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VOLUME V. PLANETARY QUARANTINE, SECOND EDITION

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Mary Shipp Watson and Frances Hong

of the

Biological Sciences Communication Project

C. W. Shilling, M. D., Director

The George Washington University Medical Center

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PREFACE

As the amount of scientific information continues to "explode", bibliographies have become an important means by which science administrators and research scientists can maintain a current awareness of their primary and relative fields of interest. In addition to listing the available literature, bibliographies can be used to identify scientists, laboratories, and institutions conducting research in similar disciplines, and to examine the growth and changing directions of research in specific subject areas.

The second edition of <u>Scientific Publications of the Bioscience Programs</u> <u>Division of the National Aeronautics and Space Administration</u> consists of five volumes: Volume I, Behavioral Biology; Volume II, Environmental Biology; Volume III, Exobiology; Volume IV, Physical Biology; and Volume V, Planetary Quarantine. Each principal investigator was requested to contribute his current list of publications resulting from research support by the Bioscience Programs Division, and to edit the citations included in last year's bibliography.

Publications appearing as serial literature, monographs, books, reports and speeches were used in compiling this bibliography. This volume contains a list of citations arranged chronologically according to author's names, a permuted title index, an author index, and a senior author and laboratory directory.

The authors gratefully acknowledge the technical assistance of Mrs. Roger Allen and Betty Yee in the preparation of this report.

TABLE OF CONTENTS

PREFACE	• • • • • • • •		• • • • • • • • • • •		• • • • • • • • • • •		page 111
LIST OF	CITATIONS		•••••			• • • • • • • • • •	1
AUTHOR I	NDEX	• • • • • • • • • • •	••••				20
PERMUTED	TITLE IN	DEX	•••••		• • • • • • • • • • • •		22
SENIOR AU	UTHORS AN ABORATORY	D ABBREVIAT ADDRESSES	ED •••••		• • • • • • • • • • • •	() C O O O O O O O O	37
JOURNALS	PUBLISHI	NG PLANETAR	Y OUARANTIN	E ARTICLES			42

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SCIENTIFIC PUBLICATIONS OF THE PLANETARY QUARANTINE PROGRAM.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

1962

1. CORNELL, R. G. A method for fitting linear combinations of exponentials. Biometrics 18(1):104-113. 1962.

1964

- 2. CORNELL, R. G. Spearman estimation for a simple exponential model. FSU Statistical Rept. M-52. Tallahassee, Fla., Florida State University, 1964. 9 p.
- KOLODZIEJ, B. J., and SLEPECKY, R. A. Trace metal requirements for sporulation of <u>Bacillus</u> <u>megaterium</u>. J. Bacteriol. 88:821-830. 1964.
- ROGOLSKY, M., and SLEPECKY, R. A. Elimination of a genetic determinant for sporulation of <u>Bacillus subtilis</u> with acriflavin. Biochem. Biophys. Res. Commun. 16:204-208. 1964.

- 5. CORNELL, R. G. Spearman estimation for a simple exponential model. Biometrics 21(4):858-864. 1965.
- 6. CORNELL, R. G., and SPECKMAN, J. A. Estimation for a one-parameter exponential model. J. Amer. Stat. Ass. 60:560-572. 1965.
- 7. FAVERO, M. S., PULEO, J. R., and TRITZ, G. J. Techniques for removing microbial contamination from spacecraft hardware. I. A model system. Presented at Arizona Chapter of the American Society for Microbiology, Phoenix, Arizona, December 11, 1965.
- GILLIS, J. R., ROSAS DEL VALLE, M., VINTER, V., and SLEPECKY, R. A. Sporulation studies in a synchronous culture of <u>B</u>. <u>megaterium</u>. Bacteriol. Proc., p. 37. 1965.

9. GRUFT, H. M., BUCKMAN, J., and SLEPECKY, R. A. Amino acid replacement of the manganese sporulation requirement of <u>B. megaterium</u> in a synchronous system. Bacteriol., Proc., p. 37., 1965.

うれの説

No. of Concession, Name

- 10. POWERS, E. M. Microbial contamination of a surface by handling. GSFC Document X-624-65-491. Greenbelt, Md., Goddard Space Flight Center, November, 1965. 5 p.
- 11. POWERS, E. M. Microbial profile of laminar flow clean rooms. GSFC Document X-600-65-308. Greenbelt, Md., Goddard Space Flight Center, September, 1965. 40 p.
- 12. PULEO, J. R., and FAVERO, M. S. Recovery of viable microorganisms from solids. Presented at Arizona Chapter of the American Society for Microbiology, Phoenix, Arizona, December 11, 1965.
- 13. ROGOLSKY, M., and SLEPECKY, R. A. Induction of asporogeny in <u>B</u>. <u>subtilis</u> with acriflavin.. Bacteriol. Proc., p. 36. 1965.
- 14. VINTER, V., and SLEPECKY, R. A. Direct transition of outgrowing bacterial spores to new sporangia without intermediate cell division. J. Bacteriol. 90:803-807. 1965.

249

- 15. BEAKLEY, J. W., WHITFIELD, W. J., and MASHBURN, J. C. Deposition of nutrients to surfaces by Rodac plates. Rept. SC-RR-66-386. Albuquerque, N. M., Sandia Corp., July, 1966. 16 p. Refs.
- 16. BEAKLEY, J. W., WHITFIELD, W. J., and MASHBURN, J. C. Evaluation of the efficiency of a class 100 laminar-flow clean room for viable contamination cleanup. Rept. SC-RR-66-385. Albuquerque, N. M., Sandia Corp., September, 1966. 9 p. 9 refs.
- 17. BEAUCHAMP, J. J., and CORNELL, R. G. Simultaneous nonlinear estimation. Technometrics 8(2):319-326. May, 1966.
- 18. COOLEY, W. C., and SCHALKOWSKY, S. Special problems in spacecraft sterilization. <u>In</u> Proceedings of the National Conference on Spacecraft Sterilization Technology, Pasadena, Calif., Nov. 16-18, 1965, p. 547-556. Washington, D. C., Nat. Aeron. Space Admin., 1966. 7 refs. (NASA SP-108)

- 19. DUGAN, V. L. Production of low concentration particulate aerosols by a sonic disseminator technique. Rept. SC-RR-67-14. Albuquerque, N. M., Sandia Corp., December, 1966. 16 p.
- 20. FAVERO, M. S. Assessment of microbial contamination on space hardware. Presented before the American Society for Microbiology, Los Angeles, Calif., May 1-5, 1966 and published in Bacteriol. Proc., 1966. (Abstract)
- 21. FAVERO, M. S. Factors influencing detection and enumeration of microbial contaminants on space hardware. Presented at Fifth Annual Meeting of the American Association for Contamination Control, Houston, Texas, March 29, 1966.
- 22. FAVERO, M. S., and DRAKE, C. H. Factors influencing the occurrence of high numbers of iodine-resistant bacteria in iodinated swimming pools. Appl. Microbiol, 14:627-635. July, 1966.
- 23. FAVERO, M. S., PETERSON, N. J., and OXBORROW, G. S. Occurrence of non-logarithmic death rates of bacterial spores exposed to dry heat. Presented at Arizona Chapter, American Society for Microbiology, Phoenix, Arizona, October 8, 1966.
- 24. FAVERO, M. S., PULEO, J. R., MARSHALL, J. H., and OXBORROW, G. S. Comparative levels and types of microbial contamination detected in industrial clean rooms. Appl. Microbiol. 14:539-551. July, 1966.
- 25. FAVERO, M. S., PULEO, J. R., MARSHALL, J. H., and OXBORROW, G. S. Environmental factors influencing the survival of microorganisms on surfaces. Presented at the Arizona Chapter of the American Society for Microbiology, Tucson, Arizona, April 23, 1966.
- 26. FAVERO, M. S., PULEO, J. R., MARSHALL, J. H., and OXBORROW, G. S. Microbial contamination in conventional and laminar flow clean rooms. Presented at Fifth Annual Technical Meeting of the American Association for Contamination Control, Houston, Texas, March 29-April 1, 1966. 10 p. Bacteriol. Proc., 1966.
- 27. FAVERO, M. S., PULEO, J. R., and TRITZ, G. J. Use of ultrasonication for the enumeration of microbial contamination on surfaces. Presented before the American Society for Microbiology, Los Angeles, Calif., May 1-5, 1966. Bacteriol. Proc., 1966.

-3-

28. FIELDS, N. D., MOORE, B., and TRITZ, G. J. Microbial contamination levels encountered by the Lunar Orbiter spacecraft. Presented at Southeastern Branch, American Society for Microbiology, Gainesville, Florida, October 21-22, 1966. 「おお」

- 29. GREENE, V. W., and QUAN, T. J. Sensitivity of bacteriological detection techniques to low levels of contamination. Appl. Microbiol. 14:979. 1966.
- 30. IM.NAKA, H., and SLEPECKY, R. A. Enzyme synthesis during sporulation of <u>Bacillus megaterium</u> in a synchronous growth system. Ninth International Congress of Microbiology. Abstracts of Papers, p. 151. 1966.
- 31. KALFAYAN, S. H., and CAMPBELL, B. A. Effects of the thermal sterilization procedure on polymeric products. JPL Tech. Rept. 32-973. Pasadena, Calif., Jet Propulsion Laboratory, November, 1966.
- 32. McDADE, J. J., FAVERO, M. S., and HALL, L. B. Sterilization requirements for space exploration. Presented at International Association of Milk, Food, and Environmental Sanitarians, Minneapolis, Minn., August 15-18, 1966. J. Milk Food Technol. 30:179-185. 1966.
- 33. McDADE, J. J., FAVERO, M. S., MICHAELSEN, G. S., and VESLEY, D. Environmental microbiology and the control of microbial contamination. Presented at First Annual National Conference on Spacecraft Sterilization Technology, Pasadena, Calif., November 16-18, 1965. <u>In</u> Spacecraft Sterilization Technology, p. 51-86. Washington, D. C., Nat. Aeron. Space Admin., 1966. 35 refs. (NASA SP-108)
- 34. MARDRES, J. W. Dry heat survival of <u>Bacillus subtilis</u> var. <u>niger</u> in association with soil mineral particles. GSFC Document X-624-66-187. Greenbelt, Md., Goddard Space Flight Center, May, 1966. 11 p.
- 35. MARDRES, J. W. Survival of selected microorganisms in high ultraviolet flux. GSFC Document X-624-66-189. Greenbelt, Md., Goddard Space Flight Center, December, 1966. 9 p.
- 36. MARSHALL, J. H., FAVERO, M. S., PULEO, J. R., and OXBORROW, G. S. Comparative levels of microbial contamination among hospital operating rooms and industrial clean rooms. Presented at Arizona Chapter of the American Society for Microbiology, Tucson, Arizona, April 23, 1966.

- 37. MOORE B., FIELDS, N.D., and TRITZ, G. J. Reduction of microbial contamination levels by use of laminar flow clean rooms. Presented at Southeastern Branch, American Society for Microbiology, Gainesville, Florida, October 21-22, 1966.
- 33. NORTHROP, J., and SLEPECKY, R. A. Temperature-induced sporulation mutations in <u>Bacillus subtilis</u>. Bacteriol. Proc., p. 16. 1966.
- 39. OXBORROW, G. S., FAVERO, M. S., PULEO, J. R., and MARSHALL, J. H. Microbiological profiles of conventional and laminar flow clean rooms. Presented at the Arizona Chapter of the American Society for Microbiology, Tucson, Arizona, April 23, 1966.
- 40. PETERSEN, N. J. Preliminary results using coated stainless steel strips as an assay tool. Presented at the Fifth Annual Meeting of the American Association for Contamination Control, Houston, Texas, March 29, 1966.
- 41. PICCIOLO, G. L. Bioluminescence, a selected bibliography from the Literature Retrieval System, GSFC Document X-624-66-152. Greenbelt, Md., Goddard Space Flight Center, April, 1966. 14 p.
- 42. PICCIOLO, G. L., POWERS, E. M., and RICH, E. An experiment to detect microorganisms in the upper atmosphere flown on Aerobee NASA 4,150. GSFC Document X-624-66-359. Greenbelt, Md., Goddard Space Flight Center, December, 1966. 26 p.
- 43. PICCIOLO, G. L. Sterilization, a selected bibliography from the Literature Retrieval System. GSFC Document X-450-66-53. Greenbelt, Md., Goddard Space Flight Center, March, 1966. 18 p.
- 44. POWERS, E. M. Microbiological burden on the surfaces of the AIMP spacecraft, Part 1. GSFC Document X-624-66-342. Greenbelt, Md., Goddard Space Flight Center, May, 1966. 10 p.

