

APPENDIX

NOMENCLATURE OF NUTRITIONAL TYPES OF MICROORGANISMS

Many designations have been proposed for the delineation of groups of microorganisms on the basis of nutritional requirements. Various authors have defined such terms in different ways. This is confusing, and leads to misinterpretation when a term is used without reference or redefinition.

It has been felt that an international agreement in regard to terms and definitions is desirable. The following terminology is hereby proposed to characterize nutritional types. The segregation of these types is based on their minimal requirements for growth. Certain terms previously used have been redefined, and new ones introduced.

I. Nomenclature based upon energy sources.

A. PHOTOTROPHY

Energy chiefly provided by photochemical reaction.

1. *Photolithotrophy*

Growth dependent upon exogenous inorganic H-donors.

2. *Photoorganotrophy*

Growth dependent upon exogenous organic H-donors.

B. CHEMOTROPHY

Energy provided entirely by dark chemical reaction.

1. *Chemolithotrophy*

Growth dependent upon oxidation of exogenous inorganic substances.

2. *Chemoorganotrophy*

Growth dependent upon oxidation or fermentation of exogenous organic substances.

C. PARATROPHY

Energy apparently provided by the host cell.

1. *Schizomycetotrophy*

Growth only in bacterial cells.

2. *Phytotrophy*

Growth only in plant cells.

3. *Zootrophy*

Growth only in animal cells.

II. Nomenclature based upon ability to synthesize essential metabolites.

A. AUTOTROPHY

All essential metabolites are synthesized.

1. *Autotrophy sensu stricto*

Ability to reduce oxidized inorganic nutrients.

2. *Mesotrophy*

Inability to reduce one or more oxidized inorganic nutrients = need for one or more reduced inorganic nutrients.

B. HETEROTROPHY

Not all essential metabolites are synthesized = need for exogenous supply of one or more essential metabolites (growth factors or vitamins).

C. HYPOTROPHY

The self-reproducing units (bacteriophages, viruses, genes, and so on) multiply by reorganization of complex structures of the host.

Composite names are used for the concise characterization of a nutritional type with respect to the chief energy source as well as to the capacity for the synthesis of all essential cell constituents.

Examples:

Photolithoautotrophic—*Chlorella vulgaris*.

Chemoorganoheterotrophic—*Phycomyces blakesleeanus*.

		Autotrophy		Heterotrophy	Hypotrophy
		Autotrophy S.S.	Mesotrophy		
Phototrophy	Photolithotrophy Photoorganotrophy	<i>Chlorella vulgaris</i>		<i>Rhodospseudomonas palustris</i> <i>Rhodospirillum rubrum</i>	
Chemotrophy	Chemolithotrophy Chemoorganotrophy	<i>Thiobacillus denitrificans</i> <i>Pseudomonas fluorescens</i>	<i>Escherichia coli</i>	<i>Saccharomyces cerevisiae</i>	
Paratroph	Schizomycetotrophy Phytotrophy Zootrophy				Bacteriophages? Plant viruses? Animal viruses?

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INDEX TO VOLUME XI

Figures in parentheses indicate the number of the bibliographic reference, where an author's name does not appear in the text.

- ABDERHALDEN, E., 262
Acetobacter melanogenum, 25, 278-281
 adaptation, nutritional mutants, 215-227
 adaptin, 270
 agglutination, bacteria, 51, 60-66, 178-183
 agglutinins, in pneumococcal transformation, 178-183
 V. ALBERTINI, A., 213
 ALLEN, R. F., 92
 ALTENBURG, E. J., 24, 31, 110-112, 253-254
 amino acid, activation of phages, 3-5
 synthesis in bacteria, 133-136
 synthesis in *Neurospora*, 18-21, 215-225
 anaphragmic mutation, bacteria, 139-149, 154-155
 anaplasia, malignant cells, 102
 ANDERSEN, A. A., 224 (37, 38)
 ANDERSON, E. G., 202, 203
 ANDERSON, E. H., 38, 130(1, 2), 133, 150-152, 154, 278
 ANDERSON, T. F., 2(5, 32, 34), 3(2, 14, 34), 4(3, 4), 6(1), 7(21, 36), 10(55), 11(55), 67(22), 83, 134, 255
 ANDERVONT, H. B., 104(1)
 ANDREWES, C. H., 105 (2), 192
 ANDREWS, F. W., 61(1), 64(1)
 ANDREWS, H. N., 194(7)
 antibacterial agents, 130-138
 antigenic properties, bacteria, 60-66
 cancer, 95-102
 Antirrhinum, 202
 AQUILONIUS, L., 122, 126
 ARKWRIGHT, J. A., 62(2, 3, 4), 63(5)
 ASCOLI, A., 105
 ASHWORTH, D., 86 (2)
Aspergillus terreus, 78, 80-84
 nidulans, *niger*, *oryzae*, 194-198
 ATKIN, L., 262, 265
 AUERBACH, C., 15, 49
 AUDUREAU, A., 130, 139 (23-26), 140-141, 146-147, 278
 AUGUSTINE, D. L., 106
 autonomy, malignant cells, 102
 autotrophy, 302
 AVERY, A. T., 11(35), 58(14, 15), 62(6), 67(1), 75(1), 102, 105, 107(5, 77, 78), 130(4), 177-183, 177(2, 9, 10), 181(2, 9), 269, 274, 276
B. megatherium, 189
B. proteus, 53-54, 56-58
B. typhosum, 282
B. subtilis, 281, 283
 BABES, V., 120
 back-mutation, 216-227
 bacteria, anaphragmic mutation, 139-145
 antigenic properties, 60-66
 biochemistry, pneumococcus, 177-183
 classification, 285-301
 color inheritance, 25-32
 effect of radiation, 38-50
 effect of ultraviolet, 84
 evolution, 152
 growth, kinetics of, 228-235
 immunochemical study, 60-66
 killing effect, radiation, 45-47
 large bodies, 51-58
 metabolism of ternary compounds, 65-66, 139-150
 mutations, 25-32, 38-50, 60-66, 113-114, 130-155, 228-235, 278-284
 phase variation, 61-62
 reproductive processes, 51-58
 resistance to antibacterial agents, 38-50, 114, 130-138, 150-151
 respiration, 139
 sexual phase, 283-284
 transformation, pneumococcus, 177-183
 bacterial dissociation, 62
 bacterial virus, see bacteriophage
 bacteriophage, amino acid activation, 3-6
 chemistry of, 1-13
 induced mutation, 33-37
 lysis inhibition, 33-37, 69-77
 morphology of, 1-13
 mutual exclusion, 33-37
 plaque type mutations, 33-37, 67-77
 rapid lysis mutation, 33-37, 68-77
 resistance to, 38-50, 114, 130-135, 150-152
 spontaneous mutation, 67-77
 Bacteroides, reproduction of, 53-54
 BAILEY, W. T., 33-37
 BAKER, Z., 30(1)
 BALLENTINE, R., 215, 222(22)
 BANG, O., 104 (31, 32)
 BARNES, W. A., 156(1)
 BAUMANN, C. A., 25(15)
 BAUR, E., 202, 204
 BAWDEN, F. C., 9(6), 67(2), 71(2), 74(2), 184(3, 6), 185(1, 4, 6), 186(2), 187(8), 188(4, 5-8)
 BEADLE, G. W., 14(3, 4, 6, 21), 15(6), 16(5, 9), 18(2, 10, 21, 43), 20(3, 4, 46), 21, 21(4), 25, 67(3), 80(2), 149, 193, 195, 196(1), 198, 218(1), 221(2, 4, 34)
 bean mosaic, virus, 10
 BEARD, D., 8(46, 47, 59)
 BEARD, J. W., 7(49), 8(46-48, 59), 186
 BECKWITH, T. D., 61(34)
 BEIJERINCK, M. W., 60, 149, 290-291
 BELL, T. T., 17(44)
 BENECKE, W., 297
 BENNETT, A. H., 208-209, 211, 213

