SMITHSONIAN MISCELLANEOUS COLLECTIONS
VOLUME 130 (WHOLE VOLUME)

ANNOTATED, SUBJECT-HEADING BIBLIOGRAPHY OF TERMITES 1350 B.C. TO A.D. 1954

By
THOMAS E. SNYDER
Washington, D.C.

(Publication 4258)

CITY OF WASHINGTON
PUBLISHED BY THE SMITHSONIAN INSTITUTION
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THE LORD BALTIMORE PRESS, INC.
BALTIMORE, MD., U. S. A.

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INTRODUCTION

As early as 1350 B.C. (Dow, 1915), the Rig Vedas referred in Sanskrit to "ghuna" as destroyers of wood, and these were probably termites. The animals of India were known to the early B.C. Greek authors. Pliny in his Natural History of the World, 77 A.D., in a manner similar to his other "facts," discusses Indian "pissmires," which may be "white ants" or ants. Hagen in 1855 gives a historical summary of these early accounts of termites.

A bibliography of the Isoptera (1758-1949), Griffin, 1951, has been used in this work. Like Griffin, I have not included some of the articles listed in the Review of Applied Entomology (series A), or in the Index of American Economic Entomology, where papers on termites are also referred to under subject headings.

The bibliography is partly selective. Taxonomic articles published since 1949, when my Catalog of Termites of the World was published, are included, but not those papers referred to in that catalog unless subjects other than taxonomy are discussed. This bibliography includes papers through 1954, with some of 1955. A total of 3,624 references are included.

ACKNOWLEDGMENTS

This bibliography was begun in 1909 when I was in the Division of Forest Insects, Bureau of Entomology, U.S. Department of Agriculture; work was continued until I retired in 1951. Since then, most of the annotations have been made, and much more time has been available to complete it.

Dr. Alfred E. Emerson of the University of Chicago has supplied many references, especially those relating to taxonomy and biology.

Librarians, bibliographers, and translators of the Department of Agriculture, librarians of the U.S. National Museum, and my wife have all given help in its preparation.

Funds for typing the manuscript were kindly furnished by Dr. Frederick Cunliffe, Director, Pinellas Biological Laboratory, Inc., St. Petersburg, Fla.

A grant from the National Science Foundation, Washington, D.C., has assisted the Smithsonian Institution in publishing the bibliography. Editors of the Smithsonian have been very helpful.

Grateful acknowledgment is made to the E. L. Bruce Co., of Memphis, Tenn., for a grant applied toward the costs of preparing this paper for the printer.

LIST OF SUBJECT HEADINGS

Anatomy, see Morphology.
Arsenic hazard.
Bacteria; see also Nutrition.
Baits, see Soil poisons.
Balance of nature.
Bees, stingless, association with.
Behavior; see also Biology.
Bibliography.
Biography.
Biology, ecology.
Building codes; see also Control, Resistant woods, Wood preservation.
Caste determination, intermediates, intercastes.
Chemical analysis.
Chemical warfare.
Cold, see Temperature.
Communication.
Control, construction, termite-proofing.
Courtship.
Cytology (cell growth).
Damage.
Damage to living vegetation.
Detection; see also Experimentation, Microphones.
Digestion; see also Nutrition, Protozoa.
Diseases, human, plant, and termite; see also Parasites.
Distribution.
Dusts, poison, see Poison dusts.
Ecology, see Biology.
Electricity, see Detection, Experimentation, Microphones.
Embryology.
Evolution.
Experimentation; see also Detection, Microphones.
Fire hazard; see also Control.
Flight.
Folklore.
Food, termites as.
Fossil.
Fumigation.
Fungi, association with; see also Rearing.
Fungus cultivation.
Gaseous environment.
Genetics.
Genitalia, reproductive or sex organs.
Geologic agents.
Heat, see Temperature.
Hermaphrodites, see Biology.
Histology, see Morphology.
Humidity.
Introduced.
Legislation or regulation.
Medicine, uses in.
Microphones.
Migration, see Biology.
Moisture, see Biology.
Molds, see Nutrition, Parasites.
Morphology, Histology (tissue growth).
Neoteinia, see Biology.
Nests.
Nutrition.
Obituary.
Parasites.
Parthenogenesis, see Biology.
Phylogeny; see also Evolution, Taxonomy.
Physiology, see Biology.
Poison dusts.
Population.
Predators.
Protozoa; see also Digestion, Nutrition.
Racket.
Rearing.
Regeneration.
Regulation, see Legislation.
Repellents, see Soil poisons.
Reproductive organs, see Genitalia.
Resistant woods.
Respiration, see Gaseous environment.
Reviews.
Rhythm, coordinated.
Secretions.
Sense organs.
Sex organs, see Genitalia.
Shields, metal barriers.
Soil poisons, baits, repellents.
Sound.
Spermatogenesis.
Stridulation.
Superorganism, supraorganism, colony as.
Swarm, see Flight.
Symbiosis, see Biology, Nutrition, Protozoa, Termitophiles.
Tax status of loss, see Damage.
Taxonomy.
Temperature.
Termitophiles.
Uses in industry, arts, and religion.
Water table.
Wood preservation, poisons for fabrics and fiberboards, insulation, etc.
X-ray, see Detection and Experimentation.
Zoogeographical regions.

NOTE.—In the "Index of American Economic Entomology," under the heading "Termites" and supplementary subject-headings there are many papers not referred to in this bibliography; some are of minor importance, others repetitions.

SUBJECT HEADINGS

(For complete citations see List of Authors and Titles beginning on page 149. References marked with an asterisk are not listed in this publication, but will be found in Snyder's "Catalog of the Termites of the World," Smithsonian Misc. Coll., vol. 112, 1949.)

ANATOMY, See MORPHOLOGY

ARSENIC HAZARD

Anonymous, 1953k, pp. 42, 44, 46. (Dosages arsenic recommended as safe by U.S. Dept. Agriculture.)

Hay, H. R., 1939, pp. 126-130. (No hazard from arsene gas.)

Kofoid, C. A., 1934, 2d ed., p. 17. (Relation moisture to production arsene.)

1934a, pp. 47-50. (Arsenic not a termite barrier.)

Kofoid, C. A., et al., 1934, 2d ed., p. 582. (Arsenic hazard.)

Kofoid, C. A., Stohler, R., and Hendee, E. C., 1934, 2d ed., pp. 766-771. (Hazard where arsenic used in dwellings.)

Kreer, J. G., 1936, pp. 38-40. (No health hazard.)

Snyder, T. E., 1950, pp. 12-14. (No health hazard.)

1952b, pp. 34, 48. (No health hazard when used as soil poison, wallboard poison, or wood preservative.)

BACTERIA

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Baldacci, E., *in* Visintin, 1941-1942, pp. 157-159, 1941. (Schizomycetes or Protozoa in digestion cellulose?)

Baldacci, E., and Verona, O., 1940, pp. 592-593. (Presence of *Cytophaga* and *Cellvibrio* in digestive systems *Reticulitermes lucifugus* and *Calotermes flavicollis.*)

Beckwith, T. D., and Light, S. F., 1927, pp. 656-657. (Spirals *Vibrio* and *Spirochaeta* for class use.)

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1928, pp. 231-237. (U.S., relation of spirochaetes to termites and to intestinal Protozoa.)

Damon, S. R., 1926, pp. 31-36. (Spirochaetes of termites.)

Dickman, A., 1931, pp. 85-92. (Spirochaetes in gut *Reticulitermes* and *Termopsis,* true significance not demonstrated, ability intestinal flora to digest cellulose.)

Ergene, S., 1949, pp. 49-70. (*Calotermes flavicollis,* role bacteria in assimilation and fixation of atmospheric nitrogen.)

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Henderson, J. C., 1941, pp. 357-378. (Bacteria in intestine *Cubitermes,* Africa.)

Hirst, L. F., 1933, pp. 47-48. (Ceylon, bacteria associated with dry-wood termites that might cause sprue.)

Hollande, A. C., 1922, p. 23. (Spirochaetes of termites, process of division, formation of schizoplast.)

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Jírovec, O., 1929, pp. 346-356. (Greece, *"Calotermes"* (sic!) *lucifugus,* bacteria and spirochaetes, cocci and vibrios.)

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SNYDER, T. E., 1935e, p. 82.

1948, p. 97. (Role bacteria and fungi obscure.)

STEINHAUS, E. A., 1940, pp. 17-57. (Relationships between bacteria and insects.)

BAITS, POISON, See SOIL POISONS

BALANCE OF NATURE

CORY, E. N., 1939, pp. 36-38. (*Reticulitermes flavipes* an object lesson.)

SNYDER, T. E., 1925f, p. 32. (Advancing civilization changes habits.)

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1935e, p. 99. (Advancing civilization changes habits, invasion man's dwellings due to disturbance balance of nature.)

1948, pp. 111-116, 120-121. (Advancing civilization changes habits, invasion man's dwellings due to disturbance balance of nature, cycles of activity.)

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EMERSON, A. E., 1929, pp. 24-30. (Social life.)

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1938, pp. 247-284. (Nesting habits various families termites.)

1953a, pp. 277-304. (Biological foundations of ethics.)

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Imms, A. D., 1931, pp. 67-82. (Social behavior.)
Kalshoven, L. G. E., 1935, pp. 21-22. (Odor swarming *Schedorhinotermes javanicus*, habits.)
Koenig, J. G., 1779, pp. 1-28.
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1951b, pp. 404-408. (Determination substitute reproductives, *Calotermes flavicollis*.)
1952, pp. 123-141. (Production and elimination substitute reproductives, *C. flavicollis*.)
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Miller, E. M., 1940, pp. 136-147. (Chemical integrative mechanisms in insect societies.)
Myers, J. G., 1938, pp. 7-8. (Epigamic behavior *Microtermes sudanensis*, biting female during courtship.)
Richard, G., 1948, pp. 356-357. (*Calotermes flavicollis*, mature nymphs photopositive, immature photonegative.)
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1924c, pp. 1-14. (Adaptions to social life.)
1935c, pp. 4-5. (Tropisms, reversal during and after swarm.)
1948, pp. 53-54. (Tropisms, reversal during and after swarm, amatory procedure.)
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1862b, pp. 342-343. (Covers world.)
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worker 9 to 1; 4 queens to 1 or 2 males. Respiratory needs slight. Hostility to alien termites.)

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1863-1870, pp. 737-743, 753-759, 769-774, 785-791, 801-807, 817-820; 1870, pp. 556-558.
1863a, pp. 94-95.
1877, pp. 51-52.
1894, p. 140. (*Termes taprobanes.*)
1900, pp. 170-177.
1907, p. 26123. (Australia.)
1919, p. 873. (India.)
1929, p. 277. (India.)
1934, p. 16. (Indiana.)
1935, p. 178. (Number castes in mound nest in Australia: 1,561,400 workers, 201,000 soldiers, 44,100 nymphs.)
1945, pp. 1-14. (Cawnpore, India.)
1950, pp. 1-4. (Australia.)
1950a, pp. 1-43. (South Africa.)
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1855-1858, *in* Hagen, pp. 270-287. (Amazon.)
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1923, pp. 403-409. (Nest of *Eutermes matangensis* with nest of *Microtermes.*)
1927. (*Macrotermes gilvus,* pp. 258-269; *Eutermes matangensis,* pp. 279-293.)
1942, pp. 181-182. (Neoteinic reproductives of *Reticulitermes lucifugus* survived in laboratory while normal forms died.)

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Beatty, J., 1953, pp. 20-22. (1951 flood at Kansas City submerged termites for 7 days, were not killed.)

Becker, G., 1952, pp. 270-273. (Copulation *Calotermes flavicollis.*)

Beebe, W., 1916, pp. 114, 116. (Termites in jungle debris.)

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Belt, T., 1873, pp. 142-143. (Nicaragua, sudden death termites in nests in roof of house in June.)

Bequaert, J., 1913, pp. 396-431. (Congo, Africa.)
1921, pp. 194-196. (Congo, Africa, 3 queens in royal cell, 3 in. long.)
1925, pp. 289-294. (Amazon.)

Bequaert, J., et al., 1926, pp. 129-183. (Amazon.)
1930, pp. 819-823. (Liberia and Belgian Congo.)

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1926, p. 291. (Communism.)

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1884, pp. 522-534.
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1913b, pp. 119-123. (Ceylon, *Eutermes monoceros.*)
1913c, pp. 125-135. (Sound production.)
1913f, pp. 24-58. (Ceylon, distribution.)
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1935, pp. 21-22. (Java, odor swarming adults, *Schedorhinotermes javanicus*.)
1936, pp. 50-51. (East Indies, dipterous parasite, mixed colonies, nest structure *Macrotermes gilvus*.)
1936a, pp. 427-435. (Java.)
1950, pp. 146-177. (Indonesia.)
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1797, p. 550. (Nests, *Termes*.)
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1942-1943, pp. 312-326, 46-63. (Determination castes inhibition theory.)
1944, pp. 405-412. (Parthenogenesis, *Zootermopsis*, progeny all females.)
1944a, pp. 413-454. (Ectohormonal control of development supplementary reproductives in *Zootermopsis.*)
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1948, pp. 54-68. (Swarming, Arizona.)
1951, pp. 397-414. (Production supplementary reproductives, *Zootermopsis.*)
1955, pp. 135-146. (U.S., *Tenuirostritermes tenuirostris* egg laying 4 days after pairing, 55 eggs first 10 days, 31 days for development, nasutes 25-33% in first group.)
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1951b, pp. 404-408. (Determination substitute reproductives (*Kalotermes flavicollis*), inhibition of these forms in presence adult sexual pairs.)
1951c, pp. 36-43. (Details colony formation, as in 1950.)
1952, pp. 123-141. (Production and elimination of supplementary reproductives, *Kalotermes flavicollis.*)
1952a, pp. 529-543. (Growth and molting of individuals of *Kalotermes flavicollis*, regression.)
1953, pp. 74-76, 78. (Tropical queens lay 20,000 eggs per day, p. 74; *Kalotermes flavicollis* nymphs molt 5 to 7 times, p. 75.)
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1874, pp. 15-16. (*Calotermes* in wood that produces gum copal, Zanzibar; brood of termites at Kew.)
1876, p. 17. (Colony American termites in Vienna.)
1878, p. xii. (*T. trinervius,* Africa; *T. ripperti,* Cuba, with protective head secretion.)
1882, pp. 150-183. (Madeira and Canary Islands.)
1883, pp. 226-228. (Hawaii.)
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Marais, E. N., 1933, pp. 138-159. (Queen as the brain of colony, South Africa.)
1937, pp. xv+184. (Life in colony, South Africa.)
1950, pp. 1-196. (General, South Africa.)
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Marcus, H., 1952, pp. 24-28. (Castration by feeding larva with product of colleterial gland of queen.)
Marshall, T. A., 1878, pp. xxvii-xxxviii. (Windward Islands, *Termes destructor* F. ?, Antigua.)
Martens, E. C. von, 1876, p. 136. (East Asia.)
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1949, pp. 1-30. (Florida termites.)
1955, pp. 34, 36, 48. (Florida, flight dates and tolerance to drying.)
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Milne, L. J., and Milne, M. J., 1954, pp. 21, 185, 189. (General, erroneous statements that fungus growers nest in trees and that supplementary pairs of reproductives function in same nest with primary pair.)
Mitsch, H. J., 1947, pp. 7-37. (Africa, queen 150 mm. long, 60 mm. wide, nests, predators.)
Mjöberg, E. G., 1920*, pp. 1-128. (Australia.)
Monrad, H. C., 1824, pp. 1-188. (Coast of Guinea.)
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Monte, O., 1931, pp. 69-70. (Brazil.)
Morstatt, H., 1913, pp. 443-464. (East Africa.)
1920, pp. 415-427.
1922, pp. 9-16. (General.)
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Moutia, A., 1936, pp. 1-30. (Mauritius.)
Mueller, Fr., 1871, pp. 205-206. (Brazil.)
1873-1875. (Genitals soldiers *Calotermes,* pp. 333-340; dwellings of termites, pp. 341-358; nymphs with short wing pads, *Calotermes* winged and substitute reproductives, number latter in Brazil in *Eutermes,* 1 true king, 31 substitute queens, a sultan in his harem, pp. 451-463; larvae of *Calotermes rugosus,* pp. 241-264.
1874a, pp. 308-309. (South America.)
1875, p. 218. (Brazil.)
1887, pp. 177-178. (Nymphs.)
Mukerji, D., and Mitra, P. K., 1949, pp. 9-27. (India, *Odontotermes redemanni,* cavities in nest contain fungus combs where nymphs live among inhibited growth fungus *Xylaria,* royal cell near largest comb chamber. Workers forage in covered runways, never attack living plants. Flights occur each June to August.)
1949a, pp. 186-189. (India, *O. redemanni.*)

1949b, p. 158. (Effect of transplanting physogastric queen *Odontotermes redemanni.*)

Murkerji, D., and Raychaudhuri, S., 1943b, p. 167. (Bearing of exudate organs on postadult growth queen. *T. redemanni.*)

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Muller, W. de, 1915, pp. 28-35.

Myers, J. G., 1938, pp. 7-8. (Sudan, *Microtermes sudanensis,* biting of female during courtship.)

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Nichols, E. R., 1929, p. 123. (Southern California.)

Nicholson, H. A., 1871, pp. 261-264. (Bates' observations, South America.)

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Noirot, C., 1949, pp. 600-602. (Development of neuters—sterile castes, Amitermitinae and Microcerotermitinae.)

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1950, pp. 475-477. (Development of neuters —sterile castes, Macrotermitinae.)

1951, pp. 447-449. (Development of neuters—sterile castes, Termitinae.)

1952, pp. 103-116. (Polymorphism.)

1953, pp. 405-414. (Care and feeding of young.)

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Noyes, H., 1937, pp. xiv+289. (*Macrotermes natalensis,* Africa.)

Oates, F., 1881, p. 134. (Matabele Land and Victoria Falls, Africa.)

Osborn, H., 1898, p. 231. (*Termes flavipes,* Iowa.)

Oshima, M., 1913*, pp. 271-281. (Japan.)

1917*, pp. 221-225. (Philippines.)

1919, pp. 319-383. (Formosa.)

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Oviedo y Valdéz, G. F. de, 1851, pp. 450-453. (Santo Domingo.)

Packard, A. S., 1883, pp. 326-329. (*Termopsis angusticollis, Termes flavipes.*)

1889, pp. 586-588. (General.)

Pangga, G. A., 1936, pp. 233-265. (General, Philippines.)

Paoli, G., 1934, pp. 1-427. (*Coptotermes sjöstedti,* var. *subintacta,* and *Termes classicus* in Italian Somaliland.)

Park, O., 1929, pp. 121-126. (*Reticulitermes tibialis* in Chicago region.)

Parker, B. M., 1941, pp. 1-34.

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Patterson, W. H., 1927, pp. 35-39. (Gold Coast.)

Pendlebury, H. M., 1930, pp. 45-56. (Malaya.)

Perez, C., 1902, pp. 195-427. (Metamorphosis.)

Perez, J., 1894, pp. 804-806. (*Termes lucifugus,* foundation colonies.)

1894a, pp. 866-868. (*Termes lucifugus,* foundation colonies, swarming.)

1896, pp. 65-66. (Nymphs.)

1896a, pp. 56-62. (*T. lucifugus.*)

1907, pp. 4-7, 37-40, 71-77. (Termites in SW. France.)

Perkins, R. C. L., 1899, p. 88. (*Calotermes* in Hawaii.)

Perris, E., 1876, pp. 201-202. (*T. lucifugus* and *"Eutermes" flavicollis* in Landes.)

1876a, pp. ccxvi-ccxvii. (Emery on flight *"Eutermes" flavicollis.*)

Petch, T., 1917, pp. 395-397. (Flight *Termes obscuriceps,* Ceylon, narrowing of exit at midday by workers, emergence 5:57 p.m., main flight 13 min. Soldiers and workers exit to protect winged, close exit after flight. Return of dealated male and female to nest apparently before fertilization.)

Pickens, A. L., 1932, pp. 178-180. (*Reticulitermes,* distribution, population, increase; biology *R. hesperus.*)

1934, *in* Kofoid, 2d ed., pp. 157-196. (*Reticulitermes,* distribution, population, increase; biology *R. hesperus* and *R. tibialis,* western U.S.)

1940, p. 1. (U.S., caste arrangement for *Reticulitermes,* 3 intercastes. Premature or delayed adulthood gives many subcastes.)

1940a, pp. 5-6. (U.S., *Reticulitermes flavipes,* broods from alate swarms in spring 1936, required until spring 1940 to produce first swarm alates.)

1941, pp. 115-116. (U.S., *Reticulitermes flavipes,* broods from alate swarms in spring 1936, required until spring 1940 to produce first swarm alates, change from primary to secondary reproductive heads.)

1941a, p. 119. (No winged termites in colony in spring after 1937 flood at Paducah, Ky.)

Pickens, A. L., and Light, S. F., 1934, *in* Kofoid, 2d ed., pp. 196-198. (*Heterotermes.*)

Pictet, A. E., 1865, pp. 1-123. (Two termites of Spanish Peninsula.)

Pinter, T., 1914. pp. 71-95.

Pinto, M. P. D., 1941, pp. 73-105. (Ceylonese Calotermitidae, neoteinic forms do not necessarily breed true; inhibition of substitute reproductives in presence of functional dealated adults.)

Poeppig, E. F., 1836, pp. 205, 242. (Chile, Peru.)

Prell, H., 1911, pp. 243-253. (East Africa.)

Pruthi, H. S., 1939, p. 108. (Swarming *Odontotermes* and *Microtermes,* Delhi, India.)

Pujiula, J., 1904, pp. 23-28, 51-60, 83-99. Tortosa, Spain, environs.)

Pycraft, W. P. (ed.), 1931, pp. 226-236, 309. (General, Africa.)

Quatrefages, A. de, 1853a, pp. 16-21. (La Rochelle, France.)
1854. (General.)

Rafinesque, C. S., 1820, pp. 1-16.

