



This work is licensed under the Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/us/> or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, USA.

CONTENTS

Editorial- Words, words, words	i
Khan - Behaviour of <i>Aedes</i> mosquitoes in relation to repellents	1
Book review	36
Editorial- Beastly teachers	39
Pucat - The functional morphology of the mouthparts of some mosquito larvae	41
Freitag - A revision of the North American species of the <i>Cicindela maritima</i> group with a study of hybridization between <i>Cicindela duodecimguttata</i> and <i>oregona</i>	87
Guest editorial- Two cultures and the information explosion . . .	171
Wellington - An approach to a problem in population dynamics	175
Wada - Population studies on Edmonton mosquitoes	187
Wada - Effect of larval density on the development of <i>Aedes aegypti</i> (L.) and the size of adults	223
Announcement	250
Corrigenda	250

INDEX

- Aedes*, 1, 41, 187, 223
aegypti, 1, 46, 64, 71
campestris, 198
canadensis, 58, 61, 69, 78, 81,
 198
cantator, 29
cataphylla, 5, 69, 71, 195
communis, 69, 73, 188, 195
dorsalis, 198
excrucians, 61, 71, 78, 195, 197
fasciata, 51
fitchi, 46, 50, 54, 61, 63, 76,
 78, 195
hexodontus, 59, 61, 78, 188, 195
impiger, 61
implicatus, 61, 195
increpitus, 61, 195, 197
intrudens, 5, 188, 195
niphadopsis, 189
pionips, 61, 78
pullatus, 189
punctor, 5, 61, 71, 188, 195
riparius, 61, 69, 195, 197
sollicitans, 29
sticticus, 61, 69, 195, 197
stimulans, 61, 78, 195, 197
vexans, 49, 61, 78
- Amoore, J. E., 4, 31
Anabaena, 76
 Anderson, E., 89, 167
 Andrewartha, H. G., 201, 221
Ankistrodesmus, 76
Anopheles, 44, 72, 75, 81, 194
earlei, 72, 81
fasciatus, 44
gambiae, 223
maculipennis, 24, 29, 42, 62, 80
messeae, 79
quadrimaculatus, 42, 49, 60, 190
rossi, 44
Anophelinae, 43
 anopheline larvae, 80, 249
 Anthon, H., 49, 82
 Anscombe, F. J., 201, 221
Apoidea, 163
 Applegarth, A. G., 56, 82
Apterobittacus, 56, 58
Asaphidion, 36
- attractant, 4, 21, 28
 Atwood, C. E., 3, 34
 autogeny, 223
 Baker, F. C., 219, 221
 Ball, G. E., 38
 Banks, C. S., 13, 31
 Bates, M., 5, 31
 barrier, communication, 172
 geographic, 115, 133, 165, 166
 Bar-Zeev, M., 18, 31
 Beckel, W. E., 188, 221
 bees, dancing, 180
 honey, 120, 164
 behavior, blood feeding, 1, 2
 feeding, 41, 72, 73
 group, 66
 individual, 178
 mosquito, 1
 orthokinetic, 72
 variations, 179
 Bekker, E., 42, 82
Bembidion, 36
graciliforme, 37
humboldtiense, 37
immaturum, 37
incrematum, 37
nigrum, 37
Bibio, 56, 58
 binomial distribution, 192, 201,
 208
 Bishop, A., 2, 31
 Blackwelder, E., 133, 167
 Blatchley, W. S., 103, 167
 Bliss, C. I., 201, 221
 Bock, J. W., 163, 167
 Bowman, M. C., 28, 32
 Brown, A. W. A., 4, 31
 Brown, W. L., 90, 167
 Browne, B. L., 15, 31
 browser, 42, 58, 65, 74, 80, 81
 Burgess, L., 28, 31
 Butt, F. H., 49, 82
 Cain, A. J., 160, 167
Calliphora erythrocephala, 80
 cannibalism, 73, 74
Carabidae, 36, 120
Carabus, 120
 Carmichael, A. G., 29, 31

