

THE ANAEROBIC BACTERIA

Their Activities in Nature and Disease

Part I

The Literature for 1952-1959

Volume 2

Dr. Leland S. McClung

THE ANAEROBIC BACTERIA

Their Activities in Nature and Disease

Part I

The Literature for 1952-1959

Volume 2

Dr. Leland S. McClung

*Department of Microbiology
Indiana University
Bloomington, Indiana*

MARCEL DEKKER, INC. *New York and Basel*

Library of Congress Cataloging in Publication Data

McClung, Leland Swint, 1910-

The anaerobic bacteria, their activities in nature and disease.

Includes indexes.

Contents: Pt. 1, v. 1. The literature for 1940-1951 -- v. 2. The literature for 1952-1959 -- v. 3. The literature for 1960-1965 -- v. 4. The literature for 1966-1969 -- v. 5. The subject listings for 1940-1969 -- Pt. 2, v. 1. The literature for 1970-1975 -- v. 2. The subject listings for 1970-1975.

1. Bacteria, Anaerobic--Bibliography. I. Title.
[DNLM: 1. Bacteria--Indexes. ZQW 4 M478a]
Z5185.A52M38 1982 [QR89.5] 016.5899'0128 82-10085
ISBN 0-8247-1202-1 (v. 1)

COPYRIGHT © 1982 by MARCEL DEKKER, INC. ALL RIGHTS RESERVED

Neither this book nor any part may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, microfilming, and recording, or by any information storage and retrieval system, without permission in writing from the publisher.

MARCEL DEKKER, INC.

270 Madison Avenue, New York, New York 10016

Current printing (last digit):

10 9 8 7 6 5 4 3 2 1

PRINTED IN THE UNITED STATES OF AMERICA

P R E F A C E

Publication of these volumes of the literature for the years 1940 through 1969 continues our previous indexing of the world literature on the activities of the anaerobic bacteria. Unfortunately, the original publications [McCoy, E., and McClung, L.S. *The Anaerobic Bacteria and Their Activities in Nature and Disease: a subject bibliography* (in two volumes), University of California Press, 1939; and *Supplement One* (literature for 1938 and 1939)] are no longer available from the publisher. As long as a limited supply lasts, they may be obtained from the author of the present volume; make inquiries to the address below. It had been planned that supplements to the original publication would be issued at 4-5 year intervals. As indicated in the Preface to *Supplement One*, unsettled world conditions occasioned the earlier (1941) release of that volume and although the indexing for the next span of years was completed on schedule, World War II intervened and this was never published. Only recently has it been possible to complete the indexing through 1969 and thus the accumulated literature (1940-1969) forms the present publication. It is expected that the volume for 1970-1975 will follow shortly.

The literature to be indexed has expanded enormously over the years both by the appearance of many new journals and also because of the accessibility of journals not previously available for indexing. The growth with respect to the number of journals covered is readily apparent by comparison of the journal lists in the present publication with that in the volumes previously published and by the numerical count of the entries for the years covered.

A question might be raised with respect to the need for a publication of this type with the availability of computer retrieval and more elaborate cumulative indices in the secondary journals. It should be obvious to the user of this publication that the detailed subject sections in it allows a more rapid *entré* to the literature for a particular topic. Records also show that at least 30 per cent of the references included in this publication were not listed in any of the more than 50 secondary source publications which were consulted in the preparation of these volumes.

The SUBJECT INDEX OUTLINE used in the previous volumes in this series has been continued and expanded by addition of new sections to accommodate new developments or subdivision of previous sections as necessitated by the expansion of the literature. The basic plan (chronological author index and subject sections reflecting the outline divisions) has been continued. The sheer magnitude of the material for the present publication, which includes more than 35,000 citations, and present publication costs have necessitated a change with respect to the format for the entries in the subject sections. Each reference (alphabetized by senior author within a given year) has been numbered in a consecutive series; these numbers are used for the entries within the subject sections. This has been necessary to bring the total pages within publishable limits. Even with this change, the typing of camera ready copy from the original card files has taken more than a year of a full time skilled typist.

The principal libraries which have been used for this publication include the following: The Library System of Indiana University (Main Library and the Branch Libraries for Biology, Chemistry, Geology, Medical Sciences, and Physical Sciences) on the Bloomington Campus; and the Medical and Dental Libraries on the Indianapolis Campus; Iowa State University (Ames, Iowa); Crerar Library (Chicago, Illinois); National Agricultural Library (Beltsville, MD), and the National Library of Medicine (Bethesda, MD). Grateful appreciation is extended to the staff of these libraries and for the latter two, the granting of stack

privileges without which the coverage of rare journals could not have been accomplished within the time available.

In addition to personal funds, special grants have provided support for a portion of the compilation period, for a Bibliographic Assistant, and for hourly workers. These have included grants from the National Institutes of Health (PHS AI 05741, R01-3 FD-00177, and LM-02604 from the National Library of Medicine); Indiana University: Biomedical Grants from PHS RR 7031 (Indiana University Accounts: 46 246 07, 46 246 10 and 50 246 17).