?

- 45. POWERS, E. M. Microbiological burden on the surfaces of the AIMP spacecraft, Part 2. GSFC Document X-624-66-368. Greenbelt, Md., Goddard Space Flight Center, June, 1966.
 6 p.
- 46. POWERS, E. M. Microbiological burden on the surfaces of the AIMP spacecraft, Part 3. GSFC Document X-624-66-369, Greenbelt, Md., Goddard Space Flight Center, July, 1966. 25 p.

-5-

- 47. POWERS, E. M. Microbiological burden on the surfaces of the AIMP spacecraft, Part 4. GSFC Document X-624-66-370. Greenbelt, Md., Goddard Space Flight Center, August, 1966. 12 p.
- 48. PULEO, J. R., and FAVERO, M. S. Factors influencing the recovery of microorganisms from solids. Presented to the American Society for Microbiology, Los Angeles, Calif., May 1-5,1966.
- 49. PULEO, J. R., and FAVERO, M. S. Heat sterilization of activated carbon. A note. Biotechnol. Bioeng. 8(4):631-632. November, 1966.
- 50. PULEO, J. R., and FAVERO, M. S. Reliability and efficiency of ultrasonics in recovery of microbial contamination from surfaces. Presented at the Arizona Chapter of the American Society for Microbiology, Tucson, Arizona, April 23, 1966.
- 51. PULEO, J. R., FAVERO, M. S., and TRITZ, G. J. Factors influencing the recovery of viable microorganisms from surfaces. Presented at the Fifth Annual Technical Meeting of the American Association for Contamination Control, Houston, Texas, March 29-April 1, 1966, and published in Proceedings. 6 p.

7

- 52. PULEO, J. R., PETERSEN, N. J., and FAVERO, M. S. The recovery of embedded spores from a plastic. Presented at Arizona Chapter, American Society for Microbiology, Phoenix, Arizona, October 8, 1966.
- 53. REMSEN, C. C., LUNGREN, D. G., and SLEPECKY, R. A. Inhibition of spore septum and forespore membrane development in <u>Bacillus cereus</u> by beta-phenethyl alcohol. J. Bacteriol. 91:324-331. 1966.
- 54. SCHALKOWSKY, S. Analytical techniques in planetary quarantine and spacecraft sterilization. Final report. Washington, D. C., Exotech, Inc., November, 1966. 44 p.
- 55. SCHALKOWSKY, S. A critique of current spacecraft sterilization standards. Washington, D. C., Exotech, Inc., January 3, 1966. 11 p.
- 56. SCHALKOWSKY, S, Estimation of planetary contamination probabilities due to flight of the USSR Venus 3. Washington, D. C., Exotech, Inc., August 10, 1966. 14 p.

- 57. SCHALKOWSKY, S., and COOLEY, W. C. Analysis of planetary quarantine requirements. Washington, D. C., Exotech, Inc., April 5, 1966. 11 p.
- 58. SCHALKOWSKY, S., and WIEDERKEHR, R. Log-normal model for microbial survival in heat sterilization. Topical report. Washington, D. C., Exotech, Inc., October, 1966. 39 p.
- 59. SCHALKOWSKY, S., and WIEDERKEHR, R. A stochastic sterilization model. Rept. No. TR-13. Washington, D. C., Exotech, Inc., May 6, 1966. 19 p. 3 refs.
- 60. SHERRY, E. J., and TRAUTH, C. A., JR. An assembly contamination model. Rept. SC-RR-66-421. Albuquerque, N. M., Sandia Corp., July, 1966. 32 p.
- 61. SHERRY, E. J., and TRAUTH, C. A., JR. A model for planetary quarantine. requirements. Rept. SC-RR-66-588. Albuquerque, N. M., Sandia Corp., September, 1966. 46 p. 9 refs.
- 62. SLEPECKY, R. A. The use of combined sonication-germacide treatment in surgical instrument cleaning. Hospital Topics 44:133-134. 1966.
- 63. TRAUTH, C. A., and TIERNEY, M. S. A model for determining the probability of failure of a valve having a particle contamination failure mode. Rept. SC-TM-66-697. Albuquerque, N. M., Sandia Corp., December, 1966.
- 64. TRAUTH, C. A., JR., and WOOLSEY, R. E. IPSC, a machine independent integer linear program. Rept. SC-RR-66-433. Albuquerque, N. M., Sandia Corp., July, 1966.
- 65. TRAUTH, C. A., JR., and WOOLSEY, R. E. Practical aspects of integer linear programming. Rept. SC-RR-66-925. Albuquerque, N. M., Sandia Corp., July, 1966.
- 66. TRITZ, G. J., FIELDS, N. D., and MOORE, B. Surveyor 2 -- its microbial load. Presented at Southeastern Branch, American Society for Microbiology, Gainesville, Florida, October 21-22, 1966.

(

- 67. VESLEY, D., KEENAN, K. M., and HALBERT, M. M. Effect of time and temperature in assessing microbial contamination on flat surfaces. Appl. Microbiol. 14(2):203-205. March, 1966. 7 refs.
- 68. WHITFIELD, W. J. Monitoring a class 100 clean room. Rept. SC-RR-66-956. Albuquerque, N. M., Sandia Corp., October, 1966.

A A CONTRACT OF A CONTRACT

69. WHITFIELD, W. J., and MASHBURN, J. C. Development of an increased sampling rate monitoring system. Rept. SC-RR-66-585. Albuquerque, N. M., Sandia Corp., October, 1966. 11 p.

- 70. ANGELOTTI, R. Protective mechanisms affecting dry-heat sterilization. <u>In</u> Proceedings of the COSPAR Symposium on Sterilization Techniques for Instruments and Materials as Applied to Space Research, London, England, August, 1967.
- 71. BERQUIST, K. R., and FAVERO, M. S. Laminar air flow systems for microbiology. Presented at Arizona Chapter of the American Society for Microbiology, Phoenix, Arizona, November 3-4, 1967.
- 72. BRANNEN, J. P. An analysis for sterilization requirements. To appear in the Proceedings of the Rocky Mountain Symposium for Aerospace Science and Technology, sponsored by the American Astronautical Society, July 13, 14, 1967, Denver, Colorado, 1967.
- 73. BRANNEN, J. P. A rational model for spacecraft sterilization requirements. Rept. SC-RR-67-256. Albuquerque, N. M., Sandia Corp., April, 1967. 30 p. Refs.
- 74. BREWER, J. H. Sampling and verification in large-scale sterilization procedures. Symposium on Sterilization Techniques for Instruments and Materials as Applied to Space Research, 10th COSPAR Meeting, London, England, July 18-22, 1967.
- 75. BREWER, J. H., and SCHMITT, R. F. Laminar air flow for sterility testing procedures. 67th Annual Meeting of the American Society for Microbiology, New York City, April 30-May 4, 1967. 5 p.
- 76. BRUCH, C. W. Microbes in the upper atmosphere and beyond. Symposia of the Society for General Microbiology. Airborne Microbes, XVII, p. 346-374. 1967.
- 77. CAMERON, R. G., BLANK, G. B., and HOROWITZ, N. H. Growth of aerobic and anaerobic bacteria in agar subjected to freezing, diurnal freezing and thawing. JPL Tech. Memo. 33-331. Pasadena, Calif., Jet Propulsion Laboratory, June, 1967.
- 78. CHAMBERIAIN, R. G. The Voyager planetary quarantine model 1973 mission. JPL Tech. Memo. 33-252. Pasadena, Calif., Jet Propulsion Laboratory, June, 1967.

- 79. CHAPPELLE, E. W., RICH, E., and MacLEOD, N. H. Prevention of protein denaturation during exposure to scerilization temperatures. Science 155(3767):1287-1288. March 10, 1967.
- 80. CHRISTENSEN, M. R., GREEN, R. H., and STERN, J. A. Microbiological sampling program for the Mariner Venus '67 flight spacecraft (Mariner V). JPL SPS No. 37-46, Vol. IV:48-55. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 81. CORNELL, R. G., and SPECKMAN, J. A. Estimation for a simple exponential model. Biometrics 23:717-737. 1967.
- 82. CRAVEN, C. W. Sterilization and decontamination techniques for space vehicles. JPL Tech. Memo. 33-370. Pasadena, Calif., Jet Propulsion Laboratory, December 1, 1967. 8 p.
- 83. CRAVEN, C. W., and WOLFSON, R. P. Techniques for the prevention of contamination of the planets by unsterile spaceflight hardware. JPL Tech. Rept. 32-1216. Pasadena, Calif., Jet Propulsion, Laboratory, December 15, 1967. 14 p.
- 84. CRAWFORD, A. M. Fireflies for space research. GSFC Special Report. Greenbelt, Md., Goddard Space Flight Center, 1967.
- 85. DUGAN, V. L. Automatic, instantaneous monitor for counting the bacterial loading of an aerosol. Rept. SC-TM-67-687. Albuquerque, N. M., Sandia Corp., August, 1967.
- 86. DUGAN, V. L. Principles of operation of the vacuum probe microbiological sampler. Rept. SC-RR-67-688. Albuquerque, N. M., Sandia Corp., August, 1967.
- 87. DUGAN, V. L., WHITFIELD, W. J., McDADE, J. J., BEAKLEY, J. W., and OSWALT, F. W. A new approach to the microbiological sampling of surfaces: The vacuum probe sampler. Rept. SC-RR-67-114. Albuquerque, N. M., Sandia Corp., March, 1967.
- 88. ELLAR, D. J., LUNDGREN, D. G., and SLEPECKY, R. A. Fine structure of <u>Bacillus megaterium</u> during synchronous growth. J. Bacteriol. 94:1189-1205. 1967.

(

- 89. FAVERO, M. S. Application of laminar airflow systems in assaying space hardware. Presented at American Society for Microbiology, New York, April 30 - May 4, 1967. Bacteriol. Proc., p. 7. 1967.
- 90. FAVERO, M. S. Assay techniques for planetary quarantine. Proceedings of the AEC/NASA Symposium on Contamination Control, Albuquerque, New Mexico, September 12-14, 1967, p. 268-270. 1967.

- 91. FAVERO, M. S. Dual meaning of activation. Spore Newsletter 2(12): 163-164. September, 1967.
- 92. FAVERO, M. S. Factors influencing the detection and the enumeration of microbial contamination on space hardware. Presented at International Symposium for Spacecraft Sterilization, London, England, July 18-22, 1967.
- 93. FAVERO, M. S. The hospital engineer and infection control. Presented before American Society for Hospital Engineers, Phoenix, Arizona, October 27, 1967.

朝田川

1

- 94. FAVERO, M. S. Services provided in support of the Planetary Quarantine requirements of NASA. Phoenix, Arizona, Planetary Quarantine Unit, Phoenix Field Station Section, Ecological Investigations Program, National Communicable Disease Center, Public Health Service, U. S. Department of Health, Education and Welfare, Rept. No. 16. January 18, 1967.
- 95. FAVERO, M. S. Services provided in support of the Planetary Quarantine requirements of NASA. Phoenix, Arizona, Planetary Quarantine Unit, Phoenix Field Station Section, Ecological Investigations Program, National Communicable Disease Center, Public Health Service, U. S. Department of Health, Education and Welfare, Rept. No. 17. April, 1967.
- 96. FAVERO, M. S. Services provided in support of the Planetary Quarantine requirements of NASA. Phoenix, Arizona, Planetary Quarantine Unit, Phoenix Field Station Section, Ecological Investigations Program, National Communicable Disease Center, Public Health Service, U. S. Department of Health, Education and Welfare, Rept. No. 18. July, 1967.
- 97. FAVERO, M. S. Services provided in support of the Planetary Quarantine requirements of NASA. Phoenix, Arizona, Planetary Quarantine Unit, Phoenix Field Station Section, Ecological Investigations Program, National Communicable Disease Center, Public Health Service, U. S. Department of Health, Education and Welfare, Rept. No. 19. October 10, 1967.
- 98. FAVERO, M. S., and HALL, I. B. Latest aspects of sterility testing. Presented before American Public Health Association, Miami Beach, Florida, October 23-27, 1967.

