposing of the alcoholic pilot" (4).

Alcoholism in aviation (Huntsville, TX): "In the U.S.A., 8% of aviation accidents are related to alcohol abuse. Guidelines for the recognition, prevention and alleviation of alcoholism are given. It is important that the physician-patient relationship is encouraged to allow continuity of observation, which is essential for the diagnosis of psychiatric disorders…

"Between 1965-75, there were approximately 50,000 general aviation accidents in the U.S.A., of which about 600 were associated with psychological and/or physiological impairment or incapacitation. Psychiatric factors were associated with 77 accidents (less than 0.5%) but alcohol was associated in over 400 (8%). About two-thirds of all accidents related to physical impairment of the pilot in command…

"Unfortunately, the medical profession has had a solid record of failure in the treatment of alcoholism. An alleged authority on the treatment of alcohol abuse states: 'Almost all of my patients who have had any success in recovery have done so with Alcoholics Anonymous.' The only requirement for joining AA is the desire to stop drinking – without motivation there will be no cure.

"The pervasive attitude in U.S. society that the drunk is a comic object is slowly changing. Respected laymen with persuasive talents are appearing in the media warning susceptible individuals, particularly teenagers, of the disastrous consequences of excessive alcohol use. Athletes, actors, and other well-known public figures, to a degree, are participating in this educational program. Regrettably, there is much more to be done because, particularly in the entertainment media, the hopelessly inebriated individual can be characterized as an amusing spectacle. The 'macho' image is associated with heavy drinking. There have been movies where the pilot in command was under the influence of alcohol with supposedly hilarious comic sequences. It is unfortunate that the tragic end results of human debris and twisted metal are not also presented as the almost inevitable end result of this particular behaviour. While there is a role for the physician to play in the recognition and treatment of alcohol abuse, at this point it is not well-defined and the most effective control of this problem has been, and probably will remain, peer pressure" (2).

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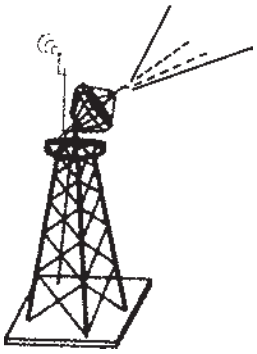

Science & Technology Watch

Keeping You Informed Of The Latest Advances In Science And Technology

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In this edition of the Watch, Dr. Robins has provided a review of hyperbaric chamber therapy, with particular discussion of new monoplace chambers and their expanded role in emergency medicine.

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Chamber Advances for Delivery of Hyperbaric Oxygen Therapy

Marc Robins, D.O., M.P.H., Hyperbaric Medicine, Utah Valley Regional Medical Center

Following evidence-based criteria, the Undersea and Hyperbaric Medical Society has approved hyperbaric oxygen therapy (HBOT) for emergency management of the following acute medical conditions: acute exceptional blood loss anemia; acute thermal burns; carbon monoxide poisoning; clostridial gas gangrene and other necrotizing soft tissue infections; compromised skin grafts and skin flaps; crush injury compartment syndrome and other acute traumatic ischemias; cyanide poisoning; decompression sickness (DCS) and arterial gas embolism (AGE); intracranial abscess; radiation tissue damage; refractory osteomyelitis; and selected problem wounds.

Hyperbaric chamber types vary but all are essentially either 'multiplace' versions with room for two or more individuals within the main treatment vessel, or a single person 'monoplace' chamber. Multiplace chambers often have one or more ante-chamber 'locks' of variable sizes allowing separate pressurization for passage of personnel, food, medications, or equipment into the main chamber or patient waste out without interrupting treatment.

Most of the conditions noted above can be treated in either multiplace or monoplace chambers with equivalent results. The exceptions are few but include acute severe conditions such as cerebral AGE that rarely requires the use of higher pressures (6,7). Few of the older monoplace chambers are able to achieve pressures greater than 2-3 absolute atmospheres (ATA), but most multiplace chambers are able to reach the 6-ATA pressures required by the USN Table 6A protocols (4). Multiplace chambers are generally preferred for treating the more critical patients with acute DCS symptoms due to their capability of locking equipment and having appropriately trained medical attendants inside for critical care monitoring. An inside nurse or medical attendant with full resuscitation equipment can readily manage treatment for vomiting and seizures. Patient procedures are also practicable during HBOT and examination during treatment can be comprehensive (3).

