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**Volume V
The 1975 Supplement**

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SCIENTIFIC PUBLICATIONS AND PRESENTATIONS
RELATING TO PLANETARY QUARANTINE

Volume V
The 1975 Supplement

Frank D. Bradley

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for

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The George Washington University
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PREFACE

This publication is the ninth annual supplement to the original bibliography which was issued in June, 1967.

The supplement consists of citations of documents relating to planetary quarantine; many, but not all, refer to work supported by the Space Bioscience Programs, National Aeronautics and Space Administration, Washington, DC. The citations are assembled to update the survey of germane literature in this substantive area. As in previous supplements there is a listing of documents published prior to the current reporting year. These are cited because of their pertinence to the planetary quarantine program.

In certain references, numerals, preceded by letter(s), are given parenthetically as part of the citation. These numbers are to assist users in the procurement of a hard copy of the document from other than the corporate source. Those citations carrying "A" numbers are obtainable, for a fee, from the

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1. BIGELOW, W.D. The logarithmic nature of thermal death time curves. *Journal of Infectious Diseases* 29:528-536. 1921.

1943

2. NELSON, F.E. Factors which influence the growth of heat-treated bacteria. I. A comparison of four agar media. *Journal of Bacteriology* 45(4):395-403. 1943.

1944

3. NELSON, F.E. Factors which influence the growth of heat-treated bacteria. II. Further studies on media. *Journal of Bacteriology* 48(4):473-477. 1944.

1951

4. FRY, R.M. and R.I.N. Greaves. Survival of bacteria during and after drying. *Journal of Hygiene (Cambridge)* 49(2&3):220-246. 1951.

1954

5. STERN, J.A. and B.E. Proctor. A micro-method and apparatus for the multiple determination of rates of destruction of bacteria and bacterial spores subjected to heat. *Food Technology* VIII(3):139-143. 1954.

1960

6. EVANS, F.R. and H.R. Curran. Influence of preheating, pH, and holding temperature upon viability of bacterial spores stored for long periods in buffer substrates. *Journal of Bacteriology* 79(3):361-368. 1960.
7. GREAVES, R.I.N. Some factors which influence the stability of freeze-dried cultures. IN: Parks, A.S. and A.U. Smith, eds. *Recent Research in Freezing and Drying*. Oxford, Blackwell. 1960. p. 203-215.

8. TREXLER, P.C. Gnotobiotics in relation to space biology. IN: Miller, B.M., ed. Developments in Industrial Microbiology. Vol. 1:15-20. New York, Plenum Press. 1960.
9. ZAMENHOF, S. Effects of heating dry bacteria and spores on their phenotype and genotype. Proceedings of National Academy of Sciences 46:101-105. Washington, DC. 1960.

1962

10. GREAVES, R.I.N. Recent advances in freeze-drying. Journal of Pharmacy and Pharmacology 14 Pt 2:621-640. 1962.
11. LIEBERMEISTER, K. Sterilization with ethylene oxide gas. Deutsche Medizinische Wochenschrift 87(11):552-555. 1962. (NASA TT F-16412).

1963

12. MARSHALL, B.J., W.G. Murrell and W.J. Scott. The effect of water activity, solutes and temperature on the viability and heat resistance of freeze-dried bacterial spores. Journal of General Microbiology 31(3):451-460. 1963.

1964

13. TREXLER, P.C. Gnotobiotic techniques and their application to spacecraft fabrication. IN: Florkin, M. and A. Dollfus, eds. Life Sciences and Space Research II:433-439. Amsterdam, North-Holland. 1964.

1966

14. KORENSTEIN, D.A. Voyager Mars quarantine, ejected particle trajectory study. Prepared for Jet Propulsion Laboratory by General Electric Company. 1966. G.E. doc. number VOY-C2-TR-7. 29 p.
15. MICHAELSEN, G.S. Basic studies in environmental microbiology as related to planetary quarantine. Progress Report for period 1 June - 1 November 1966. Minneapolis, MN, University of Minnesota. 1966. 18 p.
16. NICKS, O.W. and J.R. Miles. Some developments in sterilization for planetary probes. IN: Brown, A.H. and M. Florkin eds. Life Sciences and Space Research IV:176-196. Washington, DC, Spartan Books. 1966.

17. SAGAN, C. and S. Coleman. Decontamination standards for Martian exploration programs. IN: Pittendrigh, C.S., W. Vishniac and J.P.T. Pearman eds. *Biology and the Exploration of Mars*. Washington, DC, National Academy of Sciences/National Research Council. 1966. p. 470-481. (N66-36494#).