-10-

- 99. FAVERO, M. S., PULEO, J. R., MARSHALL, J. H., and OXBORROW, G. S. A comparison of microbial contamination levels among hospital operating rooms and industrial clean rooms. Proceedings of the 6th Annual Technical Meeting and Exhibit of the American Association for Contamination Control, Washington, D. C., May 15-18, 1967, p. 218-221. 1967.
- 100. FIELDS, N. D., MOORE, B., and GRAVES, R. C. Effect of systems tests on the microbial load of a lunar spacecraft. Presented at Southeastern Branch, American Society for Microbiology, Atlanta, Georgia, November 3-4, 1967.
- 101. FRITZ, G. J., FIELDS, N. D., and MOORE, B. Comparative levels of microbial contamination in clean rooms used for the assembly and test of lunar spacecraft. <u>In</u> Proceedings of the American Association for Contamination Control, p. 149-152. May, 1967.
- 102. GAVIN, T. R. Visual monitoring during assembly of sterilizable planetary landing capsules. JPL Tech. Memo. 33-345. Pasadena, Calif., Jet Propulsion Laboratory, July, 1967. 6 p.
- 103. GODDARD SPACE FLIGHT CENTER. A selected bibliography from the Literature Retrieval System, Space Biology Branch. X-624-67-564-Revised X-450-67-53. Greenbelt, Md., November, 1967.
- 104. GRENIER, W. G. Anchored interplanetary monitoring platform compilation materials and decontaminate compatibility tests. Goddard Report X-723-67-516. July, 1967. 518 p.
- 105. GUYTON, H. G., and MICK, C. E. Evaluation of two NASA biological isolation garments. Tech. Rept. No. 3-68. Frederick, Md., U. S. Army Biological Laboratories, December, 1967.
- 106. HAGEN, C. A., HAWRYLEWICZ, E. J., and EHRLICH, R. Survival of microorganisms in a simulated Martian environment. II. Moisture and oxygen requirements for germination of <u>Bacillus cereus</u> and <u>Bacillus subtilis</u> var. <u>niger</u> spores. Appl. Microbiol. 15(2):285-291. March, 1967.

- 107. HALL, L. B. Criteria for selection of germicides. Amer. J. Public Health 51(7):1054-1060. July, 1967.
- 108. HALL, L. B. The importance of sterilization techniques in spacecraft. International Space Science Symposium, COSPAR, London, England, August, 1967. 31 p.
- 109. HALL, L. B. Recent developments in planetary quarantine. Presented at Society for Industrial Microbiology, August 21-24, 1967, London, Ontario, Canada. 15 p.

- 110. HARSTAD, J. B., DECKER, H. M., BUCHANAN, L. M., and FILLER, M. E. Filtration of submicron virus aerosols. Amer. J. Public Health 57(12):2186-2193. 1967.
- 111. HAWRYLEWICZ, E. J., and HAGEN, C. A. Contamination of planets. Science 157:582-583. August 4, 1967.
- 112. HAWRYLEWICZ, E. J., HAGEN, C. A., TOLKACZ, V., and EHRLICH, R. Effect of reduced barometric pressure on water availability related to microbial growth. <u>In</u> A. H. Brown and F. G. Favorite, eds. Life Sciences and Space Research, V:174-186. Amsterdam, North-Holland Publ. Co., 1967.
- 113. HAWRYLEWICZ, E. J., HAGEN, C. A., TOLKACZ, V., ANDERSON, B. T., and EWING, M. Probability of growth (p_G) of viable microorganisms in Martian environments. International Space Sciences Symposium, COSPAR, London, England, July, 1967. 4 p.
- 114. HOFFMAN, A. R., and STERN, J. A. Terminal sterilization process calculation for spacecraft. Presented at Society for Industrial Microbiology, London, Ontario, Canada, August, 1967. JPL Tech. Rept. 32-1209. Pasadena, Calif., Jet Propulsion Laboratory, November, 1967.

E. C. Sandar

- 115. HOLLANDER, M. Asymptotic efficiency of two nonparametric competitors of Wilcoxon's two sample test. J. Amer. Statist. Asso 62: 939-949. September, 1967. 12 refs.
- 116. HOLLANDER, M. Rank tests for randomized blocks when the alternatives have an a priori ordering. Ann. Math. Statist. 38(3):867-877. June, 1967. 21 refs.
- 117. HOROWITZ, N. H., SHARP, R. P., and DAVIES, R. W. Planetary contamination. I. The problems and agreements. Science 155(3769):1501-1505. 1967.
- 118. IMANAKA, H., GILLIS, J. R., and SLEPECKY, R. A. Synchronous growth and sporulation of <u>Bacillus megaterium</u>. J. Bacteriol. 93: 1624-1630. 1967.
- 119. IRONS, A. S. Microbiological evaluation of HEPA filters. JPL SPS 37-43, IV:53-58. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 120. JET PROPULSION LABORATORIES, Clothing study EASL. JPL 67-108. Pasadena, Calif., Jet. Propulsion Laboratory, 1967.
- 121. JET PROPULSION LABORATORIES. CMTM Biological monitoring plan. JPL-001.01. Pasadena, Calif., Jet Propulsion Laboratory, 1967.

-12-

- 122. JET PROPULSION LABORATORIES. Evaluation of preliminary standard procedure for microbiological examination of space hardware. JPL-67-105. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 123. JET PROPULSION LABORATORIES. Identification of microbiological isolates-EASL. JPL-67-115. Pasadena, Calif., Jet Propulsion Laboratory, 1967.

Υ.

7

- 124. JET PROPULSION LABORATORIES. Microbiological assay and certification of spacecraft hardware sterility. JPL-300.01. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 125. JET PROPULSION LABORATORIES. Personnel procedures for EASL operations. JPL-201.01. Pasadena, Calif., Jet, Propulsion Laboratory, 1967.
- 126. JET PROPULSION LABORATORIES. Personnel procedures for SADL operations. JPL-201.00. Pasadena, Calif., Jet Propulsion Laboratory, 1967.

127. JET PROPULSION LABORATORIES. Process specification, decontamination of component parts, tools and equipment. JPL-200.01. Pasadena, Calif., Jet Propulsion Laboratory, 1967.

- 128. JET PROPULSION LABORATORIES. Report on determination of heat resistance of microbiological isolates. JPL-67-116. Pasadena, Calif., Jet.Propulsion Laboratory, 1967.
- 129. JET PROPULSION 'ABORATORIES. Report on a study of chemical germicides. JPL-67-113. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 130. JET PROPULSION LABORATORIES. Report on a study of plateau of microbiological contamination on surfaces. JPL-67-114. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 131. JET PROPULSION LABORATORIES. Routine cleaning and decontamination. JPL-202.01. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 132. JET PROPULSION LABORATORIES. Routine cleaning and decontamination of SADL facility. JPL-202.00. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 133. JET PROPULSION LABORATORIES. SADL assembly of CMTM for purposes of determining areas of contact during the assembly process. JPL-67-545. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 134. JET PROPULSION LABORATORIES. SADL Development of procedures for estimating the CMTM microbial burden. JPL-67-623. Pasadena, Calif., Jet Propulsion Laboratory, 1967.

- 135. JET PROPULSION LABORATORIES. SADL monitoring plan. JPL-003.00. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 136. JET PROPULSION LABORATORIES. SADL quality assurance program plan. JPL-002.00. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 137. JET PROPULSION LABORATORIES. BADL A study of chemical residues left on surfaces after biological assay procedures. JPL-67-551. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 138. JET PROPULSION LABORATORIES. SADL A study of the effects of varying the established operating and maintenance procedures of the EASL facility. JPL-67-544. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 139. JET PROPULSION LABORATORIES. SADL A study of the microbial burden accumulated on assemblies built in EASL under disrupted vertical airflow. JPL-67-550. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 140. JET PROPULSION LABORATORIES. SADL 3000 cu. ft. decontamination chamber. JPL-005.00. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 141. JONES, L. A., HOFFMAN, R. K., and PHILLIPS, C. R. Sporicidal activity of peracetic acid and beta-propiolactone at subzero temperatures. Appl. Microbiol. 15:357-362. 1967.
- 142. KALFAYAN, S. H., CAMPBELL, B. A., and SILVER, R. H. Effects of ethylene oxide-freon 12 decontamination and dry heat sterilization procedures on polymeric products. JPL Tech. Rept. 32-1160. Pasadena, Calif., Jet Propulsion Laboratory, September, 1967.

Ì

- 143. LeDOUX, F. N. Decontamination of the AIMP-D spacecraft. GSFC X-723-67-171. Greenbelt, Md., Goddard Space Flight Center, April, 1967. 66 p.
- 144. LeDOUX, F. N. Microbial decontamination and sampling program for anchored interplanetary monitoring platform (AIMPE) spacecraft. GSFC X-723-67-375. Greenbelt, Md., Goddard Space Flight Center, July, 1967. 30 p.
- 145. McDADE, J. J. Laminar air flow in the surgical theater. <u>In</u> Proceedings of American Society of Microbiology, 67th Annual Meeting, May, 1967.
- 146. McDADE, J. J., FAVERO, M. S., and HALL, L. B. Sterilization requirements for space exploration. J. Milk Food Technol. 30(6):179-185. June, 1967.

-14-

- 147. McDADE, J. J., TRAUTH, C. A., JR., WHITFIELD, W. J., and SIVINSKI, H. D. Techniques for the limitation of biological loading of spacecraft before sterilization. For presentation at COSPAR, London, England, July, 1967. 57 p.
- 148. McDADE, J. J., WHITCOMB, J. G., RYPKA, E. W., WHITFIELD, W. J., and FRANKLIN, C. M. The microbial profile of a vertical laminar airflow surgical theater. Rept. SC-RR-67-456. Albuquerque, N. M., Sandia Corp., June, 1967. 30 p. 24 refs.
- 149. MOORE, B., GRAVES, R. C., and FIELDS, N. D. Bacterial spore contamination of lunar spacecraft. Presented at Southeastern Branch, American Society for Microbiology, Atlante, Georgia, November 3-4, 1967.
- 150. MORRIS, M. E. The vacuum probe for removing microorganisms for counting. <u>In</u> Proceedings of the NASA/AEC Symposium on Current and Advanced Concepts in Instrumentation and Automation in Contamination Control, Albuquerque, New Mexico, September 12-14, 1967.
- 151. NASH, D. B. Sampling of planetary surface solids for unmanned <u>in situ</u> geological and biological analysis: Strategy, principles, and instrument requirements. JPL Tech. Rept. 32-1225. Pasadena, Calif., Jet Propulsion Laboratory, November 15, 1967. 35 p.
- 152. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. NASA standard procedures for the microbiological examination of space hardware. NHB 5340.1. August, 1967... 40 p.
- 153. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. Standards for clean rooms and work stations for the microbially controlled environment. NHB 5340.2. August, 1967. 35 p.
- 154. NORTHROP, J., and SLEPECKY, R. A. Sporulation mutations induced by heat in <u>Bacillus subtilis</u>. Science 155:839. February, 1967. 7 refs.
- 155. OLSON, R. L., GREEN, R. N., and TRITZ, G. J. Progressive biological monitoring on lunar orbiters. Presented at the 24th meeting of the Society for Industrial Microbiology, London, Ontario, Canada, August 20-24, 1967.
- 156. OPFELL, J. B., and SHANNON, J. L. Comparison of methyl-bromide and ethylene-oxide resistances of <u>Bacillus subtilis</u> and <u>Staphy-</u> <u>lococcus epidermidis</u>.population. Presented at American Society of Microbiology, New York, N. Y., 1967. 14 p.