Rambur, P., 1842*, pp. 300-310. (Natural history.)

Ratcliffe, F. N., and Cummins, J. E., 1939, pp. 221-228. (Australia.)

Ratcliffe, F. N., Gay, F. J., and Greaves, T., 1952, pp. 1-124. (Australia, pp. 19-31, queens *Eutermes exitiosus* lay 2,500 eggs per day in mature colony: hundreds egg-laying neoteinics in colony *Hamitermes laurensis,* no neoteinics of *E. exitiosus;* colony *E. triodiae* 100 years old; colony *Coptotermes lacteus* total population 1 million, may produce 66,000 winged in a year; cannibalism source protein; mixed colonies.)

Ratcliffe, F. N., and Greaves, T., 1940, pp. 150-160. (Australia, foraging, ramifying subterranean galleries *Coptotermes lacteus* and *Eutermes exitiosus* approx. 1½ acres covered and galleries connected with dead wood 50 yards from *Coptotermes* mound, 3 to 9 in. below surface.)

Ratti, F. V., 1928, pp. 1-231. (Italian comedy, caste: il termitaio, la regina e il renccio, le sterili e la larva.)

Rau, P., 1936, p. 153. (Drought influence, U.S.)

Reichenbach, H. G. L., 1854, p. 363. (Figures *T. bellicosus* and *T. flavipes.*)

Rein, J. J., 1881. (Japan.)

Reis, G. S., 1934, pp. 24-30. (India.)

Rengger, J. R., 1835, pp. 266-274. (Paraguay, 1818-1826.)

Richard, G., 1949b, pp. 67-73. (*Calotermes flavicollis,* phototropism.)
1951, pp. 485-603. (*Calotermes flavicollis,* phototropism.)

Richards, O. W., 1953, pp. 179-189, 203. (Social life; in African species queen lays 36,000 eggs in 24 hr., or 3 million per year.)

Ridley, H. N., 1893, p. 270. (Eastern Malaya.)
1910, p. 157. (8 queens in nest Malaya.)

Riley, C. V., 1894, pp. 1-74. (Swarming, postadult growth, nutrition, polygamy in true queens, U.S.)

Riley, C. V., and Howard, L. O., 1893, p. 35. (U.S., swarming in houses.)

Risbeo, J., 1950, pp. 45-47. (*Microcerotermes parvulus,* Senegal and French Sudan.)

Rodon, G. S., 1900, pp. 363-364. (India.)

Romanis, R., 1883, pp. 214-215. (Rangoon.)

Roonwal, M. L., 1954a, pp. 463-467. (India, ecological adjustment between *Coptotermes heimi* and *Odontotermes redemanni.*)

Roonwal, M. L., and Gupta, S. D., 1952, pp. 293-294. (India, *Odontotermes obesus,* 2 kings and queens in royal chamber in mound.)

Ross, H. H., 1948. (Social life, nests, pp. 207-211, figs. 185, 186; habits, pp. 257-260, figs. 219-221.)

Rossum, A. J. van, 1907, pp. 195-197.

Rudow, F., 1897, pp. 715-716. (Life activity.)

Ruiz, C. A., 1943, p. 32. (*Calotermes flavicollis* and *Reticulitermes lucifugus,* Spain.)

Sabrosky, C. W., 1952, pp. 1-7. (Numbers termites in colonies in U.S. and Tropics.)

Safford, W. E., 1919, pp. 377-434. (Florida Everglades.)

St. Vincent, B. de, 1804, p. 231. (African sea islands.)

Sanborn, F. G., 1870, pp. 266-268. (*Termes flavipes.*)

Sandias, A., 1906, pp. 121-125. (Italy.)
1907, pp. 7-11, 101-103, 125-127. (Italy.)
1908, pp. 1-9. (Italy.)
1909, pp. 131-136. (Neoteinic reproductives in European termites.)

Savage, T. S., 1849, pp. 211-221. (*T. bellicosus,* West Africa.)
1850, p. 92. (*T. bellicosus,* West Africa.)

Savigny, M. J. C. L. de, 1809-1813, figures. (Egypt.)

Schaeffer, C., 1902, p. 251. (Finding true queen *T. flavipes* in U.S.)
1912, p. 30. (Queen *T. flavipes.*)

Schenk, F., 1905, pp. 18-19. (*T. flavipes.*)

Schenkling-Prévôt, 1898, pp. 87-88, 98-100, 105-106, 110-112, 116-118, 123-124, 171-172, 176-178, 183, 234-235, 241-242, 247. (General.)

Schkaff, B. A., 1923. (Castes.)

Schmidt, H., 1950, pp. 1-37. (General.)

Schreiber, G., 1930-1931, pp. 757-827. (Neoteny, disequilibrium in development somatic and germinal line.)

Schubotz, H., 1912, pp. 328-334. (Africa.)

Schütt, O., 1862, pp. 250-252. (Japan.)

Schwarz, E. A., 1896, pp. 38-41. (*T. flavipes, lucifugus, tubiformans, Eutermes nigriceps, fumosus,* and *Calotermes* in SW. Texas.)

1901, p. 347. (First true queen found in North America.)

Scudder, S. H. (1859), 1861, pp. 287-288. (*T. frontalis* Hald., i.e. *flavipes.*)

1878, p. 275. (*Eutermes ripperti.*)

Seabra, A. F. de, 1907, pp. 122-123. (*Calotermes flavicollis* and *T. lucifugus,* Portugal.)

Sharp, D., 1894, p. vii-viii. (Neoteinic queens.)

1895, p. 20. (Living *Calotermes* from Borneo.)

1901, pp. 356-390. (General.)

1902, pp. 253-256. (General.)

Sharpe, C. F., 1894, pp. 228-229. (Deposits made by white ants, patches of egglike particles, fungi, Coonoor, South India.)

Shelford, V. E., 1913, pp. 220-252. (Middle Beach association, Chicago region.)

Silantjev, A. A., 1903, p. 29. (*Calotermes flavicollis* in Caucasus.)

Silvestri, F., 1902, pp. 173-178, 257-260, 289-293, 326-335. (South America, pp. 257-260, relative number soldiers to workers or nymphs: *Calotermes* 1:10, *Syntermes* 1:10, *Eutermes* 1:15, *Cornitermes* 1:20, *Armitermes* 1:20, *Microcerotermes* 1:50, *Capritermes* 1:80, *Microtermes* 1:80.)

1903*, pp. 1-234. (South America.)

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1929d, pp. 143-151. (General, architecture.)

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LIGHT, S. F., and WEESNER, F. M., 1947a, pp. 244-245. (Development of castes in higher termites.)

1951, pp. 397-414. (Production of supplementary reproductives, *Zootermopsis;* inhibition theory.)

LÜSCHER, M., 1951b, pp. 404-408. (Determination substitute reproductives *Calotermes flavicollis.*)

1952, pp. 123-141. (Production and elimination of replacement reproductives by inhibition, *Kalotermes flavicollis;* when king and queen removed new supplementary reproductives appear after about 8 days. Inhibitory influence upon asexual individuals maintained where direct contact with antennae or circulation of air. Surplus sexual individuals eaten.)

1952a, pp. 529-543. (Individual growth studies, *Kalotermes flavicollis,* regression.)

1952b, pp. 289-294. (Ectohormonal control caste determination.)

1953, pp. 74-76, 78. (Ectohormonal control caste determination, inhibition factor; and promotion factor, for soldiers.)

1953a, pp. 524-528. (Can determination be released by a monomolecular reaction, *Kalotermes flavicollis?*)

1955, p. 186. (Inhibition material produced by sexual adults.)

MARCUS, H., 1948, pp. 23-27. (Genetic basis of polymorphism and suppression of sexuality. Polymorphy present in common "*Nasutus*" sp. even in egg; horn soldiers visible at very early stages, represents a mutation. As soldiers sometimes lay eggs, crossing with normal forms might give heterozygotic spermatozoids. Origin polymorphy a mating between *Termes* and "*Nasutus,*" resulting in a polymorphic heterozygotic termite, with recessive horn, from which would result, in Mendelian proportions, 1 sexual termite, 2 workers in which castration had occurred, and 1 "*Nasutus*" soldier in which castration had occurred.)

1949a, pp. 97-101. (Polymorphism of *Nasutitermes chaquimayensis,* Bolivia; classes of *Nasutitermes* and queen of *Rhinotermes nasutus* living in same habitat, crossing of this female with a hornless male could produce all existent forms of polymorphism, according to laws of Mendel in connection with arbitrary castration.)

MILLER, E. M., 1942, pp. 1-27. (Caste differentiation *Prorhinotermes simplex,* Florida, extrinsic (inhibition theory), nymphs may transform to supplementary reproductives or soldiers even after attaining wing pads. No permanent well-defined worker caste.)

MONTALENTI, G., 1927, pp. 529-532. (Italy, *Calotermes flavicollis* colonies kept alive for comparatively long time on diet soluble carbohydrates. After 3 to 4 days notable diminution in number of Joenie, Mesojoenie of caecum, after 10 days completely disappeared; caecum became reduced, other flagellates diminished in numbers. Does not prove that starving Protozoa without depriving termites of food is equivalent to nutrition neoteinics receive in nature.)

1929, pp. 108-128. (*Termes lucifugus,* Italy, 2 castes recognizable in 3d instar; gonads neuters develop precociously through external cause.)

NOIROT, C., 1949, pp. 600-602. (Development of neuters in Amitermitinae and Microcerotermitinae.)

1949a, pp. 2053-2054. (Development of neuters in Nasutitermitinae.)

1950, pp. 475-477. (Development of neuters in Macrotermitinae.)

1951, pp. 447-449. (Development of neuters in Termitinae.)

1953, pp. 405-414. (Survival depends on group activities, licking, feeding, molting, nutrition not responsible for caste determination.)

PICKENS, A. L., 1932, pp. 178-180. (Ectohormonal inhibitions.)

1938, pp. 1-2. (U.S., *Reticulitermes,* workers inhibited reproductives, soldiers arise from eggs laid somewhat late, each caste blends with others.)

1940, p. 1. (*Reticulitermes,* caste arrangement, 3 intercastes premature or delayed adulthood gives many subcastes.)

1943, pp. 116-118. (*Reticulitermes,* caste arrangement, caste taxonomy, intercastes transitional forms.)

1946, p. 1. (*Reticulitermes,* caste arrangement, subcastes or hybrids in alates.)

1952, pp. 133-135. (Biochemical control of caste in an insect community, inhibitory secretion in termites, 2 sizes may be expected in the intercastes.)

1954, pp. 71-74. (Inhibition theory; in *R. flavipes* colonies in laboratory after 4 years alates produced from primary pair, even in 5th year in 2 distinct sizes.)

Pinto, M. P. D., 1941, pp. 73-105. (Ceylonese Calotermitidae, apterous and brachypterous neoteinics developed from undifferentiated nymphs in absence of functioning dealated adults in colony, or in groups of immature forms separated from parental nest. Under certain conditions nymph can inhibit development of wingpads even after latter have attained considerable size. Breeding experiments have shown that neoteinics can survive without assistance of immature forms and that they do not necessarily breed true.)

Ross, H. H., 1948, pp. 209-211. (Hormones, inhibition theory.)

Silvestri, F., 1901, pp. 479-484. (Origin of castes.)

1945, pp. 77-89. (Intercaste of *Syntermes grandis.*)

Snyder, T. E., 1913, pp. 487-488. (Differentiation soldier during molt and quiescent stage from workerlike form.)

1913a, pp. 162-165. (Changes during molt nymphs first and second forms and soldier.)

1920*, *in* Banks and Snyder, p. 112. (Food not cause caste differentiation, genetic.)

1925b, pp. 57-68. (Origin castes, genetic.)

1926f, pp. 522-552. (Origin castes, genetic; phylogenetic origin as evidenced by paleontology, taxonomy, and breeding experiments.)

1933c*, pp. 161-166. (Intermediate soldier-worker in *Nasutitermes myersi,* Brazil.)

1935e, pp. 3-4. (Theories of origin of castes, genetic theory favored.)

1948, pp. 4-8. (Theories of origin of castes, inhibition theory most acceptable.)

Snyder, T. E., and Popenoe, E. P., 1932, pp. 153-158. (U.S., genetic theory origin castes.)

Stella, E., and Ghidini, G. M., 1942, pp. 825-831. (Regression of gonads and evolution sterile castes *Trinervitermes eldirensis* and *Bellicositermes.*)

Thompson, C. B., 1917, pp. 83-136. (U.S., *Reticulitermes,* genetic theory origin castes.)

1919, pp. 379-398. (Development castes in 9 genera, 13 species.)

1922, pp. 495-535. (U.S., origin castes in *Termopsis.*)

Thompson, C. B., and Snyder, T. E., 1919, pp. 115-132. (Phylogenetic origin castes.)

1920, pp. 591-633. (Wingless type reproductive form in *Reticulitermes* and *Prorhinotermes.*)

Weesner, F. M., 1953, pp. 289-294. (Arizona, *Tenuirostritermes tenuirostris,* presence of alates inhibits the appearance of young of same line; summary of various theories of caste determination, pp. 289-291.)

Weyer, F., 1930b, pp. 177-190. (Germ glands in workers and soldiers.)

1931, pp. 353-373. ("Blastogene" and "somatogene" theory of caste differentiation. In *Eutermes amboinensis* no suggestion of separation into 2 distinct groups of reproductive and worker-soldier individuals as claimed by Thompson (1917, 1922). Eggs contain potentialities for development into specific caste but extrinsic factors as presence quartz crystals among eggs (possibly causing unequal oxygenation?) or differential handling or feeding of young by workers may modify the direction of development.)

1932, pp. 185-186. (Body, not germ, basis; influence of nutrition; first larval stage critical period.)

Wheeler, W. M., 1907, pp. 1-93. (Characters represented in the germ as dynamic potencies, not morphological determinants.)

CHEMICAL ANALYSIS, SECRETIONS

Andrews, E. A., 1916, pp. 56-60. (India, analysis of soil of a mound showed increased proportion finer particles than in surrounding soil; analysis of fungus comb, organic matter 75.78% silica 19.09%, potash 0.12%, phosphoric acid 0.35%, lime 1.45%, magnesia 0.60%, nitrogen 1.98%, water 11.9%—all on dry substance.)

Anonymous, 1938, p. 17. (Lime carbonate in mounds, East Africa.)

Auffret, C., and Tanguy, F., 1949, pp. 110-112. (Chemical analysis of termites as food, living and fried, for certain races source of protein, fat, and calories.)

Bathellier, J., 1922a pp. 399-403. (Nature of the glue of *Eutermes.*)

Baumann, E., 1882, pp. 419-424. (Analysis of a termite nest from Australia.)

Cohen, W., 1933, pp. 166-169. (Determination cellulose, lignin, and other woody constituents mound *Eutermes exitiosus,*

ratio of lignin to cellulose indicates cellulose of wood used by termites has been largely degraded, while lignin remained largely unchanged.)

Ghidini, G. M., 1938c, pp. 261-267. (Function of spongy lignin in nests of Metatermitidae.)

Grassé, P. P., and Joly, P., 1941, pp. 57-62. (Walls mounds *Amitermes evuncifer* nearly pure earth, walls larval chambers 45.6% organic matter; walls mounds *Cubitermes* sp. and *Bellicositermes natalensis* nearly pure earth.)

Griffith, G., 1938, pp. 70-71. (Analysis soil of mounds different parts Uganda, agricultural value.)

Holdaway, F. G., 1933, pp. 160-165. (Composition of different regions of mounds (walls and nursery) *Eutermes exitiosus* in 3 different regions Australia, soil analysis 5 mounds—cellulose, lignin, etc., inner wall chosen for laboratory timber tests since its variability in organic content and bulk were more suitable.)

Kofoid, C. A., and Bowe, E. E., *in* Kofoid, 1934, 2d ed., pp. 534-539. (Resistant woods.)

Oshima, M., 1919, pp. 337-338, 347-374. (Frontal gland acidulous secretions *Coptotermes formosanus* soldier dissolves lime mortar, pp. 337-338; analysis resistant woods of Formosa—sesquiterpene alcohol and tectoquinone, pp. 341, 347-374.)

Schiff, H., 1858, pp. 109-110. (Nests, Java.)

Schübel, K., 1912, pp. 303-310. (Earthen tubes of *Eutermes monoceros.*)

Sherrard, E. C., and Kurth, E. F., *in* Kofoid, 1934, 2d ed., pp. 554-563. (Resistant woods.)

Shrikhande, J. G., and Pathak, A. N., 1948, pp. 327-328. (Termite galleries.)

Snyder, T. E., 1935e, p. 56. (Analysis pellets *Cryptotermes brevis,* mostly lignin, cellulose digested.)

1948, pp. 63-64, 153. (Analysis pellets *Cryptotermes brevis,* mostly lignin, cellulose digested, pp. 63-64; chemical extractives in wood, p. 153.)

Snyder, T. E., and Zetek, J., 1924. (Shelter tubes, *Coptotermes niger*—siliceous material, lignin, p. 16; *Nasutitermes ephratae* shelter tube mostly lignin, siliceous material practically absent, p. 20; shelter tube *Microcerotermes arboreus* siliceous material, lignin with no evidence of cellular structure present as was present in lignin in *Coptotermes* tube, p. 21; all tubes from Panama.)

Stumper, R., 1923, pp. 409-411. (Chemical composition nests of *Apicotermes occultus,* Africa.)

Tihon, L., 1946, pp. 865-868. (Chemical analysis termites as food, rich source protein, value of 100 grams being 560.52 calories, high potassium and phosphoric acid, low in sulfates, oil high acidity.)

CHEMICAL WARFARE

Anonymous, 1933, pp. 8-9. (Termite secretions used in warfare by insects.)

Emerson, A. E., *in* Allee et al., 1949, pp. 425-426. (Secretions by *Rhinotermes* and *Nasutitermes.*)

Hingston, R. W. G., 1928, pp. 717-725. (India, *Eutermes biformis,* sticky clear fluid from beak of soldier for defense.)

McLachlan, R., 1878, p. xii. (*Termes trinervius* and *ripperti* head secretions.)

Snyder, T. E., 1926f, pp. 533-534. (Evolution of frontal gland, from primitive to specialized termites, as an organ of defense—a sticky white secretion exudes from the tube, very effective against insect enemies.)

1935e, pp. 29-31. (Evolution of frontal gland, from primitive to specialized termites, as an organ of defense—a sticky white secretion exudes from the tube, very effective against insect enemies.)

1948, pp. 34-36. (Protective secretions from frontal gland.)

COLD, See TEMPERATURE

COMMUNICATION

Emerson, A. E., 1929a, pp. 722-727. (Discussion by Kemner, disagrees with Emerson on communication by vibration strata.)

Fuller, C., 1915a, pp. 329-504. (South Africa, calling attitude of females *Termes natalensis, latericius,* and *vulgaris* on grass stems by violently agitating their wings.)

HUNT, E. H., 1910, pp. 196-197, 268-269. (Kuala Lumpur, *Termes carbonarius* hammer heads against nest, produce clicking sound.)
KOFOID, C. A., 1934, 2d ed., p. 11. (By sound vibration.)
MICHENER, C. D., 1953, pp. 1-15. (Females turn up tip abdomens after flight, odor.)
SNYDER, T. E., 1915, p. 32. (Convulsive movements; odor.)
1926f, pp. 540-541. (Sensitive to vibration; odor.)
1935e, pp. 28, 32, 51. (Sensitive to vibration; odor.)
1948, pp. 57-58. (Chordotonal organs, perceive sound or vibrations; odor.)

CONTROL

ADAMSON, A. M., 1937, pp. 141-149. (Trinidad, general, resistant woods.)
AGARWALA, S. B. D., JHA, M. P., and SINGH, R. P., 1954, pp. 231-232. (India, sugarcane.)
ALLIOTT, H., 1947, pp. 1-3. (Wood preservation.)
ANDREWS, E. A., 1916, pp. 54-72. (Luskerpore Valley, India, tea bushes, prune, good cultivation, mound-building, subterranean termites.)
1924, pp. 118-125. (Ceylon, tea bushes, *Calotermes,* burn badly damaged; clean out cavity, paint with creosote, fill with cement.)
ANONYMOUS, 1892, p. 201. (Remedies, fruit trees.)
1909, pp. 1-3. (South Africa, fumigation, "Universal Ant Exterminator.")
1916, p. 59. (Use ammonia fumes, books, U.S.)
1917, pp. 477-479. (Brazil, destruction mounds by hollowing out chamber in one side at base in which straw or other material is placed and lit—a draught being ensured by a hole driven obliquely through the mound, leading from the top of the combustion chamber to a point high up on the opposite side. *Eutermes rippertii, Termes tenuis, strunki,* and *spinosus.*)
1921, pp. 290-295. (Australia, chemical treatments, soil poisons.)
1923, pp. 50-55. (Protection airplanes, Eastern tropical Africa, keep off ground, sprinkle naphthalene on ground, shields, wood preservatives.)
1926, p. 22. (Protection buildings, U.S.)
1928, p. 80. (Wood preservation, U.S.)
1930, pp. 45-48, 59. (Panama, test buildings constructed of chemically impregnated timber.)
1934a, pp. 1-4. (Subterranean termites, buildings, Alabama.)
1935a, pp. 7-23. (Kaduna, Nigeria.)
1936, p. 434. (Protection buildings, U.S.)
1936a, pp. 6-7. (California, legislation.)
1936b, pp. 43-44. (Southern U.S., termite-proofing buildings.)
1936c, p. 10. (California, minimum standards repair and treating.)
1936d, pp. 12-13. (Australia.)
1936e, pp. 1-7. (U.S., fire hazard.)
1936o, pp. 8-14. (U.S., questions answered by T. E. Snyder.)
1937, p. 19. (U.S., protection buildings, chemically treated timber.)
1937a, p. 2. (U.S., protection buildings chemically treated timber.)
1937b, p. 66. (U.S., legislation, wood preservation.)
1937c, p. 48. (U.S., "jerry-building" hazard.)
1937e, pp. 1-11. (U.S., general.)
1938a, pp. 1-4. (U.S., Better Business Bureau's recommendations.)
1938b, pp. 101-110. (Philippines.)
1938c, p. 19. ("Virus" used to control termites, Australia, proved to be arsenicals.)
1940, p. 6. (Control subterranean type in buildings in U.S., by structural and chemical barriers, standards for pest control operators.)
1940a, pp. 7-9, 15. (Remedial measures in buildings, U.S. Agric. Adjustment Admin.)
1941, p. 139. (Trichinoply, South India.)
1941a, pp. 339-342. (Use of pump to blow hot arsenic and sulfur fumes into nests, South Africa.)
1942, pp. 1-37. (U.S. Dept. Agriculture's recommendations, structural and chemical methods to control subterranean termites attacking buildings; revision 1949, pp. 1-38, soil poison dosages increased.)
1944, pp. 1-4. (Revision of 1938, 3d ed., Better Business Bureau recommendations, subterranean termites, buildings, U.S.)
1945, pp. 1-14. (Cawnpore, India, Ordnance Laboratories methods.)
1946, pp. 8-11. (U.S.)
1947a, pp. 1-7. (Low-cost housing, Louisiana.)
1947b, pp. 1-4. (N.S. Wales, Australia.)

