MISS ALICE STOLL

1969 ACHIEVEMENT AWARD RECIPIENT

Miss Alice Stoll, Research Physiologist, Aerospace Medical Research Department, Naval Air Development Center, was selected as the recipient of the 1969 SWE Achievement Award "in recognition of her significant contributions in the field of the development of fire-resistance fibers and fabrics, based on her pioneering studies of heat transfer by flame contact."

Miss Stoll has pioneered in the multi-discipline field of biophysics and engineering. The importance to this space age of not only combining widely different fields but also of focussing on the practical applications of this combination cannot be overestimated.

This nominee is recommended for her contribution in the field of heat transfer, in the disciplines of biophysics and engineering. The contribution consists of the revolutionization of the approach to protection of military and civilian personnel against skin burns due to flame contact and thermal radiation. The nominee invented an apparatus and method of analysis of heat transfer by flame contact which provided previously lacking basic knowledge on the production and prevention of thermal burns. Thus it became possible for the first time to rate different materials as to their ability to protect humans from thermal pain and blisters. Formerly fire-retardant treatments of fabrics were thought to provide the ultimate in protective clothing for ordinary wear. The work of this nominee demonstrated that fabric constructions of inherently fire-resistant fibers were not only feasible but also far superior to treated fabrics. Her efforts have resulted in acceptance of the material (Nomex, a product of DuPont) for standard issue fire-resistant clothing in all branches of the armed services. Hospitals are adopting it for bed-linens and sleep-wear for paraplegics; it is being incorporated in protective clothing for racing car drivers and firemen, and in various civilian uses from thermal underwear to ironing board covers. More important than these applications, however, is the impetus this breakthrough has given industry to develop better fire resistant fibers and fabrics, as attested by the highly competitive activity now going on among the leaders of the textile world.

Miss Stoll received her education at Hunter College of New York (B.S. 1938 in chemistry and physics) and at Cornell University Graduate School at the Medical College, New York (M.S. 1948 in physiology and biophysics). She is author/co-author of numerous technical papers on her research.

In 1956 she was employed by the Federal Government as a physiologist and is presently Head of Biophysics and Bioastronautics Division and is carrying out extensive work on thermal effects in skin, protective materials, and spacecraft atmospheres.

She is active in several technical societies and is a Fellow of the American Association for Advancement of Science; Aerospace Medical Association; Associate Fellow and Charter Member of the Biophysical Society; member of the American Physiological Society, American Society of Mechanical Engineers, American Geophysical Union and Arctic Institute of North American. She has participated as lecturer and as a panelist in discussion boards concerned with women in science and engineering. Her hobbies are travel, athletics, and gardening.

Society of Women Engineers
345 E. 47th Street New York 17, N. Y. PLaza 2-6800

28 May 1969

~~L-7103~~
L9129

Miss Phyllis Gaylard
SWE Publications Chairman
604 Evergreen Street, Apt. 7
Inglewood, California 90302

Dear Phyllis:

I enclose the publicity material on the SWE Achievement Award winner for 1969, Miss Alice Stoll. I have sent identical copies to Sue Schur, Tess Tierney, and Gabrielle Smith.

I hope I have not overlooked anything.

Sincerely,

Marguerite Rogers

MARGUERITE ROGERS

Encl: 1

Miss Alice Stoll, Research Physiologist, Aerospace Medical Research Department, Naval Air Development Center, was selected as the recipient of the 1968 SWE Achievement Award "in recognition of her significant contributions in the field of the development of fire-resistant fibers and fabrics, based on her pioneering studies of heat transfer by flame contact." The SWE Achievement Award is presented annually to a woman who has distinguished herself in the engineering profession. Miss Stoll's career amply justifies this honor.

Miss Stoll has pioneered in the multi-discipline field of biophysics and engineering. The importance to this space age of not only combining widely different fields but also of focussing on the practical applications of this combination cannot be overestimated.