- 157. OFFELL, J. B., and SHANNON, J. L. Synergism in ethylene-oxide-methylbromide sterilization of very dry spore and staphylococcal populations. International Space Science Symposium, COSPAR, London, England, July, 1967. 10 p.
- 158. OSWALT, F. W., McDADE, J. J., FRANKLIN, C. M., and DUGAN, V. L. An improved sonication method for removal of microorganisms from surfaces. Rept. SC-RR-67-492. Albuquerque, N. M., Sandia Corp., June, 1967. 25 p.

h

- 159. OXBORROW, G. S., and FAVERO, M. S. A combination medium for demonstrating starch and gelatin hydrolysis. Amer. J. Med. Technol. 33(4):334-335. July/August, 1967.
- 160. PAIK, W. W., MICHAEL, S. C., SMITH, C. D., and STERN, J. A. Resistance of bacterial spores. (<u>Bacıllus globigii</u>). JPL 37-46, IV:43-55. Pasadena, Calif., Jet Propulsion Laboratory, 1967.
- 161. PETERSEN, N. J. The probability of releasing microorganisms on fracture from solids. <u>In</u> Proceedings of the NASA/AEC Symposium on Current and Advanced Concepts in Instrumentation and Automation in Contamination Control, Albuquerque, New Mexico, September 12-14, 1967, p. 287-288. 1967.
- 162. PETERSEN, N. J., and PULEO, J. R. Estimating the probability of release of viable microorganisms from fractured solids. Presented at Arizona Chapter of the American Society for Microbiology, Phoenix, Arizona, November 3-4, 1967.
- 163. PFLUG, I. J. Dry heat sterilization of interplanetary vehicles. Presented at 67th Annual Meeting of the American Society for Microbiology, New York, N. Y., April 30 - May 4, 1967.
- 164. PHILLIPS, G. B. Laminar air flow for microbiological contamination control: Needs and areas of application. Presented at the 67th Annual Meeting of the American Society for Microbiology, New York, N. Y., April 30 - May 4, 1967. 7 p.
- 165. PHILLIPS, G. B., and BREWER, J. H. Recent advances in microbiological environmental control. Presented at the 24th Meeting of the Society of Industrial Microbiology, University of Western Ontario, London, Ontario, Canada, August 20-24, 1967. 25 p.
- 166. PORTNER, D. M. Quantitative spore recoveries from diatomaceous earth pellets used as a protective material in dry heat sterilization studies. Rept. No. 13-67. Frederick, Md., U. S. Army Biological Laboratories, Physical Defense Div., February, 1967.

- 167. PORTNER, D. M. Recovery of vegetative bacteria from eccofoam FP and diatomaceous earth. Rept. No. 16-67. Frederick, Md., U. S. Army Biological Laboratories, Physical Defense Div., April, 1967.
- 168. PORTNER, D. M., PHILLIPS, C. R., and HOFFMAN, R. K. Certification of probability of sterilization of liquid by filtration. Appl. Microbiol. 15(4):800-807. July, 1967.
- 169. POWERS, E. M. Microbiological burden on the surfaces of Explorer XXXIII spacecraft. Appl. Microbiol. 15(5):1045-1048. September, 1967.
- 170. PULEO, J. R., FAVERO, M. S., and PETERSEN, N. J. Assessment of microbial contamination on surfaces of space hardware by ultrasonics. <u>In</u> Proceedings of the 6th Annual Technical Meeting and Exhibit of the American Association for Contamination Control, Washington, D. C., May 15-18, 1967, p. 153-156.
- 171. PULEO, J. R., FAVERO, M. S., and PETERSEN, N. J. Use of ultrasonic energy in assessing microbial contamination on surfaces. Appl. Microbiol. 15(6):1345-1351. November, 1967.
- 172. PULEO, J. R., FAVERO, M. S., and PETERSEN, N. J. Use of ultrasonics in assessing microbial contamination on surfaces. Presented at the American Society for Microbiology. Bacteriol. Proc., p. 20. 1967.
- 173. PULEO, J. R., FAVERO, M. S., and TRITZ, G. J. Feasibility of using ultrasonics for removing viable microorganisms from surfaces. Contamination Control. J. 4:58-67. April, 1967.
- 174. ROTHSTEIN, A. A. Sterilization reference booklet. Denver, Colo., Martin Marietta Corp., Denver Div., 1967. 36 p.
- 175. ROTHSTEIN, A. A., and ARNETT, J. C. Sterile insertion An aerospace application of gnotobiotic technology. Presented at the Society of Industrial Microbiology, London, Ontario, Canada, August, 1967.
- 176. SAVAGE, C. H. Sterilization of impact limiters. JPL SPS 37-43, IV:128-138. Pasadena, Calif., Jet Propulsion Laboratorý, 1967.
- 177. SCHALKOWSKY, S. Study of analytical techniques in planetary quarantine. Final report. Washington, D. C., Exotech, Inc., December 7, 1967. 105 p.

178. SCHALKOWSKY, S., and WIEDERKEHR, R. Estimation of microbial survival in heat sterilization. Presented at COSPAR Symposium on Sterilization Techniques, London, England, July, 1967. 15 p. 日朝

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-

- 179. SILVERMAN, G. J., and BEECHER, N. Survival of cocci after exposure to ultrahigh vacuum at different temperatures. Appl. Microbiol. 15(3):665-667. May, 1967.
- 180. SILVERMAN, G. J., DAVIS, N. S., and BEECHER, N. Resistivity of spores to ultraviolet and γ radiation while exposed to ultrahigh vacuum or at atmospheric pressure. Appl. Microbiol. 15(3):510-515. May, 1967.
- 181. SIVINSKI, H. D., WHITEFIELD, W. J., and PAULHAMUS, J. A. Contamination control principles. Washington, D. C., Nat. Aeron. Space Admin., 1967. (NASA SP-5045)
- 182. STERN, J. A., and HOFFMAN, A. R. Determination of terminal sterilization process parameters. JPL Tech. Rept. 32-1191. Pasadena, Calif., Jet Propulsion Laboratory, October 1, 1967. 8 p.
- 183. STOCKHAM, J. D., HAGEN, C. A., MILLER, S., NELSON, M., and ROBERTS, D. Results of bioclean room survey. Heating, Piping and Airconditioning 39:115-117. 1967.
- 184. TRAUTH, C. A., JR. A sequential decision model of planetary quarantine primary objectives. Rept. SC-RR-67-462. Albuquerque, N. M., Sandia Corp., June, 1967. 48 p.
- 185. TRAUTH, C. A., JR. A systems approach to contamination control. In Proceedings of the NASA/AEC Symposium on Current and Advanced Concepts in Instrumentation and Automation in Contamination Control, Albuquerque, N. M., September 12-14, 1967.
- 186. TRITZ, G. J., FIELDS, N. D., and MOORE, B. Comparative levels of microbial contamination in clean rooms used for the assembly and test of lunar spacecraft. In Proceedings of the 6th Annual Technical Meeting and Exhibit of the American Association for Contamination Control, Washington, D. C., May 15-18, 1967, p. 149-152.
- 187. TRITZ, G. J., FIELDS, N. D., and MOORE, B. Microhial contamination detected on the Surveyor 2 spacecraft. Presented at the 67th Annual Meeting of the American Society for Microbiology, New York, N. Y. April 30-May 4, 1967. Bacteriol. Proc., p. 16. 1967.
- 188. VESLEY, D. Laminer air-flow for the care of hospital patients. Presented at the 67th Annual Meeting of the American Society for Microbiology, New York, N. Y., April 30-May 4, 1967.

189. WHITFIELD, W. J. Principles of laminar air flow. Presented at the 67th Annual Meeting of the American Society for Microbiology, New York, N. Y., April 30 - May 4, 1967. 12 p.

- 190. WHITFIELD, W. J., and MASHBURN, J. C. The development of a faster monitoring system. Contamination Control J. 6:10-11. 1967.
- 191. WRIGHT, D. E. Bibliography on applications of ethylene oxide. Washington, D. C., George Washington University, Biological Sciences Communication Project, June, 1967. 26 p. 137 refs.

Surger of

- 192. WRIGHT, D. E. Bibliography on planetary quarantine, Vol. I. Policy. Washington, D. C., George Washington University, Biological Sciences Communication Project, November, 1967. 22 p. 123 refs.
- 193. WRIGHT, D. E. Bibliography on planetary quarantine, Vol. II. Environmental Microbiology. Washington, D. C., George Washington University, Biological Sciences Communication Project, November, 1967. 69 p. 359 refs.
- 194. WRIGHT, D. E. Bibliography on planetary quarantine, Vol. III. Engineering Parameters. Washington, D. C., George Washington University, Biological Sciences Communication Project, November, 1967. 43 p. 251 refs.
- 195. WRIGHT, D. E. Significant achievements in space bioscience. Spacecraft Sterilization and Planetary Quarantine. Washington, D. C., George Washington University, Biological Sciences Communication Project, May, 1967. 45 p.

AUTHOR INDEX

Anderson D M	110		
Anderson, B. T.	113	Gavin, T. R.	102
Angelotti, R.	70	Gillis, J. R.	8,118
Arnett, J. C.	175	Graves, R. C.	100,149
		Green, R. H.	80
Beakley, J. W.	15,16,87	Green, R. N.	155
Beecher, N.	179,180	Greene, V. W.	29
Beauchamp, J. J.	17	Grenier, W. G.	104
Berquist, K. R.	71	Gruft, H. M.	9
Blank, G. B.	77	Guyton, H. G.	105
Brannen, J. P.	72,73		
Brewer, J. H.	74,75,165	Hagen, C. A.	106,111
Bruch, C. W.	76		112,113,183
Buchanan, L. M.	110	Halbert, M. M.	67
Buckman, J.	9	Hall, L. B.	32,98,107
Cameron, R. G.	77		108,109,146
Campbell, B. A.	31,142	Harstad, J. B.	110
[.] Chamberlain, R. G	• 78	Hawrylewicz, E. J.	106,111,112,113
Chappelle, E. W.	79	Hoffman, A. R.	114,141,168,182
Christensen, M. R	. 80	Hollander, M.	115,116
Cooley, W. C.	18,57	Horowitz, N. H.	77,117
Cornell, R. G.	1,2,5,6,17,81	-	· · · · · ·
Craven, C. W.	82,83	Imanaka, H.	30,118
Crawford, A. M.	84	Ironș, A. S.	119
Davies, R. W.	117	Jet Propulsion Labo	ratory 120,121,122
Davis, N. S.	180		123, 124, 125, 126
Decker, H. M.	110		127, 128, 129, 130, 131
Drake, C. H.	22		132,133,134,135,136
Dugan, V. L.	19,85,86,87,158		137,138,139,140
2 agun, 1	19,09,00,07,190	Jones, L. A.	137,130,139,140
Ehrlich, R.	106,112	Jones, A, A.	141
Ellar, D. J.	88	Kalfayan, S. H.	31,142
Ewing, M.	113	Keenan, K. M.	
2w 116, 11.	115	Kolodziej, B. J.	67 3
Favero, M. S.	7,12,20,21,22,23	Roiodziej, D. J.	5
ravero, n. D.	24,25,26,27,32,33	I DOUX F N	143,144
	36,39,48,49,50,51	LeDoux, F. N.	•
	52,71,89,90,91,92	Lundgren, D. G.	53,88
	93,94,95,96,97,98	MoDeda 7 T	20 22 07 1/5
	99,146,159,170	McDade, J. J.	32,33,87,145
		Maalaad N U	146,147,148,158
Fields, N. D.	171,172,173	MacLeod, N. H.	79
Flerus, N. D.	28,37,66,100	Mardres, J. W.	34,35
Fillow M F	101,149,186,187	Marshall, J. H.	24,25,26,36,39,99
Filler, M. E.	110	Mashburn, J. C.	15,16,69,190
Franklin, C. M.	148,158	Michael, S. C.	160
Fritz, G. J.	101	Michaelsen, G. S.	33