The simplest monoplace chambers are used only for emergency onsite treatment and extraction and consist primarily of an air impervious bag with an attached pressure gauge, light enough to carry in a backpack for treatment of high-altitude illnesses during mountaineering expeditions. The victim is zipped into the bag and pressurized up to about 2-ATA with a foot pump. A slightly more robust version of a soft-walled, inflatable chamber, the Hyperlite Emergency Hyperbaric Stretcher System (EHSS), is employed by emergency service providers, including the U.S. Navy and Air Force, primarily for rapid initiation and maintenance of hyperbaric pressure while in transit to a full care hyperbaric unit.

With improving technology and greater cost efficiency, more complex monoplace treatment chambers, featuring monitored, computerized control of humidity, temperature, and pressure, have become common for most uses of hyperbaric treatment. In most systems either compressed air or oxygen is introduced into the enclosure from an external supply. Some are able to use inline sources from hospital oxygen generator systems. 100% oxygen from an external source may provide the sole gas for chamber pressurization or the patient may be pressurized using an ambient air source while breathing 100% oxygen as needed through a tight-fitting mask. Many of the newer designs in monoplace chambers make use of larger internal space (8). Chamber diameters from 30 to 40 inches allow semi-recumbent positioning and more freedom of movement. Combined with clear acrylic walls, it reduces the incidence of claustrophobia commonly experienced in smaller models while providing unobstructed, direct visualization for monitoring. Penetration portal systems allow passage of tubing and wiring from outside to inside for attachment of critical care monitoring equipment and even ventilators. Some monoplace chambers, when pressurized with 100% oxygen, can be easily vented or purged to an ambient air mixture as needed for air breaks without losing pressurization. This eliminates the need for a mask or hood for oxygen delivery.

While conventional chambers generally require external air and/or oxygen sources for pressurization, sometimes employing huge banks of pressurized cylinders, some monoplace chambers are designed to be efficient self-contained systems. These use one compressor to pressurize the internal chamber with outside air passed through an oxygen generation system with moisture, particle, and carbon filters. Exhaust air is withdrawn by a second compressor, passed through a heat exchanger and one or more molecular sieves to scrub carbon dioxide and recover oxygen. The gas is then delivered back into the interior of the sealed chamber, concentrating the oxygen up to 95-98% pure. This highly efficient closed-loop system maintains constant pressure in the return air, decreasing the gradient between the input and output gas loop pressures, greatly reducing overall energy requirements while eliminating the need for external provision of gases. Oxygen recovery can either be returned to the system or stored for later use (5).

The determination of severity in acute decompression cases is often non-distinct as to what type of chamber can be utilized. The old but still often used terminology of Type I DCS for musculoskeletal or skin only symptoms or Type II DCS for the more severe neurological symptoms are being replaced by emerging trends in nomenclature that are more descriptive to the actual symptoms and acuity demonstrated. Therefore, defining protocols to treat only Type I symptoms in monoplace chambers are no longer valid. Newer advances in monoplace chamber design and technology provide a greater range and availability of treatment options, even for the acute, critical care patient. Evidence clearly shows a benefit for earlier pressurization in the treatment of severe DCS symptoms. Monoplace chambers are found in more facilities and locations throughout the world due to their greater affordability and space management. Therefore, the chance of obtaining early treatment, preferably within the first few hours following onset of symptoms, are more likely in monoplace chambers (1,3).

The acceptable acuity level for treating an obtunded patient in a monoplace chamber will depend on a careful risk assessment, taking into consideration purge rates and emergency extraction times, availability of the right equipment and training of the medical staff in critical care skills, and their comfort level with applying these skills to the hyperbaric environment. Many HBOT medical teams have extensive experience and training necessary to successfully treat critical care patients in monoplace chambers while use of a team with little experience may increase the risk for complications (2).

Multiplace chambers remain the ideal standard of care for emergency delivery of HBOT for the treatment of severe DCS. This review does not advocate the use of a monoplace chamber in place of multiplace chambers for critical care when both are available. However, some critical patients may receive greater benefit by earlier recompression in a properly manned and outfitted monoplace chamber.