This nominee is recommended for her contribution in the field of heat transfer, in the disciplines of biophysics and engineering. The contribution consists of the revolutionization of the approach to protection of military and civilian personnel against skin burns due to flame contact and thermal radiation. The nominee invented an apparatus and method for the analysis of heat transfer by flame contact which provided previously lacking basic knowledge on the production and prevention of thermal burns. Thus it became possible for the first time to rate different materials as to their ability to protect humans from thermal pain and blisters. Formerly fire-retardant treatments of fabrics were thought to provide the ultimate in protective clothing for ordinary wear. The work of this nominee demonstrated that fabric constructions of inherently fire-resistant fibers were not only feasible but also far superior to treated fabrics. Her efforts have resulted in acceptance of the material (Nomex, a product of DuPont) for standard issue fire-resistant clothing in all branches of the armed services. Hospitals are

adopting it for bed-linens and sleep-wear for paraplegics; it is being incorporated in protective clothing for racing car drivers and firemen, and in various civilian uses from thermal underwear to ironing board covers. More important than these applications, however, is the impetus this breakthrough has given industry to develop better fire resistant fibers and fabrics, as attested by the highly competitive activity now going on among the leaders in the textile world.

The details of the foregoing work are contained in open literature cited in the bibliography appended. Fundamental biophysics data was published in 1959 which (1) related time and temperature to the production of burns in humans, and (2) presented an analysis of the relationship between pain and tissue injury (#24). Practical aspects of the protection possible through Nomex flight clothing were expounded in 1962 (#32). A series of three papers in 1964 (#35) described: (1) an apparatus and method (patent #3,148,531 issued 15 September 1964) for analyzing flame contact heat transfer through thin layers of material in two-layer systems; (2) the experimental validation of the mathematical equations and physics involved; and (3) the application of both apparatus and method to the determination of thermal constants in materials in thin layers. Later papers in 1965 to 1967 (#38, 39, 42 and 43) discussed the significance of the observed heat transfer data with respect to protection from flame contact as compared with radiation, pointing out that two-layer systems which are remarkably effective in flame contact may be of little or no use in protecting from thermal radiation. Papers currently in press are concerned with the correct measurement of optical properties of fabrics (#44) and the derivation and use of a practical rating scale for evaluating thermal protection (#45). In the latter work, an important new correlation was developed between the body of

knowledge derived from empirical observations in living subjects and that knowledge derived from heat transfer studies in physical systems. Thus, the absorbed energy productive of pain and tissue injury was related quantitatively to the temperature rise in a physical system. This correlation provided a reference scale whereby protection from pain or blistering could be predicted, in terms of tolerance time for living skin, from simple laboratory observations on small samples of inert materials. This accomplishment fills a long-standing need, for hitherto there has been no satisfactory laboratory means of assessing the fire protective effectiveness of clothing. Currently, in consultation with Miss Stoll, both military and industrial laboratories are adopting and adapting these methods in their research and development programs so that textile engineering principles can be employed and evaluated scientifically in thermal protection applications.

Miss Stoll received her education at Hunter College of the City of New York (B.A. 1938 in chemistry and physics) and at Cornell University Graduate School at the Medical College, New York City (M.S. 1948 in physiology and biophysics). She served as a research assistant in the fields of allergy, basal metabalism, and infrared spectrophotometry at Cornell University Medical College in New York City from 1938 to 1943. In 1943 she joined the Navy and was released to inactive duty as Lieutenant (J.G.) in 1946. She served in the Reserves until August 1966 and retired with rank of Commander.

Miss Stoll attended graduate school as a Research and Teaching Assistant from 1946 to 1953, where she did research in environmental physiology and instrumentation. She obtained a patent on Panradiometer and is the originator of the Thermistor Radiometer now available commercially.

In 1956 she was employed by the Federal Government as a physiologist and carried on research on the cardiovascular effects of acceleration.

In 1956 she became Special Technical Assistant to the Research Director and carried out research in thermal tissue damage and pain sensation, managing to sandwich in the routine administration of a laboratory of approximately 70 personnel.

In 1960 Miss Stoll became Head of Thermal Division, conducting studies in thermal radiation and flame contact effects and the development of fire resistant materials and methods of study. Since 1964 she has been Head of Biophysics and Bioastronautics Division (which includes her former Thermal Division) and is carrying out extensive work on thermal effects in skin, protective materials, and spacecraft atmospheres.

Miss Stoll is active in numerous technical societies, including acting as Chairman of Technical Committee K-17 (Heat Transfer in Biotechnology) of the Heat Transfer Division of the American Society of Mechanical Engineers. She is a Fellow of the American Association for Advancement of Science; Aerospace Medical Association; Associate Fellow and Charter Member of the Biophysical Society; member of the American Physiological Society, American Society of Mechanical Engineers, American Geophysical Union and Arctic Institute of North America. She has given numerous presentations of technical papers. She has participated as lecturer and as panelist on discussion boards concerned with women in science and engineering. Her hobbies are travel, athletics, and gardening.