It would have been impossible to assemble this publication without the competent aid of a number of assistants over the years. For example, Jean Weir, who, with her library training, helped solve many reference citation problems. Special gratitude is due Patricia A. Ross, who aided in the final checking of the card file among other duties, and who, with great skill, prepared the majority of the camera ready copy for these volumes. Finally, appreciation is expressed to my wife, who heard all too often on nights, weekends, and holidays "If needed, I'll be in the library," and who also, in the final months, aided with the filing and checking of the 250,000-300,000 cards in the original file. The author alone must take responsibility for errors in citations and for the indexing of all references. Regretably it has not been possible to locate the original publication or any secondary source listing of more than 200 references (mostly in Slavic or Oriental journals) included in the bibliographies of published articles used in the compilation of these volumes.

Leland S. McClung
Department of Biology
Indiana University
Bloomington, Indiana

INSTRUCTIONS TO USERS

The material available in the several parts of these two volumes of this publication is as follows: in Part I will be found, listed chronologically, all references for the years 1940 through 1969. Within each year the references are arranged alphabetically by senior author (and numbered in sequence) with complete cross references for each joint author. The previous policies were continued with regard to citations, abbreviations of journal titles, and reference to an indicated secondary source for those references unavailable in the original publication.

In Volume 5 (pp. 1-822) are to be found the SUBJECT INDEX SECTIONS according to the SUBJECT INDEX OUTLINE (pp. vii-xvi of Volume 1 and pp. v-xiv of Volume 5). Within each subject section the citations are arranged chronologically, and by number within each year; thus the complete reference for each entry may be traced quickly by reference to the appropriate year in Part I, Volumes 1-4.

For those unfamiliar with the previous publications in this series, attention should be directed to the following: the general SUBJECT INDEX OUTLINE (pp. vii-xvi of Volume 1 and pp. v-xiv of Volume 5) should be consulted as background for use of the SUBJECT INDEX SECTIONS (pp. 1-822 of Volume 5). An alphabetic INDEX (pp. 2821-2847 of Part I and pp. 823-849 of Volume 5) to the subject sections may be used by those unfamiliar with the scope of the SUBJECT INDEX OUTLINE.

The complete name of the journals cited by abbreviation in Part I may be found in the KEY TO ABBREVIATIONS USED IN THE JOURNAL CITATIONS (pp. xvii-cxlv of Volume 1). The WORLD LIST OF SCIENTIFIC PERIODICALS should be consulted for additional information for a particular title.

TABLE OF CONTENTS

	Page
PREFACE	iii-iv
TABLE OF CONTENTS	v
INSTRUCTIONS TO USERS	vi
SUBJECT INDEX OUTLINE	vii-xvi
CHRONOLOGICAL LIST OF REFERENCES	
Part I	
Volume 1: The Literature for 1940-1951	1-616
Volume 2: The Literature for 1952-1959	617-1356
Volume 3: The Literature for 1960-1965	1357-2131
Volume 4: The Literature for 1966-1969	2133-2847
Volume 5: The Subject Listings for 1940-1969	1-849
Part II	
Volume 1: The Literature for 1970-1975	1-1048
Volume 2: The Subject Listings for 1970-1975	1-308

SUBJECT INDEX OUTLINE

	Section	Page
Vol. 5		
A. HABITAT OR OCCURRENCE		
a. DAIRY PRODUCTS (milk, cheese, butter, ice cream, etc.)	Aa	1
b. SOIL, MUD, SAND, STREET DUST	Ab	2
c. WATER (ocean, rivers, lakes, drinking water.	Ac	3
d. SEWAGE AND CONTENTS OF INTESTINAL TRACT OF MAN AND ANIMALS, including stomach contents.		
1. SEWAGE.	Ad1	5
2. INTESTINAL TRACT AND EXCREMENT OF MAN	Ad2	5
3. INTESTINAL TRACT AND EXCREMENT OF HERBIVOROUS AND CARNIVOROUS ANIMALS (not including fish, fowl, termites).	Ad3	7
4. INTESTINAL TRACT AND EXCREMENT OF BIRDS (chicken, turkey, etc.).	Ad4	10
5. INTESTINAL TRACT AND EXCREMENT OF FISH AND SHELLFISH.	Ad5	10
6. INTESTINAL TRACT AND EXCREMENT OF INVERTEBRATES (insects, etc.).	Ad6	10
7. MISCELLANEOUS (protozoa, etc.).	Ad7	11
ANIMAL BODY OTHER THAN INTESTINAL TRACT		
1. NASOPHARYNGEAL AND BUCCAL CAVITIES, RESPIRATORY TRACT AND SECRETIONS (sinuses, throat, mouth, tonsils, lungs, sputum, teeth, saliva, etc.).	Ae1	11
2. INTERNAL ORGANS AND SECRETIONS (peritoneal cavity, liver, gall stones, bile, spleen, pancreas, appendix, etc.).	Ae2	13
3. UROGENITAL SYSTEM AND SECRETIONS (uterus and uterine discharges, vagina, kidney, urine, prostate gland and prostate fluid, umbilicus and umbilical cord on infant, puerperal infections, etc.).	Ae3	14
4. CIRCULATORY SYSTEM (blood, lymph)	Ae4	15
5. NERVOUS SYSTEM (brain, spinal fluid).	Ae5	16
6. SKIN, MUSCLE, MATERIALS FROM WOUNDS, PUS, BONE MARROW, ETC. (For organisms latent in tissue see Section Ha3)	Ae6	17
7. EYE AND EYE SOCKETS, EAR CANALS	Ae7	19
f. FOOD AND FOOD CONSTITUENTS FOR MAN AND ANIMAL		
1. HOME AND COMMERCIAL CANNED FOODS (including tin and glass pack) (For samples from cannery equipment, tin cans, glass jars, etc., see Section Ag4)	Af1	20
2. FOODS, ESSENTIALLY MEAT (ham, meat, meat pie, brawn, sausage, blood pudding, wurst, oysters, crabs, fish, shell fish, cockles, winkles. (Also carrion, carcasses and edibility of flesh of diseased animals).	Af2	21
3. FOODS, ESSENTIALLY VEGETABLES (olives, fruit, bread, mushrooms, fresh and fermented vegetables, frozen vegetables, uncooked foods).	Af3	23
4. CONFECTIONS AND CONDIMENTS (sugar, salt, spices, brine, starch, candy)	Af4	24
5. ENSILAGE, ETC. (hay, forage, grass, cereal grain, flour)	Af5	25
6. MISCELLANEOUS FOODS (Chinese egg, egg white, salad dressing, bone meal, fish eggs, wine, beer, lemonade, etc.).	Af6	25
g. MISCELLANEOUS		
1. SURGICAL MATERIALS AND RELATED OBJECTS (catgut, surgical instruments, suture material, chemotherapeutic powders, blood plasma, talc, vaccine points, vaccine virus, court plaster, bunion pads, bandages, etc.).	Ag1	26