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The AsMA Science and Technology Committee provides the Watch as a forum to introduce and discuss a variety of topics involving all aspects of civil and military aerospace medicine. Please send your submissions and comments via email to: barry.shender@navy.mil. Watch columns are available at www.asma.org in the AsMA News link. under Publications.

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Space Medicine at the NASA-JSC, Neutral Buoyancy Laboratory

By Samuel Strauss

The Neutral Buoyancy Laboratory (NBL) at NASA-Johnson Space Center (JSC) in Houston, TX, is where essential training in Extravehicular Activity (EVA) is conducted for U.S. astronauts and our international partners. Medical support for this training is provided by two flight surgeons from the Kelsey-Seybold Clinic, Drs. Sam Strauss and Dan Fitzpatrick, and a team of both medical staff and physiologists from Wyle Laboratories comprising the Human Test Support Group.

The NBL, which is located in the Sonny Carter Training Facility, consists of a 6.2-million-gallon water tank that is 202 ft long, 102 ft wide, and 40 ft deep (the largest indoor pool in the world). It provides controlled neutral buoyancy operations to simulate weightless conditions experienced by Space Shuttle and Space Station crews during spaceflights. The facility uses full-size mockups of spaceflight equipment inside the water tank, including the Space Shuttle cargo bay, the International Space Station, functioning remote manipulator arms, orbital replacement units, and associated flight hardware.

The ability to successfully perform on-orbit assembly and maintenance operations is critical to future space missions. The International Space Station requires hundreds of hours of spacewalks for assembly. The phenomenal scientific discoveries of the Hubble Space Telescope are also a direct result of successful maintenance spacewalks. Spacewalks will continue to be the cornerstone of future space initiatives and the NBL is the critical foundation for successful spacewalk preparation and training.

Neutral buoyancy is the equal tendency of an object to sink or float. If an item is made neutrally buoyant through a combination of weights and flotation devices, it will seem to "hover" under water. In such a state, even a heavy object can be easily manipulated, much as it is in the zero gravity of space. However, there are two important differences between neutral buoyancy that is achieved in the NBL and weightlessness. The first is that suited astronauts training in the NBL are not truly weightless. While they are neutrally buoyant, they nonetheless feel their weight while in their suits. The second is that water drag hinders motion, making some tasks easier and others more difficult to perform in the NBL than in zero gravity. These differences are recognized by spacewalk trainers and relayed to the astronauts in training. However, despite all of these differences, neutral buoyancy is still the best method currently available to train astronauts for spacewalks.

EVA mission training is provided for assigned missions scheduled on orbit from the Space Shuttle and International Space Station. The training-to-flight ratio is approximately 7-10 h of training for each 1 h of EVA planned on orbit. Therefore, a flight in which three EVAs consisting of 7 h each are planned would typically require 150-210 h of in-water, mission specific training. Mission training flows usually start approximately 1 yr before the scheduled spaceflight.

The training environment is essentially hard-hat diving to a maximum depth of 40 ft. The suit is pressurized above ambient to 4.3 psi, adding approximately 10 ft of water pressure. Unlike the Extravehicular Mobility Unit (EMU) used in space, the NBL suits are tethered to an umbilical, which delivers breathing gas (Nitrox 46 = 54% nitrogen, 46% oxygen), cooling water, and communications. This system is monitored and controlled by the NBL Environmental Control System. EMU training is supported by a team of NASA divers assigned to safety, utility, and video camera functions. Neutral buoyancy weigh-outs distribute various weights on several locations of the EMU to allow the astronauts to float neutrally buoyant in any desired body position and depth while underwater. The effects of changing water pressure with depth, fluid resistance, and Earth's gravity are experienced in the NBL, which make this training environment somewhat different from conditions of weightlessness in space.

The NBL Human Test Support team is responsible for the screening and monitoring of the astronauts and NBL divers. A fully configured hyperbaric chamber is always available during diving operations should emergency decompression illness treatment be necessary. In the 10 yr of NBL diving operations there has not been a verified case of decompression sickness or air embolism. The medical group is also prepared to respond to any major or minor medical emergency that may occur to any of the 250 employees working on site.

The team also supports the NASA

See NBL, p. 733.

Fig. 1. NBL flight surgeon Sam Strauss training on the Space Shuttle mockup.

Fig. 2. The NBL configured with mockups of the Space Shuttle cargo bay and the International Space Station.

NBL, from p. 732.