1947c, pp. 14, 16. (Standard termite clause in connection with sale of properties, U.S.)
1947d, p. 18. (Northern California PCO's greet Dr. Thomas E. Snyder and W. O. Buettner August 4-5, 1947, experimental fumigation control dry-wood termite.)
1947i, pp. 1, 58-67. (U.S. Army's recommendations for control termites, structural and chemical.)
1948, pp. 1-20. (U.S. Dept. Agriculture's recommendations for structural and chemical control, prevention, new buildings.) 1951 revision, pp. 1-26. (Soil poison dosages increased.)
1949, pp. 19-21. (Consumers Research Bulletin, control methods, U.S.)
1949m, pp. 1-11. (Protection buildings, Tropics.)
1950, pp. 1-4. (Australia, general.)
1950a, pp. 75-105. (South Africa, general.)
1950b, p. 11. (What a termite inspection report (U.S.) should include.)
1951, pp. 1-250. (Approved references procedures, National Pest Control Assoc., U.S.)
1952, pp. 37-38. (Real estate "clearances" or inspection reports on presence or absence termites, California, Nebraska, Tennessee, U.S.)
1953a, pp. 27, 30. (Kansas, U.S.)
1953a′, pp. 9-11, 36, 48. (U.S., poison soil before slab laid, install Hill-Smith "termipipe" system; pentachlorophenol sprays for foundation timbers.)
1953b, p. 12. (U.S., Schramm air compressors and air hammers, penetrate concrete.)
1953d, pp. 29, 34. (Warning by Atlanta, Ga., officials against poor termite control.)
1953g, p. 42. (U.S., slab drilling not effective, space left not filled by chemical.)
1953l, p. 29. (Florida, inspection form for report on termite infestation or not—cost $10.00.)
1953m, pp. 20, 22. (U.S., slabs (sealers for expansion joints best where rubber base), clearances for real estate, inspection reports, soil fumigants.)
1953o, pp. 37-52. (U.S. Navy's recommendations control subterranean and dry-wood termites, structural and chemical.)
1954a, pp. 43-44, 46. (U.S., "Do it yourself" quotes Dr. T. E. Snyder—employ an expert.)
Audant, A., 1946, pp. 192-196. (Haiti.)
Ayars, J. S., 1948, pp. 86-90. (Subterranean type, U.S.)
1949, pp. 90, 92. (Subterranean type, U.S.)
Azevedo, L. A. Marque de, 1925, pp. 392-394. Rio de Janeiro, Brazil.)
Bach, M., 1860, pp. 406-415, 444-460.
Back, E. A., 1940, pp. 365-374. (Fumigation books infested with dry-wood termites in vacuum cylinders.)
Baerg, W. J., 1940, pp. 1-27. (Preventing and remedying damage Arkansas, U.S.—U.S. Dept. Agriculture's methods.)
Baerg, W. J., and Lincoln, C., 1947, pp. 1-10. (Preventing and remedying damage Arkansas, U.S.—U.S. Dept. Agriculture's methods.)
Bartlett, K. A., and Plank, H. K., 1942, pp. 19-23. (Puerto Rico, *Cryptotermes brevis*.)
Basu, M., 1942, p. 617. (India, books fumigated in chamber with 40% formaldehyde solution for 5 min., then placed on shelves on which were small bags containing a powder equal parts orris root (bach), cloves (labanga), black pepper (golmorich) and cinnamon (darchini). No further attack by termites from May 1940 to May 1942.)
Bates, G., 1926, pp. 4-5. (Australia, *Mastotermes,* clear timber near fields cane, bait mixture 4 parts arsenic by weight, caustic soda 1 part mixed dry, add water until dissolved, for every pound arsenic add 2 gal. molasses.)
Bates, H. W., 1864, p. 185. (Protection timber.)
Beatty, J., 1953, pp. 20-22. (Kansas City flood 1951 submerged termites 7 days but did not kill them; standard methods control, U.S.)
Beeson, C. F. C., 1934, pp. 64-78. (India.)
1934a, pp. 19-25. (India.)
1941, pp. 44-90. (India, termite-proofing buildings, resistant woods, use of ants in nurseries.)
1941a, pp. 524-553. (India, termite-proofing buildings, resistant woods, use of ants in nurseries.)
Bentley, G. M., and Rogers, J. L., 1931, pp. 1-22. (Tennessee.)
Berger, B. G., 1947, pp. 1-44. (Illinois; 2d ed., 1953, Illinois, structural, chemical.)
Berkeley, M. J., 1865, p. 453. (St. Helena.)
Bernard, C. (1919) 1920, pp. 28-30. (Java.)
Bonaventura, G., 1953, pp. 1-12. (Italy.)
Bonavia, E., 1865, p. 237. (Admixture pulp American aloe with a plaster of clay and cow dung, preventive, gaol, Lucknow, India.)
Borror, D. J., and DeLong, D. M., 1954, p. 149. (General.)

Brandão, Filho J. S., 1943, pp. 1-3. (Rio de Janeiro, Brazil.)
1949, pp. 6, 32. (Rio de Janeiro, Brazil.)
Breck, P. A., 1953, p. 32. (Locate slab heat pipes with isotopes.)
Brook, A. A., 1930, pp. 71-73. (California, certified control.)
Brown, A. A., 1936, pp. 1-46. (California, structural and chemical, Public Works project.)
Bruce, C. A., 1938, p. 1. (Advice to lumber dealers, U.S.)
Bruce, E. L., 1931, pp. 7-9. (U.S., protection forest products.)
Burns, A. N., 1926, p. 739. (Australia, sugarcane, remove timber and burn adjacent to fields, clean strip land 1 to 2 chains wide outside infested fields; treat infested fence posts with mixture arsenic, caustic soda, and molasses.)
Burns, A. W., and Mungomery, R. W., 1926, pp. 628-630. (Australia, giant white ant, sugarcane, mixture arsenic and molasses bait, tar treatment interferes with germination, inject ¼ oz. paradichlorobenzene on both sides sets, 12 in. apart, 4½ in. deep, and 5 in. on each side. Clearing timber near cane fields and poison baits reduce damage to negligible.)
Butler, J. E., 1948, p. 11. (Alabama.)
Cachan, P., 1950, pp. 1-29. (Madagascar, mechanical, chemical.)
Chaine, J., 1913, pp. 401-403. (Danger in transport in wood and furniture, France.)
Chamberlain, W. F., and Hoskins, W. M., 1949, pp. 285-307. (Chemical protection food packages against *Zootermopsis;* 5% DDT in hot wax practicable.)
Chamberlin, W. J., 1949, pp. 11-27. (U.S., general.)
Chatterjee, N. C., Bhatia, B. M., and Chatterjee, P. N., 1950, pp. 263-266. (Antitermite characteristics of certain chemicals, India.)
Clapp, W. F., 1937, pp. 12-14. (Massachusetts, termite pit controlled experiments, *Reticulitermes.*)
Clark, A. F., 1949, pp. 392-393. (Buildings, New Zealand.)
Coaton, W. G. H., 1941, pp. 1-4. (South Africa, protection buildings against *Macrotermes, Odontotermes,* and *Hodotermes.*)
1943, pp. 1-5. (South Africa, sodium arsenite bait, *Hodotermes.*)
1947a, pp. 713-727. (South Africa, use of toxic smoke generators.)
1948, pp. 1-19. (South Africa, *Trinervitermes,* mechanical, chemical.)
1948a, pp. 97-108. (South Africa, *Trinervitermes,* mechanical, chemical.)
1948b, pp. 1-18. (Durban and Port Elizabeth, South Africa, *Cryptotermes brevis.*)
1948d, pp. 1-38. (South Africa, *Hodotermes* and *Microhodotermes,* grazing land, crops, buildings, arsenical baits.)
1949, pp. 335-338. (South Africa, queen removal ineffective.)
1949a, pp. 1-89. (South Africa, queen removal ineffective, subterranean termites, buildings, mechanical, chemical.)
1950, pp. 1-28. (South Africa, queen removal ineffective, subterranean termites, buildings, mechanical, chemical, cultivated areas, harvester, mound fungus growers, carton nesting termites; baits, fumigation, cultural methods, soil poisons.)
1951, pp. 263-267, 277. (South Africa, *Trinervitermes,* natural mortality an aid to control, drought main factor in mortality, when occurring in successive years. During population peak (70 colonies per morgen) can remove 100% of grass cover of veldt in 2 successive drought years. Control should be undertaken when nature has reduced population level to lowest ebb, fumigate nests. If mounds not inhabited, mound fragmentation recommended.)
Cockerham, K. L. and Smith, C. E., 1954, pp. 1-12. (Louisiana.)
Cosar, H. G., 1934, pp. 67-73. (Africa, wood preservation, killing queen, destruction mounds, etc.)
Cox, C. L., 1935, pp. 1-23. (Kaduna, Nigeria anti-termite work, resistant woods, wood preservation.)
Craighead, F. C., 1950, pp. 30-31, 43-47. (Nursery stock, timber, U.S.)
Cross, J. C., 1942, p. 433. (Crankcase oil as soil poison, U.S.)
Cunha, O. R., 1935-1936, pp. 46-48; 30-32; 46-49; 67-69; 63-64; 1936, 56-57; 26-28. (Rio de Janeiro.)
Davis, J. J., 1937, pp. 1-12. (Illinois, structural, chemical.)
1946, pp. 1-12. (Revision of 1937.)
1949, pp. 28, 32. (Responsibility of the pest control operator.)
1950, pp. 1-16. (4th revision of 1937.)
Dawson, T. R., and Doyle, L. A., 1950, pp. 101-105. (Protection vulcanized rubber with poisonous outer coats, repellents.)
Décamps, M., 1936. (St. Helena, chemical.)
1937, pp. 1-87. (St. Helena, chemical.)

DELAPLANE, W. K., 1953, pp. 39-40. (U.S., subterranean termites infesting building without soil contact, water leak, soil poisons ineffective.)
DELLASUS, M., LEPIGRE, A., and PASQUIER, R., 1933, pp. 28-33. (Algeria, vineyards.)
DE LONG, D. M., 1931, pp. 177-180. (Ohio, buildings.)
DENNY, C., 1953, pp. 14, 16, 18, 20. (U.S., inspection slab-type homes.)
1954, pp. 33-34, 40-42. (Precautions in treating slab-houses.)
DEORAS, P. J., 1949, pp. 445-446. (Mound-forming termites.)
DIETZ, H. F., 1921, pp. 87-96. (Indiana, structural.)
1924, pp. 299-301. (Indiana, structural.)
DIETZ, H. F., and SNYDER, T. E., 1924, pp. 279-302. (Canal Zone and Republic Panama.)
DILLER, J. D., 1953, pp. 1-8. (Roll roofing as a soil cover reduces moisture vapor under buildings, prevents condensation and decay.)
DIXON, W. A., 1910, p. 271. (Protection.)
DUCAS, D., 1949, pp. 87, 136-139. (U.S., avoid pest exterminators' racket.)
DUGAST, R., 1947, pp. 192-194. (France, DDT.)
DU PLESSIS, C., 1935, pp. 423-425. (South Africa, structural, gas, poison baits.)
D'UTRA, G. R. P., 1905, pp. 1-10. (São Paulo, Brazil.)
EASTER, S. S., 1946, 2 pp. (Army posts, structural, chemical.)
EBELING, W., 1950, pp. 1-747. (U.S., trees.)
EDWARDS, W. H., 1939, pp. 1-32. (Jamaica, prevention.)
EHRHORN, E. M., *in* Kofoid, 1934, 2d ed., pp. 330-333. (Poison dusts, fumigation with carbon disulfide, Hawaii.)
ENGBERG, A. G., 1952, pp. 23-24. (Urgent need for building standards, U.S.)
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1929b, pp. 1-11. (Living plants, *Calotermes,* Ceylon, paris green 3 to 4 months to kill colony, 3,000 bushes, 2½ cents per bush.)
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1939a, p. 1. (U.S., soil poisons, wood preservatives.)
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1919a, p. 83. (Sweet gum woodwork, building, California.)
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MUIR, F., and SWEZEY, O. H., 1926, pp. 331-335. (Hawaii.)
MULLEN, J. A., 1942, pp. 529-530. (U.S., lead foil seals and corks wine bottles in wooden boxes on concrete floor, straw jackets on bottles alive with *Reticulitermes flavipes,* none drowned by wine.)
1947, p. 164. (U.S., in cold frames.)
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NALDER, V. S., 1948, pp. 469-471. (New Zealand, subterranean termites.)
NAUDÉ, T. J., 1940, pp. 879-886. (South Africa.)
NELSON, G. N., 1941, p. 30. (Tax status of loss in termite damage—not deductible, U.S.)

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1948a, pp. 3, 47. (Like communists, damage done while hidden.)
1951 (Revision of 1948), pp. 1-11. (Ohio, buildings.)
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Plessis, See Du Plessis.
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1877, p. 43. (*Termes flavipes,* much damage in some parts Germany.)
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Ross, H. H., 1948, pp. 259, 499. (U.S., buildings, books, furniture.)
Rossi, R. T., and Snyder, T. E., 1934, pp. 755-756. (Utility (RCA) poles, Long Island, New York.)
Schmidt, H., 1951, pp. 371-372.
1954, pp. 8-9.
Scudder, S. H., 1891, pp. 15-16. (New England, wooden tubs, plants in greenhouse, cabbage.)
Seoane, V. L., 1878, pp. ccxxv-ccxxvii. (Spanish man-of-war destroyed by *Termes dives* while lying in Port of Ferrol.)
Shah, N. H., 1946, pp. 241-250. (India, cotton fibers.)
Shimer, H., 1870, p. 324. (U.S., *Termes flavipes,* "bookworms.")
Shipley, A. E., 1925, pp. 244-246. (Trinidad, books.)
Sinclair, W. F., 1897, p. 147. (India.)
Smyth, E. G., 1919, pp. 126-127. (Puerto Rico, *Eutermes morio.*)
1919a, p. 138. (Puerto Rico, *Eutermes morio,* sugarcane.)
Snyder, T. E., 1910, pp. 1-12. (U.S., utility poles.)
1911, pp. 1-6. (U.S., utility poles.)
1912, pp. 1-4. (U.S., mine props.)
1915, pp. 75-76. (U.S., general.)
1916, pp. 1-32. (U.S., buildings, stored products, vegetation.)
1916a, pp. 1-20. (U.S., buildings, stored products, vegetation.)
1919a, pp. 1-16. (U.S., buildings, stored products, vegetation.)
1920*, *in* (Banks and) Snyder, pp. 87-213. (General.)
1920b, pp. 1110-1112. (U.S., buildings.)
1922a, pp. 69-74. (U.S., poles and telephone equipment.)
1924, p. 32. (U.S., Atlantic Coast, *Kalotermes,* poles.)
1925a, p. 389. (U.S., buildings.)
1925d, pp. 277-278. (U.S., buildings.)
1925d′, pp. 253-254. (U.S., buildings.)
1925e, pp. 6-7, 12-13. (U.S., buildings.)
1925f, pp. 32-33. (U.S., buildings.)
1926, pp. 23-25. (U.S., buildings and stored material.)
1926a, p. 14. (U.S., buildings.)
1926c, pp. 1-22. (U.S., buildings, general; p. 2, map showing distribution damage by subterranean and nonsubterranean termites; revised 1939.)
1926e, pp. 14-20. (U.S., poles.)
1926g, pp. 277-280. (Metal.)
1926h, p. 254. (California.)
1927b, pp. 316-321. (Million dollar annual damage to buildings, Honolulu, Terr. Hawaii; 80% frame buildings New Orleans, La., have been damaged, 50% business buildings at Pasadena, Calif., some dangerously.)
1927f, pp. 82-83. (Buildings, U.S.)
1927h, pp. 15-17. (Buildings, U.S.)
1927k, pp. 309-314. (Buildings, U.S.)
1928, pp. 274-276. (Buildings, U.S.)
1928a, pp. 135-138. (Poles, California.)
1928c, p. 381. (*Coptotermes* dissolves lime mortar foundations by secretion from frontal gland.)
1928d, pp. 240-242. (Buildings, U.S.)
1929, p. 44. (Hawaii.)
1929b, pp. 17-28. (Pacific area.)
1929c, pp. 18-38. (General.)
1929d, pp. 143-151. (Buildings, U.S.)
1929f, p. 18. (Tropics.)
1929g, pp. 1-19. (Gulf States.)

1929h, pp. 154-158.
1929j, pp. 1-15. (Pacific area.)
1929k, pp. 210-230. (Buildings, U.S.)
1929n, pp. 96, 100, 102, 104, 106, 108. Buildings, poles, U.S.)
1930, pp. 261-269, 290.
1930a, p. 20. (Buildings, U.S.)
1931*, pp. 531-571. (General.)
1932, pp. 228-230. (General.)
1932a, p. 27. (Wood, U.S.)
1932b, pp. 25, 27, 31, 34. (Buildings, U.S.)
1933a, pp. 397-399. (Buildings, U.S.)
1933b, pp. 1-8. (Buildings, U.S., revised 1936.)
1934, *in* Kofoid, 2d ed., pp. 187-195. (Eastern U.S., subterranean termites; 40 million dollar annual damage, buildings. Eastern U.S., nonsubterranean termites, pp. 269-272.)
1934a, pp. 1-22. (Revision of 1926c, U.S., general.)
1934b, pp. 5-6, 12. (U.S., buildings.)
1935a, pp. 70-78. (U.S., buildings.)
1935c, pp. 1-6. (U.S., buildings.)
1935d, pp. 5-6, 28-30. (U.S., buildings.)
1935e, pp. 106-109. (List materials damaged by termites.)
1937, pp. 26-33. (Louisiana, buildings.)
1938, pp. 6-9. (U.S., buildings.)
1938, *in* Hyslop, p. 43. (U.S., buildings, $40,000,000 annual damage.)
1939, pp. 7-9. (U.S., buildings, $40,000,000 annual damage.)
1947b, pp. 144-147. (U.S., buildings, $40,000,000 annual damage.)
1948, pp. 58-59, 117-135. (Revision of 1935e, list materials damaged, pp. 58-59, 123, timber where heavy vibration not attacked.)
1949, pp. 432-436. (U.S., buildings.)
1949d, *in* Burton, 1949, p. 264. (General.)
1950, pp. 12-14. (U.S., buildings.)
1950a, *in* Craighead, 1950, pp. 87, 90-93. (Eastern U.S., buildings, general.)
1950d, pp. 1-16. (Dry-wood and other nonsubterranean termites, map northern limit damage in U.S., p. 3.)
1951a, pp. 237, 250, 261. (U.S., buildings.)
1953, pp. 27-28. (U.S., buildings.)
1953e, p. 30. (U.S., northern areas severe damage, limits damage in New England.)
1954, pp. 27-28. (Damage to carpet by *Reticulitermes*, U.S.)
1954b, pp. 1-64. (U.S., general.)
1954h, *in* Greathouse, G. A., 1954, pp. 204-211. (World damage and control.)
1955b, pp. 48, 56. (Damage to plastics and fabrics, U.S.)
1955d, pp. 28, 30. (Panama, C.Z., *Coptotermes* damage to lead-sheathed cables.)
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SOUZA, A. O. DE, 1948, p. 561. (Brazil, *Cornitermes*.)
SPENCER, G. J., 1937, pp. 42-43. (British Columbia, buildings, poles, *Zootermopsis, Reticulitermes hesperus,* former in dry wood.)
STEER, H. B., 1952, pp. 26, 44-45. (U.S., buildings.)
STEILBERG, W. T., *in* Kofoid, 1934, 2d ed., pp. 756-765. (California, association termite damage with earthquakes.)
STRONG, V. E., 1953, pp. 1-2. (California, regional survey percentage damage to buildings by subterranean and drywood termites.)
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TITUS, R. T., 1949, p. 17. (U.S., general.)
TURNER, N., TOWNSEND, J. F., and ZAPPE, M. P., 1935, pp. 241-245. (Connecticut, *Reticulitermes flavipes*.)
TURNER, N., and TOWNSEND, J. F., 1936, pp. 209-242. (*Reticulitermes flavipes,* Connecticut.)
TURNER, N., and ZAPPE, M. P., 1936, pp. 195-198. (*Reticulitermes flavipes,* Connecticut.)
VAN DYKE, E. C., 1927, p. 95. (*Kalotermes minor* honeycombing redwood bastions old Fort Ross, Sonoma County, Calif.)
VAN ZWALUWENBURG, R. H., 1916, p. 43. (*Eutermes morio,* Porto Rico.)
1918, pp. 25-28. (*Eutermes morio* is *Cryptotermes* sp., Porto Rico.)
VON SCHRENK, H., 1936, pp. 528-530. (U.S.)
WAND, B., 1936, p. 9. (U.S., damage grossly overestimated.)
WARD, G. A., 1923, pp. 12-15. (New Zealand, *Calotermes brounii*.)
WATERSTON, J. M., 1937, pp. 67-69. (Bermuda, *Calotermes castaneus*.)
WEIDNER, H., 1937, pp. 593-596. (Hamburg, Germany, *Reticulitermes flavipes*.)
1939, p. 40. (Hamburg, Germany, *Reticulitermes flavipes*.)
1942a, pp. 1-7. (Hamburg, Germany, *Reticulitermes flavipes*.)
1951, pp. 259-265. (Hamburg, Germany, *Reticulitermes flavipes*.)