- BERENBLUM, I., 104(6)
 BERGEY'S MANUAL, 291, 293-296
 BERG, C. P., 4, 5
 BERNAL, J. D., 9(7), 10, 11(7), 187(10)
 BERRY, G. P., 67(4), 75(4)
 BIEBL, R., 207(4)
 biochemistry, bacteria, 139-155, 177-183, 224, 278-284
 Neurospora, 14-24, 215-227
 biochemical mutations, 14-24, 139-155, 196, 215-227, 278-284
 BITTNER, J. J., 104(7, 8, 41)
 BONNER, D., 14-24, 14(21), 16(7, 9), 17(19), 18(8, 10, 21), 19(7), 20(45, 46), 145, 221(4), 225(3), 278(5), 282, 282(5, 6)
 BOIVIN, A., 130(5), 152, 177(3)
 BORNSTEIN, S., 61(8)
 BOSSHARD, E., 208
 BOVARNICK, M., 171(7), 173(7)
 BOYCOTT, A. E., 104(9)
 BRACHET, J., 274
 BRAND, E., 215, 215(5, 6, 24)
 BRANDT, K., 120, 122, 268(2)
 BRATUSCHECK, K., 208
 BRAUN, W., 63(9), 125, 137(6)
 BRAUNSTEIN, A. E., 19(11)
 BREED, R. S., 290, 290(4)
 BRICE, A. T., 208
 BRIERLEY, W. B., 64(10, 11)
 BRONFENBRENNER, J., 67(15, 16, 17)
 BRONSON, L. H., 67(24)
 BROWN, A. M., 87(40), 88(25, 41), 89(25), 90(24), 91, 92(3)
 BROWN, T. McP., 51(1), 52(1)
 Brown-Pearce rabbit carcinoma, 94-101, 106-108
Brucella abortus, 63
 BRUES, A. M., 103(10)
 BRUNER, D. W., 61(12, 13), 62(17)
 BRYAN, W. R., 105(11)
 BUCHANAN, R. E., 291(5, 6)
 BULLER, A. H. R., 198(13)
 BUNTING, M. I., 25-32, 26(3), 27(4), 28(6), 29(5), 228, 230, 232, 233
 BURCH, C. R., 208
 BURK, D., 265
 BURKHOLDER, P. R., 280
 BURNET, F. M., 7(8), 68(5), 74(6), 104(13), 130(7), 150
 bushy stunt virus, 10, 187, 284
 BUTENANDT, A., 10-11
 CASSELL, R. C., 85(47)
 CHAIN, E., 104(76)
 CHAMBERS, L. A., 7(36), 8(10, 11), 94(48), 106(48)
 CHASE, M., 176
 chemolithotrophy, 302
 chemoorganotrophy, 302
 chemotrophy, 302
 CHEN, T. T., 254
 CHESTER, K. S., 184
 chlorophyll variegation, 202-207
 chromosomes, yeast, 119-120
 classification, bacteria, 285-301
 nutritional types, 302
 CLAUDE, A., 6(12, 39), 94(15-20), 96(15-18), 104(15-19, 21), 105, 105(50), 107(19, 50), 188, 192
 CLIFTON, C. E., 146(10)
Clostridium septicum, 222-225
 CO₂ sensitivity, *Drosophila*, 252
 COBLENTZ, W. W., 80(3)
 cofactor, bacteria, 183
 virus, 3-5
 COGHILL, R. D., 78(11), 80(11, 17)
 COHEN, S. S., 3(14), 8(13), 10, 190-192, 274, 276
 COHN, F., 286-288, 290-291, 293-294
 COHN, W. E., 103(10)
Coleosporium Solidaginis, 85
 Colon bacillus, see *E. coli*
 color inheritance, bacteria, 25-32
 COLOWICK, S. P., 180, 183
 COOKE, W. R., 224(14)
 COONRADT, V. L., 16(5), 193, 195, 196(1), 198, 218(1)
 CORI, C. F., 268(3)
 CORI, G. T., 268(3)
 CORRENS, C., 202-204
 COTTER, R. U., 90(5, 28, 29, 49), 91, 91(49), 92(50)
 COWDRY, E. V., 104(22)
 COWLES, P. B., 30
 COX, M. F., 224(14)
 CRAIGIE, J. H., 86
 CROLAND, R., 45(2), 278(7)
 CURNEN, E. C., 8, 185
 CURRAN, H. R., 83
 CUSHING, H., 103(23)
 cytogene theory, 115-129
 cytoplasmic genetic factors, 236-255
 cytoplasmic inheritance, 89
 DADDI, G., 26
 DALE, H., 106
 DARLINGTON, C. D., 11(16), 107(25), 249, 254, 272-273
 DAS, N. B., 19(14)
 Dauermodifikationen, 246, 253
 DAVIS, B. D., 31
C. carotenum, 25
C. diphtheriae, 120, 136, 300-301
 cancer, causation, 94-112
 transplantation, 174-176
 carcinoma, 94-112
 CARR, J. G., 49, 192, 198
 CASPERSSON, T., 96(14), 104, 120, 122, 126, 268