SUBJECT INDEX OUTLINE

Vol. 5

	Section	Page
A. HABITAT OR OCCURRENCE--concluded		
g. MISCELLANEOUS--concluded		
2. AMMUNITION, UNIFORMS AND RELATED OBJECTS (uniforms, cartridge, gun wads, gun powder, gun shells, shrapnel, toy pistols, fire works, shot, etc.)	Ag2	27
3. GELATIN	Ag3	27
4. RETTING FIBERS (flax, jute, etc.)	Ag4	27
5. MISCELLANEOUS (air, tobacco, fly larvae, maggot larvae, coal, oil, paper, pomace, fuel, samples from cannery equipment, industrial wastes, etc.)	Ag5	28
B. CULTURE METHODS (including formulae of media, original description of methods or discussions or extensive application of these)		
a. MEDIA (For media for toxin production see Section Gd7)		
1. MEDIA FOR ROUTINE CULTIVATION	Ba1	29
2. MEDIA FOR SPECIES SEPARATION (including inoculation of laboratory animals. See also Section Ib).	Ba2	29
3. ENRICHMENT OF SELECTIVE MEDIA: use of selective media.	Ba3	30
4. COUNTING (numerical estimations of populations)	Ba4	33
5. MEDIA FOR SPORE PRODUCTION (see also Section Bd).	Ba5	34
6. SYNTHETIC MEDIA, chemically defined media, "semi-synthetic" media; media for determination of nutritive requirements	Ba6	35
7. MISCELLANEOUS MEDIA (including media for nitrogen fixation, basic media for determination of metabolic reactions, etc.)	Ba7	36
b. METHODS OF ISOLATION		
1. SINGLE CELL ISOLATION METHODS (including technic and use of).	Bb1	36
2. DIFFERENTIAL PASTEURIZATION FOR ISOLATION OF CULTURE.	Bb2	37
3. DYE STASIS AS AN AID IN ISOLATION OR PURIFICATION. See Also Section Ba3 and Fc2	Bb3	37
4. USE OF ANTIBIOTICS AS AN AID TO ISOLATION OR PURIFICATION	Bb4	38
5. USE OF MEMBRANE FILTERS	Bb5	38
6. MISCELLANEOUS (addition of various inhibitory chemicals, increased percentage of agar, etc.)	Bb6	39
c. METHODS OF CULTURE		
1. PHYSICAL METHODS OF CULTURE (deep media; vacuum and gas replacement; paraffin, vaselin, vas-par, oil or marble seal, etc.)	Bc1	39
2. CHEMICAL: use of chemicals to absorb oxygen in closed containers or addition of reducing agents (specific chemicals or natural substances) to culture medium	Bc2	40
3. BIOLOGICAL AIDS IN CULTIVATION METHODS (growth with aerobic bacteria, yeast, molds, and plant or animal tissue)	Bc3	41
4. PREREDUCED MEDIA, HUNGATE ROLL TUBE TECHNIQUE	Bc4	42
5. CONTINUOUS CULTURE TECHNIQUE.	Bc5	42
6. MISCELLANEOUS (large scale cultivation, plastic containers, redox indicator solutions, etc.)	Bc6	42
d. STOCK CULTURE MEDIA AND METHODS (comparative viability or virulence in different media; addition of calcium carbonate to increase viability. For dormancy see Section Fc4).	Bd	43

SUBJECT INDEX OUTLINE

Vol. 5
Section Page

C. MORPHOLOGY

a. MOTILE COLONIES AND SPECIAL QUESTIONS RELATING TO CELLULAR MOTILITY	Ca	45
b. LIFE CYCLES, MORPHOLOGY OF VEGETATIVE CELL OR COLONY, ETC. (See also Sections Ig1, 2, and 3.)	Cb	45
c. STAINING REACTIONS (granulose, special flagella or spore stains, bipolar granule, capsule, cell wall, etc.) For fluorescent antibody see Section Gj	Cc	46
d. DISSOCIATION (variation studies on morphology of cells and colony). For serological "variants" see Section Gh	Cd	47
e. SPORE FORMATION (morphology and cytology).	Ce	48
f. NUCLEAR MATERIAL	Cf	49