1952, pp. 829-832. (Hamburg, Germany, *Reticulitermes flavipes.*)
1953, pp. 191-192. (Hamburg, Germany, *Reticulitermes flavipes.*)

WELCH, M. B., 1929, pp. 47-53. (Australia, buildings.)

WILSON, H. B., 1952, pp. 471-472. (*Coptotermes* in buildings in Melbourne, nest in nearby tree.)

WITHYCOMBE, R., 1928, p. 1. (Zanzibar, insulation (rubber) on cable.)

WOLCOTT, G. N., 1921, pp. 1-14. (Puerto Rico.)
1927, pp. 153-162. (Haiti.)
1946, pp. 1-29. (Puerto Rico, *Cryptotermes brevis.*)

WOLCOTT, G. N., and SEIN, F., 1924, pp. 138-149. (Puerto Rico.)
1939, pp. 1-26. (Puerto Rico.)

WOODESON, A., 1921, pp. 51-86. (Ceylon, buildings.)

DAMAGE TO LIVING VEGETATION

AGARWALA, S. B. D., NAQVI, S. Z. H., and SINGH, R. P., 1954, pp. 99-100. (India, aldrin and dieldrin outstanding insecticides against *Microtermes obesi* and *Odontotermes assmuthi* attacking sugarcane.)

ALIBERT, H., 1951, pp. 9-174. (Cacao, West Africa.)

ALOI, A., 1885, pp. 89-94. (Grape vines, Catania, Sicily.)

ANDREWS, E. A., 1916, pp. 54-72. (Tea bushes, mound-builders and subterranean termites, India.)
1924, pp. 118-125. (Tea bushes, *Calotermes,* Ceylon.)

ANONYMOUS, 1871, p. 233. (Pine logs.)
1889, p. 293. (Tea plants, *Termes fatalis,* Ceylon.)
1889a, p. 340. (Trees, Australia.)
1892, p. 201. (Fruit trees, U.S.)
1897, p. 484. (Agriculture, *Termes taprobanes,* India.)
1898, p. 434. (Agriculture, *Termes taprobanes,* India.)
1914, p. 74. (Cane plants in field, *Eutermes acajutlae,* Antigua and Porto Rico.)
1914a, pp. 301-304. (Vines, near Bordeaux, France.)
1917a, p. 390. (Hawaii, *Coptotermes formosanus,* sugarcane.)
1918a, p. 253. (Florida, *Termes flavipes,* citrus trees.)
1920, pp. 206-208. (Ceylon, *Calotermes militaris ?,* crops.)
1920a, p. 469. (Pacific Coast, U.S., prune trees.)
1921a, (San Tomé, *Microcerotermes dolichognathus,* cacao.)
1925, pp. 739-745. (Australia, sugarcane.)
1926a, pp. 4-5. (Australia, sugarcane, *Mastotermes darwiniensis.*)
1927a, pp. 86-88. (*Coptotermes acinaciformis.*)
1942a, pp. 3-17. (Australia, pp. 16-17, *Termes lacteus,* orchard pest.)
1954c, p. 910. (*Paraneotermes simplicicornis* killing Eucalyptus trees, Tucson, Ariz.)

AULMANN, G., 1913, pp. 83-91. (Rubber trees.)

AZEMARD, ( ). 1914, pp. 106-110. (Senegal, ground nuts.)

BALLOU, C. H., 1945, p. 87. (Venezuela, plants.)

BALLOU, H. A., 1912, pp. 74-75. (St. Kitts, cotton.)

BANKS, C. S., 1904, pp. 1025-1026. (Philippines, cacao.)

BATES, G., 1926, pp. 4-5. (Australia, sugarcane, *Mastotermes* in sandy soil.)

BATHELLIER, J., 1927, pp. 121-165. (Indo-China, vegetation, crops.)
1933, pp. 747-750. (Indo-China, vegetation.)

BATRA, H. N., 1942, p. 15. (*Microtermes mycophagus,* fruit, N.W. Frontier Province, India.)

BEEKMAN, H., 1919, pp. 21-30. (*Calotermes tectonae,* teak, Batavia, Java.)

BEELEY, F., 1934, pp. 160-175. (Kuala Lumpur, Malaya, rubber trees.)

BEESON, C. F. C., 1941a, pp. 537-538. (India, trees in nurseries, plantations; mature rubber trees, tea bushes.)

BELL, A. F., 1939, pp. 45-59. (Queensland, *Coptotermes acinaciformis,* minor damage to mature sugarcane, p. 52.)

BEQUAERT, J., 1925, pp. 289-294. (Amazon, *Neotermes castaneus,* guava trees.)

BERGER, E. W., 1918, pp. 190-191. (Sweet potatoes, Florida.)

BOFFA, G. D., 1949, p. 65. (*Calotermes flavicollis, Reticulitermes lucifugus,* plants, Italy, general comments.)

BONAVENTURA, G., 1953b, p. 893. (Italy, plane tree.)

BONDAR, G., 1939, pp. 16-17. (*Eutermes rippertii* and *Calotermes wagneri,* subsp. *pedestans,* cacao, Bahia, Brazil.)

BOX, H. E., 1953, pp. 56-58. (Lists termites attacking sugarcane, world.)

BRUNER, S. C., SCARAMUZZA, L. C., and OTERO, A. R., 1945, pp. 35-36, 44, 129, 157. (Plants, Cuba.)

BUGNION, E., and POPOFF, N., 1910*, pp. 107-123. (Rubber trees, *Coptotermes*, Ceylon.)

BURNS, A. W., and MUNGOMERY, R. W., 1926, pp. 628-630. (Australia, giant white ant major cane pest over Lower Burdekin, in sandy soil, mixture arsenic and molasses bait; tar treatment interferes with germination; inject ¼ oz. paradichlorobenzene on both sides sets 12 in. apart, 4½ in. deep, and 5 in. on each side.)

BUZACOTT, J. H., 1947, pp. 135-140. (Sugarcane, *Masotermes*, etc., North Queensland.)

1948, pp. 136-141. (Sugarcane, *Masotermes*, etc., North Queensland.)

BYNUM, W. M., 1951, pp. 966-967. (Citrus trees, *Paraneotermes*, lower Rio Grande Valley, Tex.)

CAPRA, F., and GHIDINI, G. M., 1946, pp. 42-46. (Cabbage, Jerusalem artichoke, *Reticulitermes lucifugus*, Italy.)

CARESCHE, L., 1937, pp. 195-212. (Hevea and Kapokier, *Coptotermes curvignathus*, Indo-China.)

CARTER, W., 1949, pp. 761-766. (Pineapple, Brazil, South America, bore into stumps, cause wilt, scattered, isolated plants, p. 764.)

CASSIDY, T. P., ROMNEY, V. E., BUCHANAN, W. D., and YORK, G. T., 1950, p. 10. (Guayule nursery stock, *Amitermes tubiformans*, South Texas.)

CAVARA, F., 1922, pp. 190-194. (Plants, Italy.)

CHAINE, J., 1910, pp. 486-487. (Plants, France.)

1911-1912, pp. 678-680; 113-115. (Plants, France.)

1912, pp. 490-492. (Plants, France.)

1919, pp. 61-67. (Plants, France.)

1920, pp. 250-255, 281-285. (Plants, France.)

CHATTERJEE, N. C., 1939, pp. 15-24. (*Termes horni* collected in sandal forests, India.)

CHIESA MOLINARI, O., 1942, p. 107. (Plants, Argentina.)

CHOCK, Q. C., 1932, p. 124. (Rice plants, *Coptotermes formosanus*, Hawaii.)

CIAMPOLINI, M., 1954, pp. 291-300. (Tuscany, biology and damage to living woody shrubs or trees.)

CLAUSEN, C. P., 1913, pp. 11, 38, 41, 43, 46, 52, 77, 80, 84. (Agriculture, *Termes formosanus*, *T. vulgaris*, Japan.)

CLEARE, L. D., 1920, pp. 115-126. (Sugarcane, British Guiana.)

COATON, W. G. H., 1937, pp. 249-252. (Crops, harvester termite, *Hodotermes mossambicus*, South Africa.)

1943, pp. 346-350. (Crops, harvester termite, *Hodotermes mossambicus*, South Africa, lawns, shrubs, young trees, crops; in buildings, wall paper, carpets, curtains, etc.)

1948, pp. 1-19. (Grass on veldt, *Trinervitermes*, South Africa, overgrazing and effect on mound density.)

1948a, pp. 97-108. (Grass on veldt, *Trinervitermes*, South Africa, overgrazing and effect on mound density.)

1948c, pp. 259-267. (Crops, *Hodotermes mossambicus*, *Microhodotermes*, harvester termites, South Africa.)

1948d, pp. 1-38. (Crops, *Hodotermes mossambicus*, *Microhodotermes*, harvester termites, South Africa.)

1950, pp. 1-28. (Cultivated areas, South Africa.)

1951, pp. 263-267, 277. (Grass, *Trinervitermes*, South Africa.)

1954a, pp. 243-248. (South Africa, *Hodotermes* and veldt reclamation.)

COMSTOCK, J. H. (1879), 1880, pp. 207-208. (Texas and Florida, girdling bark orange trees, guava bushes, eating out sugarcane.)

CORBETT, G. H., and MILLER, N. C. E., 1936, pp. 1-12. (*Microtermes pallidus*, tea plants, Malaya.)

COSAR, H. G., 1934, pp. 61-67. (Africa.)

COSTA LIMA, A. DA, 1941*, pp. 377-387. (*Neotermes* spp., guava, Brazil.)

CRICHTON, A., 1883, p. 461. (Young trees, Arabia.)

CROWTHER, F., and BARLOW, H. W. B., 1943, pp. 99-112. (Tap-root cotton, Sudan Gezira, damage less on fallow land, organic matter on area increased damage, damage occurs first 2 months after sowing, loss 3% whole crop, after years fallow.)

DAMMERMAN, K. W., 1913, pp. 1-12. (*Coptotermes gestroi*, rubber, Java.)

1915*, pp. 98-100. (*Calotermes tectonae*, teak.)

1929, pp. 22-30. (Agriculture, Malay Archipelago.)

DEAN, H. A., 1954, pp. 79-81. (Texas, damage to citrus on recently cleared brushland by desert damp-wood termites.)

1954a, pp. 365-366. (Texas, *Paraneotermes simplicicornis*, damage to citrus trees on recently cleared brushland, chlordane 1 lb. or more per 50 trees effective control,

60 gals. of water per tree adequately dispersed the chemical.)

Dellasus, M., Lepigre, A., and Pasquier, R., 1933, pp. 28-33. (*Reticulitermes lucifugus* and *Calotermes flavicollis*, vineyards, Algeria.)

Deshpande, R. B., 1943, pp. 188-191. (India, localized areas, chillies.)

Dick, J., 1951, pp. 99, 101. (Natal, South Africa, sugarcane.)

Dieuzeide, R., 1933, p. 200. (*R. lucifugus* and *Calotermes flavicollis*, grapevines, Algeria.)

Ebeling, W., 1950, pp. 1-747. (Citrus, pecan.)

Ehrhorn, E. M., 1928, p. 4. (*Coptotermes*, pepper tree, Hawaii.)

Elliott, E. C., and Whitehead, F. J., 1926. (Tea plants, Ceylon.)

Escherich, K., 1911*, pp. 166-174. (Ceylon, tea, cacao, rubber.)

Feytaud, J., 1915, pp. 65-68, 82-84. (Agriculture, France.)

Fletcher, T. B., 1920, pp. 33-314. (Crops, India.)

Fonseca, J. Pinto da, 1940, pp. 222-223. (Eucalyptus plantations, *Syntermes insidians*, São Paulo, Brazil.)

1950, pp. 57-84. (Eucalyptus plantations, *Syntermes insidians*, São Paulo, Brazil; also, *Syntermes molestus*, 70% 2 million seedlings 8 to 10 months old destroyed.)

Forbes, S. A., 1895, p. 198. (Illinois, apple, pecan tree roots.)

Froggatt, J. L., 1938, pp. 66-68. (New Guinea, *Calotermes papua*, pest cacao trees.)

Froggatt, W. W., 1905, pp. 632-656, 753-774. (Australia, fruit trees.)

1905a, pp. 1-47. (Australia, fruit trees.)

Fuller, C., 1912, pp. 814-823. (South Africa, orchards and plantations.)

1912a, pp. 345-369, 543-571. (South Africa, orchards and plantations.)

1919a, pp. 301-305. (South Africa, *Hodotermes*, grassland.)

1921, pp. 462-466. (South Africa, fungus-growers, living trees.)

Furniss, R. L., 1939, pp. 5-8. (Washington and Oregon, shade trees, *Zootermopsis angusticollis* and *Reticulitermes hesperus*.)

Ghosh, C. C., 1940, p. 76. (Rangoon, Burma, sugarcane.)

Glover, P. M., 1951, pp. 116-122. (India, lac.)

Gosse, P. H., 1851, pp. 459-463. (Jamaica, sugarcane.)

Goureau, C., 1867, pp. 70-74. (*Calotermes flavicollis* and *Reticulitermes lucifugus*, shade trees.)

Gradojević, M., 1929, p. 16. (South Serbia, *Reticulitermes lucifugus*, vines, mulberry and oak trees.)

Grassi, B., and Aloi, A., 1885, p. 148. (Sicily, Catania, *Calotermes flavicollis*, vine.)

Green, E. E., 1916, pp. 608-636. (Ceylon, rubber tree.)

Greig, J. L., 1937, pp. 1-31. (Lowland tea plains Malaya, Serdang, Fed. Malay States, where poor soil and bushes' stamina not maintained, extensive attack by termites.)

Gupta, B. D., 1950, pp. 344-345. (Bangalore, India, sugarcane.)

Hagen, H. A., 1885, pp. 61, 134-136. (Cambridge, Mass., *Termes flavipes*, shade trees *Acer rubrum*; earth in hothouses infested.)

Haines, G. C., 1935, pp. 246, 248. (South Africa, *Hodotermes*.)

Hainsworth, E., 1952, p. 19. (NE. India, tea, *Kalotermes*, *Termes taprobanes*.)

Hargreaves, H., 1948, p. 15. (Cotton.)

Harler, C. R., 1933, p. 268. (Tea.)

Harris, W. V., 1936a, pp. 121-123. (Africa, *Hodotermes mossambicus*, *Microcerotermes parvus*, and *Microtermes*, cotton.)

1954, pp. 11-13. (Tropical agriculture.)

Hartley, B. J., 1938, p. 87. (Cotton.)

Hepting, G. H., 1935, pp. 29-30. (Hardwood trees, Mississippi Delta.)

Herrick, G. W., 1904, pp. 28-32. (Pecan, Mississippi.)

Heusser, C., 1926, pp. 355-363. ("Greenbark" of *Hevea braziliensis* due to destruction of outer layers of bark by termites.)

Hill, G. F., 1932, pp. 7-28. (Forest trees, SE. Australia.)

Hoffman, C. H., 1942, pp. 1-20. (Elm trees, U.S.)

Holloway, T. E., 1932, pp. 354-356. (Sugarcane, Gulf States, U.S.)

Hubbard, H. G., 1883, p. 36. (U.S., *Termes flavipes* does great damage at surface, girdling orange, lemon, and lime trees; eats tubers artichokes.)

1885, pp. 121-125. (Orange trees, U.S.)

Hunt, E. H., 1910, pp. 196-197, 268-269. (Newly planted stumps rubber on old tapioca estates, *Termes carbonarius* strips bark off, Kuala Lumpur.)

Husain, M. A., 1935, pp. 562-564. (India, intensity termite damage to wheat; *Microtermes obesi* most harmful pest of wheat, annual average total loss of 6% and occasionally 25% germinating grain. High temperatures and low soil moisture, dried up parts underground seedlings eaten, oc-

casionally plants coming to ears damaged severely.)
Hutson, J. C., 1923, pp. 83-87, 291-298. (Tea bushes, Ceylon.)
1927, pp. 220-228. (Tea bushes, Ceylon, *Calotermes dilatatus* and *militaris.*)
1932, pp. D111-D121. (Tea and rubber trees, Ceylon.)
James, H. C., 1947, p. 28. (*Nasutitermes costalis* and *Eutermes,* sugarcane, British Guiana.)
Janjua, N. A., and Samuel, C. K., 1941, pp. 1-41. (Fruit trees, *Archotermopsis,* Baluchistan.)
Jarvis, E., 1923, pp. 15-16. (Cane, Queensland.)
1926, pp. 47-50. (Sugarcane, Queensland.)
1926a, p. 6. (*Mastotermes,* Queensland, sugarcane.)
1926b, pp. 13-14, 49-52. (*Mastotermes,* Queensland, sugarcane.)
1926c, pp. 103-105. (*Mastotermes,* Queensland, sugarcane.)
1927, pp. 85-88. (*Mastotermes,* Queensland, sugarcane.)
1927a, pp. 18-23. (*Mastotermes* rated fourth in importance as sugarcane pest, Queensland.)
1927b, pp. 11-13, 31-33. (Queensland, sugarcane.)
Jepson, F. P., 1924, pp. 7-10. (*Calotermes, Termes, Eutermes, Leucotermes,* tea bushes, Ceylon.)
1926, pp. 67-69. (Tea, Ceylon.)
1926a, pp. 134-142. (Tea, Ceylon.)
1927, pp. 19-21. (Distribution Ceylon tea *Calotermes, militaris, dilatatus, greeni.*)
1929a, pp. 307-311. (*Calotermes,* living plants, Ceylon.)
1929b, pp. 1-11. (*Calotermes,* living plants, Ceylon.)
1930, pp. 143-156. (*Hevea braziliensis,* Ceylon.)
1930a, pp. 191-195. (Tea, Ceylon.)
1931, pp. 579-596. (Tea, Ceylon.)
Johnson, W. H., 1912, pp. 1-186. (Cocoa, San Thomé.)
de Jong, E., 1927, pp. 524-527. (Cotton, Belgian Congo.)
Kaiser, P., 1953, pp. 77-92. (*Anoplotermes pacificus* associated with plant roots.)
Kalshoven, L. G. E., 1924, pp. 58-72. (*Cryptotermes,* tea, Java.)
1930, pp. 1-154. (*Kalotermes tectonae.*)
1950, pp. 146-177. (Agriculture, Indonesia.)
1952, pp. 1-7. (*Neotermes,* teak.)
1954b, pp. 59-74. (Java, survival *Neotermes* colonies in felled teak.)
Kelsey, J. M., 1945a, pp. 69-75. (*Neotermes rainbowi,* coconut palms, Suwarro Island—North Cook Group.)
1952, p. 5. (*Calotermes brouni* in milled *Pinus radiata* and in dead wood living trees. *Coptotermes acinaciformis, frenchi,* and *lacteus,* introduced from Australia, in living pines and timbers, Auckland, New Plymouth, or Gisborne, New Zealand.)
Kent, G. H., 1890, p. 283. (Mississippi, *Termes flavipes* destroying collard-stalks and roots of turnip by gradually eating out interior.)
King, C. B. R., 1938, pp. 28-34, 195-205, 160-166. (Ceylon, *Neotermes militaris,* tea, 17% bushes damaged over 50-year period, less than 5% infested, infestation through roots.)
King, H. H., 1928, pp. 1-7. (Sudan, termites caused but little crop damage.)
Koningsberger, J. C., and Zimmerman, A., 1901, pp. 80-82. (Java, coffee.)
Kutchka, G. MacM., 1937, pp. 45-48. (U.S., greenhouse plants.)
Laboulbène, A., 1886, p. lii-liii. (Agen, France, *Reticulitermes lucifugus,* vine.)
Lal, R., and Menon, R. D., 1953, pp. 1-94. (India, Burma, Ceylon, crops.)
Lepesme, P., 1947, pp. 152-155. (Palm.)
Lever, R. J. A. W., 1939, pp. 17-20. (Fiji.)
Light, S. F., *in* Kofoid, 1934, 2d ed., pp. 314-320. (California, *Paraneotermes simplicicornis,* citrus trees.)
1937a*, pp. 423-464. (California, *Paraneotermes simplicicornis,* citrus trees.)
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Luke, W. J., Jr., 1952, pp. fb-7. (Dominican Republic, Aldrin most effective in soil to protect sugarcane.)
Maki, M., 1916, pp. 1-266. (Formosa, mulberry tree.)
Marais, E. N., 1937, pp. xv+184. (South Africa.)
Martin, G. C., 1950, pp. 61-63. (Rhodesia, tobacco.)
Martorell, L. F., 1941, pp. 8-81. (Puerto Rico, forest trees, *Nasutitermes costalis,* Mona Island, *Kalotermes snyderi.*)
1945, pp. 69-354. (Puerto Rico, forest trees, *Nasutitermes costalis* Mona Island, *Kalotermes snyderi.*)
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Mayné, R., 1917, pp. 1-80. (Belgian Congo, cacao.)

MILLER, D., 1940-1941, pp. 333-334. (New Zealand, *Stolotermes ruficeps* and *Calotermes brouni* native, not destructive to native or exotic forests, latter damages service timbers; introduced termites damage timbers.)

MORRIL, A. W., 1917, pp. 42-43. (Mesa, Arizona, *Amitermes tubiformans* young citrus orchard.)

MORSTATT, H., 1913, pp. 443-464. (East Africa, rubber trees.)

MOSSOP, M. C., 1949, pp. 17-19. (Rhodesia, gardens and orchards.)

MOUTIA, L. A., and MAMET, R., 1946, pp. 439-472. (Mauritius.)