Altitude Physiology Training course required for all astronauts, aircraft flight crew, and flying researchers. This program consists of aerospace physiology lectures and an altitude chamber flight which includes hypoxia and rapid cabin decompression demonstrations. The flight surgeon screens students for chamber flights, sits on console managing the hypoxia demonstration, and in-flight issues such as ear and sinus blocks. Rare cases of DCS have occurred as a result of Altitude Physiology Training and have been managed successfully with the use of 100% oxygen or a hyperbaric oxygen treatment protocol in the adjacent hyperbaric chamber. We also provide medical operations support as the flight surgeon on console for astronaut space suit vacuum chamber training, and operational altitude chamber human research.

The NBL flight surgeons are also assigned to manage the Reduced Gravity Flight Operations program, and fly as crew on board the NASA C-9 aircraft. The program conducts a variety of bioscience, applied engineering, physics, and chemistry experiments while in parabolic flight microgravity (0 g, 1/6 g - Lunar, or 1/3 g - Martian). The flight surgeon provides a medical briefing prior to each flight, and motion sickness prevention medication (scopolamine and dextroamphetamine). Medication and prevention strategies have been shown to reduce the incidence of significant symptoms for first time fliers from 80 to less than 20%. An in-flight rescue injection of scopolamine is also an option when medically indicated.

Drs. Strauss and Fitzpatrick have also served as crew surgeons for the NASA Extreme Environment Mission Operations (NEEMO) project. The purpose of the project is to develop opportunities for using the "Aquarius" habitat as an analogue for spaceflight and long-duration space habitation. Aquarius is an undersea research laboratory in a pressurized environment resting at more than 60 feet on the bottom in the Atlantic Ocean off Key Largo, FL. This project allows opportunities for astronauts, scientists, physicians, Mission Control Center personnel, and engineers to develop operational concepts, conduct experiments, perform space-analogue tasks, and sharpen team and interpersonal skills. The crew surgeon supports crew training in Key Largo and may dive onto the habitat prior to the start of the mission. He then supports the mission from Johnson Space Center, similar to a space mission.

SMA JEFF MYERS YOUNG INVESTIGATOR AWARD

The Space Medicine Association's Jeff Myers Young Investigator Award is presented to a young investigator who is the primary author of an outstanding presentation in the area of Aerospace Medicine presented at the current Annual Scientific Meeting of the Aerospace Medical Association. In addition to being the primary author, the work must be original and the young investigator must be presenting at the Annual Scientific Meeting for the first time. The Award is intended to encourage young investigators new to the field of Aerospace Medicine.

The applicant must submit a draft manuscript of their presentation to the chair of the Jeff Myers Young Investigator Award sub-Committee. To be considered for the 2008 award, manuscripts must be submitted by March 15, 2008 to:

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In Memoriam
Marge Hessberg

(taken from the memorial program with additions by Peggy Trumbo and Pam Day)

Marjorie Graham Hessberg died of complications to pulmonary fibrosis on April 26, 2008 in Leesburg, VA. She was born in Akron, OH, on July 3, 1923. She was a graduate of Russell Sage College, Troy, NY, where she received her B.S. in Nursing. She became a nurse at Albany Medical Center Hospital in Albany, NY, where she met her husband, Rufus R. Hessberg, Jr., M.D. (Dr. Hessberg was a former Executive Vice President of AsMA from 1989-1992.)

Marge was, foremost, wife, mother, grandmother, and volunteer. She traveled the world as a military wife, settling in Upper Marlboro, MD, in 1965 until her move to Falcons landing in Sterling, VA in 1996, as a charter member of the community. A seemingly indefatigable volunteer, she was involved with various committees of officers' and officers' wives clubs, volunteered at diverse military base thrift shops, worked with service organizations for military dependents and supported numerous other military-related volunteer organizations.

She held the office of president of the Wives' Wing of the Aerospace Medical Association in 1973 and served on many of the Wing's committees. She was a volunteer for the Russell Sage College, and held many leadership positions in the Presbyterian Church including elder, deacon, clerk of session, and Commissioner to Presbytery. She was a Red Cross volunteer (at Malcolm Grow Medical Center) and later an educator for diabetes classes.