Judges for this year's award are:

Dr. N. E. Ward, Assistant Technical Director for Weapons Systems and Head Aviation Ordnance Department, Naval Weapons Center, China Lake, California.

Dr. Frank Cartwright, Director of Data and Industrial Systems of Communications and Electronics Division, Philco Corporation, Philadelphia, Pennsylvania.

Mr. Howard C. Appleman, Manager Hopkins Manufacturing, Ordnance Division, Honeywell, Inc., Hopkins, Minnesota.

Dr. W. B. Simecka, Chief Scientist, Nortronics, Anaheim, California.

Dr. G. E. Sutton, Head, Mechanical Engineering Department, University of Nevada, Reno, Nevada.

The Chairman of the Awards Committee was Dr. Marguerite M. Rogers of the Naval Weapons Center, China Lake, California.

1. NAME: Miss Alice M. Stoll

2. POST OFFICE ADDRESS: Spring Valley and Mill Roads
R.D. #2
Doylestown, Pa.

3. DATE AND PLACE OF BIRTH: 8/25/17
Long Island, New York

4. MARITAL STATUS: Single

5. PRESENT POSITION: Research Physiologist, GS-14, $19,206 per annum
Aerospace Medical Research Department
Naval Air Development Center
Johnsville, Warminster, Pa. 18974

6. NAME, GRADE AND TITLE OF IMMEDIATE SUPERVISOR:

Dr. Carl F. Schmidt
PL 313
Research Director
Aerospace Medical Research Department
Naval Air Development Center
Johnsville, Warminster, Pa. 18974

7. BRIEF SUMMARY OF BASIS FOR RECOMMENDATION:

This nominee is recommended for her contribution in the field of heat transfer, in the disciplines of biophysics and engineering. The contribution consists of the revolutionization of the approach to protection of military and civilian personnel against skin burns due to flame contact and thermal radiation. The nominee invented an apparatus and method for the analysis of heat transfer by flame contact which provided previously lacking basic knowledge on the production and prevention of thermal burns. Thus it became possible for the first time to rate different materials as to their ability to protect humans from thermal pain and blisters. Formerly fire-retardant treatments of fabrics were thought to provide the ultimate in protective clothing for ordinary wear. The work of this nominee demonstrated that fabric constructions of inherently fire-resistant fibers were not only feasible but also far superior to treated fabrics. Her efforts have resulted in acceptance of the material (Nomex, a product of DuPont) for standard issue fire-resistant clothing in all branches of the Armed services. Hospitals are adopting it for bed-linens and sleep-wear for paraplegics; it is being incorporated in protective clothing for racing car drivers and firemen, and in various civilian uses from thermal underwear to ironing board covers. More important than these applications, however, is the impetus this break-through has given industry to develop better fire-resistant fibers and fabrics, as attested by the highly competitive activity now going on among the leaders in the textile world. (See detailed information attached).

8. RESUME OF FEDERAL EMPLOYMENT

1953-1956 Physiologist. Carried on research in acceleration and cardiovascular effects.

1956-1960 Special Technical Assistant to the Research Director. (1957-1958, Head of Physiology Department during military service of regular incumbent). Conducted research in thermal tissue damage and pain sensation part time. Carried on routine administration of the laboratory (approximately 70 personnel) and acted for the Research Director during his absence from the premises, customarily two or three days a week. Advised Research Director on personnel, organization, fiscal and research administration problems.

1960-1964 Returned to full-time research as Head of Thermal Division conducting studies in thermal radiation and flame contact effects and development of fire-resistant materials and methods of study.

1964 to date Head of Biophysics and Bioastronautics Division (encompassing former Thermal Division) conducting research on thermal effects in skin, protection materials and spacecraft atmospheres.

9. RESUME OF NON-FEDERAL EMPLOYMENT

1938-1943 Research assistant in fields of allergy, basal metabolism and infrared spectrophotometry at Cornell University Medical College - New York City.

1943-1946 Active duty in Navy.

1946-1953 Graduate student, Research and Teaching Assistant, and Research Associate, Department of Physiology Cornell University Medical College. Research in environmental physiology, instrumentation (patent on Panradiometer #2, 685,795 issued August 1954; originator of Thermistor Radiometer now available commercially), and research methods.