MUNGOMERY, R. W., 1947, pp. 35-45. (Brisbane, Australia, sugarcane, *Coptotermes acinaciformis, Hamitermes obtusidens, Rhinotermes intermedius seclusus.*)

NAUDÉ, T. J., 1934, pp. 1-20. (South Africa, *Termes, Hodotermes, and Trinervitermes,* veldt destruction, outbreak due scarcity birds and drought, overstocking range.)

NEETHLING, L. J., 1952, p. 65. (South Africa, *Trinervitermes havilandi* destroys 20% grass in dry winter.)

NEVES, C. M. B., 1948, pp. 444-447. (Portugal, *Reticulitermes lucifugus,* cork oak, *Quercus suber.*)

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NIRULA, K. K., ANTONY, J., and MENON, K. P. V., 1953, pp. 26-34. (India, damage to coconut and control, parathion, BHC, chlordane.)

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 1909, pp. 1-31. (Federated Malay States, *Termes gestroi,* rubber trees.)

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REH, C., 1925, pp. 238-246. (Plants.)

REIS, G. S., 1934, pp. 24-30. (India, *Coptotermes curvignathus,* rubber.)

RICHARDS, P. B., 1917, pp. 338-348. (Malaya, *Termes gestroi,* rubber and coconut trees.)

RIDLEY, H. N., 1909, p. 563. (Malaya, *Termes gestroi,* trees.)

RISBEO, J., 1950, pp. 45-47. (Senegal and French Sudan, *Microcerotermes parvulus,* crops.)

ROARK, R. C., 1939, pp. 305-309. (*Kalotermes tectonae* attacks derris.)
 1942, p. 14. (Rotenone used to control termites damaging rubber trees.)

ROBINSON, H. C., 1905, pp. 2-12. (Malaya, *Termes gestroi,* attacking para rubber, *Hevea braziliensis.*)

ROONWAL, M. L., 1954, pp. 459-462. (India, damage to teak by *Odontotermes parvidens.*)

ROUBAUD, E., 1916, pp. 363-436. (Senegal, *Termes natalensis* and *T. bellicosus* and *Microcerotermes parvulus* attacking grain in the soil.)

ROUPPERT, K., 1943, pp. 1-16. (Citrus trees, Palestine.)

RUNGS, CH., 1953, pp. 61-76. (Moroccan tree, *Argania spinosa* (L.),? *Hodotermes ochraceus* Burm.)

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RUTGERS, A. A. L., and DAMMERMAN, K. W., 1914, pp. 5-15. (*Hevea braziliensis,* Java, *Coptotermes gestroi.*)

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SARAIVA, A. C., 1939, pp. 101-114. (*Termes latericius,* cotton, citrus, deciduous fruit trees, forest trees, Portuguese East Africa.)

SARWAR, M. S., 1940, pp. 144. (Wheat, sugarcane, maize, and fruit trees, Punjab, *Odontotermes.*)

SCHUSTER, L., 1911, p. 65 (Teak trees.)

SCUDDER, S. H., 1861, pp. 287-288. (*Termes frontalis,* grapevines, in hothouses, Salem, Mass.)
 1867, pp. 154-157. (*Termes frontalis,* grapevines, in hothouses, Salem, Mass.)
 1887, pp. 217-218. (Living plants, U.S.)
 1891, pp. 15-16. (*T. flavipes,* tree ferns in tubs, hothouses, New England; also geraniums; and cabbages in gardens.)

SEABRA, A. F. DE, 1917, pp. 24-28. (*Neotermes gestri, Microcerotermes theobromae,* cacao, San Thomé.)
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1922, pp. 78-87. (Cacao, San Thomé.)
1939, pp. 1-699. (Wheat pests of the world.)
SEOANE, V. L., 1879, pp. xiv-xv. (Trees, Philippines.)
SHARPLES, A., 1936, pp. 370-384. (Rubber tree, *Coptotermes.*)
SHIRAKI, T., 1920, pp. 629-631. (Tea plants, Formosa.)
SHUMAN, F., 1954, pp. 16-17. (India, wheat, full diet equips for termite battle.)
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SMEE, C., 1932, pp. 44-46. (Young tea bushes, *Acanthotermes militaris,* Nyasaland.)
SMITH, F., 1866, p. 327. (Coffee beans, *Termes cumulans?,* Catagallo, South Brazil.)
SMITH, J. B., 1894, p. 494. (New Jersey, blackberry roots, *Termes flavipes.*)
SMITH, J. H., 1938, p. 254. (Fruit trees, Queensland.)
SMYTH, E. G., 1919a, p. 138. (Sugarcane, Cuba.)
SNYDER, T. E., 1916, pp. 18-32. (Living plants, trees, U.S., corn, cotton, sugarcane, rice, potatoes, apple, pecan trees, grapevines.)
1925, pp. 14-17. (Citrus trees, Florida.)
1926c, pp. 18-21. (Living vegetation, U.S.)
1927e, p. 17, fig. 18. (Tree, *Coptotermes,* Honduras.)
1935e, pp. 115-119. (Living vegetation, U.S.)
1948, pp. 129-135. (Living vegetation, world.)
1954b, pp. 1-64. (Living vegetation, U.S., Canada.)
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SWEZEY, O. H., 1920, p. 218. (Sugarcane, Hawaii.)
1928, p. 19. (Trees, Hawaii.)
1940, p. 177. (Cultivated plants, Guam.)
1954, pp. 20, 43, 62, 93, 98, 110, 114, 118, 123, 137, 141, 142, 148, 156, 165, 211, 217. (Hawaii, *Neotermes connexus, Kalotermes immigrans,* forest trees, all islands.)
THOMPSON, W. L., 1933, pp. 84-87. (Citrus trees, *Neotermes castaneus,* Florida.)
1934, pp. 33-39. (Citrus trees, *Neotermes castaneus,* Florida.)
THORNEWILL, A. S., 1924, pp. 738-739. (Trees, Rhodesia.)
TSE, K. B., 1936, pp. D1-22. (Crops, near Canton, China, *Termes formosanus* the most injurious termite.)
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VIVET, E., 1914, pp. 333-338. (Grapevine, *Calotermes flavicollis,* attack cicatrices due to pruning, Algiers.)
VOELCKER, O. J., 1953, pp. 15-40. (*Microtermes pallidus* damaging tea bushes, Fed. Malaya, p. 29.)
WADE, J., 1951, pp. 7-56. (Sugarcane, world; termites, p. 7, *Anoplotermes schwarzi;* p. 11, *Calotermes* sp.; p. 16, *Coptotermes acinaciformis, C. formosanus, C. heimi, C.* sp.; p. 17, *Cryptotermes piceatus;* p. 26, *Eutermes costaricensis, E. haitiensis, E. morio, E. ripperti;* p. 31, *Kalotermes immigrans, K. schwarzi;* p. 34, *Leucotermes cardini, L. flavipes, L. philippinensis, L. tenuis;* p. 35, *Mastotermes darwiniensis;* p. 37, *Microtermes nigritus;* p. 38, *Nasutitermes aequalis, N. morio, N. pallidiceps, Neotermes connexus;* p. 39, *Obtusitermes aequalis;* p. 49, *Reticulitermes speratus;* p. 56, *Termes classicus, T. formosanus, T. morio, T. obesus, T. taprobanus, T. vulgaris, T.* sp.)
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1948, pp. 1-5. (*Reticulitermes flavipes* tubes on maple trees, Toronto, Canada.)
WATSON, J. R., 1938, pp. 8, 23. (Citrus trees, banked trees, U.S.)
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Williams, F. X., 1931, pp. 76-84. (Sugarcane, Hawaii.)
Wolcott, G. N., 1925, p. 422. (Seed cane, Haiti, *Parvitermes pallidiceps.*)
Woodhouse, E. J., 1913, pp. 1-2. (Crops, Behar and Orissa, western Bengal, India, *Termes* sp., wheat, sugarcane.)
Woodworth, H. E., 1921, pp. 9-35. (Crops, Philippines.)
Yano, M., 1912, pp. 52-56. (Living plants, Japan.)
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DETECTION, See also MICROPHONES

Barton, R. C., *in* Kofoid, 1934, 2d ed., pp. 711-714. (Audioamplifying apparatus.)
Berger, B. C., 1947, pp. 1-44. (Illinois, how to recognize.)
Crawford, D. L., 1928, p. 36. (X-ray, negative results.)
Emerson, A. E., 1929a, pp. 722-727. (Communication among termites, vibration.)
Emerson, A. E., and Simpson, R. C., 1929, pp. 648-649. (Apparatus for detection substratum communication among termites.)
Gregory, J. N., 1940, pp. 310-311. (X-ray timber.)
Snyder, T. E., 1925f, pp. 32-33. (Flights.)
1935, pp. 235-236. (Flights, tubes, damage.)
1935e, pp. 159-160. (Flights, tubes, damage.)
1947b, pp. 144-147. (Flights, tubes, damage.)
1948, p. 203. (Microphone.)
1950d, pp. 9-12. (Sound, blisters, pellets, plugs—dry-wood termites.)
1951a, pp. 237, 250, 261. (Subterranean termites.)
1952, p. 28. (By frass.)
1952d, pp. 33-34. (History use stethoscopes, geophones, microphones.)
Stanford, E. E., 1934, p. 86, fig. 74. (X-ray reveals insect damage in wood.)
Sweetman, H. L., 1950, pp. 23-38. (By damage, frass.)

DIGESTION, See also NUTRITION, PROTOZOA

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Cleveland, L. R., 1923, pp. 444-461. (Symbiosis, intestinal flagellates, correlation between food and morphology and presence of Protozoa.)
1923a, pp. 424-428. (Symbiosis, intestinal flagellates, correlation between food and morphology and presence of Protozoa.)
1924, pp. 178-201, 203-227. (Symbiosis, intestinal flagellates, correlation between food and morphology and presence of Protozoa, especially *R. flavipes.*)
1925, pp. 282-287. (*Trichonympha campanula* ingests solid particles of wood for food.)
1925a, pp. 289-293. (Termites live indefinitely on diet pure cellulose.)
1925b, pp. 295-308. (Feeding habits of castes and relation to intestinal flagellates.)
1925c, pp. 309-326. (Symbiosis, *Termopsis* and its intestinal flagellates.)
1926, pp. 51-60. (Symbiosis, termites and their intestinal flagellates.)
1928, pp. 231-237. (Symbiosis, termites and their intestinal flagellates.)
Cleveland, L. R., Sanders, E. P., and Hall, S. R., 1931, p. 92. (Protozoa roach, *Cryptocercus,* and termites, relation to evolution from roaches.)
Dickman, A., 1931, pp. 85-92. (Symbiosis, intestinal Protozoa, bacteria, spirochaetes next to Protozoa in abundance.)
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1941, pp. 103-113. (Flagellates responsible for digestion cellulose, bacteria do not have prevailing role.)
Home, E., 1814, pp. 378-384. (Digestive organs.)

Hungate, R. E., 1936, pp. 240-249. (Role bacteria and molds in cellulose decomposition slight.)
1938, pp. 1-25. (Relative importance of the termite and Protozoa in wood digestion—in *Zootermopsis*.)
1938a, p. 53. (Some products of the cellulose dissimilation by termite Protozoa.)
1939, pp. 230-245. (Anaerobic carbohydrate dissimilation by intestinal Protozoa, *Zootermopsis*.)
1943, pp. 730-739. (Quantitative analysis on the cellulose fermentation by Protozoa.)
1944, pp. 91-98. (Nitrogen utilization by *Zootermopsis*.)
1946, pp. 9-24. (Symbiotic utilization of cellulose, microorganisms ferment digested cellulose, products absorbed and oxidized by host, utilization same as in cattle.)
Mansour, K., and Mansour-Bek, J. J., 1934, pp. 363-382. (Role of microorganisms in digestion of wood.)
Misra, J. N., and Ranganathan, V., 1954, pp. 100-113. (India, digestion cellulose by *Cyclotermes obesus*.)
Montalenti, G., 1932, pp. 859-864. (*Calotermes flavicollis*, amylase and invertase present in midgut: proteolytic enzyme also exists.)
Mukerji, D., and Raychaudhuri, S., 1943a, p. 166. (Digestive system *Termes redemanni*.)
Platania, E., 1938, pp. 297-328. (Structure digestive tube *Reticulitermes lucifugus*.)
Visintin, B., 1941, pp. 393-406. (*Calotermes flavicollis* fed with compressed yeast free of cellulose substances eliminates normal fauna of flagellates and loses power to digest cellulose.)
1947, pp. 290-300. (Starch in nutrition utilized as carbohydrate food, enzyme active in intestines partially free of Protozoa.)
Visintin, B., et al., 1941-1942, pp. 27-44. (Digestion cellulose (in *Kalotermes flavicollis*) due to activity flagellate Joenidae.)

DISEASES, HUMAN, PLANT, and TERMITE

Belt, T., 1874, p. 181. (Epidzootic among termites, Nicaragua.)
Bereesberg, H. v.P., 1907, pp. 757-762. (Uses in medicine, Africa.)
Fuller, C., 1918a, pp. 43-48. (Death natives following feast on *Hodotermes*, South Africa.)
Harper's Family Library, 1831, pp. 147-148. (East Indies, winged with flour made into pastry, eaten too abundantly causes fatal cholera; Africa, winged parched.)
Hirst, L. F., 1933, pp. 47-48. (Bacteriology dry-wood termites, Ceylon, relation to sprue, "*Monilia*" cultured from fecal pellets.)
Jepson, F. P., 1933, pp. 1-46. (Possible factor pellets dry-wood termites in etiology sprue, Ceylon.)
Jordens, J. H., 1801, pp. xxviii+318. (Human parasites.)
Snyder, T. E., 1951b, pp. 31-32. (Sudden death workers and nasuti *Nasutitermes costalis* in building, Dominica.)
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Adamson, A. M., 1937, pp. 141-149. (Trinidad.)
1938, pp. 220-224. (Lesser Antilles.)
1940a, pp. 12-15. (Trinidad and Tobago, 56 species from former, 10 from latter area, ecology.)
1946, pp. 221-223. (Trinidad and Tobago, 56 species from former, 10 from latter area, ecology.)
1948, pp. 53-55. (Lesser Antilles.)
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Alexander, A. E., 1936, p. 34. (*Reticulitermes flavipes* north bank Cascadilla Creek, Ithaca, central New York.)
Alibert, H., 1951, pp. 9-174. (West Africa.)
Annandale, N., 1923, pp. 233-251. (Chilka Lake, Barkuda, India.)
Anonymous, 1864, p. 310. (St. Helena.)
1870, pp. 642-644. (France.)
1891, p. 471. (Pacific Coast, U.S.)
1911, pp. 273-274. (Ceylon.)
1914, p. 74. (Barbados.)

1933a, p. 30. (No invasion of eastern U.S.—Dr. T. E. Snyder.)
1941b, pp. 117-123. (France.)
1950a, pp. 1-75. (South Africa.)
1953s, p. 148. (Toronto, Ontario, Canada, *Reticulitermes flavipes* only slightly extended the infested area.)

Assmuth, J., 1927, pp. 171-173. (British India.)

Auctores, 1952, pp. 87-88. (Japan, *Coptotermes formosanus, Leucotermes speratus,* and *Calotermes satsumensis.*)

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Berland, L., 1926, pp. 72-73. *Calotermes flavicollis,* le Var, France.)

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1954, pp. 104-111. (Sahara desert, role termites.)

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Bodenheimer, F. S., 1935, pp. 327, 329. (Palestine.)

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Bonaventura, G., 1953a, pp. 1-32. (Umbria, Italy.)

Boys, W. J. E., 1846, pp. cli-clii. (India.)

Brauer, F., 1876, pp. 265-300. (Europe, especially Austria.)

Brimley, C. S., 1938, p. 28. (North Carolina, 3 species *Reticulitermes.*)

Bugnion, E., 1913e, pp. 165-172. (Indo-Malaya.)
1913f, pp. 24-58. (Ceylon.)
1920, pp. 49-51. (*Reticulitermes lucifugus,* Basses-Pyrénées.)

Cachan, P., 1949, pp. 177-275. (Madagascar.)
1950a, pp. 111-117. (Madagascar, *Neotermes, Heterotermes philippinensis, Coptotermes truncatus, Psammotermes voeltzkowi, Eutermes caniculatus, Coarctotermes clepsydra, Capritermes capricornis,* distribution.)
1951, pp. 1-18. (Madagascar.)

Calliot, J., 1877, pp. 392-397. (South America.)

Capra, F., 1935, pp. 44-46. (*Trinervitermes tripolitanus,* Abyssinia, not Libia.)
1938, p. 125. (*Trinervitermes tripolitanus* and *T. trinervius,* Libia.)
1948, pp. 77-79. (*Reticulitermes lucifugus,* Italy.)

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1944, p. 64. (*Zootermopsis nevadensis* and *Reticulitermes tibialis,* Montana.)

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Charrier, H., 1923, pp. 216-217. (*Reticulitermes lucifugus,* Tangiers.)

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1876, p. 17. (American termites, *Termes flavipes,* in Vienna.)
1878, p. xii. (Cuba, *Termes ripperti;* Africa, *Termes trinervius.*)
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PERTY, M., 1830-1834*, pp. 19-20, 127-129. (Brazil.)
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RILEY, C. V., 1870, p. 11. (*Termes frontalis,* Schönbrunn, "Germany.")
1877, p. 43. (*Termes flavipes,* Germany.)
RILEY, N. D., 1943, p. 95. (*Nasutitermes costalis* in England, introduced.)
RODON, G. S., 1900, pp. 363-364. (India.)
ROMANIS, R., 1883, pp. 214-215. (Rangoon.)
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ROSSI, P., 1792*, p. 107. (Etruria.)
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SANDIAS, A., 1908, pp. 1-9. (Italy.)
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Pruthi, H. S., 1939, p. 108. (Swarming *Odontotermes* and *Microtermes,* Delhi, India.)

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1916, p. 8. (*Leucotermes,* U.S.)
1920, *in* (Banks and) Snyder, 1920*, pp. 89-195. (U.S. flight of *Reticulitermes* correlated with blooming of dogwood (*Cornus*); climb to elevations to obtain start for flight, pp. 98-101.)
1920a. (Colonizing flight nearctic termites by day or night, *Reticulitermes* by day, pp. 128-130; pseudoflight by brachypterous reproductive forms, pp. 130-134.)
1925c, p. 89. (Pseudoflight by brachypterous reproductive forms, *Reticulitermes,* U.S.)
1925f, pp. 32-33. (*Reticulitermes* in buildings, U.S.)
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1935e, pp. 43-47. (U.S., colonizing flight by *Reticulitermes.*)
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1950d, p. 8. (U.S., nonsubterranean termites fly by night, swarms small.)
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1953, pp. 23-24. (Swarming behavior, *Macrotermes nigeriensis,* at dusk, first rains, simultaneous emergence from number of nests.)

FOLKLORE

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BRYK, F., 1929, pp. 150-163. (Negro folklore, termites.)
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SNYDER, T. E., 1935e. (According to C. Fuller, natives Transvaal, South Africa, venerate old mounds for hundreds years, p. 64; in southern U.S. Negroes place bag white ants about neck children to help cut teeth, p. 106.)
1948. ((Same as 1935e, p. 64), p. 78; quotes Myers, used as oracles in Sudan, p. 78; (same as 1935e, p. 106), p. 117; queens eaten to invigorate old men, p. 145.)
WHITE, W. G., 1917, p. 485. (Indian tribe Savannah region British Guiana, Patamonas of upper Potaro; "Pata" means place, "mona," ants' nest.)

AS FOOD

ANONYMOUS, 1907, p. 26123. (Australia, food of blacks.)
AUFFRET, C., and TANGUY, F., 1949, pp. 110-112. (Food value termites, living and fried, Prov. de Pita, Guinea, based on winged, swarming adults (Dakar), constitute for certain races source protein, fat, and calories.)
BEQUAERT, J., 1921, pp. 194-196. (Augmented man's food supply in both early and recent times; sale baskets of dried soldier termites in native market Belgian Congo; cover nest with leaves, trap winged.)
BERENSBERG, H. VON P., 1907, pp. 757-762. (Natal.)
BONDENHEIMER, F. S., 1951, pp. 1-352. (Africa, pp. 144-160; Tropical Africa, Asia, Australia, South America.)
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Clausen, L. W., 1954, p. 151. (Bantus of South Africa eat dealated termites mixed with vegetable oil and salt and toasted.)
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Hope, F. W., 1842, pp. 145-149. (Food to man.)
Kevan, D. K. McE., 1942, pp. 109-110. (Termites favorite food toad-bug in laboratory rearing.)
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Liong, L. S., 1953, pp. 220-222. (East Java, winged termites trapped in pit, from tube made of banana stem from nest to funnel (banana leaf), 60 cc. one trap, steamed or roasted.)
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1948. (Food man Africa, trap winged, p. 51; food, animals, pp. 139-145; (same as 1935e, p. 127), p. 145.)
Subrahmanian, T. V., 1934, p. 498. (Methods capture, cooking, South India.)
Tihon, L., 1946, pp. 865-868. (Lightly grilled termites among richest sources protein, value of 100 grams being 560.52 calories; ash shows high potassium and phosphoric acid, low in sulfates; oil high acidity, not sticky, yields clear, firm soap.)
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1949a, pp. 164-165. (*Ulmeriella latahensis*, n. sp., Miocene, Washington, U.S.)
1949b, pp. 352-373, 483-490. (World list, taxonomy.)
1950b, pp. 190-193. (U.S. fossils, their living relatives and habitats.)

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1955a, p. 32. (California, U.S., *Parastylotermes frazieri* Sny.)
1955c, pp. 79-80. (*Parastylotermes frazieri,* n. sp., from the Miocene, California, U.S.)
STEUDEL (Dr.), 1896, p. xcv. (East Africa, copal, winged.)
STONE, B., 1950, p. 17. (*Lagena samanica* Berry, Foraminifera, Upper Eocene, NW. Peru, described in 1928, included in catalog; is termite pellet.)
1951, p. 139. (Above species described as Eocene protozoan, order Foraminifera, is fecal pellet of *Cryptotermes brevis* (Walker 1853).)
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WOODWARD, H., 1892, pp. 193-198. (Lower Lias, Barrow-on-Soar, Leicestershire.)