More recently, she was a volunteer at the Johnson Center, assisting in exercise probrams, had participated in the Falcons Landing tennis program, and had just begun her position as a reader for Head Star Programs. A true Renaissance woman, whe continued her life-long quest for learning, most recently refreshing her violin skills, and studying Italian and French.

Some Personal Comments from Wing Members about Marge Hessberg

Rufus and Marge were very involved in the development and support of what was then known as the "Wives' Wing". Lois Moser, a longtime friend of Marge's, remembers her days on the Wing board in the 1980s. "Marge and Rufus were wonderful to me during the annual October Wing board meeting which was always held in Bethesda. They would meet us at the airport, and then we stayed with them at their home in Maryland. They took good care of us."

Though so many miles apart, Helene White continued her very special friendship with Marge through regular phone calls and notes. "Marge was the epitome of a true, gentle lady," said Helene. "And she was, indeed a true friend." As Helene thought back over the years in the Wing with Marge, she said "That was a special time in our lives and a real family feeling in our relationship. Even though our ages were much the same, she was a mentor for me."

"Marge was my own personal angel," said Pam Day. "When my mom was in the Johnson Center, I could always depend on Marge to run out and get supplies and to stop by for a visit when I couldn't be there. She also hosted a lovely 'Bed & Breakfast' for me, my aunt and cousin when we needed a place to stay while visiting my mom. I could never thank her enough for all her kindness."

For those who wish, memorial contributions may be made to Falcons Landing Benevolent Fund, 20522 Falcons landing Circle, Potomac Fall, VA 20165.

AsMA Future Meetings

May 3-7, 2009
Westin Bonaventure Hotel
Los Angeles, CA

May 9-13, 2010
Sheraton Hotel
Phoenix, AZ

May 8-12, 2011
Egan Convention Center
Anchorage, AK

News of Members

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Colonel David E. Geyer, USAF, MC, CFS, Command Surgeon, United States Strategic Command, is currently serving a 15-month tour as Task Force Med Commander/455 Air Expeditionary Medical Group, Bagram Airfield, Afghanistan. Colonel Geyer is responsible for medical operations and approximately 1100 multi-service personnel throughout the Afghanistan theater. He assumed command 9 April 2008.

Robert R. Orford, M.D., CM, M.S., M.P.H., FACOEM, was installed as the new president of the American College of Occupational and Environmental Medicine (ACOEM) in April in New York. Dr. Orford was among 10 physicians who took office during ACOEM's 93rd annual membership meeting. He is Consultant and Former Chair, Division of Preventive, Occupational Medicine, and Aerospace Medicine, at Mayo Clinic Arizona in Scottsdale. He is an Assistant Professor at Mayo Medical School and Associate Professor at the University of Texas Medical Branch in Galveston. Dr. Orford received his M.D. and CM from McGill University, Montreal, Canada, his M.S. from the University of Minnesota, and his M.P.H. from the University of Washington in Seattle. He has been certified by the Royal College of Physicians and Surgeons of Canada in internal medicine and community medicine, by the American Board of Internal Medicine, and by the American Board of Preventive Medicine in occupational medicine, aerospace medicine, and public health and general preventive medicine.

In Memoriam

Dr. Edwin Hendler

Dr. Edwin (Ed) Hendler, 85, of Cherry Hill, NJ, a retired Federal Aerospace Physiologist, died peacefully while working at his desk on March 30, 2008. For more than 40 years, starting in 1947, he was employed by the Naval Air Engineering Center in Philadelphia, and upon the center's transfer, he worked at the Naval Air Development Center in Warminster, PA. During most of these years he was the Head of the Life Sciences Division of the Aerospace Crew Equipment Laboratory (ACEL), later renamed the Crew Systems Department. In that capacity, he directed the basic and advanced research work of aerospace scientists, engineers, and technicians to establish the criteria to adapt aircrew to the hostile environment in which they are required to perform. He was a pioneer in his specialized field. In 1974 he was chosen as a Fellow of the Aerospace Medical Association for his outstanding contributions in the field of aerospace medicine for his research in the safety and performance of persons involved in air and space travel.