- Carpenter*, S. J., 64, 82
Carr, F.S., 152, 168
Casey, T. L., 36
Chadwick, L. E., 27, 32
Chaoboridae, 43
Chaoborus, 43, 73, 75, 80
 americanus, 41, 63, 73, 75, 78
chemoreceptors, 1, 3, 8, 10, 15
Chironomidae, 49
Chironomus, 46, 51, 60
 hyperboreus, 80
Chitty, D., 177, 185
Chlamydomonas, 77
Christophers, S.R., 3, 31, 42
Cicindela, audax, 111
 bellissima, 87, 94, 101
 bucolica, 102
 californica, 91
 columbica, 87, 94, 101
 depressula, 87, 92, 101, 138
 duodecimguttata, 87, 91, 101, 144
 guttifera, 111, 126
 hirticollis, 87, 94, 101, 161
 hudsonica, 102
 limbata, 87, 94, 101, 161
 oregona, 87, 92, 101, 111, 144
 ovalipennis, 111
 praetextata, 91
 provensis, 111
 quadripennis, 111
 repanda, 94, 103
 scutellaris, 111, 126
 sterope, 111
 trannebarica, 126
 theatina, 87, 97, 102
Cladosporium, 76
Clements, A.N., 42, 82
corrigenda, 250
Coggeshall, A.S., 80
Cohn, G., 27, 31
color, elytra, 122, 139, 140,
 pattern, 88, 113, 120, 122, 144
Compositae, 77
Contia tenuis, 143
Cook, E.F., 42, 82
Corvus corone, 159
Cox, E. L., 209, 222
Cryophilalapponica, 74
Culex, 41, 44, 58, 74, 80, 194
 annulatus, 44
Culex(cont.)
 atratus, 44
 fatigans, 44
 molesitus, 24, 49, 223
 nemorosus, 44
 peccator, 44
 pipiens, 29, 44, 61, 223
 tarsalis, 61
 territans, 51, 54, 58, 61, 72, 75
Culicoides circumscriptus, 80
Culicidae, 58
Culicinae, 43
Culiseta, 41, 44, 58, 74, 80, 194
 impatiens, 58, 61, 69, 78, 81
 incidens, 55, 60, 78
 inornata, 46, 55, 58, 63, 66, 71,
 73, 75, 77, 79, 80, 81
 morsitans, 51, 54, 58, 61, 63, 66,
 71, 73, 75, 77, 79, 187
current feeding, 41, 68, 79
Cyclops, 68, 77
Daphnia, 68
Das, G. M., 56, 82
Davidson, R. H., 4, 32
Davies, J. T., 4, 31
DeLong, D. M., 2, 31
Dethier, V. G., 2, 32
diapause, 219
Dicaelus, 120
Diptera, 56, 58, 62
Dobzhansky, T., 158, 168
DuPorte, E. M., 50, 82
Dyar, H. G., 42, 83
Dyson, G. M., 27, 32
ecophenotypes, 126
elytral pattern, 88, 103, 105, 109,
 112, 120, 146, 160
emergence, 218
Eucorethra, 43, 81
 underwoodi, 73
Euglena, 77, 80
Evans, D. R., 11, 32
evolution, 43, 80, 109, 133, 163
Ferris, G. F., 49, 83
filter feeders, 42, 58, 72, 74, 79
Findley, J. S., 143, 168
Fisher, R. A., 204, 221
flight, 220
food, 190, 192
 shortage of, 224, 228