10. RESUME OF MILITARY SERVICE

Enlisted in U. S. Naval Reserves July 1943; Pharmacists Mate 2nd Class September 1943; Officer Candidate School March 1944; Ensign, Hospital Corps May 1944; released to inactive duty April 1946 as Lt(j.g.); served in Reserves until August 1966, retired with rank of Commander, Medical Service Corps. Principle duty both enlisted and officer was in research in Parasitology (Bibliography reference #2,3,4,5 and 6).

11. RESUME OF EDUCATION

a. Secondary school - St. Peter High School, Staten Island, New York
b. College - Hunter College of the City of New York
(B.A. 1938, chemistry and physics)

Cornell University Graduate School (at the Medical College, New York City)
(M.S. 1948, physiology and biophysics)

c. None

12. RESUME OF SPECIAL AWARDS OR HONORS

a. Civil Servant of the Year 1965 presented by the Federal Business Association and the Federal Personnel Council of Philadelphia for significant achievements in thermal research.

b. Incentive awards from Naval Air Development Center for publications of technical papers in: acceleration research, flame contact studies, thermal protection capacity of aviator's textiles, a thermistor temperature-gradient measuring device, atmospheric oxygen enrichment effects on burning rates, skin temperature measurements, thermal protection principles, and chapter on heat transfer in biotechnology.

c. Incentive awards from Naval Air Development Center for invention disclosure and patent of instrument for heat transfer analysis.

d. Appointment as Chairman of Technical Committee K-17 (Heat Transfer in Biotechnology) of the Heat Transfer Division of the American Society of Mechanical Engineers for 3-year period 1965-1968.

e. Letter of commendation in Navy Officer's Jacket for leadership in organizing ONR Research Reserve Company 4-12 while serving as Officer-in-Charge of a panel of USNRR Company 4-2.

13. PARTICIPATION IN SOCIETIES, ORGANIZATIONS, CIVIL ACTIVITIES AND HOBBIES

Fellow of the American Association for Advancement of Science; Aerospace Medical Association; Associate Fellow of the charter member of the Biophysical Society; member of the American Physiological Society, American Society of Mechanical Engineers, American Geophysical Union and Arctic Institute of North America. Numerous presentations of technical papers; occasional lecture and participation as panelist on discussion board concerned with women in science.

Hobbies: travel, athletics and gardening.

14. PUBLISHED PAPERS, ARTICLES OR BOOKS

Bibliography appended.

15. INVENTIONS

a. Liquid cell for infrared spectrophotometer, 1943.

b. Thermistor radiometer, 1952 - first thermistor radiometer (prototype of many now used for surface temperature measurements) used in field and laboratory studies in ambient temperatures as low as -45°C for measurement

of sky, ground, skin and other surface radiant temperatures. Available commercially.

c. Panradiometer (co-inventor) - an instrument for measuring environmental radiation partitionally. Patented 1954, #2,685,795.

16. PUBLICITY MATERIAL

Photograph appended.

Item #7 (Continued)

BASIS FOR RECOMMENDATION (IN DETAIL)

The details of the foregoing work are contained in the open literature cited in the bibliography appended. Fundamental biophysical data was published in 1959 which: (1) related time and temperature to the production of burns in humans, and (2) presented an analysis of the relationship between pain and tissue injury (#24). Practical aspects of the protection possible through Nomex flight clothing were expounded in 1962 (#32). A series of three papers in 1964 (#35) described: (1) an apparatus and method (patent #3, 148,531 issued 15 September 1964) for analyzing flame contact heat transfer through thin layers of material in two-layer systems; (2) the experimental validation of the mathematical equations and physics involved; and (3) the application of both apparatus and method to the determination of thermal constants in materials in thin layers. Later papers in 1965 to 1967 (#38,39,42 and 43) discussed the significance of the observed heat transfer data with respect to protection from flame contact as compared with radiation, pointing out that two-layer systems which are remarkably effective in flame contact may be of little or no use in protecting firm thermal radiation. Papers currently in press are concerned with the correct measurement of optical properties of fabrics (#44) and the derivation and use of a practical rating scale for evaluating thermal protection (#45). In the latter work, an important new correlation was developed between the body of knowledge derived from empirical observations in living subjects and that knowledge derived from heat transfer studies in physical systems. Thus, the absorbed energy productive of pain and tissue injury was related quantitatively to the temperature rise in a physical system. This correlation provided a reference scale whereby protection from pain or blistering could be predicted, in terms of tolerance time for living skin, from simple laboratory observations on small samples of inert materials. This accomplishment fills a long-standing need, for hitherto there has been no satisfactory laboratory means of assessing the fire protective effectiveness of clothing. Currently, in consultation with this nominee, both military and industrial laboratories are adopting and adapting these methods in their research and development programs so that textile engineering principles can be employed and evaluated scientifically in thermal protection applications.