D. METABOLISM (substrates acted upon; enzymes concerned)

a. CARBON

1. FERMENTATION OF NAMED SUGARS AND OTHER DEFINITE FERMENTABLE CARBON COMPOUNDS (glucose, xylose, etc.; glycerol, mannitol). For organic acids see Section Da4; for starch, pentosans see Section Da2	Dal	51
2. FERMENTATION OF NATURAL PRODUCTS (lignins, cereals, molasses, starch, pentosans, milk, retting of pectins, etc.). For the latter see also Section Dcl4.	Da2	52
3. CELLULOSES AND HEMICELLULOSES	Da3	53
4. METABOLISM OF VARIOUS COMPOUNDS NOT INCLUDED IN Dal-3. (Salts of organic acids; alcohols, hydroxy and uronic acids, complex polysaccharides, nicotinic acid, carbon dioxide fixation, etc.)	Da4	54

b. NITROGEN

1. PROTEOLYSIS. Breakdown of proteins and polypeptides. For amino acid metabolism see Db6. For specific proteolytic enzymes see Dc4.	Db1	55
2. NITROGEN FIXATION (positive fixation or experiments to demonstrate).	Db2	57
3. NITRATE AND NITRITE REDUCTION	Db3	58
4. UTILIZATION OF SALTS OF NITROGEN COMPOUNDS (ammonium salts, etc.)	Db4	58
5. METABOLISM OF PURINES AND PYRIMIDINES	Db5	59
6. METABOLISM OF AMINO ACIDS	Db6	59

c. SPECIAL ENZYMES

1. TEST FOR CATALASE (peroxidases in general).	Dcl	60
2. PRESENCE OR FUNCTIONING OF DEHYDROGENASE	Dc2	61
3. PRESENCE OR ABSENCE OF LIPASE.	Dc3	62
4. EXPERIMENTS CONCERNING PROTEOLYTIC ENZYMES (For amino acid metabolism see Section Db6)	Dc4	63
5. REDUCTION OF SULFUR COMPOUNDS (thiosulphate, sulphate, sulphide reductase).	Dc5	63
6. LECITHINASE	Dc6	65
7. COLLAGENASE	Dc7	66
8. HYALURONIDASE	Dc8	67
9. UREASE.	Dc9	68
10. NEURAMINIDASE	Dcl0	68
11. HYDROGENASE	Dcl1	69
12. BLOOD GROUP DECOMPOSING ENZYMES	Dcl2	69
13. BILE ACID ENZYMOLOGY.	Dcl3	70
14. PECTINASE	Dcl4	70

SUBJECT INDEX OUTLINE

	Vol. 5	
	Section	Page
D. METABOLISM--concluded		
c. SPECIAL ENZYMES--concluded		
15. PRODUCTION OF VARIOUS SPECIAL ENZYMES (including various reductases, oxidases, carbohydrases, phosphatase, selenite and tellurite reduction, etc.)	Dc15	71
d. MISCELLANEOUS		
1. METABOLISM OF VARIOUS COMPLEX NATURAL COMPOUNDS AND SUBSTANCES (disposal of domestic and municipal sewage, animal wastes, sewage digesters, septic tank systems)	Dd1	73
2. METABOLISM OF VARIOUS COMPLEX NATURAL COMPOUNDS (disposal of industrial wastes)	Dd2	74
3. METABOLISM OF VARIOUS COMPLEX NATURAL COMPOUNDS (use of lagoons and ponds for sewage and industrial wastes)	Dd3	75
4. METABOLISM OF VARIOUS COMPLEX NATURAL COMPOUNDS (corrosion of metals by microbic action)	Dd4	75
5. METABOLISM OF VARIOUS COMPLEX NATURAL COMPOUNDS (petroleum formation and decomposition)	Dd5	76
E. PRODUCTS OF METABOLISM		
a. ACIDS		
1. ACETIC ACID	Ea1	79
2. BUTYRIC AND ISOBUTYRIC ACIDS	Ea2	80
3. LACTIC ACID (<i>d</i> -, <i>l</i> -, and <i>i</i> -, and unspecified)	Ea3	81
4. PROPIONIC ACID	Ea4	82
5. FORMIC ACID	Ea5	83
6. VALERIANIC AND ISOVALERIANIC ACIDS	Ea6	84
7. CAPROIC AND ISOCAPROIC ACIDS	Ea7	85
8. SUCCINIC ACID	Ea8	86
9. VALERIC AND ISOVALERIC ACIDS	Ea9	86
10. MISCELLANEOUS ACIDS (including higher volatile acids by name, unnamed acids, and "total acids")	Ea10	87
b. ALCOHOL		
1. ETHYL ALCOHOL	Eb1	88
2. BUTYL ALCOHOL	Eb2	89
3. ISO-PROPYL ALCOHOL	Eb3	90
4. AMYL ALCOHOL	Eb4	91
5. MISCELLANEOUS ALCOHOLS including propyl, isobutyl and unidentified	Eb5	91
c. ACETONE	Ec	91
d. INTERMEDIATE COMPOUNDS IN FERMENTATIONS	Ed	92
e. MISCELLANEOUS		
1. GASES (carbon dioxide, hydrogen, hydrogen sulfide, ammonia, methane, etc.)	Ee1	93
2. ACETYL-METHYL-CARBINOL AND 2-3 BUTYLENE GLYCOL	Ee2	94
3. PIGMENTS (For photosynthetic pigments see Section Fg)	Ee3	95
4. VITAMINS	Ee4	96
5. INDOLE	Ee5	96
6. SKATOLE	Ee6	97
7. MISCELLANEOUS PRODUCTS (including products of protein breakdown as amino acids, histamine, dextrin, cellulose, reducing sugars, peroxide, ptomains, acrolein and other aldehydes, etc.)	Ee7	98
f. CHEMISTRY OF CELL COMPONENTS	Ef	98
g. USE OF GAS CHROMATOGRAPHY TO DETERMINE METABOLIC PRODUCTS	Eg	100
h. DNA COMPOSITION	Eh	100
i. METALLOPROTEINS (ferredoxin, etc.)	Ei	100