- DAWSON, M. H., 51(2), 63(14), 177
 DE BARY, A., 289(8)
 DEDRICK, H. M., 67(4), 75(4)
 DE HAAN, H., 206
 DELAUNAY, A., 130(5), 177(3)
 DELBRÜCK, M., 2(5, 17, 34), 3(34), 6(33), 22-23, 33(2, 3, 6), 34(1), 35(2), 37(2, 3, 6), 47, 67(22), 68, 72, 114(2), 130, 130(18), 131-132, 132(18), 133(8), 149-150, 154, 189, 189(14), 15, 22), 200, 223, 223(17), 228, 229, 233, 234, 278(24)
 DESKOWITZ, M. W., 63(15), 228, 229, 231
 DEMEREC, M., 2, 2(5), 3, 38-50, 38(4, 8), 39(4), 40(4), 42(4), 48, 67(10), 68(10), 130(9, 11), 131(9, 11), 132(10), 133(11), 134(11), 136(9), 199(2), 200, 202, 203, 223(8, 9), 278(8), 279
 D'HERELLEN, 3
 dicarboxylic acid mutation, bacteria, 139-140
 DICKENS, F., 102(26), 104(26)
 DIENES, L., 51-59, 51(3), 53(3, 4, 5, 7, 8), 54(5), 55(3), 64(16), 283
 diffraction plates, 210
 DINGLE, J. H., 8(59)
 DINERT, F., 262
 diphtheria bacillus, 120, 136, 300-301
 DIPPELL, R. V., 236, 237(14)
 DISKANT, E. M., 215(5)
 dissociation, bacterial, 62-64
 DIXON, T. F., 107(27)
 DMOCHOWSKI, L., 106
 DOCHEZ, A. R., 105, 185
 DODGE, B. O., 78(5), 86(11, 12), 193, 195(3), 198(3)
 DOERMANN, A. H., 20(12, 13), 68, 76-77
 D'OLIVEIRA, B., 88(43), 91
 DOUDOROFF, M., 118, 126, 153, 278(10)
 DOLJANSKI, L., 103(49)
 DROSOPHILA, 15, 49, 83-84, 154-155, 252, 280
 DUBIN, I. N., 211
 DUBOS, R. J., 60-66
 DUBUY, H. G., 107(110), 206
 DUFFET, N. D., 120
 DUGGAR, B. M., 83
 DUNN, R., 266(26)
 DU VIGNEAUD, V., 5, 126, 265
 duplication, 259-261
 formation, 258-259, 261
 enzymes, effect on virus, 187-189
 effect of mutation on, 14-24, 148-149
 factors controlling, 256-277
 EPHRUSSI, B., 127-128, 252
 ERIKSSON, J., 85
Escherichia coli, 2-4, 38-50, 53-54, 68-77, 83, 113-114, 131-137, 143-148, 150-153, 177, 200, 224-225, 227, 278-284
typhosa, 61, 63
 v. EULER, H., 19(14)
 EVANS, F. R., 83
 evolution, virus, 110-111
 FANKUCHEN, I., 9(7), 10, 11(7), 187(10)
 FANO, U., 2, 3, 67(10), 68(10), 130(11), 131(11), 133(11), 134(11), 149
 FARR, W. K., 209
 FELIX, A., 62(18)
 FELLER, A. E., 8(59)
 FILDES, P., 282
 FINDLAY, G. M., 67(11), 74(11)
 FINDLEY, M. D., 170
 FIRTSCH, G., 60(19)
 FISCHER, A., 289(10)
 FITZGERALD, R. J., 134, 189
 Flavobacterium, 53
 FLOR, W. H., 89(14)
 FOCHT, E., 39
 FOSTER, J. W., 17(39), 20(39)
 FOULDS, L., 102, 104(33, 34), 107, 192
 FOWLER, E. H., 106, 209(10), 209, 212
 FREUND, J., 95
 FRIEDEWALD, W. F., 94(36), 97(36, 58), 98(58), 101(36), 104(58), 106(36, 58)
 FRIES, N., 278(12), 282(12)
 FREY, C. N., 262, 265
 FULLAM, E. F., 6(12, 39)
 fungi, genetics of, 85-93, 193-201
 heterocaryosis, 193-201
 life cycle, rust, 86
 mutation in, 14-24, 78-84, 215-227
 speciation, 78-84
 variation, 85-93
 FURTH, J., 94(37), 104(52), 106(37), 156(1), 157(2)
 GAISER, L. O., 86(12)
 galactose fermentation, inheritance of, 115-117, 143-148
 GANZ, E., 213
 GARBOWSKI, L., 90(15), 91
 GARD, S., 9, 61(20), 187, 188(17)
 GASIC, G., 166, 170
 GASSNER, G., 91
 GATES, F. L., 39(5)
 GAY, H., 83
 GELBER, J., 246(1)
 EAST, E. M., 203
Eberthella typhi, 145
 EDWARDS, P. R., 61(12, 13), 62(17)
 EISENBERG, P., 26
 ELLERMANN, V., 104(30-32)
 EMERSON, S., 149, 221(10)
 EMMONS, C. W., 38(7), 39(7), 44(7), 78-84, 78(6, 7, 10), 79(8)
 encephalomyelitis virus, 8
 ENDERLEIN, G., 299(9)
 Endophyllum, 86
 enzymatic adaptation, 148-149, 256-258