Dr. Hendler authored numerous scientific articles and publications related to the physiological effects of extremes in acceleration, pressure breathing, spatial disorientation, hypoxia, and other threats to pilot/crew performance and survivability. Ed was a "hands-on" supervisor. Using the unique facilities of the Center, he personally led a number of programs directly supported by the U.S. Navy and other Federal agencies, such as NASA (National Aeronautics and Space Administration), DOT (Department of Transportation), and NIH (National Institutes of Health). The information gathered during these programs was often directly transferred for use in the civilian sector. A listing of just some of the many programs he was responsible for is as follows:

- Development of impact and penetration test methodologies for head protective systems (helmets).
- Respiration studies for NASA to determine the effects of breathing oxygen at high altitude while working with the original Mercury Astronauts.
- Senior physiologist in charge of the development of the Mercury Astronauts' pressure suits.
- Determination of the optimum oxygen environment needed for long-term space travel using long-term habitability testing in the Navy altitude chamber.
- Human volunteer immersion studies to determine the effectiveness of anti-exposure suits, which became a requirement during military operations over frigid waters.
- Conduct of research studies to determine the effects of high impact acceleration forces on the human body.

Dr. Hendler was born in Philadelphia on August 29, 1922. He grew up in the West Philadelphia section of the city and graduated from West Philadelphia High School where he won the American Legion Award and was the president of the school. He earned his undergraduate degree from Pennsylvania State University, his Master of Science degree from Cornell University, and his Ph.D. in Physiology from the University of Pennsylvania. He served as a Naval Officer during World War II and attained the rank of Commander during his tenure in the U.S. Navy Reserves.

Obituary Listings

AVM Peter Howard, RAF(Ret), of Church Crookham, Hampshire, England, has died. A Fellow of AsMA, AVM Howard received its Eric Liljencrantz Award in 1978 for his many contributions to the field of acceleration physiology during his long tenure at the RAF Institute of Aviation Medicine at Farnborough. He also delivered the 1977 Armstrong Lecture.

Gerald Noga, M.D., Winston-Salem, NC, a former AsMA Fellow and member since 1969, has died. He received his Bachelor's degree from the U.S. Military Academy and his M.D. from George Washington University and was a former U.S. Army flight surgeon.

New Members

Ballard, Sarah-Blythe, M.D., Niceville, FL
Bard, Catherine S., Lt.Col., USAF, MC, APO, AP
Barson, John K., B.S., Peachtree City, GA
Buschmann, Donald K., M.D., Victoria, BC, Canada
Chiodo, Ernest P., M.D., J.D., M.P.H., Clinton Township, MI
Cummis, Scott M., Maj., USAF, MC, San Antonio, TX
Douglas, Thomas H., COL, NC-ANG, MC, Charlotte, NC
Edelmann, Karl J., Col., USAF, MC, Ann Arbor, MI
Endo, Toru, Capt., USAF, MC, San Angelo, TX
Frank, Frederick M., Maj., USAF, MC, North Liberty, IA
Geraci, Vincent T., Capt., USAF, MC, Stony Brook, NY
Ingham, Tiffany M., Capt., USAF, MC, Williamsburg, VA
Jansen, Scott T., Capt., USAF, MC, APO AP
MacKenzie, Karen M., Maj., USAF, MC, Visalia, CA
Nowell, Clifton M., Capt., USAF, MC, Mililani, HI
Okabe, Hideaki, M.D., Ph.D., Ota-ku, Tokyo, Japan
Otto, William C., Maj., USAF, MC, Laurel, MD
Restivo, Natalie L., Maj., USAF, MC, Tacoma, WA
Sakurada, Hideki, M.D., Ph.D., Ota-ku, Tokyo, Japan
Schiavone, Michael A., Maj., Yardley, PA
Townson, Walter K., Maj., USAF, MC, Sandy, UT
VanderArk, Stephen T., B.A., M.S., Houston, TX
Vu, Lynda K., Lt.Col., USAF, MC, Kaneohe, HI
Wu, Jimmy H., B.S., Webster, TX
Zeffiro, Thomas A., M.D., Ph.D., Potomac, MD

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POSITIONS AVAILABLE

AEROSPACE MEDICINE SPECIALIST

The Tennessee Air Guard is looking for one special person to fill the above position. Position requires military membership in the Air National Guard and is located in Memphis. Serve one weekend per month and 15 days of active duty per year and receive a tremendous incentive package, to include a $75K cash bonus and a $50K student loan repayment program. Please email CV to Bradley.tidwell@us.af.mil for further information and qualifications. Also check out our website at www.goang.com.