- Foskett, D. J., 172, 174
Fowler, H. W., 219, 221
Fraenkel, G. S., 72, 83
Fragilaria, 76
Freitag, R., 87
Frings, H., 3, 32
Frisch, K. von, 180, 185
Geminella, 76
genes, 158
 infiltration, 150
 pleiotropic, 146
geneticist, 173
genitalia, 88, 91, 102, 161
geologist, 172
Gilchrist, B. M., 2, 31
Gillies, M. T., 223, 249
Gleocapsa, 76
Goeldi, E. A., 5, 32
Comphonema, 76
Gordon, R. M., 5, 32
Gouck, H. K., 28, 32
Gouin, F. J., 60, 83
Graves, R. C., 103, 168
Gressitt, J. S., 165, 168
Gryllus luctuosus, 49
Gunn, D. L., 72, 83
Günther, A., ii
Haddow, A. J., 5, 32
Hagen, H., ii
Hamilton, C. C., 87, 168
Hammond, A. R., 60, 84
Hamrum, C. L., 3, 32
Hanson, N. R., 183, 185
Harrison, G. A., 160, 167
Hatch, M. H., 111, 168
Haufe, W. O., 190, 221
Hayward, R., 36
Henry, L. M., 49, 83
Hinton, E. H., 56, 83
Hocking, B., ii, 19, 40, 32
Hodgson, E. S., 29, 32
homodynamy, 163
Hooke, R., 41, 83
Horn, W., i
Horsfall, W. R., 190, 221
Howard, L. O., 42, 83
Howland, L. J., 80, 83
Howlett, F. M., 4, 33
Hoyle, F., 172, 174
Hubbell, T. H., 120, 168
Hubbs, C. L., 133, 168
hybrid index, 87, 89, 105, 144, 146
 zone, 89, 90, 144, 160
hybridization, 87, 144, 150, 152,
 158, 163, 166
Imms, A. D., 56, 84
Inger, R. F., 90, 169
intergradation, 87, 90, 103, 134,
 144, 148, 159
introgression, 126, 152, 162
isolation, 159, 166
 differentiation, 143
 geographical, 164
 spatial, 134
James, H. G., 74, 84
Johannsen, O. A., 42, 84
Johnston, J. W., 4, 31
Jones, F. N., 4, 33
Jones, J. C., 60, 84
Kalmus, H., 1, 33
Kellogg, F. E., 5, 33
Kemper, H., 28, 33
Kendrew, W. G., 125, 169
Kennedy, J. S., 24, 33
key, 101
Khan, A. A., 1
Khelevin, N. V., 219, 222
King, P. B., 164, 169
Klomp, H., 224, 249
Knab, F., 42, 83
Knight, K. L., 189, 222
Krishnamurthy, B. S., 223, 249
Kupka, H., 28, 34
LaCasse, W. J., 64, 82
larvae, mosquito
 active, 180
 browsing, 41, 51, 62, 70, 74, 77
 density, 223
 development, 223
 filter feeding, 41, 42, 63, 77
 labium, 59
 labrum, 50
 mortality, 223
 non-predatory, 41
 predatory, 41, 43, 63, 73, 74, 77
 overcrowding, 223, 249
 sluggish, 180
Laven, H., 223, 249
Leng, C. W., 87, 169
Lepidoptera, 62, 163

- Lindroth, C.H., 36
 Linsley, E.G., 163, 169
 Lotmar, R., 8, 35
 Lumsden, W.H.R., 5, 32
Lutzia, 43
halifaxi, 50
 Macfie, J.W.S., 10, 33
Malacosoma pluviale, 175
 Manton, S.M., 46
 Martin, P.S., 164
 mating, 13, 25, 27, 157
 Mayr, E., 90, 169
 MacGinitie, H.D., 164, 169
 McGregor, D., 80, 84
 McLintock, J., 46, 84
 Mecham, J.S., 158, 169
 mechanoreceptors, 1, 3, 29
 Mecoptera, 46, 56
 Meinert, F., 42, 84
Melanoplus puer, 120
 Mellon, De F., 29, 32
 Menees, J.H., 46, 84
 Mengel, R.M., 164, 169
 Miall, L.C., 42, 84
Microspora, 76
 migration, 220
 Miller, R.R., 133, 168
 Miocene, 164
 Mitchell, E., 42, 84
Mochlonyx, 43, 75, 80, 81
culiciformis, 74
velutinus, 41, 63, 73, 74, 78
 Montchadsky, A.S., 42, 84
 Morita, H., 30, 33
 morphology, 91
 Morris, R.F., 204, 222
 mortality, 187, 189, 221, 223,
 225, 235
 mosquitoes, black-legged, 187
 control of, 187, 217
 Edmonton, 187
 mouthparts, 41, 42, 64, 81
 mutation, 109, 163
Navicula, 76
 Nearctic, 165
 Nematocera, 46, 56, 58, 62
 Nuttall, G.H.F., 42, 85
Ochlerotatus, 187, 196, 197
Obiogaster, 49
 olfaction, 4, 27
Omus californicus
Oncopeltus fasciatus, 49
Opifex fuscus, 80
 overwintering, 220
 oviposition, 15, 17, 25, 27, 30,
 190, 194, 219, 221
 Owen, A.R.G., 202, 221
 Palearctic, 165
Panorpa, 56, 58, 62
 Panorpoidae, 58
 Papp, H., 91, 169
 Peffly, R.L., 4, 32
 Peters, W., 8, 33
 Peterson, A., 43, 85
Phacus, 77
 phenology, 139
Phormia regina, 14, 15, 29
Phrypeus, 36
 phylogeny, 160
Pinnularia, 76
Pinus, 77
 Platt, J.R., 177
 Pleistocene, 133, 144, 158, 163
 Pliocene, 165, 166
 Poisson distribution, 200, 203
 population, allopatric, 158
 alpine, 122, 125
 boreal, 122
 density, 190, 192, 201, 210, 216
 desert, 125
 dynamics, 175, 221, 223
 ecology, 177, 184
 literature, 176
 primitive, 166
 samples, 89, 121
 studies, 187
 theory, 177, 179, 184
 world, 171, 172
Populus, 77
 Potter, E., 56, 85
 predators, 43, 73, 74, 81
 Provost, M.W., 220, 222
 Pucat, A.M., 41
 pupation, 224, 228
 Puri, I.M., 42, 85
 Putnam, P., 14, 34
 Quate, L.W., 163, 169
Quiscalus quiscula, 159
 Rahm, U., 3, 33
Rana aurora, 143