FUMIGATION

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1947d, p. 18. (California, dry-wood termites.)
1947e, pp. 12-13. (California, methyl bromide, dry-wood termites.)
1947f, p. 28. (California, rules for fumigating structures, dry-wood termites.)
1950a, pp. 77-84. (South Africa, toxic smokes; also liquid fumigants.)
1952b, p. 30. ("Duratex" tarpaulins to seal structures.)
1953, pp. 22-25. (Methyl bromide, U.S.)
BACK, E. A., 1940, pp. 365-374. (Books, U.S., HCN gas in cylinders, dry-wood termites.)
DIETZ, H. F., and SNYDER, T. E., 1924, p. 301. (Panama, hot fumes arsenic and sulfur pumped into mounds.)
DU PLESSIS, C., 1931a, pp. 1-7. (South Africa, termite colonies.)
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1921a, pp. 17-23. (France, chloropicrin, *Reticulitermes lucifugus,* buildings, 15 grams per cubic meter.)
FULLER, C., 1912a, pp. 345-369, 543-571. (Natal, South Africa, "Universal Ant Exterminator," nests in ground, mixture sulfur (3 lbs.) and arsenic (7 lbs.) heated and blown into nests.)
GUNN, J. W., 1953, p. 20. (California, 3 lbs. ethylene dibromide per 100 sq. ft. soil fumigation under concrete slabs.)
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SMITH, H. C., 1952, pp. 20, 28. (Safety rules in fumigation buildings in Southern California to control *Kalotermes minor* using methyl bromide.)
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1916, p. 31. (Exposed woodwork buildings, dry-wood termites, U.S., HCN gas, also books, papers, exposed furniture.)
1926c, pp. 17-18. (No permanent value in control subterranean termites; HCN recommended for control dry-wood termites, 12 oz. per 1,000 cu. ft.)
1935e, pp. 129, 146, 150, 158. (Not effective for control subterranean termites.)

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1948. (Fumigation dry-wood termites, U.S., p. 159; effective in control dry-wood termites, sealing, pp. 192-195; control termites in mound or carton nests, Tropics, p. 208.)

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FUNGI, ASSOCIATION WITH

Anonymous, 1930a, pp. 172-173. (Ceylon, symbiotic activity between termites and cellulose-decomposing bacteria; cellulose fabrics of nutritive value to termites only when microorganisms capable of converting cellulose into soluble carbohydrates had initiated destruction of the cellulose.)

Barker, S. G., 1938, pp. 1221-1229. (Fabrics protected against microbiological decay will not be attacked by termites, jute rot-proofed with Cuprinol, Cawnpore, unattacked after 8½ months, cellulose acetate fabric in Ceylon intact after long exposure, hessian treated with Bakelite varnish also immune.)

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FUNGUS CULTIVATION

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Berkeley, M. J., and Broome, C. E., 1870, pp. 494-567. (Ceylon.)
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Heim, R., 1938-1939, pp. 45-68. (Basidiomycetes, Madagascar.)
1940, pp. 410-412. (Ivory Coast in Guinea, Africa, termitophile agarics, grow in soil in direct connection with fungus heads (mycotêtes) which appear on piles chewed up vegetable material.)
1940a, pp. 121-127. (Spherical shape conidia not due to termites.)
1941, pp. 146-148. (*Termitomyces* not produced for food, only tolerated in chambers termites.)
1942, pp. 69-86. (Combs formed of fine ligneous residues, all agarics of combs are termitophilous *Termitomyces* eaten only occasionally by termites, inconvenient commensals, expel combs *T. microcarpus* as soon as there is risk of fructification or pullulation.)
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Xylaria; unrepaired nests have colony killed by excessive fungus growth.)

Penzig, O., and Saccardo, P. A., 1897, p. 496. (Java, *Xylaria torrubioides* "in vidis Termitidum" at Buitenzorg.)

Petch, T., 1906, pp. 185-270. (Fungi of nests of *Termes redemanni* and *obscuriceps,* Peradeniya, Ceylon.)

1907, pp. 229-238. (*Volvaria eurhiza* (agaric) and *Xylaria nigriceps* cultivated by *Termes.*)

1913, pp. 303-341. (Ceylon.)

1913a, pp. 389-393, 395-420. (Ceylon, *Eutermes monoceros.*)

1917, pp. 395-397. (Ceylon, *Termes obscuriceps.*)

Rant, A., 1921, pp. 170-173. (Molds of termites.)

1923, pp. 125-134. (*Termes gilvus* and *Odontotermes grandiceps.*)

Reichensperger, A., 1921, pp. 104-105. (*Termes* sp. during rainy season drags out cabbage material, fungus, and later replaces it in nest.)

Sharpe, C. F., 1894, pp. 228-229. (Coonoor, South India, vegetable substance deposited on ground by termites, egglike particles become fungi.)

Silvestri, F., 1903*, p. 153. (*Termes,* fungi for nutrition.)

Sjöstedt, Y., 1896*, pp. 267-280. (*Termes lilljeborgi,* fungus-grower (day termite) of the Cameroon.)

1900a*, pp. 1-236. (Africa.)

1903, pp. 89-101. (Africa.)

1904*, pp. 1-120. (Africa.)

Smeathman, H., 1781, pp. 139-192. (Pp. 60-85.)

Smith, E. F., 1896, pp. 319-321.

Snyder, T. E., 1935e, pp. 18, 55, 83-84. (General.)

1948, pp. 23, 62-63, 65, 99. (General.)

Trägårdh, I., 1904*, pp. 1-47. (Sudan.)

Volk, H. O., 1952, pp. 41-43. (Fungus gardens.)

Wheeler, W. M., 1907a, pp. 802-803. (Fungus-growing termites of Tropics—bibliography.)

GASEOUS ENVIRONMENT

Cleveland, L. R., 1925a, pp. 289-293. (Ability to live on pure cellulose, fix nitrogen?)

1925c, pp. 309-326. (Effects of oxygenation on symbiosis between *Termopsis* and its intestinal flagellates.)

Cook, S. F., 1932, pp. 246-257. (Respiratory gas exchange in *Termopsis nevadensis,* able to respire normally in carbon dioxide tension as high as 20%; evolve either H or CH_4.)

Cook, S. F., and Scott, K. G., 1932, pp. 505-512. (Absorption and elimination of water, *Termopsis angusticollis.*)

1933, pp. 95-110. (Nutrition requirements of *Zootermopsis* (*Termopsis*) *angusticollis.*)

Cook, S. F., and Smith, R. E., 1942, pp. 211-219. (Respiratory gas exchange of *Zootermopsis angusticollis* can be differentiated from that of the symbiotic microfauna. Respiration of the termite increases with rising temperature between 4° and 32° C., but metabolism of Protozoa, as indicated by hydrogen production, reaches a maximum between 16° and 24°. At 4° the respiration quotient of the termite falls from a normal of 0.9 to 0.7. Starvation can produce a similar condition due to functional failure of the intestinal fauna and consequent depletion of available food.)

Day, M. F., 1938, pp. 317-327. (*Eutermes exitiosus,* Australia, has concentration of CO_2 50 times as great as that of normal atmosphere; while injurious to many animals, is normal environment certain termites.)

Desneux, J., 1948, pp. 1-54. (Nests *Apicotermes* tropical Africa.)

Doflein, F., 1906-1907, pp. 203-209.

Emerson, A. E., 1937a, pp. 241-248.

1938, pp. 247-284.

1949, *in* Allee, p. 633. (Exchange gases between nest and surrounding soil necessary in African *Apicotermes,* more imperative in moist soil.)

Fyfe, R. V., and Gay, E. J., 1938, pp. 1-22. (Humidity of atmosphere within mounds *Eutermes exitiosus.*)

Ghidini, G. M., 1939a, pp. 385-399. (Respiration quotient different castes *Reticulitermes lucifugus.*)

Gilmour, D., 1940, pp. 297-308. (Anaerobic gaseous metabolism of the roach *Cryptocercus punctulatus,* intermediate between higher roaches and more primitive termites.)

1940a, pp. 331-342. (Anaerobic gaseous metabolism of *Zootermopsis nevadensis.*)

Grassé, P. P., 1937b, pp. 383-390. (Air (microclimate) in termite nests rich in anhydrid carbonique.)

GRASSÉ, P. P., and NOIROT, C., 1948, pp. 735-736. (Nests *Apicotermes arquieri.*)
1948b, pp. 869-871. (The climatization of the termitarium by termites and the transportation of water.)
HUNGATE, R. E., 1938, pp. 1-25. (Nutrition of *Zootermopsis.*)
1941, pp. 467-489. (Nitrogen economy, *Kalotermes, Zootermopsis,* and *Reticulitermes.*)
PETCH, T., 1906, pp. 185-270. (Ceylon.)
RICHARDSON, H. B., 1929, pp. 61-125. (Respiratory quotient.)
ROESSLER, E. S., 1932, pp. 357-368. (Nitrogen needs growing *Termopsis.*)
SNYDER, T. E., 1948, pp. 23, 73, 105. (Air conditioning.)
TANG, PEI-SUNG, 1933, pp. 260-274. (Rate oxygen consumption of tissues and lower organisms as a function of oxygen tension.)
VOLK, H. O., 1952, pp. 41-43. (Climate foundation in termite nest.)
WILLIAMS, O. L., *in* Kofoid, 1934, 2d ed., pp. 42-49. (Factors limiting distribution, differences in moisture requirements native termites; *Reticulitermes hesperus* prefers more moisture and more carbon dioxide gas than *R. tibialis.*)

GENETICS

BENKERT, J. M., 1930, pp. 1-3. (*R. flavipes* has 42 diploid chromosomes in macropterous male and male soldier.)
1933, pp. 121-122. (*R. flavipes* macropterous male has 42 diploid chromosomes, male soldier has 2 (probable) haploid chromosomes, diploid 42.)
EMERSON, A. E., 1945, pp. 14-19. (Population, genetics.)
GRASSÉ, P. P., 1937, p. 1677-1679. (Aberrant spermatogenesis in the Metatermitidae.)
GRASSÉ, P. P., and BONNEVILLE, P., 1936, pp. 1009-1010. (Abortive or atypical spermatogenesis in *Bellicositermes natalensis.*)
PADOA, L., 1942, *in* Visintin, 1941-1942, pp. 13-17. (Blood lymph, repartition different elements, differed according to origin "larvae," nymphs or soldiers *Calotermes flavicollis,* Italy.)
STEVENS, N. M., 1905, pp. 1-32. (In *Zootermopsis* male nymphs diploid chromosomes number 52.)

GENITALIA, EXTERNAL AND INTERNAL

AHRENS, W., 1934, pp. 187-195. (Accessory glands homologous to those of Blattidae and Mantidae.)
1935, pp. 223-302. (*Termes redemanni* female genitalia.)
BATHELLIER, J., 1927, pp. 311-321. (Castes *Eutermes matangensis.*)
BROWMAN, L. G., 1935, pp. 113-129. (Female genitalia homologized with those of female roaches.)
BRUNELLI, G., 1904, pp. 285, 350-356. (Ovary of social insects.)
1905, pp. 121-126. (Structure of ovary.)
1905a, pp. 718-721. (Destruction of the oocytes of the queen infested by Protozoa.)
1906, pp. 55-62. (Destruction of the oocytes of the queen infested by Protozoa.)
CLÉMENT, G., 1953a, pp. 1095-1096. (*Anacanthotermes ochraceus,* differentiation of ovocytes in testicles of neuters.)
GEYER, J. W., 1950, pp. 106-107. (Oocytes and spermatozoa found in testes (? gonads) of reproductive castes but not in soldiers of *Neotermes zuluensis.*)
1951, pp. 233-325. (Hermaphrodites of *Neotermes,* germ cells of both sexes in same individual, reproductive organs 9 other species in 6 genera.)
GRASSI, B., and SANDIAS, A., 1897, pp. 8-9.
HAGEN, H. A., 1885a, p. 211. (Ovaria Embiidae similar to those of *Termes.*)
HOLMGREN, N., 1909*, pp. 185-188. (Anatomy.)
JUCCI, C., 1926a, pp. 248-250. (Cell nutrition sperm.)
1930, pp. 231-238. (Cell nutrition sperm.)
JUCCI, C., and SPRINGHETTI, A., 1952, pp. 130-132. (Evolution seminal vesicles.)
KNOWER, H. McE., 1901, pp. 135-138. (Development generative tract.)
MARCUS, H., 1953, pp. 1-16. (Illustrates genitalia.)
MUELLER, FR., 1873-1875, pp. 333-340. (Genitalia soldiers, *Calotermes.*)
MUKERJI, D., and RAYCHAUDHURI, S., 1944, p. 76. (Reproductive organs *Termes redemanni.*)
NEEFS, Y., 1932, pp. 409-424. (Evolution external genitalia, *Calotermes flavicollis.*)

Snodgrass, R. E., 1937, pp. 12-14. (Reproductive system termites, structure male shows group (orthopteroid) unity by the compounding of the accessory genital glands.)

Springhetti, A., 1952, pp. 1-4. (Seminal vesicle in *Mastotermes* and *Macrotermes*.)

1953. (Seminal vesicle, *Zootermopsis* and *Blattela*.)

Stella, E., 1936, pp. 731-734. (Maturation gonads in *Reticulitermes lucifugus*.)

1939, pp. 81-85. (Behavior gonads in workers *Reticulitermes lucifugus*.)

1939a, pp. 255-262. (Cytological data on the gonads of soldiers of *Bellicositermes bellicosus*.)

Stella, E., and Ghidini, G. M., 1942, pp. 825-831. (Soldiers of *Trinervitermes eldirensis* showed ovaries with small resting oögonia, degenerative or testes with resting spermatogonia, undifferentiated or no gonads, workers had no gonads in this species or in *Bellicositermes*, regression of gonads and evolution of sterile caste.)

Weyer, F., 1930b, pp. 177-190. (Germ-glands in workers and soldiers, *Calotermes, Microcerotermes,* and *Prorhinotermes,* germ-glands in all castes and species; in a few male germ-glands of *Calotermes* soldiers and *Microcerotermes* workers, mature spermatozoa present.)

GEOLOGIC AGENTS

Adamson, A. M., 1943, pp. 107-112. (Termite consumption plant remains accelerates formation humus; nest and runway building brings soil above surface and exposes it to weathering and admixture with humus; promotes aeration, drainage. On the other hand, termites feeding in large numbers may seriously reduce amount of organic matter in soil; harvester termites denude parts of African veldts causing erosion; soil surrounding large mounds may be deficient in calcium owing to accumulation calcium carbonate in mounds.)

Branner, J. C., 1900, pp. 151-153. (Geologic agents in Tropics.)

1911, p. 303. (Geologic agents in Tropics, tropical America.)

1911a, pp. 449-496. (Geologic agents in Tropics, tropical America.)

Chevalier, A., 1949, pp. 1057-1092. (Role in soil impoverishment or improvement, tropical Africa.)

Corbet, A. S., 1935, pp. xiv + 156. (Biological processes in tropical soils, special reference to Malaysia.)

Cosar, H. G., 1934, pp. 73-79. (Africa, enriching soil.)

Dimo, N. A., 1917, pp. 153-190. (Importance in character soil, Turkestan.)

Drummond, H., 1887, pp. 137-146. (Termite tropical analog earthworm.)

1888, pp. 123-158. (Termite tropical analog earthworm, Africa.)

Eyles, F., 1927, pp. 289-297. (Salisbury Commonage, South Africa, termite mounds one of six plant habitats.)

Grassé, P. P., 1950a, pp. 549-554. (Tropical soils and termites.)

Hamilton, R., 1954, pp. 153-155. (Africa.)

Hummel, K., 1930, pp. 356-363. (Movements of earth by termites in nest building in Africa (arid forests) are not less than those by men in thickly settled parts of Europe.)

Joachim, A. W. R., and Pandittesekera, D. G., 1948, pp. 119-129. (Crumb structure and stability of local soils; termite mound earth superior in crumb content to soils from which they were derived except when latter under grass.)

Kalshoven, L. G. E., 1941a, pp. 568-582. (Influence termites on fertility soil in Java.)

1941b, pp. 702-716. (Influence termites on fertility soil in Java, bibliography.)

Kays, C. W., 1936, p. 8. (Termites vs. government geologists, tubes in sand dunes, California.)

MacGregor, W. D., 1950, pp. 3-8. (Termites in relation to vegetation and soil fertility.)

Murray, J. M., 1938, pp. 288-297. (Termites in relation to vegetation and soil fertility, South Africa.)

Naudé, T. J., 1934, pp. 1-20. (Termites in relation to veldt destruction and erosion.)

Passarge, S., 1896, p. 350.

Pendleton, R. L., 1941, pp. 29-53. (Analysis termite mounds in Thailand shows soils differ from local soils as to pH and occurrence of $CaCO_3$ together with increased replaceable bases and organic matter (from low levels?). Physically there is a higher air dry moisture content, higher pore space, more water absorption, volume expansion greater. Surrounding soils are acid pH 4.1 to 5.8,

mounds often pH 8 or higher in lower parts. Ca content fine earth mounds higher—concretions made up 33% or 41% from base old mounds, containing 35% and 18% of $CaCO_3$, although there are no known deposits of $CaCO_3$ available to the termites. Possibly the termites concentrate the $CaCO_3$ from the plant materials and this indicates use of the mound for long periods of time. Mounds average 1 per acre, allow for growing of vegetation which does not do well in arid, poorly drained surrounding soil. Judicious admixtures of mound soil enrich land, but unless widely mixed, infertile areas, often "gravelly," are left due to presence of calcareous concretions.)

1942, pp. 340-344. (Soils of termite mounds in Thailand have higher fertility; higher pH, plant nutrient content, more satisfactory moisture relationships, $CaCO_3$ concentrations near base mounds, even though built from acid soils; mounds 2 to 3 m. high, 5 to 7 m. in diameter.)

Prescott, U. A., and Pendleton, R. L., 1952, pp. 23, 41-48. (Laterite and laterite soils.)

Ratcliffe, F. N., Gay, F. J., and Greaves, T., 1952, pp. 45-47. (Australia, denude grassland, reduce productivity pastures, mounds menace on aerodromes.)

Sen, A., 1944, pp. 280-281. (India, soil of termites feeding on paper, wood, and cow dung particularly rich in plant-food nutrients.)

Shrikhande, J. G., and Pathak, A. N., 1948, pp. 327-328. (Relation to soil fertility.)

Snyder, T. E., 1915, p. 85. (Relation termites to origin of hog wallows and prairie mounds, references.)

1948, pp. 77-78. (Lead to soil erosion in African veldt, fertility in Thailand.)

Spellig, F., 1924, pp. 352-354. (German East Africa, fertility soil increased.)

Steel, D., 1913, pp. 429-433. (Geologic work in Belgian Congo.)

Thomas, A. S., 1943, pp. 149-177. (Uganda, termites have important soil-building functions.)

Thorp, J., 1949, pp. 185-186. (Effects of certain animals that live in soils, concentration calcium in mounds in Tropics by termites.)

Wüst, J., 1932, p. 49. (Africa, turning up large amounts soil.)

HEAT, See TEMPERATURE

HUMIDITY

Emerson, A. E., 1938, pp. 268, 281. (Termite nest functions primarily to maintain a constant high humidity.)

Emerson, A. E., *in* Allee et al., 1949, p. 672. (Termite nest functions primarily to maintain a constant high humidity.)

Fyfe, R. V., and Gay, F. J., 1938, pp. 1-22. (Humidity of atmosphere and moisture conditions within mounds *Eutermes exitiosus,* Australia, humidity usually 95% in inner mound. Structure mound retains moisture produced by metabolism termites, and temperature maintained by termites and mound material prevents deposition of free water in central regions.)

Geigy, R., and Ernst, E., 1951, pp. 414-420. (Gradual increase in length life individuals *Kalotermes flavicollis* raised under increasing humidity. *R. lucifugus* and *Nasutitermes arborum?* individuals showed significant increase in length life only at 70% R.H. or higher. *Nasutitermes* worker showed greater resistance when with soldiers than when isolated. *K. flavicollis* showed greatest resistance to drying. Results correlated with humidity normal habitats.)

Grassé, P. P., and Noirot, C., 1948b, pp. 869-871. (Climate of the termitarium and the transportation of water; 70 to 98% relative humidity in nest.)

McKeown, K. C., 1944, rev. ed., p. 67. (Australia, humidity 93 to 95% in nest.)

Snyder, T. E., 1948, pp. 8, 54, 56, 76, 81, 85, 88, 106, 119, 153, 155, 160. (Need humidity in wood, earth, shelter tubes; humidity *Nasutitermes* in Australia at least 92% maintained because of a relatively impervious surface layer. Amount of moisture in wood directly under earthlike shelter tubes *Reticulitermes* in eastern U.S. 25%, which corresponds approximately to the humidity in mounds. Shelter tubes constructed when temperature ranges from 80° to 90° F. and relative humidity ranges from 70% upward; few tubes constructed at humidities below 50%.)

INTRODUCED

Adamson, A. M., 1938, pp. 221-223. (*Coptotermes havilandi* introduced into Barbados from Java.)

Ahmad, M., 1953, pp. 35-36. (*Cryptotermes cyanocephalus* and *Coptotermes formosanus* into Ceylon.)

Anonymous, 1864, p. 310. (Termites from Guinea introduced to St. Helena.)

1933a, p. 30. (No "invasion" eastern U.S.—Dr. T. E. Snyder.)

(Banks, N., and) Snyder, T. E., 1920, p. 144. (*Cryptotermes brevis* from West Indies to U.S.)

Brown, A. A., *in* Kofoid, 1934, 2d ed., p. xxi. *Coptotermes formosanus* in ships to California.)