	Mick, C. E.	105
Moore, B. 28,37,66,100 101,149,186,187 Morris, M. E. 150 Nash, D. B. 151 NASA, Goddard Space Flight Center 103 NASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,168 Oxborrow, G. S. 23,24,25,26 Soborrow, G. S. 23,40,52,161 I62,170,171,172 163 Phillips, C. R. 141,168 Phillips, C. R. 144,165 Phillips, G. B. 164,165 Phillips, G. B. 164,165 Potner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas,Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		183
101,149,186,187 Morris, M. E. 150 Nash, D. B. 151 NASA, Goddard Space Flight Center 103 MASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 166,167,168 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		28,37,66,100
Morris, M. E. 150 Nash, D. B. 151 NASA, Goddard Space Flight Center 103 NASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 Soborrow, G. S. 23,40,52,161 Paulhamus, J. A. 161 Petersen, N. J. 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 27,36,39,48,49 50,51,52,99,162 27,36,39,48,49 50,51,52,99,162 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas,Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka,	•	
NASA, Goddard Space Flight Center 103 NASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 Soborrow, G. S. 23,24,25,26 Soborrow, G. S. 23,40,52,161 Petersen, N. J. 162,170,171,172 Pflug, I. J. 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 10,11,42,44 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Roothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	Morris, M. E.	· · ·
NASA, Goddard Space Flight Center 103 NASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 161 Pflug, I. J. 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 21,224,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Roothstein, A. A. 174,175 Rypka, W. J. 148	Nash, D. B.	151
Center 103 NASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,168 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Roothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	17	Flight
NASA Headquarters 152,153 Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		-
Nelson, M. 183 Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas,Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		152,153
Northrop, J. 38,154 Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas,Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	-	
Olson, R. L. 155 Opfell, J. B. 156,157 Oswalt, F. W. 87,168 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
Opfell, J. B. 156,157 Oswalt, F. W. 87,168 Oxborrow, G. S. 23,24,25,26 36,39,99,159 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 Powers, E. M. 10,11,42,44 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	Norentop, J.	50 g I.J.T
Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas,Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	Olson, R. L.	155
Oswalt, F. W. 87,158 Oxborrow, G. S. 23,24,25,26 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas,Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	Opfell, J. B.	156,157
Oxborrow, G. S. 23,24,25,26 36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
36,39,99,159 Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	-	
Paik, W. W. 160 Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Roogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Powers, E. M. 10,11,42,44 Powers, E. M. 10,11,42,44 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		00,00,00,00,00
Paulhamus, J. A. 181 Petersen, N. J. 23,40,52,161 162,170,171,172 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	Paik, W. W.	160
Petersen, N. J. 23,40,52,161 162,170,171,172 Pflug, I. J. 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 7,12,24,25,26 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		181
162,170,171,172 Pflug, I. J. 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	-	23,40,52,161
Pflug, I. J. 163 Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 146		
Phillips, C. R. 141,168 Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 146	Pflug T T	
Phillips, G. B. 164,165 Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
Picciolo, G. L. 41,42,43 Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
Portner, D. M. 166,167,168 Powers, E. M. 10,11,42,44 45,46,47,169 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	•	
Powers, E. M. 10,11,42,44 45,46,47,169 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	-	• •
45,46,47,169 Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
Puleo, J. R. 7,12,24,25,26 27,36,39,48,49 50,51,52,99,162 170,171,172,173 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	Powers, E. M.	
27,36,39,48,49 50,51,52,99,162 170,171,172,173 Quan, T. J. Remsen, C. C. Rich, E. Roberts, D. Roberts, D. Rogolsky, M. Rosas.Del Valle, M. Rothstein, A. A. Rothstein, A. A. Savage, C. H. 176		
50,51,52,99,162 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148	Puleo, J. R.	7,12,24,25,26
50,51,52,99,162 170,171,172,173 Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		27,36,39,48,49
170,171,172,173Quan, T. J.29Remsen, C. C.53Rich, E.42,79Roberts, D.183Rogolsky, M.4,13Rosas, Del Valle, M.8Rothstein, A. A.174,175Rypka, W. J.148Savage, C. H.176		
Quan, T. J. 29 Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148		
Remsen, C. C. 53 Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas. Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	-	
Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas, Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	Quan, T. J.	29
Rich, E. 42,79 Roberts, D. 183 Rogolsky, M. 4,13 Rosas Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	Remsen, C. C.	53
Roberts, D. 183 Rogolsky, M. 4,13 Rosas. Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176		42,79
Rogolsky, M. 4,13 Rosas.Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176	•	
Rosas. Del Valle, M. 8 Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176		
Rothstein, A. A. 174,175 Rypka, W. J. 148 Savage, C. H. 176		· · ·
Rypka, W. J. 148 Savage, C. H. 176		_
Savage, C. H. 176		
	курка, w. J.	148
	Savage, C. H.	176
Schalkowsky, S. 18,54,55,56	Schalkowsky, S.	18,54,55,56
57,58,59,177,178		
Schmitt, R. F. 75	Schmitt, R. F.	

Shannon, J. L.	156,157
Sharp, R. P.	117
Sherry, E. J.	60,61
Silver, R. H.	142
Silverman, G. J.	179,180
-	147,181
Sivinski, H. D.	
Slepecky, R. A.	3,4,8,9,13,14
	30,38,53,62
	88,118,154
Smith, C. D.	160
Speckman, J. A.	6,81
Stern, [†] . A.	80,114,160,182
Stockham, J. D.	183
BEOCKHAM, J. D.	105
	63
Tierney, M. S.	
Tolkacz, V.	112,113
Trauth, C. A., Jr.	60,61,63,64,65
	147,173,184,185
Tritz, G. J.	7,27,28,37,51
	66, 155, 186, 187
Vesley, D.	33,67,188
Vinter, V.	8,14
vincer, v.	• • • • • • • • • • • • • • • • • • • •
Whitcomb, J. G.	148
-	15,16,68,69,87
Whitfield, W. J.	
	147, 148, 181, 189, 190
Wiederkehr, R.	58,59,178
Wolfson, R. P.	83
Woolsey, R. E.	64,65
Wright, D. E.	191,192,193,194,195

ļ

[]

1

A statement of the stat

I)

112

]

||

U

D

IJ

-21-

PERMUTED TITLE INDEX

achievements in space bioscience, Spacecraft sterilization and planetar 195 acriflavin/Elimination of a genetic determinant for sporulation of Bacil 4 13 acriflavin/Induction of asporogeny in <u>B</u>. <u>subtilis</u> with 91 activation/Dual meaning of Aerobee 4.150/An experiment to detect microorganisms in the upper atmosp 42 aerobic and anaerobic bacteria in agar subjected to freezing, diurnal fr 77 aerosol/Automatic, Instantaneous monitor for counting the bacterial load 85 aerosols/Filtration of submicron virus 110 aerosols by a sonic disseminator technique/Production of low concentrati 19 (AIMP) Anchored interplanetary monitoring platform compilation materials 104 AIMP spacecraft. Part 1/Microbiological burden on the surfaces of the 44 AIMP spacecraft. Part 2/Microbiological burden on the surfaces of the 45 AIMP spacecraft. Part 3/Microbiological burden on the surfaces of the 46 AIMP spacecraft. Part 4/Microbiological burder on the surfaces of the 47 AIMP-D spacecraft/Decontamination of the 143 (AIMP-E) spacecraft/Microbial decontamination and sampling program for a 144 Amino acid replacement of the manganese sporulation requirements of <u>B</u>. m 9 77 anaerobic bacteria in agar subjected to freezing, diurnal freezing and t Analysis of planetary quarantine requirements/ 57 72 analysis for sterilization requirements/An Analytical techniques in planetary quarantine and spacecraft sterilizati 54 analytical techniques in planetary quarantine/Study of 177 anchored interplanetary monitoring platform (AIMP-E) spacecraft/Microbia 144 Anchored interplanetary monitoring platform compilation materials and de 104 asporogeny in <u>B</u>. <u>subtilis</u> with acriflavin/Induction of 13 assay and certification of spacecraft hardware sterility/Microbiological 124 assay procedures/SADL - A study of chemical residues left on surfaces af 137 90 Assay techniques for planetary quarantine/ 40 assay tool/Preliminary results using coated stainless steel strips as an 89 assaying space hardware/Application of laminar airflow systems in 60 assembly contamination model/An assembly process/SADL assembly of CMTM for purposed of determining areas 133 assembly of sterilizable planetary landing capsules/Visual monitoring du 102 atmosphere and beyond/Microbes in the upper 76 atmosphere flown on Aerobee NASA 4.150/An experiment to detect microorga 42 180 atmospheric pressure/Resistivity of spores to ultraviolet and γ radiatio B. cereus and B. subtilis germination/Survival of microorganisms in a si 106 Bacillus cereus by beta-phenethyl alcohol/Inhibition of spore septum and 53 160 (Bacillus globigii)/Resistance of bacterial spores 8 <u>B. megaterium</u>/Sporulation studies in a synchronous culture of 9 B. megaterium in a synchronous system/Amino acid replacement of the mang-Bacillus megaterium during synchronous growth/Fine structure of 88

l

Bacillus megaterium in a synchronous growth system/Enzyme synthesis during 🔅 30 Bacillus megaterium/Trace metal requirements for sporulation of 3 B. subtilis with acriflavin/Induction of asporogeny in 13 <u>B</u>. subtilis germination/Survival of microorganisms in a simulated Martian 106 Bacillus subtilis with acriflavin/Elimination of a genetic determinant fo 4 Bacillus subtilis/Sporulation mutations induced by heat in 154 Bacillus subtilis and Staphylococcus epidermidis population/Comparison of 156 Bacillus subtilis/Temperature-induced sporulation mutations in 38 Bacillus subtilis var. niger in association with soil mineral particles/D 34 bacteria in agar subjected to freezing, diurnal freezing and thawing/Grow 77 (bacteria) Amino acid replacement of the manganese sporulation requiremen 9 (bacteria) Comparison of methyl-bromide and ethylene-oxide resistances of 156 (bacteria) Dry heat survival of <u>Bacillus subtilis</u> var. <u>niger</u> in associati 34 bacteria from eccofoam FP and diatomaceous earth/Recovery of vegetative 167 (bacteria) Enzyme synthesis during sporulation of <u>Bacillus</u> megaterium in 30 (bacteria) Fine structure of Bacillus megaterium during synchronous growt 88 (bacteria) Induction of asporogeny in <u>B</u>. <u>subtilis</u> with acriflavin/ 13 (bacteria) Inhibition of spore septum and forespore membrane development ' 53 bacteria in iodinated swimming pools/Factors influencing the occurrence o 22 (bacteria) Sporulation studies in a synchronous culture of <u>B</u>. megaterium/ 8 (bacteria) Survival of cocci after exposure to ultrahigh vacuum at differ 179 (bacteria) Survival of microorganisms in a simulated Martian environment. 106 (bacteria) Synchronous growth and sporulation of <u>Bacillus</u> megaterium/ 118 (bacteria) Synergism in ethylene oxide-methyl bromide sterilization of ve 157 (bacteria) Temperature-induced sporulation mutations in Bacillus subtilis 38 (bacteria) Trace metal requirements for sporulation of <u>Bacillus</u> megateriu 3 bacterial loading of an aerosol/Automatic, instantaneous monitor for coun 85 Bacterial spore contamination of lunar spacecraft/ 149 bacterial spores (<u>Bacillus</u> globigii)/Resistance of 160 bacterial spores exposed to dry heat/Occurrence of non-logarithmic death 23 bacterial spores to new sporangia without intermediate cell division/Dire 14 bacteriological detection techniques to low levels of contamination/Sensi 29 191 Bibliography on applications of ethylene oxide/ bibliography from the Literature Retrieval System/Bioluminescence, a sele 41 103 bibliography from the Literature Retrieval System, Space Biology Branch/A bibliography from the Literature Retrieval System/Sterilization, a select 43 192 Bibliography on planetary quarantine. Vol. I. Policy/ Bibliography on planetary quarantine. Vol. II. Environmental microbiolog 193 Vol. III. Engineering parameters/ 1.94 Bibliography on planetary quarantine. 183 bioclean room survey/Results of (bioinstrumentation) Development of an increased sampling rate monitoring 69 Bioluminescence, A selected bibliography from the Literature Retrieval Sy 41 calculation for spacecraft/Terminal sterilization process 114 102 capsules/Visual monitoring during assembly of sterilizable planetary land 49 carbon. A note/Heat sterilization of activated certification of spacecraft hardware sterility/Microbiological assay and 124