- GEMMELL, A. R., 193, 195(9), 197(8)
 gene
 action, theory of, 270-273
 bacteria, 278-284
 control of enzymes, 256-270
 Neurospora, 14-24, 215-227
 Paramecium, 247-248
 structure of, 247-248
 yeast, 256-277
 gene-induced plastid mutations, 204-206
 GENEVRAY, J., 25(15)
 GENGHOF, D. S., 61(21)
 GILES, N. H., 280
 GILMAN, A., 15
 GLASER, R. W., 9, 94(38)
 GLASS, H. B., 154
Glomeralla cingulata, 128
 GOLDWATER, W. H., 215(6)
 GOODPASTURE, E. W., 188(28)
 GOODSPEED, T. H., 207
 GORDON, W. G., 4, 5
 GORER, P. A., 106, 176
 GOSSOP, G. H., 195(4), 197(4)
 GOWEN, J. W., 46, 74(12)
 GRATIA, A., 68(13)
 GRAY, C. H., 25(10), 30(10), 151, 224(11), 278-280, 282(14)
 GREEN, R. G., 104(41), 106
 GREEN, R. H., 7(21), 67(24)
 GREENSTEIN, J. P., 102(42), 104(42)
 GREGORY, R. P., 202
 GREGORY, P. H., 199
 GRIFFITH, F., 63(22), 177
 GROUPE, V., 94(48), 106(48)
 growth, bacteria, 228-235
 growth-factor mutations, bacteria, 150-152, 154
 GUILLIERMOND, A., 107(43), 120
 GULICK, A., 21(16)
 GUNTHER, G., 19(14)
 GYE, W. E., 104(44), 105(43)

H. influenzae, 51, 53, 55
H. parainfluenzae, 53
 HABERMAN, S., 25(11)
 HADDOW, A., 107(48)
 HADLEY, P., 62(23-25), 63(26)
 HAGE, D., 63(27)
 HALDANE, J. B. S., 14(17), 20(17), 21(17), 103(46)
 HANSEN, H. N., 193, 195(6)
 HANSON, H. J., 78(16)
 HARRIS, D. L., 17
 HARRIS, J. S., 278(20)
 HARRISON, J. A., 106, 209, 212
 HARRISON, R. W., 30(1)
 HUGON DE SCOEUUX, M., 252
 HAWKING, F., 138
 HEATLEY, N. G., 104(6)
 HEDGECOCK, L., 149(41), 256(29)
 HEFFERAN, M., 25(12)
 HEHRE, E. J., 61(21, 35)
 HEILMAN, F. R., 51(9), 53
 HELE, T. S., 284
 HENLE, G., 189(18)
 HENLE, W., 8, 8(10, 11), 94(48), 106(48), 189(18)
 HENNENBERG, W., 122
 HENRICI, A. T., 228
 HENSELEIT, K., 19(23)
 HERSHEY, A. D., 33-37, 67-77, 67(15, 16), 68(14), 69(14), 71(14), 72(14), 74(14), 113, 134, 200
 heterocaryosis, 193-201
 heterotrophy, 302
 HINSHELWOOD, C. N., 130(13), 135(13)
 HIRST, G. K., 7(24), 189
 HOBBY, G. L., 51(2)
 HOFER, A. W., 209, 212
 HOFFMAN, R. S., 103(49)
 HOGEBOOM, G. H., 105(50), 107(50)
 HOLLANDER, A., 38(7, 8), 39(7), 44(7), 78-84, 78(7, 10, 11, 13), 79(8), 80(11, 13, 17), 82(9), 83, 83(9, 12), 279
 HOOK, A. E., 7(49)
 HOROWITZ, N. H., 14(21), 15, 17(18, 19), 18(21), 19, 221(30), 227, 280, 282(17), 289, 289(11), 290
 HORSFALL, F. L., 8, 185, 189(29)
 HOTCHKISS, R. D., 105(50), 107(50)
 HOULAHAN, M. B., 15(20), 17, 17(19), 18(27), 20(27, 28), 280(17), 282(17)
 HOYLE, L., 106
 HRUBY, K., 207(14)
 HUNGATE, F. P., 20(22)
 HUNGATE, M., 15(20), 280(17), 282, 282(17)
 HURST, C. C., 286
 hypotrophy, 302

 IMAI, Y., 202(18), 205, 206
 immunochemistry of bacteria, 60-66
 IMSENECKI, A., 299(13)
 influenza virus, 8, 185-187, 191
 INGRAHAM, L. J., 28(6)
 INGRAHAM, M., 25(13, 14)

 JACKSON, H. S., 90
 JACKSON, R. W., 4, 5
 JACOBSEN, H. C., 291
 JAEGER, L., 119
 JAFFE, E., 61(35)
 jaundice, silkworm, 8
 JENNINGS, H. S., 246(2)
 JOHNSON, T., 85-93, 85(22), 87(20, 40), 88(20, 25, 41), 89(21, 25, 34, 35), 90(19, 37), 91(23, 34, 36, 38, 39)
 JOHNSTON, C. O., 91
 JOLLOS, V., 246, 246(3), 253
 JONES, M. J., 282(21)
 JONES, R. P., 208(5)