1967

18. AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES. Minutes of mathematical models subcommittee of the Spacecraft Sterilization Advisory Committee. Arlington, VA. 1967. 17 p.
19. ZIMMER, H. Results of the world space research, 1966/67. *Weltraumfahrt* 18(5):138-141. 1967. (NASA TT F-16,634).

1969

20. HOTCHIN, J., F.D. Baker and L. Benson. Survival of RNA and DNA viruses in space on the Gemini XII satellite. IN: Vishniac, W. and F.G. Favorite, eds., *Life Sciences and Space Research VII*:67-68. Amsterdam, North-Holland. 1969.

1972

21. BOND, R.G. and J.H. Brewer. Elements in implementation of planetary quarantine constraints. COSPAR presentation. 1972.

1973

22. ASLANYAN, R.R. et al. Inhibition of germination of actinomycetes spores in a stationary magnetic field. *Microbiologiya* XLII(3):556-558. 1973. (NASA TT F-16,203).
23. HERS, J.F. Ph. and K.C. Winkler eds. *Airborne transmission and airborne infection*. New York, N.Y. John Wiley & Sons. 1973. 602 p.

1974

24. CAMPBELL, J.E. Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components. 38th Quarterly Progress Report for period 1 July - 30 September 1974. 1974.

25. CZERNIAWSKI, E. and L. Stolarczyk. Attempt to establish the ionizing radiation dose to be used in the sterilization of one-used medical equipment units. *Acta Microbiologica Polonica*, Series B, 6(23), No. 4:177-183. 1974.
26. DE FREES, R.E. Planetary quarantine impacts on probe design. IN: Dynatrend, Inc. Proceedings of Outer Planet Probe Technology Workshop. Burlington, MA. 1974. (N75-20407).
27. HALMANN, M. Evolution and ecology of phosphorus metabolism. IN: Dose, K., S.W. Fox et al, eds. *The Origin of Life and Evolutionary Biochemistry*, New York, Plenum 1974. p. 169-182. (A75-18509).
28. HOFFMAN, A.R. An overview of planetary quarantine considerations for outer planet probes. IN: Dynatrend, Inc. Proceedings of Outer Planet Probe Technology Workshop. Burlington, MA. 1974. (N75-20406).
29. HORNECK, G., R. Facius, W. Enge, R. Beaujean and K.P. Bartholoma. Microbial studies in the Biostack experiment of the Apollo 16 mission: germination and outgrowth of single *Bacillus subtilis* spores hit by cosmic HZE particles. IN: Sneath, P.H.A., ed. *Life Sciences and Space Research*. XII:75-83. Berlin, Akademie-Verlag. 1974.
30. HOWELL, R. Viking planetary quarantine procedures and implementation. IN: Dynatrend, Inc. Proceedings of Outer Planet Probe Technology Workshop. Burlington, MA. 1974. (N75-20408).
31. KLEIN, H.P. Automated life-detection experiments for the Viking mission to Mars. *Origins of Life* 5(3&4):431-441. 1974.
32. PFLUG, I.J., ed. Environmental microbiology as related to planetary quarantine. 13th Semiannual Progress Report for period 1 June - 30 November 1974. Minneapolis, MN, University of Minnesota. 1974. 58 p.
33. PFLUG, I.J. Factors affecting the dry heat destruction of microorganisms. IN: Pflug, I.J., ed. Environmental microbiology as related to planetary quarantine. Semiannual Progress Report 13 for period 1 June - 30 November 1974. 1974. p. 35-56.

34. PHILLIPS, C.R. Planetary quarantine program, origins and achievements, 1956-1973. Washington, DC, National Aeronautics and Space Administration. 1974. NASA SP-4902. (N75-14670#). 61 p.
35. RECKZEK, G. and W. Döntenwill. Contribution to the question of the contamination of suspended-substances filters by germs. Translation from Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene, Abteilung I, Originale B, 159:272-283. 1974. Washington, DC. (NASA TT F-16,149).