Cachan, P., 1949, pp. 177-275. (*Heterotermes philippinensis* to Madagascar.)

Chaine, J., 1913, pp. 401-403. (Danger of introduction in wood and furniture.)

Clark, A. F., 1938, pp. 177-179. (*Calotermes insularis* and *Coptotermes lacteus* introduced into New Zealand from Australia.)

De Mello, I. F., 1952, pp. 433-445. (*Cryptotermes havilandi,* Africa to Brazil.)

Dobson, R. J., 1918, p. 99-101. (*Reticulitermes lucifugus,* Europe to vicinity Boston (in reality a native species *R. arenincola*).)

Ehrhorn, E. M., 1915, pp. 55-56. (*Coptotermes* to Oahu, Hawaiian Islands.)

1928, pp. 4, 18. (*Coptotermes* and *Kalotermes* to Oahu.)

1934, *in* Kofoid, 2d ed., pp. 321-324. (*Cryptotermes* and *Coptotermes* probably introduced into Hawaii, also lists other termites, intercepted at quarantine.)

Emerson, A. E., 1936, pp. 410-411. (*Reticulitermes flavipes* introduced into greenhouses near Vienna, Austria, from the U.S. 1837; *Cryptotermes dudleyi* introduced into Panama (before 1890) from the Orient; *Cryptotermes brevis* introduced into buildings in Durban, Natal, before 1921; British Guiana 1920; *Heterotermes philippinensis* into Mauritius before 1933; *Coptotermes formosanus* prior to 1913 into Hawaii from China or Formosa; *Heterotermes tenuis* from tropical America into St. Helena in 1840—this last case is probably incorrect since Silvestri in 1936 described this termite as a new species, *perfidus;* in reality *platycephalus* from Australia.)

1939, pp. 1-2. (*"Coptotermes formosanus,"* introduced into South Africa before 1925, is *havilandi* of Java; *Coptotermes javanicus* introduced into Jamaica is *havilandi.*)

Esaki, T., 1937, pp. 344-346. (*Zootermopsis angusticollis* introduced from Oregon into Japan.)

Feytaud, J., 1911, pp. 154-155. (In 1797, termites present in Rochefort, in 1853 at Bordeaux, introduced.)

1924, pp. 241-244. (Both *R. lucifugus* and *flavipes* occur in France, *flavipes* from America, introduced into ports of Aunis and Saintonge.)

1924b, pp. 69-73. (*R. flavipes* to Charentes, Saintonge.)

Fullaway, D. T., 1926, pp. 68-88. (*Coptotermes* introduced into Hawaii from Japan, *Cryptotermes* introduced through oriental commerce about 1900.)

1929b, pp. 205, 210. (*Coptotermes* on Kauai.)

1931, p. 8. (*Coptotermes* and *Cryptotermes* on Lanai.)

Gassies, J. B., 1855, pp. 427-428. (Introduction termites into Bordeaux, France.)

Harris, W. V., 1953, pp. 13-14. (*Cryptotermes brevis* from America, in 1939; *Heterotermes platycephalus* from Australia introduced into St. Helena—latter in 1843. Previously *C. brevis* had been found in South Africa, Belgian Congo, Sierra Leone, and, in 1951, Nigeria.)

1954d, pp. 194-197. (Europe, introduction of termites to France, England, and Germany.)

Harrow, K. M., 1948, p. 234. (*Coptotermes* nymphs introduced into New Zealand in hardwoods from Australia.)

Jackson, J. R., 1874, p. xxviii. (Living termites in wood, Kew Museum.)

Kalshoven, L. G. E., 1935a, p. 176. (Java, termite colony on sailing freighter.)

Kofoid, C. A., 1934, 2d ed., pp. 18-19. (*Coptotermes formosanus* spread rapidly after introduced into Honolulu, infests woodwork steamships at Honolulu, might be introduced to Pacific Coast ports U.S.)

Kutchke, G. MacM., 1936, pp. 45-48. (Probable distribution through greenhouse plants.)

Lever, R. J. A. W., 1939a, pp. 36-37. (Fiji, *Calotermes-Cryptotermes brevis.*)

1952, pp. 214-217. (Singapore, *Coptotermes parvulus.*)

Light, S. F., 1935a*, pp. 235-256. (Origin species in Pacific islands.)

1936*, pp. 125-126. (*Cryptotermes brevis*

introduced in wood from Lima, Peru, to California, *pseudobrevis* (*brevis*) into South Africa.)

McLachlan, R., 1869, p. xiii. (*Termes tenuis?* introduced into St. Helena.)

1874, pp. 15-16. (*Calotermes* to Kew from Zanzibar.)

1876, p. 17. (American termite (*flavipes*) in Vienna.)

Miller, D., 1939, pp. 57-65. (*Coptotermes acinaciformis* and *lacteus*, introduced into New Zealand from Australia.)

1940-1941, pp. 333-334. (*Coptotermes acinaciformis* and *lacteus*, introduced into New Zealand from Australia, also *Coptotermes frenchi, Calotermes insularis, condonensis* (*oldfieldi*, var. *chryseus*) and *Porotermes adamsoni; oldfieldi*, var. *chryseus* synonym of *condonensis*.)

Moutia, A., 1936, p. 14. (*Coptotermes* sp. near *intermedius* (synonym of *havilandi*) introduced into Mauritius from Indo-Malaya; *Heterotermes philippinensis* from Philippines.)

Riley, N. D., 1943, p. 95. (*Nasutitermes costalis* introduced into England from Martinique; history other termites introduced into England.)

Saint, S. J., 1940, pp. 9-10. (*Coptotermes testaceus and Nasutitermes* sp. imported into Barbados in wallaba firewood from British Guiana.)

Sénesse, P., 1947, pp. 30-32. (Introduction termites into Roussilon.)

Snyder, T. E., 1924e, pp. 381-384. (Origin termites Hawaii.)

1931*, pp. 531-579. (*Cryptotermes* of Hawaii had origin in China.)

1952a, p. 56. (*Zootermopsis angusticollis* found alive in Douglas fir lumber at Philadelphia shipped from Oregon.)

1952e, pp. 23, 26. (Nonsubterranean termites into U.S.)

1953, pp. 27-28. (*Zootermopsis* from Oregon to eastern U.S.)

1954a, p. 47. (*Zootermopsis* into eastern and central western U.S.)

1954b, pp. 1-64. (*Zootermopsis* into eastern and central western U.S.)

1954c, pp. 33-34. (*Zootermopsis* into eastern and central western U.S.)

1954g, p. 28. (U.S., *Cryptotermes brevis* damage to building, Washington, D.C.)

Sweeney, R. C. H., 1948, pp. 164-166. (*Trinervitermes*, minor (or small) soldiers in hay at bottom hedge at Croydon, Surrey, England, probably from Africa.)

Swezey, O. H., 1945, p. 397. (*Nasutitermes, corniger* and sp. introduced into Hawaii.)

Urquhart, F. A., 1953, pp. 292-293. (*Reticulitermes flavipes* to Toronto, Ontario, Canada, 1938, map distribution 1953.)

1934, p. 576. (Ontario, Canada, *Reticulitermes flavipes*, Kincardine, Bruce Co.)

Weidner, H., 1937, pp. 593-596. (*R. flavipes* introduced from America to Hamburg, Germany, in wooden crates.)

1937a, pp. 1-2. (*R. flavipes* introduced from America to Hamburg, Germany, in wooden crates.)

1939, p. 40. (Infesting buildings.)

1942a, pp. 1-7. (Spread.)

1951, pp. 259-265. (Further spread, block of buildings infested.)

1952, pp. 829-832. (Spread since 1937, control measures.)

1953, pp. 191-192. (Danger to structures, figures castes, except winged.)

Whitney, L. A., 1929, p. 222. (*Reticulitermes speratus* intercepted in Hawaii, from Japan, from flowering *Prunus* sp. in baggage.)

LEGISLATION

Anonymous, 1936a, pp. 6-7. (California pest control act.)

1936c, p. 10. (Minimum termite repair and treatment standards, U.S., California.)

1940b, pp. 1-16. (Termites Act, 1940, New Zealand, Regulations, 1940/320, 1942/288, require inspection and control by state; fine for noncompliance.)

1949a, pp. 1-16. (California termite operators minimum standards for inspections and recommendations.)

1950a, pp. 212-218, Appendixes I, II. (South Africa, no bark on lumber, or insect infestation; no sale or use timber infested with *Cryptotermes brevis* unless treated with wood preservative; 20 pounds fine.)

1953c, p. 38. (Insecticide act, U.S. Dept. Agriculture, effective Jan. 19, 1953, establishes method for renewal, clarifies provisions relating to permits for economic poisons for experimental work.)

1953h, pp. 28, 30, 56. (Arkansas, Florida, California, and Oklahoma pest control operators favor legislation.)

Bowe, E. E., *in* Kofoid, 1934, 2d ed., pp. 743-745. (Municipal laws.)

Chamberlin, W. J., 1949, pp. 23-25. (U.S., State legislation.)

CLARK, A. F., (1941) 1942, pp. 23-32. (New Zealand, legislation.)
1942, pp. 23-32. (New Zealand, legislation, State inspection, building termite-proof, prohibit sale infestesd timber, free chemical control, control mandatory.)

CREIGHTON, J. T., 1947, pp. 36, 38, 40. (Florida, structural pest control law.)

HARROW, K. M., 1942, pp. 47B-52B. (New Zealand, State inspection, poison-dust treatment.)

HASSLER, K., and MESECHER, R., 1949, pp. 16, 18. (Why California code of minimum standards was established.)

HUNT, P. J., 1950, pp. 13-16. (Violations Florida pest control law.)

JACOBSON, W. C., and BROWN, A. C., *in* Kofoid, 1934, 2d ed., pp. 746-750. (U.S., State laws.)

MACGREGOR, W. D., 1950, pp. 10-11. (South Africa, use of chemically treated softwoods enforced.)

SNYDER, T. E., *in* Kofoid, 1934, 2d ed., pp. 751-752. (Federal quarantine laws.)
1935e. (Formosa, Japanese government prohibited use lime mortar in foundations buildings, p. 93; municipal legislation, p. 137; California, legislation, p. 139; Canal Zone, Panama legislation, p. 149; Cuba legislation, p. 150; Florida, legislation, p. 150.)
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Litchfield, J. S., 1948, pp. 38, 40. (*Hamitermes meridionalis,* magnetic nests Northern Terr., Australia.)

Luja, M., 1919, p. 178. (Congo.)

MacDonald, C. H., 1947, p. 359. (Panama, termite castles.)

McKeown, K. C., 1944, rev. ed., pp. 63-69. (Australia, nests illustrated.)

McLachlan, R., 1881, p. vi. ("Negrohead nests," species allied to *T. opacus,* Brazil, nasutiform termite; comment on E. A. Ormerod's note, p. v.)

Maidl, F., 1935, pp. 36-37. (*Apicotermes occultus* and possibly other species, Africa.)

Marais, E. N., 1937, pp. xv+184. (South Africa.)

March, A. W., 1931, pp. 495-496. (Nest *Macrotermes barneyi,* Philippines.)

Maynard, C. J., 1888, pp. 111-113. (Bahamas, hive-shaped tree nests, on Andros, probably *Nasutitermes rippertii,* common near Nassau.)

Michaelsen, W., 1914, p. 33. (Nest of *Termes* at Okahandja, South West Africa.)

Millett, G. P., 1902, pp. 581-582. (White ants' castles.)

Mjöberg, E. G.*, 1920, pp. 1-128. (Australia.)

Monte, O., 1941, pp. 200-201. (Nests of *Cornitermes cumulans,* Pirassununga, Brazil.)

Morin, H., 1896, p. 237. (Queen cell in nest.)

Müller, Fr., 1873-1875, pp. 341-358. (Nests, South America.)

Mukerji, D., and Mitra, P. K., 1949, pp. 9-27. (Calcutta, *Odontotermes redemanni,* mounds, partly above, partly below ground, consist of cavities, many cavities contain fungus combs. Acidity conditions comparable in nest and trophic field, but moisture varies little in former, very much in latter. Depth nest 3 ft. underground, 4 ft. maximum; height above ground 1.5 to 3 ft., maximum 6 ft.)

Murray, J. M., 1938, pp. 288-297. (Nest structure *Cubitermes Hodotermes, Microcerotermes, Trinervitermes, Macrotermes, Microtermes* and *Odontotermes,* South Africa.)

Musgrave, A., 1930, pp. 87-89. (Nest exhibit, Australia.)

Naudé, T. J., 1935, pp. 1-20. (South Africa, drought and sparse short grass favorable for new nests, *Trinervitermes havilandi* mounds 3 ft. in diameter, 2 ft. in height, masticated grass in mound.)

Noyes, H., 1937, pp. xiv+289.

1950, pp. 323-329. (Behind scenes, *M. bellicosus* citadels, Africa (West, Central, and East), colony organization, cultivation fungi, mounds near unharmed native shelter, Belgian Congo.)

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Pascoe, F. P., 1881, p. vi. (Nest from Brazil.)

Peal, S. E., 1882, p. 343. (Nest substance, outer walls mounds clay, inner chambers excreted wood.)

Pierre, M., 1941, pp. 129-135.

Pollard, J., 1945, pp. 15-16. (Northern Australia.)

Ratcliffe, F. N., and Greaves, T., 1940, pp. 150-160. (Subterranean foraging galleries *Coptotermees lacteus,* Australia.)

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Rennie, J., 1846, pp. 287-305. (Termite architecture.)

Ridley, H. N., 1910, p. 157. (Nest with 8 queens, Malaya.)

Rohland, P., 1911, pp. 178-179. (Nests and brickmaking.)

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Schmidt, R. S., 1955, pp. 157-181. (Africa, *Apicotermes* evolutionary nest-building.)

Silvestri, F., 1903*, pp. 110-142. (South American nests.)

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1924*, pp. 1-8. (Subterranean nest from Congo *Apicotermes* (*Termes*) *lamani.*)

1926*, pp. 1-419. (Africa.)

Smeathman, H., 1781, pp. 139-192. (Africa.)

Smith, H. H., 1879, p. 139. (Luminous termite mounds, Brazil.)

Snyder, T. E. 1924c, pp. 10-11. (General.)

1926f, pp. 541-549. (General.)

1929a, pp. 40-46. (General.)

1929d, pp. 143-151. (Termites and architecture, evolution nests from primitive to highly specialized, invasion of man's dwellings.)

1935e, pp. 18, 64-79. (General.)

1948, pp. 73-92. (General.)
1949d, *in* Burton, pp. 264-272. (India, mound nests, queen cells.)
Snyder, T. E., and Zetek, J., 1924, pp. 1-26. (Panama.)
1934, *in* Kofoid, 2d ed., pp. 342-346. (Panama.)
Stumper, R., 1923, pp. 409-411. (Chemical composition nests *Apicotermes occultus.*)
1924, pp. 351-352. (An odd termite nest.)
Taylor, J. E., 1942, p. 49. (Mounds used for manure.)
Tovell, T. R., 1946, p. 37. (Shapes nests.)
Uichanco, L. B., 1919, pp. 59-65. (Philippines.)
Wahl, R. O., and Powell, A. R., 1927, pp. 125-140. (Importance nest structure fumigation calcium cyanide.)
Wasmann, E., 1902a*, pp. 293-298. (*Termes monodon,* var. *lujana,* Zambesi, Portuguese East Africa.)
1902b*, pp. 99-164. (Ceylon.)
Wild, H., 1952, pp. 280-292. (Southern Rhodesia, vegetation of termitaria.)

NUTRITION

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Andrews, E. A., 1911, pp. 200-204. (Jamaica, *Eutermes ripperti,* "fungus gardens" developed from dry masses in nest?; stored food nodules of eaten wood bound together with secretion.)
Beckwith, T. D., and Rose, E. J., 1929, pp. 4-6. (Cellulose digestion by gut organisms.)
Bottomly, A. M., and Fuller, C., 1921, pp. 139-144, 223. (Fungus food.)
Buchner, P., 1928, pp. 1-64. (Alimentation from wood and symbiosis.)
Buscalioni, L., and Combes, S., 1910, pp. 1-16. (Protozoan symbiosis in digestion vegetation.)
Carl, J., 1932, pp. 97-99. (Make provision of wood?)
Cleveland, L. R., 1923, pp. 444-461. (Correlation between food, morphology, and Protozoa.)
1925a, pp. 289-293. (Live indefinitely on diet pure cellulose.)
1925b, pp. 295-308. (Feeding habits and symbiosis Protozoa.)
1925c, pp. 309-326. (Effects oxygenation and starvation on symbiosis *Termopsis* and Protozoa.)
1926, pp. 51-60. (Symbiosis, Protozoa.)
1928, pp. 231-237. (Symbiosis, Protozoa.)
Coaton, W. G., 1947, pp. 130-177. (Wood-eating termites South Africa.)
Cook, S. F., 1943, pp. 123-128. (Nonsymbiotic utilization carbohydrates by *Zootermopsis angusticollis.*)
Cook, S. F., and Scott, K. G., 1932, pp. 505-512. (Relation between absorption and elimination of water by *Termposis angusticollis.*)
1933, pp. 95-110. (Nutritional requirements *Zootermopsis angusticollis.*)
1943, p. 95. (Nutritional requirements *Zootermopsis angusticollis.*)
Cook, S. F., and Smith, R. E., 1942, pp. 211-219. (Metabolic relations, Protozoa symbiosis, temperature effects.)
Dickman, A., 1931, pp. 85-92. (Ability intestinal flora to digest cellulose.)
Ergene, S., 1949, pp. 49-70. (Role intestinal bacteria in assimilation atmospheric nitrogen?)
Fuller, C., 1915, pp. 60-64. (Food *Hodotermes* and *Trinervitermes* South Africa.)
Ghidini, G. M., 1940, pp. 220-221. (Cellulose (digestion) breaking down by intestinal fauna and flora, *Reticulitermes lucifugus.*)
1941, pp. 103-113. (Breaking down of cellulose in intestines of termites.)
Gösswald, K., 1943, pp. 297-316. (Addition diastase to wood hastened development *Calotermes flavicollis.*)
Goetsch, W., 1946a, pp. 58-86. (Intestinal symbionts as sources of proteins and vitamin distributors.)
1947, pp. 193-274. (Influence vitamin T (torutilin) on form and habits of insects. Soldier formation obtained in soldierless *Anoplotermes.* Such "development stimuli" obtained in Blattidae when fed on termites, extreme forms with magnified heads were equal to termite soldiers. Three factors decisive for "big-head" formation: (1) critical phase, (2) vitamin T, (3) sufficient protein nutrition. Vitamin T, alone, causes accelerated skin casting without body magnification; protein alone provokes body enlargement without creating extreme forms. Only combined factors provoke gigantism and corresponding changes in behavior. Vitamin T found in fat of termites.)

1948, pp. 533-626. (Action vitamin T on vertebrates, "termitine" (vitamin T) increases weight of mammals 20%, independent of quality nutrition; not a growth vitamin but a stimulant.)

1948a, pp. 115-118. (Review present status research on vitamin T (=termitin).)

Goetsch, W., and Grüger, R., 1942, pp. 41-112. (Fungal nutrition frequent in social insects. In termites considered purely lignivorous, as *Kalotermes* and *Reticulitermes* spp., use various fungi as additional food, can live on these for long time, represent initial stages of an evolutionary series to exclusive fungus feeders.)

Grassé, P. P., 1939b, pp. 251-262. (Feeding soldiers.)

Grassé, P. P., and Noirot, C., 1945, pp. 273-292. (Transmission of symbiotic flagellates and the nourishment of termites.)

Hegh, E., 1922, pp. 219-369. (Food termites, world.)

Hendee, E. C., 1933, pp. 111-134. (Association *Kalotermes minor, Reticulitermes hesperus,* and *Zootermopsis angusticollis* with fungi.)

1934, p. 316. (Role fungi in diet *Zootermopsis angusticollis;* fed on rotten, fungus-containing wood increased in dry weight and total nitrogen, more rapid growth.)

1934, *in* Kofoid, 2d ed., pp. 105-116. (Association termites and fungi, former benefit by presence fungi in cellulose diet, latter by transport spores and hyphae.)

1935, pp. 499-525. (Fungi form essential part natural diet *Zootermopsis angusticollis.*)

Hungate, R. E., 1936, pp. 240-249. (Molds in alimentary tract *Zootermopsis* not numerous enough to be of significance in digesting cellulose. Bacteria that could decompose cellulose not sufficiently abundant to make cellulose available to termites. Amount cellulose digested by molds and bacteria much less than that digested during passage of wood through the termites.)

1938, pp. 1-25. (Relative importance of *Zootermopsis angusticollis* and *nevadensis* and Protozoa in wood digestion; digestion ⅔ dependent upon Protozoa.)

1938a, p. 53. (Some products of the cellulose dissimilation by termite Protozoa.)

1939, pp. 230-245. (Anaerobic carbohydrate dissimilation by intestinal Protozoa, *Zootermopsis.*)

1940, pp. 382-392. (Nitrogen content of sound and decayed wood and its relation to loss in weight during decay.)

1941, pp. 467-489. (Dependence upon fungi as food primitive feature, transport nitrogen which is not fixed from the air, comes from wood.)

1943, pp. 730-739. (Quantitative analysis on the cellulose fermentation by Protozoa.)

1943a, pp. 56-58, *in* Campbell, F. L., and Moulton, F. R. (Laboratory procedures.)

1944, pp. 91-98. (Growth and nitrogen utilization in laboratory cultures *Zootermopsis nevadensis,* no fixation atmospheric nitrogen, obtained from wood and soil, acted on by fungi; in nature fungi hinder growth termites by rapid decomposition wood.)

1946, pp. 9-24. (Symbiotic utilization of cellulose.)

Joly, P., 1940, pp. 408-410. (Chemical research on principal vitamins and ketonic hormones in blood *Bellicositermes natalensis* queen.)

Kalshoven, L. G. E., 1937a, p. 35. (Java, *Macrotermes* feeding on dead leaves.)