- JULIANELLE, L. A., 63(28, 29)
 JUPNICK, H., 208, 209(2), 211(2)
- KABAT, E. A., 94(37), 104(52), 106(37)
 KAHLER, H., 105(11)
 KALMANSON, G., 67(17)
 KAMEN, M. D., 266(24, 26), 267(25)
 kappa factor, *Paramecium*, 236-255
 KARPER, R. E., 202
 KARSTRÖM, H., 146, 256
 KASSELL, B., 215(6)
 KAUFMANN, B. P., 83, 84
 KAUFMANN, F., 61(30)
 KAUSCHE, G. H., 7, 74(19)
 KIDD, J. G., 94-112, 94(36, 53-55, 76), 96(54),
 97(36, 58, 76), 98(54, 57, 58), 99(54, 55, 57,
 76), 101(36, 60, 76), 103(93), 104(58, 76),
 105(56, 57, 59, 60, 76, 91, 92), 106(36, 54, 55,
 56, 58), 107(57), 137-138, 174-176, 188, 192
 Killer character, *Paramecium*, 93, 236-255
 KIMURA, F., 67(16)
 KLECZKOWSKI, A., 185(1)
 KLIENEBERGER, E., 51, 52
 KLUYVER, A. J., 290, 293, 294, 297, 299(16)
 KNAYSI, G., 211
 KNIGHT, B. C. J. G., 130(14), 215, 224(12),
 225(12), 278
 KNIGHT, C. A., 8, 8(27), 9(57), 11, 11(26), 185
 KNUDSON, L., 207
 KÖHLER, A., 208
 KOHN, H. I., 278(20)
 KOLLER, P. C., 104
 KORTWEG, R., 104(62, 63)
 KOSER, S. A., 152, 224(13)
 KOSTER, H., 228, 229
 KOTTMANN, V., 1, 3
 KRASSILNIKOV, N. A., 299(17)
 KREBS, H. A., 19(23)
 KREMIEŃSKA, H., 299(18, 19)
 KRISTENSEN, M., 132, 145
 KRITZMANN, M. G., 19(11)
Kunkelia nitens, 86
 KÜSTER, E., 207
 KYNETTE, A., 105(105)
- L-type Streptobacillus, 51-58
Lactobacillus arabinosus, 224-225
 lactose mutation, bacteria, 146-148
 LAIDLAW, P. P., 104(64)
 LAMB, I. M., 89
 LAMPEN, J. O., 224, 282(21)
 LANCEFIELD, R. C., 62(31), 183(7)
 LANKFORD, C. E., 224(14)
 large bodies, bacteria, 51-58, 65-66
 LATARJET, R., 38-50, 47(9), 74, 77, 78, 84, 200, 254
 LAUFFER, M. A., 8(10, 11, 29)
 LAUSTSEN, O., 256, 257
 LAVIN, G. I., 189(29)
 LEDERBERG, J., 113-114, 113(4, 5), 199, 200, 215,
 216(25), 217, 218(25), 218, 221(25), 226,
 227, 278, 280, 284
 LEE, M. E., 134(12), 189
 LEGROUX, R., 25(15)
 LEHOULT, Y., 130(5), 152, 177(3)
 LEONIAN, L. H., 221(40), 224(15, 16)
 leukemia, 156-176
 LEVINE, M. N., 87(48), 90, 90(49), 91(6, 49),
 92(50)
 LEWIS, I. M., 132, 146
 LEWIS, W. H., 104 (66, 67)
 L'HERITIER, P., 107(65), 247, 249, 252
 LIBBY, R. L., 151, 152, 199(10), 224(21), 225(18,
 21), 278, 279
 LIESKE, R., 291
 life cycle,
 Protozoa, 246
 rust, 86-87
 LILLY, V. G., 221(40), 224(15, 16)
 LINDEGREN, C. C., 78(15), 107(68, 69, 100), 115-
 129, 117(19), 118(24), 122(13, 15), 124(16),
 125(18), 146(19), 149, 193, 194, 206, 248,
 249, 254, 256, 256(27-29), 257, 257(7, 8),
 259, 261(7, 8, 19, 30), 262(20), 283, 284
 LINDEGREN, G., 78(15), 107(100), 115-129, 117
 (19), 118(24), 146(19), 149, 206, 256, 257,
 259
 LINDFORS, T., 86(31)
 LIPMANN, F., 268(13)
 LITTLE, C. C., 104(70), 169(3)
 LOEB, L., 103(72, 73), 107(71, 73), 166(4)
 LÖHNIS, F., 51
 LOOS, W., 208
 LORING, H. S., 9, 18(24)
 LUCKE, B., 105(74)
 LUDFORD, R. J., 104(75)
 LURIA, S. E., 2(32, 34), 3(34), 6(31, 33), 33(3, 5,
 6), 37(3, 6), 67(22), 68(20, 21), 72, 74, 84,
 114(2), 130-138, 130(18, 21), 131, 131(21),
 132, 132(18), 134(17), 136(21), 150, 189,
 189(22), 199, 223, 223(17), 228, 233, 234,
 278(23, 24), 283
 LUSH, D., 68(5)
 LWOFF, A., 130, 139-155, 139(23-26), 140, 141,
 152, 221(18), 224(18), 254, 278, 279, 281,
 283, 290
- MACDOWELL, E. C., 156-176, 166(9), 171(6,7),
 172 (5, 8, 12), 173(7)
 MACINDOE, S. L., 85(32)
 MACKENZIE, I., 94(76), 97(76), 99(76), 101(76),
 104(76), 105(76)
 MACLEOD, C. M., 67(1), 75(1), 107(5), 130(4),
 177(2), 181(2)
 maize, 202-203, 205
 malignant growth, 94-112, 156-176
 MARCHAL, J. G., 25(16), 63(32)
 MARCHAL, P., 146
 MARINELLI, L. D., 39