1975

36. BALDWIN, C.L. and P.H. Errico. Biological safety cabinets for contamination control. Journal of Chemical Education 52(12):A545-A548. 1975.
37. BARENGOLTZ, J. and D. Edgars. Relocation of particulate contamination during spaceflight. Pasadena, CA, Jet Propulsion Laboratory. 1975. Technical Memorandum 33-737. 140 p.
38. _____. Spacecraft recontamination. Pasadena, CA, Jet Propulsion Laboratory. Presentation at NASA Spacecraft Sterilization Seminar, Cocoa Beach, FL. 1975.
39. BOND, W.W. and M.S. Favero. Thermal profile of a *Bacillus* species (ATCC 27380) extremely resistant to dry heat. Applied Microbiology 29(6):859-860. 1975.
40. BRADLEY, F.D. Scientific publications relating to planetary quarantine. Vol. 5, 1974 Supplement. Washington, DC, George Washington University. 1975. GWU-SCD 75-07P. 48 p.
41. DASPIT, L.P., J.A. Stern and E.M. Cortright. Viking heat sterilization - progress and problems. Acta Astronautica 2(7-8):649-666. 1975.
42. DIMMICK, R.L., A. Boyd and H. Wolochow. A simple method for estimation of coagulation efficiency in mixed aerosols. Journal of Aerosol Science 6(5):375-377. 1975.
43. DIMMICK, R.L. and M.A. Chatigny. Possibility of growth of airborne microbes in outer planetary atmospheres. Oakland, CA, ONR/Naval Biomedical Research Laboratory. 1975. (N75-15266#;NASA CR-141958).

44. DIMMICK, R.L., P.A. Stratt, H. Wolochow, G.V. Levin, M.A. Chatigny and J.R. Schrott. Evidence for metabolic activity of airborne bacteria. *Journal of Aerosol Science* 6(6):387-394. 1975.
45. DIMMICK, R.L., H. Wolochow and M.A. Chatigny. Possibility of growth of airborne microbes in a Jovian atmosphere. 2nd Quarterly Progress Report. Oakland, CA, Naval Biomedical Research Laboratory. 1975. 8 p. (N75-33975#;NASA CR-119149).
46. _____. Studies on possible propagation of microbial contamination in planetary atmospheres. 1st Quarterly Status Report for period 1 Feb. - 30 April 1975. Oakland, CA, Naval Biomedical Research Laboratory. 1975. (N75-24296#;NASA CR-142825).
47. _____. Studies on propagation of microbes in the airborne state. 4th Quarterly Status Report for 1974-1975. Oakland, CA, Naval Biomedical Research. 1975. 5 p. (N75-24294#;NASA CR-142757).
48. FARMER, F.H. and M.D. Pierson. Effects of ultra-high temperatures on bacterial spore aerosols as a function of relative humidity. Presentation at annual meeting of American Society for Microbiology at New York, NY. Langley Station, VA, NASA Langley Research Center. 1975.
49. FISHER, D.A., R.L. Jacobson and I.J. Pflug. Indices of water content in gaseous systems, their measurement, and relationship to each other. *Journal of Milk Food Technology* 38(11):706-714. 1975.
50. FOSTER, T.L. Response of selected microorganisms to experimental planetary environments. Semiannual Progress Report #5 for period 1 July - 31 December 1974. Abilene, TX, Hardin-Simmons University. 1975. 52 p. (N75-17934#;NASA CR-136758).
51. _____. Semiannual Progress Report #6 for period 1 January - 30 June 1975. Abilene, TX, Hardin-Simmons University. 1975. 38 p. (N75-32990#;NASA CR-119146).
52. FOSTER, T.L. and L. Winans, Jr. Psychrophilic microorganisms from areas associated with the Viking spacecraft. *Applied Microbiology* 30(4):546-550. 1975.