chemical germicides/Report on a study of

chemical residues left on surfaces after biological assay procedures/SADL 137 class 100 laminar-flow clean room for viable contamination cleanup/Evalua 16 (clean room) The deposition of nutrients to surfaces by Rodac plates/ 15 clean room/Monitoring a class 100 68 clean room for viable contamination cleanup/Evaluation of the efficiency 16 clean rooms/Comparative levels of microbial contamination among hospital . 36 clean rooms/Comparative levels and types of microbial contamination detec 24 clean rooms/Comparison of microbial contamination levels among hospital 99 clean rooms/Microbial contamination in conventional and laminar flow 26 clean rooms/Microbial profile of laminar flow 11 clean rooms/Microbiological profiles of conventional and laminar flow 39 clean rooms/Reduction of microbial contamination levels by use of laminar 37 clean rooms used for the assembly and test of lunar spacecraft/Comparativ-101 clean rooms used for the assembly and test of lunar spacecraft/Comparativ 186 clean rooms and work stations for the microbially controlled environment/ 153 cleaning and decontamination/Routine 131 cleaning and decontamination of SADL facility/Routine 132 Clothing study - EASL/ 120 CMTM biological monitoring plan/ 121 CMTM microbial burden/SADL - Development of procedures for estimating the 134 CMTM for purposes of determining areas of contact during the assembly pro 133 cocci after exposure to ultrahigh vacuum at different temperatures/Surviv 179 Comparative levels of microbial contamination among hospital operating ro 36 Comparative levels and types of microbial contamination detected in indus 24 component parts, tools, and equipment/Process specification, decontaminat 127 contaminants on space hardware/Factors influencing detection and enumerat 21 contamination in clean rooms used for the assembly and test of lunar spac 101 contamination in clean rooms used for the assembly and test of lunar space 186 contamination cleanup/Evaluation of the efficiency of a class 100 laminar 16 contamination control: Needs and areas of application/Laminar air flow fo 164 Contamination control principles/ 181 contamination control/A systems approach to 185 contamination in conventional and laminar flow clean rooms/Microbial 26 contamination detected in industrial clean rooms/Comparative levels and t 24 contamination detected on the Surveyor 2 spacecraft/Microbial 187 contamination/Environmental microbiology and the control of microbial 33 contamination failure mode/A model for determining the probability of fai 63 contamination on flat surfaces/Effect of time and temperature in assessing, 67 contamination among hospital operating rooms and industrial clean rooms/C 36 contamination levels among hospital operating rooms and industrial clean 39 contamination levels encountered by the Lunar Orbiter spacecraft/Microbia 28 contamination levels by use of laminar flow clean rooms/Reduction of micr 37 contamination of lunar spacecraft/Bacterial spore 149 (contamination) Microbiological burden on the surfaces of the AIMP spacec 44 (contamination) Microbiological burden on the surfaces of the AIMP spacec 45 (contamination) Microbiological burden on the surfaces of the AIMP spacec 46 (contamination) Microbiological burden on the surfaces of the AIMP spacec 47 (contamination) Microbiological burden on the surfaces of Explorer XXXIII 169 contamination model/An assembly 60 contamination I: The problem and agreements/Planetary 117

: .

1.4.4.4

Contamination of planets/	777
contamination of the planets by unsterile spaceflight hardware/Techniques	111 83
contamination probabilities due to flight of the U.S.S.R. Venus 3/Estimat	56
contamination on space hardware/Assessment of microbial	20
contamination on space hardware/Factors influencing the detection and enu	20 92
contamination from spacecraft hardware. I. A model system/Techniques for	92 7
contamination of a surface by handling/Microbial	
contamination from surfaces/Reliability and efficiency of ultrasonics in	10
contamination on surfaces/Report on study of plateau of microbiological	50
contamination on surfaces of space hardware by ultrasonics/Assessment of	130
contamination on surfaces/Use of ultrasonic energy in assessing	170
contamination on surfaces/Use of ultrasonication for the enumeration of of	171
contamination on surfaces/Use of ultrasonics in assessing microbial	27
control of microbiol contemination (Environmental microbiolan	172
control of microbial contamination/Environmental microbiology and the	33
control/The hospital engineer and infection	93
control/A systems approach to contamination	185
conventional and laminar flow clean rooms/Microbiological profiles of	39
critique of current spacecraft sterilization standards/A	55
(culture) The deposition of nutrients to surfaces by Rodac plates/	15
death rates of bacterial spores exposed to dry heat/Occurrence of non-log	23
decision model of planetary quarantine primary objectives/A sequential	184
decontaminate compatibility tests/Anchored interplanetary monitoring plat	104
Decontamination of the AIMP-D spacecraft/	143
decontamination chamber/SADL 3000 cu. ft.	140
decontamination of component parts, tools, and equipment/Process specific	127
decontamination/Routine cleaning and	131
decontamination of SADL facility/Routine cleaning and	132
decontamination and sampling program for anchored interplanetary monitori	144
decontamination techniques for space vehicles/Sterilization and	82
denaturation during exposure to sterilization temperatures/Prevention of	79
deposition of nutrients to surfaces by Rodac plates/The	15
detection and enumeration of microbial contaminants on space hardware/Fac	21
detection and enumeration of microbial contamination on space hardware/Fa	92
detection techniques to low levels of contamination/Sensitivity of bacter	29
development in <u>Bacillus cereus</u> by beta-phenethyl alcohol/Inhibition of sp	53
Development of an increased sampling rate monitoring system/	69
developments in planetary quarantine/Recent	109
diatomaceous earth pellets used as a protective material in dry heat ster	166
diatomaceous earth/Recovery of vegetative bacteria from eccofoam FP and	167
disseminator technique/Production of low concentration particulate aeroso	19
dry heat/Occurrence of non-logarithmic death rates of bacterial spores ex	23
Dry heat sterilization of interplanetary vehicles/	163
dry heat sterilization procedures on polymeric products/Effects of ethyle	142
dry-heat sterilization/Protective mechanism affecting	70
dry heat sterilization studies/Quantitative spore recoveries from diatoma	166
Dry heat survival of <u>Bacillus subtilis</u> var. <u>niger</u> in association with soi	34

and a second sec

Contract S

1

(MOND)

j

120 EASL/Clothing study -EASL under disrupted vertical airflow/SADL - A study of the microbial bur 139 EASL facility/SADL - A study of the effects of varying the established op 138 EASL/Identification of microbiological isolates -123 EASL operations/Personnel procedures for 125 eccofoam FP and diatomaceous earth/Recovery of vegetative bacteria from 167 Effect of reduced barometric pressure on water availability related to mi 112 100 Effect of systems tests on the microbial load of a lunar spacecraft/ Effect of time and temperature in assessing microbial contamination 67 Effects of ethylene oxide-freon 12 decontamination and dry heat steriliza 142 31 Effects of the thermal sterilization procedure on polymeric products/ 138 effects of varying the established operating and maintenance procedures of 93 engineer and infection control/The hospital 194 Engineering parameters/Bibliography on planetary quarantine. Vol. III. enumeration of microbial contaminants on space hardware/Factors influenci 21 92 enumeration of microbial contamination on space hardware/Factors influenc enumeration of microbial contamination on surfaces/Use of ultrasonication 27 165 environmental control/Recent advances in microbiological 25 Environmental factors influencing the survival of microorganisms on surfa Environmental microbiology/Bibliography on planetary quarantine, Vol. II 193 Environmental microbiology and the control of microbial contamination/ 33 30 Enzyme synthesis during sporulation of <u>Bacillus</u> megaterium in a synchrono 127 equipment/Process specification, decontamination of component parts, tool 56 Estimation of planetary contamination probabilities due to flight of the 81 Estimation for a simple exponential model/ estimation/Simultaneous nonlinear 17 191 ethylene oxide/Bibliography on applications of ethylene oxide-freon 12 decontamination and dry heat sterilization proced 142 157 ethylene oxide-methyl bromide sterilization of very dry spore and staphyl 156 ethylene-oxide resistances of Bacillus subtilis and Staphylococcus epider 16 Evaluation of the efficiency of a class 100 laminar-flow clean room for vi exploration/Sterilization requirements for space 146 169 Explorer XXXIII spacecraft/Microbiological burden on the surfaces of 6 exponential model/Estimation for a one-parameter 81 exponential model/Estimation for a simple 2 exponential model/Spearman estimation for a simple 5 exponential model/Spearman estimation for a simple 1 exponentials/A method for fitting linear combinations of 119 filters/Microbiological evaluation of HEPA 168 Filtration/Certification of probability of sterilization of liquid by 110 filtration of submicron virus aerosols/

Fireflies for space research/

freezing, diurnal freezing and thawing/Growth of aerobic and anaerobic ba

(gamma radiation) Resistivity of spored to ultraviolet and γ radiation wh180garments/Evaluation of two NASA biological isolation105gelatin hydrolysis/A combination medium for demonstrating starch and159

84

genetic determinant for sporulation of Bacilius subtilis with acriflavin/ 4 germicide treatment in surgical instrument cleaning/The use of combined s 62 germicides/Griteria for selection of 107 germicides/Report on a study of chemical 129 germination/Survival of microcrganisms in a simulated Martian environment 106 gnotobiotic technology/Sterile insertion - an aerospace application of 175 (Goddard Space Flight Center) A selected bibliography from the Literature 103 Growth of aerobic and anaerobic bacteria in agar subjected to freezing, d 77 growth/Effect of reduced barometric pressure on water availability relate 112 growth/Fine structure of <u>Bacillus megaterium</u> during synchronous 88 growth and sporulation of Bacillus megaterium/Synchronous 118 growth (PG) of viable microorganisms in Martian environments/Probability 113 I. A model system/Techniques for removing microbial contaminat 7 hardware. hardware/Application of laminar airflow systems in assaying space 89 hardware/Assessment of microbial contamination on space 20 hardware/Evaluation of preliminary standard procedure for microbiological 122 hardware/Factors influencing detection and enumeration of microbial conta 21 hardware/Factors influencing detection and enumeration of microbial conta 92 152 hardware/NASA standard procedures for the microbiological examination of hardware sterility/Microbiological assay and certification of spacecraft 124 hardware/Techniques for the prevention of contamination of the planets by 83 hardware by ultrasonics/Assessment of microbial contamination on surfaces 170 heat in Bacillus subtilis/Sporulation mutations induced by 154 23 heat/Occurrence of non-logarithmic death rates of bacterial spores expose 128 heat resistance of microbiological isolates/Report on determination of Heat sterilization of activated carbon. A note/ 49 heat sterilization/Estimation of microbial survival in 178 163 heat sterilization of interplanetary vehicles/Dry heat sterilization/Log-normal model for microbial survival in 58 142 heat sterilization procedures on polymeric products/Effects of ethylene o heat sterilization studies/Spore recoveries from diatomaceous earth pelle 166 HEPA filters/Microbiological evaluation of 119 hospital engineer and infection control/The 93 99 hospital operating rooms and industrial clean rooms/Comparison of microbi 36 hospital operating rooms and industrial clean rooms/Comparative levels of 188 hospital patients/Laminar air flow for the care of hydrolysis/A combination medium for demonstrating starch and gelatin 159 impact limiters/Sterilization of 176 industrial clean rooms/Comparison of microbial contamination levels among 99 infection control/The hospital engineer and 93 Inhibition of spore septum and forespore membrane development in Bacillus 53 151 instrument requirements/Sampling of planetary surface solids for unmanned (instrumentation) Automatic, instantaneous monitor for counting the bacte 85 63 (instrumentation) A model for determining the probability of failure of a (instrumentation) Monitoring a class 100 clean room/ 68 (instrumentation) Principles of operation of the vacuum probe microbiolog 86

-27-

7-

(instrumentation) The vacuum probe for removing microorganisms for count 150 integer linear program/IPSC, a machine independent 64 integer linear programming/Practical aspects of 65 iodine-resistant bacteria in iodinated swimming pools/Factors influencin 22 IPSC, a machine independent integer linear program/ 64 isolates - EASL/Identification of microbiological 123 isolation garments/Evaluation of two NASA biological 105