- MARTON, L., 3(45)
 MASSINI, R., 146
 mating type, yeast, 115-116, 128
 MAURER, J. A., 209(10)
 MAZIA, D., 119
 McCARTY, M., 11(35), 58, 67(1), 75(1), 107(5, 77, 78), 130(4), 177-183, 177(2, 9, 10), 181(2, 8, 9), 269, 274
 McELROY, W. D., 21
 McILWAIN, H., 136(20), 200
 MEDAWAR, P. B., 103(79), 106
 MEISEL, D., 105(106)
Melampsora Lini, 88-89
Euphorbiae, 91
 MELCHERS, G., 74(23)
 melibiose fermentation, inheritance of, 116-119, 257, 259-261
 MELLON, R. R., 63(33), 65-66, 300
 mesotrophy, 302
 metabolism, effect of mutation in bacteria, 139-155
 methionine mutation, bacteria, 150
 MEYER, A., 115(21), 120
 MEYERHOF, O., 275, 276
 MEYERS, W. G., 78(16)
 MICHEL, K., 208
Micrococcus ochraceus, 283
tetragens, 26
 microscope, phase, 208-214
Microsporium gypseum, 78
 MIGULA, W., 288, 291, 293
 MILLER, B. F., 30(1)
 MILLS, K. C., 185
Mirabilis jalapa, 202-203
 MIRSKY, A. E., 21(26)
 MITCHELL, H. K., 14(21), 17, 18(21, 27), 20(27, 28), 21
 mitosis, yeast, 121-123
 MOLISCH, H., 291, 291(24)
 MONOD, J., 143, 146, 146(29-31, 34), 147(30-31), 149, 150, 152, 255, 264, 267, 274, 275, 281
 MOORE, S., 216(19)
 MOOSEY, M. M., 104(41)
Moraxella twoffi, 139-145, 148, 278
 MOREL, M., 153
 MORGAN, H. R., 61(34)
 MOSLEY, V. M., 187
 mouse leukemia, 156-176
 MRAK, E. M., 115-116, 127
 MUDD, S., 7(36)
 MULLER, H. J., 21(29), 200
 MÜLLER, J. H. H., 289(25)
 MÜLLER, R., 145
 MURPHY, H. C., 88(33)
 MURPHY, J. B., 104(21)
 mutation, anaphragmic, 139-149, 154-155
 biochemical, 14-24, 139-155, 215-227, 278-284
 growth-factor, 150-152
 induced, bacteria, 38-50, 278-284
 fungi, 14-24, 78-84, 215-227
 virus, 36-37
 mustard gas induced, 280-281
 nutritional, *Neurospora*, 14-24, 215-227
 pigment, 25-32, 197
 plastid, 202-207
 Protozoa, 246-247
 rate, 42-49, 69-70, 130-133, 228-235
 reverse, 69-70, 130, 216-227
 somatic, 103-104
 spontaneous, bacteria, 25-32, 60-66, 113-114, 130-155, 228-235
 rusts, 90-92
 virus, 67-77
 mutation rates, bacteria, 42-49, 130-133, 228-235, 278
 bacteriophage, 69-70
Mycobacterium phlei, 25
N. gonorrhoeae, 53-55
 NADSON, G. A., 207(22)
 NATHANSOHN, A., 291
 NEEDHAM, J., 31
 NEILL, J. M., 61(21, 35)
Neurospora, 78, 86, 198, 200, 278-284
 biochemical mutations, 14-24, 215-227
 NEWTON, M., 85(22), 87(20, 40), 88(20, 25, 41), 89(21, 25, 34, 35), 90(18, 19, 24, 37), 91(23, 34, 36, 38, 39)
 NIEMANN, C., 5
 NILSSON, R., 262
 nitrogen mustard, effect on mutation, 15, 280-284
 nitrogen-sulphur mutation, bacteria, 140-143
 nomenclature, nutritional types, 302
 Novikoff, A. B., 290
 NOZAWA, M., 262(31)
 nuclear ratios, 198-199
 nucleic acid, content of virus, 190-192
 role in transformation, 177-183
 nucleoprotein, in enzyme synthesis, 267-270
 nucleus, in heterocaryosis, 194-196
 NUNEMAKER, T. C., 51(1), 52(1)
 nutrition, effect of mutation, bacteria, 278-284
 Neurospora, 14-24, 215-227
 Penicillium, 16
 nutritional types, nomenclature, 302
 OAKBERG, E. F., 130(21), 131(21), 136(21)
 OBERLING, C., 103(81)
Oenothera, plastid inheritance, 204
 OERSKOV, J., 51(17), 55(16)
 OLIVE, E. T., 86(42)
 OPARIN, A. I., 289, 290
 OPIE, E. L., 107(82)
 ORLA-JENSEN, S., 289, 290, 293, 297, 298
 OSTERBERG, H., 208, 209(2), 210(17), 211(2)
 oxaloacetic acid, 139-145
 PAL, B. P., 205
 PALETTA, F. X., 104(22)
 papilloma virus, rabbit, 8-9, 191-192

- Paramecium, 93, 236-255
 concentration of kappa, 237-246
 Dauermodifikationen, 246
 kappa factor, 236-255
 Killer character, 236-255
 phase microscope studies, 211-212
 paratroph, 302
 PARKER, R. F., 67(24)
 PARR, L. W., 130(22)
 PASTEUR, L., 60
 pathogenic characters, rust, 88-92
 PAULING, L., 3(37)
 PEACOCK, P. R., 104(83)
 Pelargonium, 203-204
 penicillin, resistance to, 133, 135-137
Penicillium notatum, 16-17, 78, 80, 193-194, 197, 201
 PENISTON, A., 120, 121
 phage resistance, 130-135, 150-152
 phase microscopy, 208-214
 phase variation, bacteria, 61-62
 PHILIPS, F. S., 15
 photolithotrophy, 302
 photomicrography, 213
 photoorganotrophy, 302
 phototrophy, 302
 phytotrophy, 302
 PICKELS, E. G., 7, 7(50)
 PIEMEISEL, F. J., 85(51, 52)
 PIERCE, J. C., 18(24)
 PIERSON, B. F., 246(6)
 PIESCHEL, E., 91
 pigment, *Aspergillus*, 197
 bacteria, 25-32
 Neurospora, 218
 Penicillium, 197
 Puccinia, 89-90
 PIRIE, A., 189
 PIRIE, N. W., 9, 184-192, 184 (3, 6, 26), 185(4, 6), 186(2, 26), 187(8), 188(4-8), 226, 284
 PITT, R. M., 62(18), 63(5)
 plasmagene, 250-251, 270-277
 plastid mutations, 202-207
 plastogene, 202, 205
 pneumococcus, 60-63, 177-183
 pneumonia virus, 185
 POIRAULT, G., 86
 poliomyelitis virus, 8
 POLERITZKY, K., 7(36)
 PONTECORVO, G., 49-50, 193-201, 195(9), 197(8), 276
 population genetics, fungi, 199
 PORTER, K. R., 6(39)
 POTTER, J. S., 156, 157, 170, 171(6, 7), 172(5, 8, 12), 173(7)
 POTTER, V. R., 107(84)
 PREER, J. R., 126, 236, 237, 237(7), 238, 243, 245, 246, 253
 PREISZ, H., 61(37)
 PRESSMAN, D., 3(37)
 PREVOT, A. R., 293, 294
 PRICE, W. C., 10(40)
 PRICE, W. H., 180, 183
Primula sinensis, 202
 PRINGSHEIM, E. G., 299(33)
 proline mutation, bacteria, 150-151
Proteus vulgaris, 153
 Protozoa, genetics of, 236-255
Pseudomonas pyocyanea, 3
Puccinia, 85-93
 PURDY, W. J., 104(44)
 R antibody, 177-183
 rabbit serum, 177-183
 RACIBORSKI, M., 86
 RAFALKO, J. S., 115, 119, 126(22)
 RAHN, O., 294, 297
 RANDOLPH, L. F., 202, 203
 RAPER, K. B., 78(11), 80(11, 17)
 REAGH, A. L., 60(42)
 REBENSBURG, L., 74(26)
 REED, G. B., 25(17), 26
 REGNERY, D. C., 20(30), 215(20), 221(20)
 RENNER, O., 202, 204, 204(26)
 REIMANN, H. A., 26, 63(38, 39)
 reproductive processes, bacteria, 51-58
 RETTGER, L. F., 25(19)
 reverse mutation, 69-70, 130
 rhamnose mutation, bacteria, 145
 RHINEBERG, J., 208
 RHOADES, M. M., 107(85), 202-207, 205
 RICHARDS, O. W., 208-214, 208(21), 209, 209(2, 10), 211 (2, 22), 212, 213
 RICHTER, M. N., 166(9)
 RILEY, V., 105(11)
 RITTENBERG, D., 19
 RIVERS, T. M., 7, 104(86)
 ROBERTS, E. C., 282
 ROBSON, J. M., 15, 49
 ROCHLIN, E. J., 207(22)
 ROEPKE, R. R., 151, 152, 199(10), 224, 224(21), 225, 278, 279, 281, 282(21, 27)
 ROTHHAAS, A., 25(27)
 ROSE, W. C., 14(31)
 ROUS, P., 101(60), 103(93), 104(59, 87-89), 105(60, 90, 91, 92), 107
 RUDD, G. V., 178(11)
 RUSKA, H., 1, 3, 5, 7
 rust fungi, 85-93
 RYAN, F. J., 49, 113(3, 4, 5), 199, 215, 215(5, 6, 24), 216(25), 217, 218(25), 221(25), 222(22)
Saccharomyces, 53, 58, 115-129, 153-154, 257-277
 SAIDEL, L. J., 215(6)
 SALAMAN, R. N., 74(25)
Salmonella, 61-63, 145, 228-235
 SANSOME, E. R., 38(8), 197(11), 198
 SANTESSON, L., 96(14), 104
 SAPPIN-THOUFFY, P., 86(46)
 sarcoma, filterable agents, 192