53. FRASER, S.J., W.M. Leavens, R.L. Olson and D.M. Taylor. Sterilization with RF-generated cold plasma. Presentation at annual meeting of American Society for Microbiology at New York, NY... Seattle, WA, Boeing Company. 1975.
54. GAMMON, R.A. Effects of temperature and concentration of ethylene oxide on *Bacillus subtilis* var. *niger* strain *globigii* spores. IN: Underkofler, L.A., ed. Developments in Industrial Microbiology Vol. 16:313-317. Washington, DC, American Institute of Biological Sciences. 1975.
55. GODBER, G. Report of the working party on the laboratory use of dangerous pathogens. London, England, Her Majesty's Stationery Office. 1975. 44 p.
56. HECKLY, R.J. and J. Di Matteo. Rhythmic changes in dry heat resistance of *Bacillus subtilis* spores after rapid changes in pH. Applied Microbiology 29(4):565-566. 1975.
57. HOWARD, R.A., D.W. North and J.P. Pezier. A new methodology to integrate planetary quarantine requirements into mission planning, with application to a Jupiter orbiter. Prepared for the Jet Propulsion Laboratory. Menlo Park, CA, Stanford Research Institute. 1975. Final Report. 124 p.
58. IMSHENETSKIY, A.A., S.V. Lysenko and G.A. Kazakov. Microorganisms in the stratosphere. Doklady Akademii Nauk SSSR. 224(1): 223-225. 1975. (NASA TT F-16,872).
59. LABEDA, D.P., D.L. Balkwill and L.E. Casida, Jr. Soil sterilization effects on *in situ* indigenous microbial cells in soil. Canadian Journal of Microbiology 21(3):263-269. 1975.
60. LIN, S.H. A theoretical analysis of thermal sterilization in a continuous sterilizer. Journal of Fermentation Technology 53(2):92-98. 1975.
61. MAHONEY, T.A. Organization and administration of back contamination programs. Presentation to AIBS, P.Q. Panel, Cape Kennedy, FL. April 1975.
62. MEYER, E.D., N.A. Sinclair and B. Nagy. Comparison of the survival and metabolic activity of psychrophilic and mesophilic yeasts subjected to freeze-thaw stress. Applied Microbiology 29(6):739-744. 1975.
63. MICHAELSEN, G.S. and T.A. Mahoney. Personnel management techniques to maximize bio-barrier integrity at a Martian receiving laboratory/Safety of containment systems. Annual Report for period 1 July 1974 - 30 June 1975. Minneapolis, MN. University of Minnesota. 1975. 13 p. (N75-26665#;NASA CR-142963).

64. MILLER, M.W., H.D. Maillie and G.E. Kaufman. Pioneer 10 Jovian encounter: Radiation dose and implications for biological lethality. *Science* 187(4178):738-739. 1975.
65. MOLIN, G. and K. Ostlund. Dry-heat inactivation of *Bacillus subtilis* spores by means of infra-red heating. *Antonie van Leeuwenhoek*. 41(3):329-335. 1975.
66. NENNO, R.E. and A.H. Oldland. Contamination control during acceptance testing of Mariner class spacecraft propulsion hardware. *Journal of Testing and Evaluation* 3(5):392-397. 1975.
67. OXBORROW, G.S., N.D. Fields, J.R. Puleo and C.M. Herring. Quantitative relationship between airborne viable and total particles. *Health Laboratory Science* 12(1):47-51. 1975.
68. PULEO, J.R., M.S. Favero, G.S. Oxborrow et al. Method for collecting naturally occurring airborne bacterial spores for determining their thermal resistance. *Applied Microbiology* 30(5):786-790. 1975.
69. REYES, A.L. Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components. 39th Quarterly Report of Progress for period 1 October - 31 December 1974. Cincinnati, Ohio, Food and Drug Administration. 1975. 16 p. (N75-25528#;NASA CR-142909).
70. REYES, A.L. and J.E. Campbell. Ecology and thermal inactivation of microbes in and on interplanetary space vehicle components. 40th Quarterly Report of Progress for period 1 Jan. - 31 March 1975. Cincinnati, OH, Food and Drug Administration, HEW. 1975. 11 p. (N76-10695#;NASA CR-145480).
71. _____. 41st Quarterly Report of Progress for period 1 April - 30 June 1975. Cincinnati, OH, F&DA, HEW. 1975.
72. RHODES, E.J., JR. and E.J. Smith. Multispacecraft study of the solar wind velocity at interplanetary sector boundaries. *Journal of Geophysical Research* 80(7):917-928. 1975.
73. ROEMER, G.B. Hot air sterilization. *Deutsche Medizinische Wochenschrift* 13(100)709-710. 1975.
74. SCHNEIDER, H.W. Evaluation of particulate contamination for unmanned spacecraft prelaunch operations. *Journal of Environmental Sciences* 18(1):20, 29-36. 1975.

75. TAYLOR, D.M., A.R. Hoffman, J.R. Puleo et al. Planetary quarantine. Semiannual review supporting research and technology, for period 1 July - 31 December 1974. Pasadena, CA, Jet Propulsion Laboratory. 1975. Document 900-701. 125 p. (N75-24362#;NASA CR-142878).
76. Taylor, D.M., J.R. Puleo et al. Semiannual review supporting research and technology, for period 1 Jan. - 30 June 1975. Pasadena, CA, Jet Propulsion Laboratory. 1975. Document 900-715. 122 p. (N76-10971#;NASA CR-145436).
77. TEAH, B.A. Bibliography of germfree research. 1974 supplement. Notre Dame, In. University of Notre Dame. 1975. 19 p.
78. WARDLE, M.D. and G.M. Renninger. Bactericidal effect of hydrogen peroxide on spacecraft isolates. Applied Microbiology 30(4):710-711. 1975.
79. WERBER, M. Objectives and models of the planetary quarantine program. Washington, DC, National Aeronautics and Space Administration. 1975. NASA SP-344. 140 p. (N75-25604#).
80. WHITBOURNE, J. and K. West. Ethylene oxide application. IN: Underkofler, L.A., ed. Developments in Industrial Microbiology. Vol. 16:57-66. Washington, DC, American Institute of Biological Sciences. 1975.