75

89

71

26

11

39

37

1.6

1

64

65

58

28

9

80

106

113

159

158

156

157

76

139

134

21

186

3

1

liquid by filtation/Certification of probability of sterilization of 1.68 Laminar air flow for the care of hospital patients/ 188 laminar air flow/Principles of 189 Laminar air flow for sterility testing procedures/ Laminar air flow in the surgical theater/ 145 laminar airflow surgical theater/The microbial profile of a vertical 148 laminar airflow systems in assaying space hardware/Application of Laminar air flow systems for microbiology/ Laminar air flow for microbiological contamination control: Needs and ar 164 laminar flow clean rooms/Microbial contamination in conventional and laminar flow clean rooms/Microbial profile of laminar flow clean rooms/Microbiological profiles of conventional and laminar flow clean rooms/Reduction of microbial contamination levels by laminar-flow clean room for viable contamination cleanup/Evaluation of t linear combinations of exponentials/A method for fitting linear program/IPSC, a machine independent integer linear programming/Practical aspects of integer Literature Retrieval System, Space Biology Branch/A selected bibliograph 103 Log-normal model for microbial survival in heat sterilization/ Lunar Orbiter spacecraft/Microbial contamination levels encountered by t Lunar Orbiters/Progressive biological monitoring on 155 lunar spacecraft/Bacterial spore contamination of 149 lunar spacecraft/Comparative levels of microbial contamination in clean 186 lunar spacecraft/Comparative levels of microbial contamination in clean 101 lunar spacecraft/Effect of system tests on the microbial load of a 100

manganese sporulation requirements of B. megaterium in a synchronous sys Mariner Venus '67 flight spacecraft (Mariner V)/Microbiological sampling Martian environment. II. Moisture and oxygen requirements for B. cereus Martian environments/Probability of growth, (p_G) of viable microorganisms medium for demonstrating starch and gelatin hydrolysis/A combination metal requirements for sporulation of Bacillus megaterium/Trace method for fitting linear combinations of exponentials/A method for removal of microorganisms from surfaces/An improved sonication methyl-bromide and ethylene-oxide resistances of Bacillus subtilis and S methyl bromide sterilization of very dry spore and staphylococcal popula Microbes in the upper atmosphere and beyond/ microbial burden accumulated on assemblies built in EASL under disrupted microbial burden/SADL - Development of procedures for estimating the CMT

microbial contaminants on space hardware/Factors influencing detection a microbial contamination in clean rooms used for the assembly and test of

microbial contamination in clean rooms used for the assembly and test of 101 Microbial contamination in conventional and laminar flow clean rooms/ 26 microbial contamination detected in industrial clean rooms/Comparative 1 24 Microbial contamination detected on the Surveyor 2 spacecraft/ 187 microbial contamination/Environmental microbiology and the control of 33 microbial contamination on flat surfaces/Effect of time and temperature i 67 microbial contamination among hospital operating rooms and industrial clea 36 Microbial contamination levels encountered by the Lunar Orbiter spacecraf 28 microbial contamination levels among hospital operating rooms and industr 99 microbial contamination levels by use of laminar flow clean roome/Reducti 37 microbial contamination from spacecraft hardware. I. A model system/Tech 7 microbial contamination on space hardware/Assessment of 20 microbial contamination on space hardware/Factors influencing the detecti 92 Microbial contamination of a surface by handling/ 10 microbial contamination from surfaces/Reliability and efficiency of ultra 50 microbial contamination on surfaces of space hardware by ultrasonics/Asse 170 microbial contamination on surfaces/Use of ultrasonic energy in assessing 171 microbial contamination on surfaces/Use of ultrasonics in assessing 172 microbial contamination on surfaces/Use of ultrasonication for the enumer 27 Microbial decontamination and sampling program for anchored interplanetar 144 microbial growth/Effect of reduced barometric pressure on water availabil 112 microbial load of a lunar spacecraft/Effect of systems tests on the 100 microbial load/Surveyor 2 -- its 66 Microbial profile of laminar flow clean rooms/ 11 microbial profile of a vertical laminar airflow surgical theater/The 148 microbial survival in heat sterilization/Estimation of 178 microbial survival in heat sterilization/Log-normal model for 58 microbially controlled environment/Standards for clean rooms and work sta 153 Microbiological assay and certification of spacecraft hardware sterility/ 124 Microbiological burden on the surfaces of the AIMP spacecraft. Part 1/ 44 Microbiological burden on the surfaces of the AIMP spacecraft. Part 2/ 45 Microbiological burden on the surfaces of the AIMP spacecraft. Part 3/ 46 Microbiological burden on the surfaces of the AIMP spacecraft. Part 4/ 47 Microbiological burden on the surfaces of Explorer XXXIII spacecraft/ 169 microbiological contamination control: Needs and areas of application/Lam 164 microbiological contamination on surfaces/Report on study of plateau of 130 microbiological environmental control/Recent advances in 165 Microbiological evaluation of HEPA filters/ 119 microbiological examination of space hardware/Evaluation of preliminary s 122 microbiological examination of space hardware/NASA standard procedures fo 152 microbiological isolates - EASL/Identification of 123 microbiological isolates/Report on determination of heat resistance of 128 Microbiological profiles of conventional and laminar flow clean rooms/ 39 microbiological sampler/Principles of operation of the vacuum probe 86 Microbiological sampling program for the Mariner Venus '67 flight spacecr 80 microbiological sampling of surfaces: The vacuum probe sampler/A new appr 87 microbiology and the control of microbial contamination/Environmental 33 (microorganism) A stochastic sterilization model/ 59 microorganisms for counting/The vacuum probe for removing 150

161 microorganisms on fracture from solids/The probability of releasing 162 microorganisms from fractured solids/Estimating the probability of releas 35 microorganisms in high ultraviolet flux/Survival of selected 113 microorganisms in Martian environments/Probability of growth (P_G) of viab 106 microorganisms in a simulated Martian environment. II. (198) Bure and Oxy 48 microorganisms from solids/Factors influencing the recovery of 12 microorganisms from solids/Recovery of viable 25 microorganisms on surfaces/Environmental factors influencing the survival 51 microorganisms from surfaces/Factors influencing the recovery of 173 microorganisms from surfaces/Feasibility of using ultrasonics for removing 158 microorganisms from surfaces/An improved sonication method for removal of 42 microorganisms in the upper atmosphere flown on Aerobee NASA 4.150/An exp 34 mineral particles/Dry heat survival of Bacillus Subtilis var. niger in as (mitosis) Direct transition of outgrowing bacterial spores to new sporang 14 63 mode/A model for determining the probability of failure of a valve having 60 model/An assembly contamination 63 model for determining the probability of failure of a valve having a part 6 model/Estimation for a one-parameter exponential 81 model/Estimation for a simple exponential 58 model for microbial survival in heat sterilization/Log-normal 78 model 1973 mission/The voyager planetary quarantine 184 model of planetary quarantine primary objectives/A sequential decision 61 model for planetary quarantine requirements/A 17 (model) Simultaneous nonlinear estimation/ 73 model for spacecraft sterilization requirements/A rational 2 model/Spearman estimation for a simple exponential 5 model/Spearman estimation for a simple exponential 59 model/A stochastic sterilization 7 model system/Techniques for removing microbial contamination from spacecr 106 Moisture and oxygen requirements for <u>B</u>. cereus and <u>B</u>. subtilis germinatio 155 monitoring on Lunar Orbiters/Progressive biological 121 monitoring plan/CMTM biological 135 monitoring plan/SADL 190 monitoring system/The development of a faster 69 monitoring system/Development of an increased sampling rate 88 (morphology) Fine structure of Bacillus megaterium during synchronous gro mutations in Bacillus subtilis/Temperature-induced sporulation 38 154 mutations induced by heat in Bacillus subtilis/Sporulation 105

NASA biological isolation garments/Evaluation of two105NASA/Services provided in support of the planetary quarantine requirement94NASA/Services provided in support of the planetary quarantine requirement95NASA/Services provided in support of the planetary quarantine requirement96NASA/Services provided in support of the planetary quarantine requirement97NASA/Services provided in support of the planetary quarantine requirement97NASA standard procedures for the microbiological examination of space har152nonlinear estimation/Simultaneous17nutrients to surfaces by Rodac plates/The deposition of15

3

South Participation

Orbiters/Progressive biological monitoring on Lunar	155
oxygen requirements for <u>B. cereus</u> and <u>B. subtilis</u> germination/Survival of	106
particulate aerosols by a sonic disseminator technique/Production of low	19
peracetic acid and beta-propiolactone at subzero temperatures/Sporicidal	141
Personnel procedures for EASL operations/	125
Personnel procedures for SADL operations/	126
beta-phenethyl alcohol/Inhibition of spore septum and forespore membrane	53
Planetary contamination I: The problems and the agreements/	117
planetary quarantine/Recent developments in	109
planetary quarantine requirements/Analysis of	57
planetary quarantine requirements of NASA/Services provided in support of	94
planetary quarantine requirements of NASA/Services provided in support of	95
planetary quarantine requirements of NASA/Services provided in support of	96
planetary quarantine requirements of NASA/Services provided in support of	97
planets/Contamination of	111
planets by unsterile spaceflight hardware/Techniques for the prevention o	83
plastic/The recovery of embedded spores from a	52
Policy/Bibliography on planetary quarantine Vol. I.	192
polymeric products/Effects of ethylene oxide-freon 12 decontamination and polymeric products/Effects of the thermal sterilization procedure on pressure/Resistivity of spores to ultraviolet and Y radiation while expos	142 31 180
pressure on water availability related to microbial growth/Effect of redu	112
probability of release of viable microorgansims from fractured solids/Est	162
probability of releasing microorganisms on fracture from solids/The	161
probe microbiological sampler/Principles of operation of the vacuum	86
probe for removing microorganisms for counting/The vacuum	150
problems in spacecraft sterilization/Special	18
procedure for microbiological examination of space hardware/Evaluation of	122
procedures for estimating the CMTM microbial burden/SADL - Development of	134
procedures/Laminar air flow for sterility testing	75
procedures for the microbiological examination of space hardware/NASA sta	152
procedures/Sampling and verification in large-scale sterilization	74
beta-propiolactone at subzero temperatures/Sporicidal activity of peracet	141
Protective mechanisms affecting dry-heat sterilization/	70
protein denaturation during exposure to sterilization temperatures/Preven	79
quarantine requirements/Analysis of planetary	57
radiation while exposed to ultrahigh vacuum or at atmospheric pressure/Re	180
randomized blocks when the alternatives have an a priori ordering/Rank te	116
recovery of embedded spores from a plastic/The	52
recovery of microbial contamination from surfaces/Reliability and efficie	50
recovery of microorganisms from solids/Factors influencing the	48
Recovery of vegetative bacteria from eccofoam FP and diatomaceous earth/	167
Recovery of viable microorganisms from solids/	12
recovery of viable microorganisms from surfaces/Factors influencing	51

STRUCTURE S

.