SUBJECT INDEX OUTLINE

		Vol. 5
E. PRODUCTS OF METABOLISM--concluded	Section	Page
j. PROTEIN SYNTHESIS.	Ej	101
F. PHYSIOLOGY		
a. GROWTH STIMULANTS, requirement for and production of (so-called accessory factors, ascorbic acid, salts, carbon dioxide, acetylene, proteins, yeast autolysate, fresh tissue, inert carriers, soil, "sporogenes vitamin," "heat shock," etc.)	Fa	103
b. MECHANISM OF METABOLISM INCLUDING ENERGY CONSIDERATIONS. For isolation of intermediates in fermentations see Section Ed. For photosynthetic mechanisms see also Section Fg. See also Sections Dcl-15 for special enzymes and Sections Eal-Ee7 for products of metabolism . .	Fb	104
c. RESISTANCE TO ADVERSE AGENTS		
1. RESISTANCE TO HEAT AND COLD. (Effect of temperature on vegetative cells and spores of organism; resistance to heat or cold including simple "has survived" and experimental maximums. Process studies for canned foods. Sterilization of surgical instruments, catgut, etc., by heat.)	Fc1	108
2. RESISTANCE TO CHEMICALS (inhibition of growth and death by disinfectants, gases, dyes, sugar, spices, salt, nitrite and nitrate. Sterilization of catgut or surgical instruments by chemicals.) For action of antibiotics see Section Fc6. For chemoprophylaxis and/or chemotherapeutic effects see Section Hcl-10 . .	Fc2	109
3. RESISTANCE TO DESICCATION	Fc3	111
4. RESISTANCE TO TIME (including viability, generation time, growth rates, dormancy. For stock culture viability see Section Bd and for cells latent in tissue see Section Ha3).	Fc4	111
5. RESISTANCE TO OXYGEN OF PURE OR MIXED CULTURES (including aerobization experiments. For oxidation- reduction potential see Section Fe4. For hyperbaric oxygen therapy see Section Hc5).	Fc5	112
6. RESISTANCE TO ANTIBIOTICS. (Resistance of pure or mixed anaerobic cultures to concentrations of antibiotics <i>in vitro</i> . Action of antibiotics on anaerobic flora of buccal and intestinal canals, canned and other foods. Spheroplast formation in antibiotic containing cultures. For <i>in vivo</i> use of antibiotics in disease condition see Section Hc8) .	Fc6	113
7. SUSCEPTIBILITY/RESISTANCE TO BACTERIAL VIRUS (BACTERIOPHAGE) OF ANAEROBIC SPECIES. Isolation of bacterial viruses for anaerobic bacteria and testing reactions of anaerobic species. Temperate viruses and lysogenic hosts.	Fc7	115
8. PRODUCTION OF BACTERIOCINE or similar substance by anaerobic species.	Fc8	116
9. RESISTANCE TO IONIZING RADIATION (X-ray, gamma-rays, vegetative cells, spores, enzymes, and toxins, etc.) by anaerobic species. Possible use of ionizing radiations in sterilization (pasteurization) of food and other substances. For additional references to government contract research projects on latter topics see <i>Nuclear Science Abstracts</i>	Fc9	116