- Rao, T.R., 24, 34
Raschke, E.W., 42, 85
Rausch, R.L., 120, 169
Reaumur, M., 41, 85
receptors, 1
 olfactory, 4, 16, 30
Reed, W., 1
Rees, B.E., 56, 83
Rempel, J.G., 64, 85
Renn, C.E., 42, 85
repellents, 1
Reuter, J., 4, 34
Richards, D.W., 14, 34
Ridgway, R., 88, 169
Rivalier, E., 91, 169
Roeder, K.D., 29, 33
Ross, R., 1, 34
Roth, L.M., 3, 34
Rubin, M., 4, 31
Rumpp, N.L., 91, 170
Sabrosky, C.W., 163, 170
Salem, H.H., 51, 85
Saltatoria, 164
Sass, J.E., 75, 85
Scenedesmus, 76
Schenkling, K., i
Schremmer, F., 43, 85
Sekhon, S.S., 3, 34
sex hybrid, 90
Shaerffenberg, B., 28, 34
Shalaby, A.M., 46, 85
Shannon, R.C., 14, 34
Shelford, V.E., 122, 170
Shipley, A.E., 42, 85
Short, L.L., 89, 170
Shute, G.T., 223, 249
Sibley, C.G., 89, 170
Simulium, 79
Slifer, E.H., 3, 34
Smith, C.N., 29, 35
Snodgrass, R.E., 42, 86
Snow, C.P., 172
Sorex vagrans, 143
Southwood, T.R.E., 220, 222
Spielman, A., 223, 249
Spirogyra, 76, 77
Stace-Smith, G., 148
Stagmomantis carolina, 49
Stahler, N., 223, 249
Stauroneis, 76
Stebbins, R.C., 143, 170
Steward, C.C., 3, 34
Sturckow, B., 30, 34
Sturtevant, A.H., 163, 170
subspecies, 125, 134, 139, 143
sugar feeding, 10, 25, 27, 30
Sullivan, C.R., 177, 185
Surtees, G., 42, 86
Sylvester-Bradley, P.C., 163, 170
Sylvester, E.S., 209, 222
synonymy, 103, 112, 139
Systematic Zoology, 90
taxonomist, 173
taxonomy, 97, 125
teachers, 39
Telford, A.D., 219, 222
temperature, 190, 192, 219, 233
Tertiary, 163, 164
Theobaldia incidunt, 55, 60
thermoreceptors, 1, 2, 30
Thiel, Van, P.H., 4, 34
Tipula, 56, 58
Travis, B.V., 29, 35
Trechus, 36
Trembley, H.L., 46, 86
Ulmus, 71
variation, color, 105, 106, 112, 141
 geographic, 89, 103, 112, 134
 interspecific, 88, 91, 97
 intraspecific, 88
 population, 109, 112
Venard, C.E., 4, 32
Vimmer, A., 49, 86
Vockeroth, J.R., 188, 222
Wada, Y., 187, 223
Wallis, J.B., 4, 35
Waters, W.E., 201, 222
Weismann, R., 8, 35
Wellington, W.G., 175, 185
Wesenberg-Lund, C.N., 42, 86
Wheeler, W.M., 49, 86
Williams, T.R., 80, 86
Willis, E.R., 3, 35
Wilson, E.O., 90, 170
Winteringham, F.P.W., 174
Wright, R.H., 5, 35
Xiphidium ensiferum, 49
Yost, M.T., 8, 32
Zeuner, F.E., 163, 170
zoogeography, 160, 163