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BOOKS CONTAINING
PLANETARY QUARANTINE RELATED MATERIAL

Each of the following books, cited in this bibliography, contains information pertinent to the substantive program of the NASA Planetary Quarantine mission.

Airborne Transmission and Airborne Infection. Hers, J.F.Ph. and K.C. Winkler, eds. New York, John Wiley & Sons. 1973.

Bibliography of Germfree Research, 1974 supplement. Teah, B.A. Notre Dame, IN., Notre Dame University. 1975.

Biology and the Exploration of Mars. Pittendrigh, C.S., W. Vishniac and J.P.T. Pearman, eds. Washington, D.C., National Academy of Sciences/National Research Council. 1966.

Developments in Industrial Microbiology, Vol. 1. Miller, B.M., ed. New York, Plenum. 1960.

Developments in Industrial Microbiology, Vol. 16. Underkofler, L.A., ed. Washington, D.C., American Institute of Biological Sciences. 1975.

Life Sciences and Space Research, Vol. II. Florkin, M. and A. Dollfus, eds. New York, John Wiley & Sons. 1964.

Life Sciences and Space Research, Vol. IV. Brown, A.H. and M. Florkin, eds. Washington, D.C. Spartan Books. 1966.

Life Sciences and Space Research, Vol. VII. Vishniac, W. and F.G. Favorite, eds. Amsterdam, North-Holland Pub. Co. 1969.

Life Sciences and Space Research, Vol. XII. Sneath, P.H.A., ed. Berlin, Akademie-Verlag. 1974.

Objectives and Models of the Planetary Quarantine Program. Werber, M. Washington, D.C., National Aeronautics and Space Administration. 1975.

Planetary Quarantine Program, origins and achievements, 1956-1973.
Phillips, C.R. Washington, D.C., National Aeronautics and
Space Administration. 1974.

Recent Research in Freezing and Drying. Parks, A.S. and A.U. Smith,
eds. Oxford, Blackwell. 1960.

The Origin of Life and Evolutionary Biochemistry. Dose, K., S.W.
Fox, G.A. Deborin and T.E. Pavlovskaya, eds. New York,
Plenum. 1974.

JOURNALS PUBLISHING

PLANETARY QUARANTINE RELATED ARTICLES

Below is an alphabetical list of journals in which articles germane to planetary quarantine have been published. The number of articles from each journal cited in this bibliography is indicated parenthetically.

Acta Astronautica	(1)
Acta Microbiologica Polonica	(1)
Antonie van Leeuwenhoek	(1)
Applied Microbiology	(6)
Canadian Journal of Microbiology	(1)
Deutsche Medizinische Wochenschrift	(2)
Doklady Akademii Nauk SSSR	(1)
Food Technology	(1)
Health Laboratory Science	(1)
Journal of Aerosol Science	(2)
Journal of Bacteriology	(3)
Journal of Chemical Education	(1)
Journal of Environmental Sciences	(1)
Journal of Fermentation Technology	(1)
Journal of General Microbiology	(1)
Journal of Geophysical Research	(1)
Journal of Hygiene	(1)
Journal of Infectious Diseases	(1)
Journal of Milk Food Technology	(1)
Journal of Pharmacy and Pharmacology	(1)
Journal of Testing and Evaluation	(1)
Microbiologiya	(1)
Origins of Life	(1)
Science	(1)
Weltraumfahrt	(1)
Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene	(1)

PROCEEDINGS PUBLISHING
PLANETARY QUARANTINE RELATED PAPERS

Below is an alphabetical list of the proceedings in which papers germane to planetary quarantine have appeared. The number of papers from each meeting cited in this bibliography is indicated parenthetically.

- American Society for Microbiology. Abstracts of the Annual Meeting - 1975. (2)
- Dynatrend, Inc. Proceedings of Outer Planet Probe Technology Workshop. 1974. (3)
- National Academy of Sciences. Proceedings, Vol. 46. Washington, D.C. 1960. (1)

CORPORATE SOURCES

Below is an alphabetical address list of NASA centers, NASA contractors, and other sources of the material cited in this bibliography.

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