BIBLIOGRAPHY

1943 to 1948

1. Hypothermia in Experimental Infections. XII. The Effect of Hypothermia on Resistance to Experimental Pneumococcus Infection. Muschenheim, C., Duerschner, D., Hardy, J. D. and Stoll, A. M. J. Inf. Dis. 72: 187-196, 1943.

2. Sterilization of Individual Water Supplies (canteens). XII. An Evaluation of Elemental Bromine Absorbed on Activated Silica. Mathieson, D. R. and Stoll, A. M. Naval Medical Research Institute Project X-110. Report No. 3, 6 July 1944.

3. Evaluation of Canteen Dechlorinators. Stoll, A. M. Naval Medical Research Institute, Project X-110, Report No. 6, 8 February 1945.

4. Comparison of Methods for Detecting Eggs of Schistosoma Japonicum in Feces. Naval Medical Research Institute, Project X-535, 25 April 1945. Stoll, A. M. and Mathieson, D. R.

5. The Effect of Ultraviolet Radiation on Cysts of Endamoeba Histolytica. Stoll, A. M., Ward, P. A., and Mathieson, D. R. Science 101:463, 4 May 1945.

6. The Survival Time of Cysts of Endamoeba Histolytica in Sea Water. Stoll, A. M. Naval Medical Research Institute, Project 133, 23 Jan 1946.

7. Direct Experimental Comparison of Several Surface Temperature Measuring Devices. Stoll, A. M., Hardy, J. D. Rev. Sci. Instr. 20: 678-686, 1949 and Fed. Proc. 7: 120, 1948.

1949 to 1959

8. Temperature: Measuring Devices. Stoll, A. M. and Hardy, J. D. Medical Physics, Vol. 2, Otto Glasser, 1950 (p 1112-1116).

9. Study of Thermocouples as Skin Thermometers. Stoll, A. M. and Hardy, J. D. J. Appl. Physiol., Vol II, 10: 531-543, 1950.

10. Measurement of Radiant Heat Load on Man in Outdoor Environment. Stoll, A. M. Fed. Proc. 10: Part I, 139, 1951.

11. The Pantadiometer: An Absolute Measuring Instrument for Environmental Radiation. Richards, C. H., Stoll, A. M. and Hardy, J. D. Rev. Sci. Instr. 22: 925-934, 1951.

12. A Method for Measuring the Radiant Temperature of the Environment. Stoll, A. M. and Hardy, J. D. J. Appl. Physiol. 5: 117-124, 1952.

13. Thermistor Radiometer for Measurement of Skin Temperature of Small Areas. Stoll, A. M. Fed. Proc. 12, Part I, 138, 1953.

1954 to 1958

14. Cutaneous Pain Threshold in the Native Alaskan Indian and Eskimo. Meehan, J. P., Stoll, A. M. and Hardy, J. D. J. Appl. Physiol. 6: 397, 1954.

15. A Wide Range Thermistor Radiometer for the Measurement of Skin Temperature and Environmental Radiant Temperature. Stoll, A. M. Rev. Sci. Instr. 25: 184-187, 1954.

16. Radiometric Methods for Measurement of Skin Temperature. Hardy, J.D. and Stoll, A. M. Methods in Medical Research, Vol 6, Chicago, Yearbook Publishers, 1954.

17. Measurement of Radiant Heat Load on Man in Summer and Winter Alaskan Climates. Hardy, J. D. and Stoll, A. M. J. Appl. Physiol. 7:200-211, 1954.

18. Thermal Radiation Measurements in Summer and Winter Alaskan Climates. Stoll, A. M. and Hardy, J. D. Transactions Am. Geophys. Union 36: 213-226, 1955.

19. Human Tolerance to Positive G as Determined by Physiological End Points. Stoll, A. M. J. Av. Med. 27: 356-367, 1955.

20. Relation of Thermal Pain and Tissue Injury to Stimulus Intensity-time and Skin Temperature. Stoll, A. M. and Hardy, J. D. Fed. Proc. 15: Part I, 181, 1956.