C. The state of th

Compared of

Ĩ

(

-31-

requirements/Analysis of planetary quarantine 57 requirements/An analysis for sterilization 72 requirements for <u>B</u>. cereus and <u>B</u>. subtilis germination/Survival of microo 106 requirements/A model for planetary quarantine 61 94 requirements of NASA/Services provided in support of the planetary quaran 95 requirements of NASA/Services provided in support of the planetary guaran requirements of NASA/Services provided in support of the planetary quaran 96 requirements of NASA/Services provided in support of the planetary quaran 97 requirements/A rational model for spacecraft sterilization 73 requirements/Sampling of planetary surface solids for unmanned in situ ge 151 requirements for space exploration/Sterilization 32 requirements for space exploration/Sterilization 146 Resistance of bacterial spores (Bacillus globigii)/ 160 resistance of microbiological isolates/Report on determination of heat 128 59 (resistance) A stochastic sterilization model/ Resistivity of spores to ultraviolet and γ radiation while exposed to ult 180 Rodac plates/The deposition of nutrients to surfaces by 15 SADL assembly of CMTM for purposed of determining areas of contact during 133 134 SADL - Development of procedures for estimating the CMTM microbial burden SADL facility/Routine cleaning and decontamination of 132 135 SADL monitoring plan/ 126 SADL operations/Personnel procedures for 137 SADL - A study of chemical residues left on surfaces after biological ass SADL - A study of the effects of varying the established operating and ma 138 139 SADL - A study of the microbial burden accumulated on assemblies built in 140 SADL 3000 cu. ft. decontamination chamber/ 136 SADL quality assurance program plan/ Sampling of planetary surface solids for unmanned in situ geological and 151 sampling program for anchored interplanetary monitoring platform (AIMP-E) 144 sampling program for the Mariner Venus '67 flight spacecraft (Mariner V) 80 sampling rate monitoring system/Development of an increased 69 sampling of surfaces: The vacuum probe sampler/A new approach to the micr 87 sample test/Asymptotic efficiency of two nonparametric competitors of Wil 115 Sampling and verification in large-scale sterilization procedures/ 74 selection of germicides/Criteria for 107 29 Sensitivity of bacteriological detection techniques to low levels of cont sequential decision model of planetary quarantine primary objectives/A 184 II. Moisture and oxygen requirements for 106 simulated Martian environment. soil mineral particles/Dry heat survival of Bacillus subtilis var. niger 34 162 solids/Estimating the probability of release of viable microorganisms fro solids/The probability of releasing microorganisms on fracture from 161 solids/Recovery of viable microorganisms from 12 solids for unmanned in situ geological and biological analysis: Strategy, 151 sonic disseminator technique/Production of low concentration particulate 19 62 sonication-germicide treatment in surgical instrument cleaning/The use of 158 sonication method for removal of microorganisms from surfaces/An improved 44 spacecraft. Part 1/Microbiological burden on the surfaces of the AIMP

4

ŵ

「「「「「「」」

「「「「「「「」」」」」」

4

-32 -

spacecraft. Part 2/Microbiological burden on the surfaces of the AIMP 45 spacecraft. Part 3/Microbiological burden on the surfaces of the AIMP 46 47 spacecraft. Part 4/Microbiological burden on the surfaces of the AIMP spacecraft/Comparative levels of microbial contamination in clean rooms u 186 spacecraft/Comparative levels of microbial contamination in clean rooms u 101 spacecraft/Decontamination of the AIMP-D 143 163 (spacecraft) Dry heat sterilization of interplanetary vehicles/ 100 spacecraft/Effect of systems tests on the microbial load of a lunar spacecraft/The importance of sterilization techniques in 108 spacecraft/Microbial contamination detected on the Surveyor 2 187 spacecraft/Microbial contamination levels encountered by the Lunar Orbite 28 144 spacecraft/Microbial decontamination and sampling program for anchored in 169 spacecraft/Microbiological burden on the surfaces of Explorer XXXIII 54 spacecraft sterilization/Analytical techniques in planetary quarantine an spacecraft sterilization requirements/A rational model for 73 18 spacecraft sterilization/Special problems in spacecraft sterilization standards/A critique of current 55 spacecraft before sterilization/Techniques for the limitation of biologic 147 114 spacecraft/Terminal sterilization process calculation for 32 space exploration/Sterilization requirements for 83 spaceflight hardware/Techniques for the prevention of contamination of th 146 (space flight) Sterilization requirements for space exploration/ (space probe) Estimation of planetary contamination probabilities due to 56 84 space research/Fireflies for 82 space vehicles/Sterilization and decontamination techniques for 2 Spearman estimation for a simple exponential model/ 5 Spearman estimation for a simple exponential model/ 127 specification, decontamination of component parts, tools and equipment/Pr sporangia without intermediate cell division/Direct transition of outgrow 14 149 spore contamination of lunar spacecraft/Bacterial 166 spore recoveries from diatomaceous earth pellets used as a protective mat spore septum and forespore membrane development in Bacillus cereus by bet 53 157 spore and staphylococcal populations/Synergism in ethylene oxide-methyl b 160 spores (Bacillus globigii)/Resistance of bacterial spores exposed to dry heat/Occurrence of non-logarithmic death rates of b 23 14 spores to new sporangia without intermediate cell division/Direct transit spores from a plastic/The recovery of embedded 52 spores to ultraviolet and γ radiation while exposed to ultrahigh vacuum 180 Sporicidal activity of peracetic acid and beta-propiolactone at subzero t 141 118 sporulation of <u>Bacillus</u> megaterium/Synchronous growth and 30 sporulation of <u>Bacillus</u> megaterium in a synchronous growth system/Enzyme 3 sporulation of <u>Bacillus</u> <u>megaterium</u>/Trace metal requirements for sporulation of <u>Bacillus</u> subtilis with acriflavin/Elimination of a genetic 4 38 sporulation of Bacillus subtilis/Temperature-induced 154 Sporulation mutations induced by heat in <u>Bacillus</u> subtilis/ 8 Sporulation studies in a synchronous culture of B. megaterium/ Standards for clean rooms and work stations for the microbially controlle 153 standards/A critique of current spacecraft sterilization 55 156 Staphylococcus epidermidis population/Comparison of methyl-bromide and et

staphylococcal populations/Synergism in othylene oxide-methyl bromide ster 157 starch and gelatin hydrolysis/A combination medium for demonstrating 159 (statistics) Estimation for a one-parameter exponential model/ 6 81 (statistics) Estimation for a simple exponential model/ (statistics) A method for fitting linear combinations of exponentials/ 1 (statistics) Rank tests for randomized blocks when the alternatives have a 116 (statistics) Simultaneous non Monear estimation/ 17 (statistics) Spearman estimation for a simple exponential model/ 2 5 (statistics) Spearman estimation for a simple exponential model/ 40 steel strips as an assay tool/Preliminary results using coated stainless 175 Sterile insertion - an aerospace application of gnotobiotic technology/ sterility/Microbiological assay and certification of spacecraft hardware 124 98 sterility testing/Latest aspects of sterilizable planetary landing capsules/Visual monitoring during assembly 102 49 sterilization of activated carbon. A note/Heat (sterilization) Analysis of planetary quarantine requirements/ 57 sterilization/Analytical techniques in planetary quarantine and spacecraft 54 82 Sterilization and decontamination techniques for space vehicles/ sterilization/Estimation of microbial survival in heat 178 176 Sterilization of impact limiters/ sterilization of liquid by filtration/Certification of probability of 168 58 sterilization/Log-normal model for microbial survival in heat sterilization model/A stochastic 59 sterilization and planetary quarantine/Significant achievements in space bi 195 sterilization procedure on polymeric products/Effects of the thermal 31 74 sterilization procedures/Sampling and verification in large-scale sterilization process calculation for spacecraft/Terminal 114 182 sterilization process parameters/Determination of terminal sterilization/Protective mechanisms affecting dry-heat 70 Sterilization reference booklet/ 174 sterilization requirements/An analysis for 72 sterilization requirements/A rational model for spacecraft 73 Sterilization requirements for space exploration/ 32 146 Sterilization requirements for space exploration/ Sterilization, a selected bibliography from the Literature Retrieval Syste 43 sterilization/Special problems in spacecraft 18 sterílization standards/A critique of spacecraft 55 147 sterilization/Techniques for the limitation of biological loading of space sterilization techniques in spacecraft/The importance of 108 79 sterilization temperatures/Prevention of protein denaturation during expos sterilization of very dry spore and staphylococcal populations/Synergism i 157 surfaces/Effect of time and temperature in assessing microbial contaminati 67 surfaces/An improved sonication method for removal of microorganisms from 158 surfaces: The vacuum probe sampler/A new approach to the microbiological s 87 Surveyor 2 -- its microbial load/ 66 Surveyor 2 spacecraft/Microbial contamination detected on the 187 survival of <u>Bacillus</u> subtilis var. <u>niger</u> in association with soil mineral 34 179 Survival of cocci after exposure to ultrahigh vacuum at different temperat survival in heat sterilization/Estimation of microbial 178

C

survival in heat sterilization/Log-normal model for microbial	58
Survival of microorganisms in a simulated Martian environment. II. Moistu	106
survival of microorganisms on surfaces/Environmental factors influencing t	25
Survival of selected microorganisms in high ultraviolet flux/	35
synchronous growth/Fine structure of <u>Bacillus megaterium</u> during	88
Synchronous growth and sporulation of <u>Bacillus megaterium</u> /	118
Synergism in ethylene oxide-methyl bromide sterilization of very dry spore	157
synthesis during sporulation of <u>Bacillus megaterium</u> in a synchronous growt	30
systems approach to contamination control/A	185
(technique) A critique of current spacecraft sterilization standards/ technique/Production of low concentration particulate aerosols by a sonic (technique) A stochastin sterilization model/ (technique) The use of combined sonication-germicide treatment in surgical Techniques for the limitation of biological loading of spacecraft before s techniques for the limitation of biological loading of spacecraft before s techniques for planetary quarantine/Sensitivity of bactériological d techniques in planetary quarantine and spacecraft sterilization/Analytical techniques in planetary quarantine/Study of analytical Techniques for the prevention of contamination from spacecraft hardware. techniques for removing microbial contamination from spacecraft hardware. techniques for space vehicles/Sterilization and decontamination temperature in assessing microbial contamination on flat surfaces/Effect o Temperature in description of protein denaturation during exposure to sterili. temperatures/Prevention of protein denaturation during exposure to sterili. temperatures/Sporicidal activity of peracetic acid and beta-propriolactone temperatures/Sporicidal activity of rescentication of testing/Latest aspects of sterility testing procedures/Laminar air flow for sterility test/Asymptotic efficiency of two inonparametric competitors of Wilcoxon's tests/Anchored interplanetary monitoring platform compilation materials an tests on the microbial load of a lunar spacecraft/Effect of systems tests for randomized blocks when the alternatives have an a priori orderin thawing/Growth of aerobic and anaerobic bacteria in agar subjected to free thermal sterilization procedure on polymeric products/Effects of the time and temperature in assessing microbial contamination on flat surfaces	$\begin{array}{c} 55\\19\\59\\62\\147\\29\\90\\54\\177\\87\\108\\82\\67\\38\\79\\141\\179\\182\\98\\75\\115\\104\\100\\116\\77\\31\\67\end{array}$
ultrahigh vacuum or at atmospheric pressure/Resistivity of spores to ultra	180
ultrahigh vacuum at different temperatures/Survival of cocci after exposur	179
ultrasonic energy in assessing microbial contamination on surfaces/Use of	171
ultrasonication for the enumeration of microbial contamination on surfaces	27
ultrasonics/Assessment of microbial contamination on surfaces of space har	170
ultrasonics in assessing microbial contamination on surfaces/Use of	172
ultrasonics in recovery of microbial contamination from surfaces/Reliabili	50
ultrasonics for removing viable microorganisms from surfaces/Feasibility o	173

The second second

]

Ć

-35-

ultraviolet flux/Survival of selected microorganisms in high 35 ultraviolet and γ radiation while exposed to ultrahigh vacuum or at atmos 180 U.S.S.R. Venus 3/Estimation of planetary contamination probabilities due t 56

vacuum or at atmospheric pressure/Resistivity of spores to ultraviolet and 180 vacuum at different temperatures/Survival of cocci after exposure to ultra 179 vacuum probe microbiological sampler/Principles of operation of the 86 vacuum probe for removing microorganisms for counting/The 150 vacuum probe sampler/A new approach to the microbiological sampling of sur 87 vegetative bacteria from eccofoam FP and diatomaceous earth/Recovery of 167 (Venus) Estimation of planetary contamination probabilities due to flight 56 Venus '67 flight spacecraft (Mariner V)/Microbiological sampling program f 80 verification in large-scale sterilization procedures/Sampling and 74 vertical airflow/SADL - A study of the microbial burden accumulated on ass 139 viable microorganisms from fractured solids/Estimating the probability of 162 viable microorganisms from surfaces/Feasibility of using ultrasonics for r 173 virus aerosols/Filtration of submicron 110 Visual monitoring during assembly of sterilizable planetary landing capsul 102 voyager planetary quarantine model 1973 mission/The 78

water availability related to microbial growth/Effect of reduced barometri 112 Wilcoxon's two sample test/Asymptotic efficiency of two nonparametric comp 115