- schizomycetotrophy, 302
 SCHNEIDER, L. K., 222(22)
 SCHEURLIN, E., 25(20)
 SCHONHEIMER, R., 14
 SCHOPFER, W. H., 17(33), 224(26), 225(26)
 SCHRAMM, G., 74(26)
 SCHREK, R., 103(95)
 SCHULTZ, A. S., 262, 265
 SCHULTZ, E. W., 3(45)
 SCHULTZ, J., 21(34), 122, 126
 SCHWERDT, C. E., 9
Sclerotinia Gladioli, 86
 SCOTT, M. A., 125 (18)
 SCOTT, W. M., 61(40), 64(40)
 SCOTT, V., 224(14)
 serological reactions, carcinoma, 95-102, 105-106
 serology of cancer, 95-102, 105-106
Serratia marcescens, 25-32, 63, 230, 232-233
 SERTIC, V., 68(27, 28)
 serum, anti-R rabbit, 177-183
 SEVERENS, J. M., 278(29)
 sexual phase, bacteria, 283-284
 SHAPIRO, A., 228-235, 228, 229, 231
 SHARP, D. G., 7(49), 8(46-48, 59), 211
 SHEDLOVSKY, T., 7(50)
 SHEMIN, D., 19, 282(30, 31)
 SHENG, T. C., 215, 221
 SHERRICK, J. L., 25(19)
 SHIVE, W., 282
 SIA, R. H. P., 177
 SIGOT, A., 247(4), 252
 SILVER DOWDING, E., 198(13)
 SILVERMAN, M., 224(27-29)
 SIMIZU, A., 61(41)
 SKEGGS, H. R., 224
 SKOOG, F., 126
 SLIZYNSKI, B., 50
 SMADEL, J. E., 7, 7(21, 50), 188(27)
 SMALL, M. H., 151, 152, 199(10), 224(21), 225(21), 278, 279
 SMITH, J. D., 208(5)
 SMITH, T., 60(42)
 SMITH, W. E., 53(8), 107(96)
 SMITH, W., 51(18)
 So, M., 205, 206(28)
 SOLNTZEVA, L., 299(13)
 somatic mutation theory of cancer, 103
 SONNEBORN, T. M., 11(52), 77, 93, 107(97-99), 126, 128-129, 138, 174-175, 206, 236-255, 236(9-13), 239(12), 240(12), 243(12), 245(13), 246(2, 8), 237(12, 14), 247(11, 12), 251-253, 272
 sorghum, 202
 SORIANO, S., 299
 SOROKIN, H., 212
 SOULE, M. H., 63(43)
 speciation, fungi, 78-84
 SPEMANN, H., 106
 SPENCER, H., 246
 SPIEGELMAN, S., 11(53), 107(100), 117(19), 118 (24), 125, 126, 146(19), 149-153, 206, 228, 229, 250-252, 256(19, 20, 27-29), 257, 258(19), 259, 262(19, 21, 31), 263(23), 265(22), 266(24, 26), 267(25), 274-276
 SRB, A. M., 19, 20(36), 221(30)
 STADLER, L. J., 38(12), 44(12), 67(29), 74(20), 207
 STAKMAN, E. C., 85, 85(47), 87(48), 90(28, 29, 49), 91(49), 92(50)
 STANIER, R. Y., 293, 298, 299(37-40)
 STANLEY, W. M., 8, 8(29), 9, 9(57), 10, 10(55), 11, 11(55), 74(30), 104(101)
 STANNARD, J. N., 262(33)
 Staphylococcus, 61-62, 133-137
 STARKEY, R. L., 298
 STEDMAN, E., 119
 STEDMAN, ELLEN, 119
 STEENBOCK, H., 25(14)
 STEIN, W. H., 216(19)
 STERN, K. G., 94(102), 105(102), 253, 277
 STETTEN, D., 17(38)
 STEPHENSON, M., 262
 STIER, T. J. B., 262(33)
 STOCK, J. P. P., 208
 STOKES, J. L., 17(39), 20(39)
 STONE, J. D., 74(6)
 STOTZ, E., 143
 STRAIB, W., 91
 STRAUB, F. B., 142
 strawberry virus, 185
Streptobacillus moniliformis, 51
 streptococcus, 54, 61-63, 66
 STRONG, L. C., 168(13), 175
 STRYKER, L. M., 63(44)
 STUBBE, H., 74(19)
 SUGG, J. Y., 61(35)
 SULLIVAN, M. X., 25(21)
 sulfur mustard, effect on mutation, 15, 280-284
 sulphathiazole, resistance to, 133, 135-137
 suppressor genes, 154-155, 216
 SWANSON, M. A., 268(3)
 SWANSON, C. P., 83, 83(12)
 symbiosis, 51
 SZENT-GYORGI, A., 142
 TALIAFERRO, W. H., 105
 TANNER, F. W., 278(29)
 TATUM, E. L., 14(6, 21, 40), 15, 15(6), 17, 17(44), 18(10, 21, 43), 20(45, 46), 25, 25(10), 30(10), 49, 80(2), 113-114, 126, 151, 199(14), 216(31), 221(2, 4, 34), 224, 224(11, 32), 225(31, 33), 278-284, 278(33), 279, 280, 282(14, 33)
 TAYLOR, A., 105(104, 105)
 TAYLOR, A. R., 3(58), 7(49), 8, 8(46, 48)
 TAYLOR, H. E., 177-183
 TAYLOR, M. J., 172(8, 12)
 TEAS, H. J., 18,
 TEISSIER, G., 107(65), 247(5), 252