21. Responses of the Rat to Thermal Radiation. Hardy, J. D., Stoll, A. M., Cunningham, D., Benson, W. M. and Greene, L. C. Am. J. Physiol. 189: 1-5, 1957.

22. G Tolerance in Primates. I. Unconsciousness End Point. Kydd, G. H. and Stoll, A. M. J. Av. Med. 29: 413-421, June 1958.

23. Physiological and Pathological Effects in Chimpanzees during Prolonged Exposure to 40 Transverse G. Stoll, A. M. and Mosely, J. D. J. Av. Med. 31: 8 August 1958

1959 to 1963

24. Relationship between Pain and Tissue Damage due to Thermal Radiation. Stoll, A. M. and Greene, L. C. J. Appl. Physiol. 14: 373, May 1959.

25. The Production of Burns by Thermal Radiation of Medium Intensity. Stoll, A. M. and Greene, L. C. Mechanical Engineering 81: No. 8, 74, August 1959.

26. Temperature Measuring Devices. Stoll, A. M. Medical Physics Vol. III, Otto Glasser, Editor, 1960 (659-660).

27. Pain and Thermal Burns in Skin Areas Previously Exposed to Ultraviolet Radiation. Stoll, A. M., Greene, L. C. and Hardy, J. D. J. Appl. Physiol. 15: 489-492, May 1960.

28. The Role of the Skin in Heat Transfer. Stoll, A. M. Journal of Heat Transfer of the ASME 82: 239-242, August 1960.

29. A Computer Method for the Determination of Tissue Damage Integrals from Experimental Data. Stoll, A. M. IRE Transactions on Medical Electronics ME-7, #4: 355-358, Oct. 1960.

30. Thermistor System for Measuring Thermal Gradients. Stoll, A. M. Fed. Proc. 20: 401, Mar 1961.

31. Fabric for Flight Clothing, Amer. Dyestuff Reporter, p 35-38 and 86, Nov 13, 1961. Hays, M. B. and Stoll, A. M.

32. Thermal Protection Capacity of Aviator's Textiles. Stoll, A. M. J. of Aerospace Medicine 33: #7, 844-850, July 1962.

33. The Measurement of Bioclimatological Heat Exchange. Stoll, A. M. "Temperature: Its Measurement and Control in Science and Industry" Vol. III, Part 3: 73-82, 1963 Reinhold Pub. Corp, N.Y., N.Y.

1964 to present

34. Heat Transfer in Protection from Flames. Chianta, M. A. and A. M. Stoll, Aerospace Med. 35: 7-11, Jan 1964.

35. Flame Contact Studies, Parts I, II, and III. Stoll, A. M., Chianta, M. A., and Monroe, L. R. J. Heat Transfer of ASME Series C 449-456, August 1964.

36. Effect of Oxygen Enriched Atmospheres on Burning Rate of Fabrics, Chianta, M. A. and Stoll, A. M., Aerospace Med. 35: #9, 870-873, Sep 1964.

37. Techniques and Uses of Skin Temperature Measurements, Stoll, A. M., Annals. of N. Y. Acad. of Sci. 121: Art. 1, 49-56, Oct 9, 1964.

38. Thermal Injury by Radiation and Flame Contact. Stoll, A. M. and M. A. Chianta, Fed. Proc. Am. Soc. Exp. Biol. 28: Mar-Apr 1969.

39. Thermal Protection Principles, Stoll, A. M. and M. A. Chianta, AGARD publication of papers presented in September 1969.

40. Effect of Inert Gases in Fabric Burning Rate, Chianta, M. A. and A. M. Stoll (to be published in Aerospace Med., presented 18 Apr 1966)

41. Mathematical Model of Skin Exposed to Thermal Radiation, Weaver, J.A. and A. M. Stoll (to be published in Aerospace Med., presented 21 April 1966)

42. Heat Transfer in Biotechnology, Stoll, A. M. Chapter for Vol 4 of Advances in Heat Transfers, 1967, edited by J. P. Hartmett & T. F. Irvine

43. Burn Production and Prevention in Convective and Radiant Heat Transfer. Stoll, A. M. and M. A. Chianta. Aerospace Medicine 39: #10, 1097-1100, October 1968.

44. Measurement of Optical Properties of Fabrics. Stoll, A. M. and M. A. Chianta. Accepted for publication in Textile Research Journal, 10 October 1968.

45. A Method and Rating System for Evaluation of Thermal Protection. Stoll, A. M. and M. A. Chianta. To be submitted to J. Applied Physiology, December 1968.