SUBJECT INDEX OUTLINE

	Section	Page
F. PHYSIOLOGY--concluded		
c. RESISTANCE TO ADVERSE AGENTS--concluded		
10. RESISTANCE TO MISCELLANEOUS AGENTS (including light and specific radiations not included in Section Fc9, sound waves, hydrostatic, osmotic and applied pressure, lysozyme, bile, etc.).	Fc10	117
d. TEMPERATURE RELATIONS		
1. OPTIMUM GROWTH TEMPERATURE IN THERMOPHILIC.	Fd1	118
2. OPTIMUM GROWTH TEMPERATURE IS LESS THAN 37°C.	Fd2	119
3. MISCELLANEOUS EXPERIMENTS, CONCERNING TEMPERATURE RELATIONS (including adaptation from one optimum to another; growth of mesophilic species at thermophilic temperature; temperature growth range studies)	Fd3	120
e. GROWTH REQUIREMENTS AND RELATED TOPICS		
1. GROWTH REQUIREMENTS: CARBON, NITROGEN, AMINO ACID AND OTHER GROWTH REQUIREMENTS:	Fe1	120
2. REQUIREMENTS FOR SPORULATION AND SPORE GERMINATION.	Fe2	121
3. HYDROGEN ION RELATIONS (range of growth, optimum, pH curves during fermentation, etc.).	Fe3	122
4. OXIDATION-REDUCTION POTENTIAL AND GROWTH (theory and chemical indicators of anaerobiosis; relation to glucose, sulfur containing compounds and other reducing substances. For oxygen potential of tissue in relation to spore germination see Section Ha6)	Fe4	123
5. METALS (effect of metals on metabolism and morphology of anaerobic species. Effect on nitrogen fixation, toxin production, fermentation processes, sewage disposal systems. Mineral requirements in nutrition)	Fe5	124
f. ASSOCIATED GROWTH		
1. SYMBIOTIC GROWTH OF ANAEROBES AND OTHER ORGANISMS (including symbiotic growth in wounds, etc.)	Ff1	125
2. ANTAGONISM (including prevention of toxin formation; destruction of toxin (see also Section Gd5); selective competition, e.g., acid-producing versus proteolytic species, production of antibiotic by anaerobic species, etc.)	Ff2	126
g. RESPIRATION AND PHOTOSYNTHESIS (including oxygen uptake)	Fg	127
h. FERMENTATION PROBLEMS (effect of temperature and other agents on products, influence of end products on course of fermentation, stimulants, immunization to "sluggishness," criteria of fermentation, history of inoculum, commercial practices like "slopping back," pH control, continuous process, etc.)	Fh	128
i. MISCELLANEOUS EXPERIMENTS (including surface tension, conductivity, pressure effect, heavy water, lysis of cells, etc.)	Fi	129
G. SEROLOGICAL STUDIES (and related phenomena as acid agglutination)		
a. AGGLUTINATION REACTION (including reaction of cells of organism and serum of animals experimentally immunized or serum of normal man or animals or serum from man or animals suffering from or convalescent from anaerobic diseases)	Ga	131
b. PRECIPITIN REACTION (including regular, polysaccharide and Ramon flocculations).	Gb	132

SUBJECT INDEX OUTLINE

	Section	Page
G. SEROLOGICAL STUDIES--continued		
c. COMPLEMENT FIXATION REACTION	Gc	133
d. TOXIN AND ANTITOXIN REACTIONS		
1. ANATOXIN OR TOXOID, PRODUCTION OF BY HEAT OR CHEMICALS AND PURIFICATION. See Section Hb5 for toxoid immunization.	Gd1	134
2. EXPERIMENTS CONCERNING SPECIFIC TOXINS BY NAME (hemotoxin, spasmotoxin, etc.; see also Section Gf). For lecithinase see also Section Dc6; for collagenase, Section Dc7; hyaluronidase, Section Dc8; neuraminidase, Section Dcl0; hemolysin, Section Gf	Gd2	136
3. USE OF TOXIN-ANTITOXIN REACTION FOR CLASSIFICATION (reports of new subgroups (types) within species groups; proof of presence or absence of specific toxin for new species; identification of cultures by toxin-antitoxin reaction)	Gd3	137
4. STUDIES ON THE PURIFICATION AND NATURE OF THE TOXIN OR ANTITOXIN PRINCIPLE	Gd4	138
5. STUDIES ON THE EFFECT OF HYDROGEN ION CONCENTRATION, CHEMICALS, LIGHT, HEAT, AGE, OTHER SPECIES OF BACTERIA, ETC., ON EXOTOXINS. Also effect of body fluids, bile, etc. (For production of toxoid by chemicals see Section Gd1; for endotoxins see Section Gd11.)	Gd5	139
6. RECOGNITION OF ATOXIC STRAINS OF TOXIC SPECIES (report of atoxic strain, atoxicity in normal body, lack of atoxic strains, production of atoxic strains by laboratory procedures)	Gd6	141
7. TOXIN (EXOTOXIN) PRODUCTION (media for, environmental effects on, standardization, M.L.D. Classic exotoxins production intracellularly. Toxin activation factors. Chemical composition of exotoxins.) For endotoxin see Section Gd11; for recent methods for assay of exotoxins see Section Gd10	Gd7	142
8. ANTITOXINS (production and purification, standardization and commercial units, commercial producers, distribution of antitoxin in tissues) . . .	Gd8	145
9. TOXINS IN NATURAL MATERIALS (including "toxic substances" in certain substances like fodder, mud, food, intestinal tract) and bursting or chaining factors of strains.	Gd9	147
10. RECENT METHODS FOR ASSAY OF TOXINS.	Gd10	148
11. PRODUCTION OF ENDOTOXIN. For intracellular production of classical exotoxins see Section Gd7	Gd11	148
e. PHAGOCYTOSIS-AND OPSONINS.	Ge	149
f. LYSINS (particularly hemolysins). Kinetics of lysis	Gf	149
g. BACTERICIDINS OF SERUMS, LEUCOCIDINS OF BACTERIA, AND β LYSIN	Gg	150
h. SEROLOGICAL DISSOCIATION (usually induced serological "variants." For morphological dissociation see Section Cd. .	Gh	151
i. MISCELLANEOUS (including thermoprecipitin and acid agglutination; heterophile antigen; Shwartzman phenomenon; toxins on tissue cultures; tetanus toxin and agglutination of red blood corpuscles; non specific "anti-shock"; virulence factors)	Gi	151