- TENEBAUM, E., 103(49)
 ternary compounds, bacterial metabolism of, 139-150
 THAXTER, R., 299
 THOMASSEN, P. R., 3(45)
 tobacco mosaic virus, 10-11, 74, 184-187, 284
 tobacco necrosis virus, 10
 TOBIE, W. C., 25(22)
 TOOLAN, H., 176
 TRACY, M. M., 103(10)
 transformation, pneumococcus, 177-183
 transplantation, cancer, 174-176
 mouse leukemia, 157-176
 TREFFERS, H. P., 136
Treponema pallidum, 11
 Trichophyton, 78-80
 Trypanosoma, 105
 tumor cells, 94-112
 TURFITT, G., 25(23)
 TWOMBLY, G. H., 105(106)
 typhus rickettsia, 191
- UBER, F. M., 38(12), 44(12), 207
 ultraviolet absorption, virus, 10-11
 ultraviolet induced mutation, bacteria, 38-50, 279-281
 fungi, 14-15, 78-84
 virus, 74
 uracil requirement, Clostridium, 222-225
Uromyces Rudbeckiae, 86
- V2 carcinoma, 99-101, 106-108
 vaccinia, 7-8, 191
 VAN NIEL, C. B., 25, 227, 285-301, 288(44), 290, 293, 294, 297, 298, 299(16, 40, 43), 301
 variation, bacteria, 25-32, 60-66, 199-200
 fungi, 85-93
 leukemic cells, 156-176
 variegation, 202-207
 VENDRELY, R., 130(5), 152, 177(3)
 VICTOR, J., 166(15), 171
 v. EULER, H., 262
 viroid theory, 110-112
 virulence variation, leukemia, 157-166
 virus, animal, 6-9, 74
 bacterial, 1-6, 33-37, 67-77, 114
 bushy stunt, 10, 187-188
 chemistry of, 1-13
 cofactors, 3-5
 effect of enzymes, 187-189
 evolution, 110-111
 induced mutation, 33-37
 influenza, 8, 185-187, 191
 isolation of, 186-187
 morphology of, 1-13
 mutual exclusion, 33-37
 nucleic acid content, 190-192
 phosphorus content of, 190-191
 plant, 9-11, 74
 pneumonia, 185
 size, 6-9
 spontaneous mutation, 67-77
 state in infected cell, 184-192
 strawberry, 185
 tobacco mosaic, 10-11, 74, 184-188
 vitamin synthesis, Neurospora, 16-18
 volutin, yeast cell, 119-120
- WADDELL, A. H., 195(15)
 WAGER, H., 120, 121
 WALL, M. J., 188(27)
 WARBURG, O., 104(107)
 WARD, H. K., 178(11)
 WASSEN, A., 61(45)
 WASSERZUG, E., 25
 WATERHOUSE, W. L., 88(54), 90(53), 91
 WATSON, I. A., 88(54)
 WEIL-MALHERBE, H., 102(26), 104(26)
 WENT, F., 221(35)
 WERKMAN, C. H., 224(27-29, 37-38)
 WETZEL, K., 154
 WHITE, M. J. D., 23, 201, 254
 WHITE, P. B., 62(46-49), 293, 293(45)
 WICKERHAM, L. J., 115, 127
 WILLIAMS, R. C., 1(61), 8, 10, 10(40)
 WILSON, E. B., 105(108), 107(108)
 WINGE, O., 53(19), 78(19), 202, 256, 257
 WINKLER, W., 289(46)
 WINOGRADSKY, S., 288, 291
 WINSLOW, C. E. A., 290, 291(50)
 WINTERSTEINER, M. R., 166(15)
 WINZLER, R. J., 265, 267(38)
 WITKIN, E. M., 38, 44, 130(24), 131(24), 133(24), 136, 223(36)
 WOLBACH, S. B., 103(33)
 WOLLMAN, E., 150-152
 WOOD, H. G., 224(37, 38)
 WOODRUFF, C. E., 188(28)
 WOODRUFF, L. L., 246(15, 16)
 WOODS, M. W., 107(110), 206
 WOODWARD, C. R., 17(39), 20(39)
 WREDE, F., 25(27)
 WRIGHT, B., 15(20)
 WRIGHT, L. D., 224
 WRIGHT, M. H., 152, 224(13)
 WRIGHT, S., 14(47), 20(47), 21(47), 270, 272, 273
 WYCKOFF, R. W. G., 1(61), 8, 10, 10(40), 94(38, 111), 187
 WYSS, O., 221(40)
- X-ray diffraction, virus, 10-11
 X-ray induced mutation, bacteria, 38-50, 278-281
 fungi, 14-15, 78, 83
 virus, 74
 xylose mutation, bacteria, 145
- YASUI, K., 206

yeast, centriolar bodies, 122
 chromosomes, 119-120
 cytogenes, 115-129
 cytoplasmic granules, 120-122
 metabolism, 153-154
 mitosis, 121-123
 phase microscope studies, 212
 reproduction of, 53, 58
YORKE, W., 137
YUDKIN, J., 148, 262, 275

YUILL, E., 195(4), 197(4), 197
YUILL, J. L., 195(4), 197(4), 197

ZAMENHOF, S., 77, 153, 227, 235, 274, 276
ZERNICKE, F., 208
ZIEGLER, J. E., 189(29)
ZIMMER, E., 38(8), 78(13), 80(13)
zootrophy, 302
ZWORYKIN, V. K., 1(62), 10