SUBJECT INDEX OUTLINE

	Section	Page
Vol. 5		
G. SEROLOGICAL STUDIES--concluded		
j. FLUORESCENT ANTIBODY STUDIES	Gj	152
k. HEMAGGLUTINATION	Gk	152
H. DISEASE RELATIONS. (Disease referring to both anaerobic infections and to anaerobic intoxications)		
a. DISEASE MANIFESTATIONS (Sections 1-6 subdivided: botulism, food poisoning by <i>Clostridium perfringens</i> , gangrene, tetanus, diseases due to non-spore forming species)		
1. SYMPTOMATOLOGY (including types of manifestation like cephalic versus general tetanus; relation to severity to incubation; post mortem pictures; whole course of disease [including mortality unless that is statistically treated]; prognosis; identity of diseases. For case histories see Section Hd).	Ha1	155
2. PATHOLOGY (tissue responses; presence and diffusion of toxin or antitoxin in tissue, etc.)	Ha2	160
3. INCUBATION TIME (latent versus normal infection time, latent organisms in apparently normal tissues)	Ha3	168
4. ETIOLOGIC AGENT OF A PARTICULAR DISEASE	Ha4	171
5. HOST SUSCEPTIBILITY OR NATURAL IMMUNITY (including animals susceptible to certain diseases, or susceptible to laboratory infection (laboratory use); age, sex, etc., and susceptibility; duration of immunity following vaccination or toxin-antitoxin injection (see also Sections Hb1a, Hb1c, Hb2, etc.)	Ha5	179
6. INFECTIVITY, PATHOGENICITY AND VIRULENCE (not toxicity).	Ha6	187
7. CATAPHYLAXIS, SYNERGISM IN INFECTION, ETC. (broadly: calcium, lactic, debilitating tissue, quinine, soil, bile, flukes as primary invaders).	Ha7	188
b. IMMUNOLOGICAL THERAPY IN DISEASES		
1. ANTITOXIN THERAPY (for toxoid see Section Hb5. Sections a-c subdivided: botulism, gangrene, tetanus)		
a. PROPHYLACTIC USE OF ANTITOXIN (for toxoid see Section Hb5).	Hb1a	189
b. THERAPEUTIC USE OF ANTITOXIN	Hb1b	191
c. EXPERIMENTAL STUDIES ON TOXOID IMMUNIZATION AND ANTITOXIN THERAPY (including routes of injection of serum, etc.)	Hb1c	196
2. USE OF VACCINES IN IMMUNIZATION (including whole cultures, anaculture, "O" vaccine, muscle powder).	Hb2	199
3. AGGRESSINS, "VIRUSES," FILTRATES (principally on blackleg products, but some others, e.g. <i>C. histolyticum</i> filtrate)	Hb3	200
4. ANAPHYLAXIS, SERUM ACCIDENTS, LOCAL REACTIONS, ALLERGY, PARALYSIS, OR ANY DISORDER SUPPOSEDLY RESULTING FROM SERUM OR TOXOID INJECTIONS.	Hb4	201
5. PROPHYLACTIC USE OF TOXOID. (Section subdivided: botulism, gangrene, tetanus)	Hb5	202
c. THERAPY OTHER THAN IMMUNOLOGICAL		
1. USE OF PHENOL INJECTION IN TREATMENT OF DISEASE (including Baccelli technique)	Hc1	208

SUBJECT INDEX OUTLINE

	Section	Page
H. DISEASE RELATIONS--concluded		
c. THERAPY OTHER THAN IMMUNOLOGICAL--concluded		
2. USE OF CARREL-DAKIN TECHNIQUE AND OTHER HYPOCHLORITE METHODS (including Eusol)	Hc2	209
3. MAGNESIUM SULPHATE INJECTIONS (anesthesia for tetanus therapy)	Hc3	209
4. CALCIUM CHLORIDE AND OTHER CALCIUM THERAPY.	Hc4	210
5. USE OF OXYGEN IN TREATMENT OF DISEASE (including gaseous and chemically bound).	Hc5	210
6. USE OF SEDATIVES IN TREATMENT OF DISEASE (including chloral, avertin, curarine, bromides, etc.)	Hc6	211
7. USE OF X-RAY OR RADIUM IN DISEASE (including therapeutic and diagnostic use).	Hc7	214
8. THERAPY BY VARIOUS CHEMICALS, some by trade or wartime name; DEBRIDEMENT AND AMPUTATION; OPEN AIR, "CLOSED PLASTER" AND TRUETA CASTS; INTRAVENOUS GLUCOSE; etc.	Hc8	215
9. SULFONAMIDE DRUG THERAPY.	Hc9	217
10. PROPHYLACTIC AND THERAPEUTIC USE OF ANTIBIOTICS	Hc10	219
11. BACTERIOPHAGE THERAPY	Hc11	223
d. CASE HISTORIES OF DISEASE		
1. CASE HISTORIES OF BOTULISM.	Hd1	223
2. CASE HISTORIES OF TETANUS	Hd2	224
3. CASE HISTORIES OF GANGRENE.	Hd3	227
4. CASE HISTORIES OF ANAEROBIC DISEASES CAUSED BY NON-SPORE FORMING SPECIES.	Hd4	228
5. CASE HISTORIES OF FOOD POISONING BY <i>Clostridium perfringens</i>	Hd5	233
e. DISTRIBUTION OF DISEASE (epidemiology. Sections 1 and 2 subdivided: botulism, food poisoning by <i>Clostridium perfringens</i> , gangrene, tetanus, others)		
1. GEOGRAPHICAL DISTRIBUTION OF DISEASE (also including regional or seasonal distribution incidence, as tetanus and the Fourth of July. See also the reports on the prevalence of disease as tabulated in the issues of <i>Morbidity and Mortality Weekly Reports (U.S.)</i> . These are not included in the following section.) . . .	He1	233
2. STATISTICS ON INCIDENCE OF ANAEROBIC DISEASES (including summary records of certain hospitals, armies, boards of health; incidence in relation to Fourth of July or vaccinations; literature summaries (not case histories) with comparison of therapy, etc.)	He2	239
f. HISTORICAL QUESTIONS, PARTICULARLY ANTIQUITY, RELATING TO DISEASE	Hf	244
g. MEDICO-LEGAL [medico-legal suits; governmental control, license and prohibition; Army orders; and standardization of units of toxin or antitoxin (national or international, World Health Organization, etc.)]	Hg	245
h. GENERAL REFERENCE LIST TO ANAEROBIC DISEASES AND THEIR AGENTS. (For other studies concerning particular disease agents see Section Id: list of species)		
1. BOTULISM.	Hh1	245
2. TETANUS	Hh2	249
3. GANGRENE.	Hh3	263
4. FOOD POISONING BY <i>Clostridium perfringens</i>	Hh4	269
5. NON-SPORE FORMING SPECIES	Hh5	271
6. ANAEROBIC BACTERIA ASSOCIATED WITH CANCER	Hh6	281
7. DISEASES OF INVERTEBRATES ASSOCIATED WITH ANAEROBES	Hh7	281

SUBJECT INDEX OUTLINE

	Section	Vol. 5 Page
I. CLASSIFICATION		
a. IDENTITY OR SEPARATION OF TWO OR MORE SPECIES.	Ia	283
b. LONG PAPERS ON ONE OR MORE ORGANISMS (also including long species descriptions, description or short "diagnosis.") See Section Ie for first description	Ib	284
c. KEYS OR SYSTEMS OF CLASSIFICATION OR DECISIONS ON SPECIFIC POINTS (e.g., by Microbiological Congress, characteristics used in classification, etc.). Decisions on validity of systems.	Ic	285
d. SPORE FORMING SPECIES LISTED ALPHABETICALLY BY <i>SPECIFIC</i> NAME.	Id	286
e. NEW SPECIES OR RECOGNIZED TYPES (e.g., <i>Cl. botulinum</i> type D or E; first description and assignment of species name) OF SPORE FORMING SPECIES.	Ie	510
f. UNNAMED CULTURES OR SPECIES PRIOR TO NAMING OR TRIVIAL NAMES STILL IN USE OF SPORE FORMING SPECIES	If	523
g. PHOTOGRAPHS OR DRAWINGS OF ANAEROBIC BACTERIA		
1. CELLS, FLAGELLA, SPORES, ETC.	Ig1	541
2. PHOTOGRAPHS OR DRAWINGS OF COLONY STRUCTURE OF ANAEROBIC BACTERIA	Ig2	542
3. ELECTRON MICROGRAPHS OF ANAEROBIC BACTERIA.	Ig3	543
h. NON-SPORE FORMING SPECIES LISTED ALPHABETICALLY BY <i>SPECIFIC</i> NAME WITH GENERIC NAME FOLLOWING. Synonyms, especially the Prévot designations, are listed wherever possible.	Ih	545
i. NEW SPECIES OR GENERA OR RECOGNIZED TYPES OF NON-SPORE FORMING SPECIES. First descriptions and assignment of names	Ii	768
j. UNNAMED CULTURES OR SPECIES PRIOR TO NAMING OR TRIVIAL NAMES STILL IN USE OF NON-SPORE FORMING SPECIES	Ij	784
X. SPECIAL LISTS		
XB BULLETINS AND ANNUAL REPORTS OF INSTITUTES, GOVERNMENTS, ETC., which report new data or summarize current information	XB	815
XM MONOGRAPHS [BOOKS (OR CHAPTERS) OR REVIEW ARTICLES] on the activities of the anaerobic bacteria	XM	815
XO OBITUARIES, honors, prizes, etc., for workers in anaerobic bacteriology.	XO	817
XP PATENTS.	XP	818
XR CONTRACT RESEARCH REPORTS [For additional references consult <i>Nuclear Science Abstracts</i> and <i>U.S. Government</i> <i>Research Reports</i> . Representative titles only included as majority of material is included in published research articles.]	XR	819
XS SPECIAL SYMPOSIA OR CONFERENCE PAPERS (not including annual meetings of microbiological societies)	XS	819
XT THESES	XT	820