1954, pp. 319-323. (Java, *Macrotermes gilvus* primary mound builder, can live without wood, on grass.)

Keene, E. A., and Light, S. F., 1944, pp. 283-290. (Results of feeding ether extracts of male reproductives to groups nymphal termites.)

Koch, A., 1938, pp. 81-90. (Bacterial symbiosis in *Mastotermes darwiniensis.*)

Leach, J. G., 1940, pp. 67-74. (Transmission plant diseases, termites, fungi, Protozoa.)

Leach, J. G., and Granovsky, A. A., 1938, pp. 66-67. (Possible explanation apparent ability termites to thrive on nitrogen-deficient diet, anal feeding reabsorption nitrogen from Malpighian tubes and Protozoa from the gut, nitrogen used repeatedly enables termites to live on pure cellulose for long time.)

Lund, E. C., 1930, pp. 81-96. (Effect of diet upon intestinal fauna of *Termopsis.*)

Mansour, K., 1936, pp. 233-241. (Enzymes of wood-eating insects, significance of intestinal microorganisms in nutrition.)

Mansour, K., and Mansour-Bek, J. J., 1934, pp. 363-382. (Role microorganisms in digestion wood.)

Montandon, A. L., 1910, pp. 444-452. (Neuters produced by castration of young through special diet.)

Morstatt, H., 1922, pp. 9-16.

NOYES, H., 1951, p. 59. (Peculiarities of the termite to satisfy desire for honey dew.)

PICKENS, A. L., 1952, p. 134. (U.S., *Reticulitermes,* queen sterile on mere cellulose, soon begins to lay when fed fungus-infested wood, used yeasts to offset deficiency diets long before man.)

PIETSCH, A., 1926, p. 164. (Wood-eating termites.)

RANDALL, M., and DOODY, T. C., *in* Kofoid, 1934, 2d ed., pp. 99-104. (Hydrogen-ion concentration in intestine, pH acid.)

RATCLIFFE, F. N., and CUMMINS, J. E., 1939, pp. 221-228. (Food preferences, Australia.)

ROESSLER, E. S., 1932, pp. 357-368. (U.S., *Termopsis nevadensis,* nitrogen needs of growing termites, thrived better on pure wood and filter paper moistened with extract of Douglas fir than on pure cellulose (Whatman's filter paper, nitrate solutions slightly accelerated growth.)

SCHMIDT, H., 1949a, pp. 140-142. (Food economy.)

SKAIFE, S. H., 1954a, pp. 123-133. (*Amitermes atlanticus,* South Africa, food, drugs, and hormones.)

SNYDER, T. E., 1924c, pp. 5-6. (Hunger stimulus.)

1935e, pp. 80-93. (Food, general.)

1948, pp. 93-104. (Food, general.)

TIHON, L., 1946, pp. 865-868. (Chemical composition termite nourishment.)

TÓTH, L., 1944-1945, pp. 7-36. (*Kalotermes flavicollis* can assimilate nitrogen from air—in 24 hours each insect can assimilate an amount corresponding to 65% of its own body weight.)

1949, pp. 22-29. (Nitrogen-binding by *Kalotermes flavicollis* and its symbionts.)

TRAGER, W., 1941, p. 15. (Isoptera.)

VISINTIN, B., 1941, pp. 27-44. (Digestion cellulose due to activity of flagellate Joenidae, *Calotermes flavicollis.*)

1947, pp. 290-300. (*Calotermes flavicollis,* starch in nutrition utilized as carbohydrate food, enzyme active in intestines partially freed of Protozoa, loss in weight, cellulose not digested.)

WEBER, N. A., 1948, pp. 31-35. (African *Pheidole* larvae feed on termites; interesting since Goetsch 1937 and 1947 states development soldier caste depends on termite vitamin T.)

YONGE, C. M., 1925, pp. 242-248. (Digestion cellulose.)

1938, pp. 638-647. (Digestion cellulose and chitin.)

OBITUARY

ANONYMOUS, 1925a, pp. 127-128. (Grassi, Giovanni Battista, 1854-1925.)

1929b, p. 282. (Fuller, Claude, 1872-1928.)

1931, p. 240. (Wasmann, Erich, 1859-1931.)

1935d, p. 308. (Handlirsch, Anton, 1865-1935.)

1937g, p. 42. (Tillyard, Robin John, 1881-1937.)

1940c, p. 51. (Knower, Henry McElderry, 1868-1940.)

1946b, pp. 3-4. (Adamson, Alastair Martin, 1901-1945.)

1948b, p. 3, frontispiece. (Sjöstedt, Ynge, 1866-1948.)

1949b, p. 45. (Imms, August Daniell, 1880-1949.)

1949c, p. 154. (Silvestri, Filippo, 1873-1949.)

CARL, J., 1939, pp. 616-617. (Bugnion, Frederick Edouard, 1845-1939.)

CARPENTER, M. M., 1945, pp. 1-116. (Entomologists.)

1953, pp. 257-348. (Entomologists, supplement.)

CONSTANT, J. B., 1937, p. 143. (Wheeler, William Morton, 1865-1937.)

DARLINGTON, P. J., JR., 1953, p. 372. (Banks, Nathan, 1868-1953.)

ESSIG, E. O., 1948, pp. 50-53. (Light, Sol Felty, 1886-1947.)

GEISER, S. W., 1930, pp. 133-134. (Buckley, Samuel Botsford, 1809-1883.)

HORN, W., 1935, p. 63. (John, Oskar, 1875-1935.)

HOWARD, L. O., 1929, pp. 142-143. (Schwarz, Eugene Amandus, 1844-1928.)

KIRBY, H., JR., 1948, pp. 403-404. (Kofoid, Charles Atwood, 1865-1947.)

ROHWER, S. A., 1948, pp. 103-108. (Cockerell, Theodore Dru Alison, 1866-1948.)

SAALAS, U., 1948, pp. 22-25. (Kemner, Nils Viktor Alarik, 1887-1948.)

SCHWARZ, E. A., et al., 1901a, pp. 350-360. (Hubbard, Henry Guernsey, 1850-1899.)

SNYDER, T. E., 1922, pp. 41-42. (Thompson, Caroline Burling, 1869-1921.)

USINGER, R. L., 1941, p. 84. (Ehrhorn, Edward Macfarlane 1862-1941.)

WALKER, J. J., 1937, pp. 155-156. (Froggatt, Walter Wilson, 1858-1937.)

PARASITES

ALSTON, R. A., 1947, p. 120. (Fungous parasite on *Coptotermes curvignathus,* Malaya, possibly *Conidiobolus,* n. sp.)

ANONYMOUS, 1936f, pp. 77-78. (Abdomen soldier *Macrotermes gilvus* parasitized by *Misotermes exenterans.*)

1938c, p. 19. ("Virus" used to control termites in Australia, proved to be arsenical.)

ASHMEAD, W. H., 1901, p. 42. (*Caratomus* sp. supposed chalcidid parasite on *Termes flavipes.*)

BAKER, E. W., and WHARTON, G. W., 1952, p. 56. (Termites have tropical or subtropical discozerconids (mites) as ectoparasites.)

(BANKS, N., and) SNYDER, T. E., 1920*, pp. 116-118. (General, and fungous disease of *Reticulitermes.*)

BELT, T., 1874, p. 181. (Epidzootic among termites, heaps of dead about, Nicaragua.)

BRIDWELL, J. C., 1920, p. 301. (*Sclerodermus immigrans* experimentally parasitized *"Calotermes castaneus"* in Hawaii, possibly attack termites in nature.)

BRUNELLI, G., 1950a, pp. 718-721. (Destruction oocytes of queen infested by Protozoa.)

1906, pp. 55-62. (Destruction oocytes of queen infested by Protozoa.)

BUCHLI, H. H. R., 1952, pp. 519-524. (Fungus, *Antennopsis gallica.*)

DEBACH, P. H., and MCOMIE, W. A., 1939, pp. 137-146. (First record of *Serratia marcescens* and *Bacterium* sp. in Isoptera, *Zootermopsis angusticollis.*)

DESCH, H. E., 1953, p. 235. (Bacteriological methods of extermination, claimed for some proprietary products, merely direct arsenious poisons.)

FEYTAUD, J., and DIEUZEIDE, R., 1927, pp. 161-163. (Fungous parasite *Reticulitermes lucifugus, Termitaria* sp. close to *T. snyderi,* southwestern France.)

1927a, pp. 671-672. (Fungous parasite *Reticulitermes lucifugus, Termitaria* sp. close to *T. snyderi,* southwestern France.)

FORBES, S. A., 1895, p. 198. (Illinois, *Entomophthora aphidis* and *Sporotrichum globuliferum* killed *Termes flavipes* in insectary.)

GHIDINI, G. M., and MORIGGI, M., 1941, pp. 161-175. (*Gregarina ausoniae,* gregarine wormlike Protozoa in *Reticulitermes lucifugus.*)

1943, pp. 57-58. (*Gregarina ausoniae,* gregarine wormlike Protozoa in *Reticulitermes lucifugus.*)

HEGH, E., 1922, pp. 594-598. (General.)

HEIM, R., and BUCHLI, H., 1951, pp. 277-280. (Fungous parasite *Antennopsis gallica, Reticulitermes* sp. of Saintonge.)

HILL, G. F., 1922a, pp. 346-347. (*Mordellistena,* n. sp., family Mordellidae, parasitic on termites, Australia.)

HOWARD, L. O., 1901, pp. 353-360. (Big-headed chalcid fly (*Caratomus*) possibly parasite of *Reticulitermes,* p. 359.)

KALSHOVEN, L. G. E., 1938, pp. 391-395. (Parasite of soldier of *Macrotermes gilvus.*)

1938a, pp. 395-397. (*Misotermes,* abdominal larvae.)

KEMNER, N. A., 1925*, pp. 1-15. ("Larva termitovorax," a parasitic fly larva in the heads of termite soldiers, leading to distortion and the establishment of a special termite genus containing 2 species.)

1925b, pp. 157-163. (Further observations on the genus *Gnathotermes* established on parasitized individuals of *Termes.*)

KEVORKIAN, A. G., 1937, pp. 191-199. (*Conidiobolus* sp. (Entomophoraceae) fungous parasite of *Nasutitermes* in Cuba.)

KONINGSBERGER, J. C., and ZIMMERMANN, A., 1901, p. 81. (*Cordyceps.*)

KUDO, R. R., 1942, pp. 307-333. (The microsporidian *Duboscquia legeri* parasitic in *Reticulitermes flavipes.*)

1943, pp. 265-278. (*Nosema termitis,* n. sp., parasitic in *R. flavipes,* Urbana, Ill., bodies workers, epithelial cells midintestine, infected cells continuously sloughed off.)

LEIDY, J., 1877, pp. 146-149. (Intestinal parasites *Termes flavipes.*)

1881, pp. 425-447. (Parasites, entozoic.)

1882, p. 50. (Abstract of 1881 article.)

1904, pp. 1-281. (Researches in helminthology and parasitology.)

LESPÈS, C., 1856a, pp. 335-336. (Nematode parasite of termites, *R. lucifugus.*)

LINSTOW, O. VON, 1900, p. 418. (New nematode in termite nest in South Africa.)

MERRILL, J. H., and FORD, A. L., 1916, pp. 115-127. (Two new nematodes, one parasitic in native termites (heads) *Reticulitermes,* Kansas.)

NEWMAN, E., 1841, p. 61. (Nurseries slightly overgrown with mold.)

NOIROT, C., 1953a, pp. 11-20. (Parasitism workers leads to development of gonads, *Noditermes curvatus,* Ivory Coast, Africa, dipterous larvae.)

PEMBERTON, C. E., 1928a, pp. 148-150. (Nematodes associated with termites in Hawaii, Borneo, and Celebes.)

PICKENS, A. L., 1952, p. 134. (*Reticulitermes, Termitaria pacedens.*)

REICHENSPERGER, A., 1923, pp. 103-114. (*Termitaria thaxteri*, a new fungus parasitic on *Eutermes* and *Cornitermes.*)

ROBERTS, F. H. S., 1952, p. 27. (*Macrohodotermes mossambicus transvaalensis* intermediate host of poultry roundworm in South Africa.)

RUTLEDGE, W., 1925, pp. 187-188. (*Mermis* sp., a mermithid worm in body of *Cornitermes orthocephalus.*)

SCHMIDT, H., 1950, pp. 1-37. (General.)

SCHMITZ, H., 1936b, pp. 77-78. (Myiasis in soldiers of *Macrotermes gilvus* in Java.)

1938, pp. 369-391. (*Misotermes exenterans*, n. gen., n. sp., a parasitic phorid fly causing myiasis in soldiers of *Macrotermes gilvus* in Java.)

SÉGUY, E., 1953, pp. 21-28. (Diptera, Calliphoridae infesting *Noditermes curvatus*, Ivory Coast, 1 new genus, 2 new species.)

SILVESTRI, F., 1926, pp. 3-18. (Larvae of a fly (Conopidae?) parasitic in heads *Macrotermes gilvus* causing myiasis in certain individuals, mandibular muscles are reduced, parasitized workers "myiagenes.")

SILVIA, C., 1929, pp. 39-48. (Fungi, *Termitaria, Mattirolella*, p. 44 near *Termitaria, M. silvestrii* on *Rhinotermes marginalis*, British Guiana.)

SKAIFE, S. H., 1954a, p. 132. (South Africa, *Termitometopia skaifei*, with *Amitermes atlanticus.*)

SNYDER, T. E., 1929a, pp. 40-46. (General.)

1933a*, pp. 1-15. (Fungous disease on foreleg *Nasutitermes fletcheri* (Holmgren, K. and N.), (*Termitaria*) in India.)

1935e, pp. 120-121. (General.)

1948, pp. 136-139. (General.)

1951b, pp. 31-32. (Wholesale death *Nasutitermes*, Dominica.)

1953c, pp. 40-41. (Myiasis in *Macrotermes*, Orient.)

STEINHAUS, E. A., 1949. (Spirochaetes, p. 106; bacteria, p. 148; fungi Entomophthora, p. 325; nematodes in termites, p. 635.)

STIFFLER, C. B., 1941, pp. 82-86. (Fungous parasite *Cordycepioideus* on *Macrotermes* in Africa.)

SWEETMAN, H. L., 1936, p. 69-70. (Fungous disease termites, *Ectomyces* and *Termitaria.*)

TATE, P. C., 1927, pp. 54-60. (*Ectomyces calotermi*, a new genus and species of Ascomycete parasitic on *Calotermes samoanus* Holmgren.)

1928, pp. 77-78. (*Ectomyces calotermi*, a synonym of *Termitaria snyderi;* Tate described *Ectomyces* as an ascomycete, while Thaxter placed *Termitaria* in the Fungi Imperfecti, and considered this parasite external; Tate found haustorial cells under the integument connected with the sporodochium by a fine hypha.)

THAXTER, R., 1895, p. 470. (*Laboulbenia hageni* on *Termes bellicosus*, var. *mozambica*, Africa, fungous parasite.)

1920, pp. 3-9. (*Termitaria snyderi* and *coronata*, fungi on *Reticulitermes*, U.S., and *Eutermes*, Grenada, British West Indies.)

THEILER, A., 1919 (1918), pp. 697-706. (Nematode *Filaria* in *Hodotermes*, South Africa; *F. gallinarum*, n. sp., in fowls has termite as an intermediary host.)

THOMPSON, W. R., 1944, p. 101. (Parasites termites, 1 artificially induced, 3 probably parasites of guests in termite nests.)

TSVETKOVA, V. P., 1953, pp. 132-141. (Odessa, *R. lucifugus* not economically important in southern Russia; parasitic mite *Acotyledon feytaudi* in nests.)

VAN ZWALUWENBURG, R. H., 1928, pp. 1-68. (Termites in Hawaii infested with nematodes and mermithid worms.)

PHYLOGENY

AHMAD, M., 1950, pp. 39-86. (Phylogeny of termite genera based on imago-worker mandibles.)

BUGNION, E., and FERRIÈRE, C., 1911a, pp. 102-103. (Prothoracic processes on *Coptotermes flavus* vestiges of an ancestral type.)

CLEVELAND, L. R., SANDERS, E. P., and HALL, S. R., 1931, p. 92. (Relation Protozoa of *Cryptocercus* to Protozoa termites and bearing of this relationship on evolution of termites from roaches.)

CRAMPTON, G. C., 1916, pp. 244-258. (Phylogeny termites and related groups.)

1919, pp. 64-72. (Phylogeny termites and related groups, Zoraptera and Orthoptera.)

1920, pp. 105-110. (Ancestry of insects and their allies.)

1920b, pp. 137-145. (Terminal abdominal structures primitive Australian *Mastotermes darwiniensis.*)

1920c, p. 116. (Lines of descent of lower winged insects.)

1921, p. 99. (Phylogenetic study venation forewings termites.)
1921a, pp. 110-117. (Phylogenetic study venation forewings termites.)
1923, pp. 85-93. (Comparative study terminal abdominal structures adult alate female primitive *Mastotermes darwiniensis* with those of the roach *Periplaneta americana*.)
1926, pp. 78-85. (Affinities of *Grylloblatta* as indicated by head and appendages.)
1926a, pp. 198-248. (Comparison of neck and prothoracic sclerites throughout the orders of insects from standpoint of phylogeny.)
1932, pp. 19-49. (Phylogenetic study of head capsule, termites and related groups.)

Desneux, J., 1904a*, pp. 146-151. (Critical of Wasmann's division genus *Termes* into genera and subgenera based on soldier caste.)
1904b*, pp. 278-286. (Relation of termites to Blattidae.)
1904d*, pp. 372-378. (Response to Wasmann—soldier caste cannot serve as basis for natural classification.)
1953, pp. 1-123. (Phylogeny *Apicotermes* nests.)
1953a, pp. 393-396. (Phylogeny *Apicotermes* nests.)

Emerson, A. E., 1926, pp. 69-100. (Development soldier *Constrictotermes cavifrons* and its phylogenetic significance.)
1937, p. 56. (Phylogeny nests.)
1938, pp. 247-284. (Phylogeny of behavior, nests, behavior of a population, patterns hereditary.)
1941, p. 115. (Phylogeny.)
1942*, pp. 1-12. (Relations of a relict South African termite, *Stolotermes*.)
1943, pp. 97-118.
1953, pp. 101-121. (*Apicotermes*, Africa.)

Handlirsch, A., 1903, pp. 729-730. (Isoptera.)
1908*, pp. ix+1430. (Phylogeny.)
1939, pp. 1-240. (Phylogeny.)

Hare, L., 1937, pp. 459-486. (Phylogeny as evidenced by soldier mandible development.)

Haviland, G. D., 1898, p. 358. (Genus *Termes* cannot be subdivided by characters common to every caste.)

Holmgren, N., 1912*, pp. 129-136. (World termites.)

Jucci, C., 1952, p. 837. (*Mastotermes darwiniensis* alone among termites demonstrates bacterial symbiosis, which every cockroach presents.)
1952a, pp. 449-453. (Symbiosis and phylogeny.)

Light, S. F., 1930d*, pp. 215-232. (Phylogenetic groupings Mexican *Amitermes*.)

Martynov, A. V., 1937*, pp. 83-150. (Wings and phylogeny termites and allied groups.)
1938, pp. 81-83, 147. (Derivation termites, geologic history.)

Packard, A. S., 1883, pp. 326-329. (Orthoptera in relation to Termitidae.)

Rau, P., 1941, pp. 256-259. (Cockroaches forerunners of the termites, based on behavior various species roaches.)

Scudder, S. H., 1885, pp. 319-351. (Palaeodictyoptera, or affinities of Paleozoic Hexapoda.)

Snyder, T. E., 1926f, pp. 522-552. (General.)
1935e, pp. 2, 5, 18, 25, 33-34, 60, 82. (General.)
1948, pp. 20-25, 38, 97. (General.)

Thompson, C. B., and Snyder, T. E., 1919, pp. 115-132. (Phylogenetic origin termite castes.)

Tillyard, R. J., 1936, p. 655. (Are termites descended from cockroaches?)

Walker, E. M., 1919, pp. 267-316. (Terminal abdominal structure Orthoptera, phylogeny termites.)
1922, pp. 1-88. (Terminal abdominal structure Orthoptera, phylogeny, termites and Zoraptera included.)

Wasmann, E., 1904*, pp. 370-371. (Criticism Desneux's views of division genus *Termes* based on soldiers.)
1905, pp. 436-449. (Phylogenetic metamorphosis East Indian termite guests.)

Wheeler, W. M., 1904, pp. 29-37.

Zalessky, G., 1937*, pp. 847-848. (Ancestors some groups of the present-day insects.)

POISON DUSTS

Anonymous, 1945a, pp. 19-30. (Colonies of *Eutermes exitiosus* in mounds, Australia, killed in 12 weeks, treated with white arsenic at rate ¼ oz. per mound; only 25% mortality with paris green; dusts of 666 and DDT (10% in kaolin) at rate ½ oz. per mound ineffective.)

Beeley, F., 1934, pp. 160-175. (Chemical dusts about roots young rubber trees, Malaya.)

Brittain, W. H., 1925, pp. 82-87. (Calcium cyanide in control mound-building termites, India.)
1926, pp. 45-48. (Calcium cyanide in con-

trol mound-building termites, India, Ceylon.)

1928, pp. 115-124. (Cyanogas in control of scavenger termites, India and Ceylon.)

Coaton, W. G. H., 1948b, pp. 1-18. (*Cryptotermes brevis,* South Africa.)

Doane, R. W., Van Dyke, E. C., Chamberlin, W. J., and Burke, H. E., 1936, p. 412. (Dry-wood termites, California.)

Ehrhorn, E. M., *in* Kofoid, 1934, 2d ed., pp. 330-333. (Hawaii, dry-wood termites and *Coptotermes,* paris green.)

Fullaway, D. T., 1926, pp. 68-88. (Hawaii.)

Fuller, C., 1919a, p. 303. (South Africa, *Hodotermes,* white arsenic or corrosive sublimate.)

Harrow, K. M., 1942, pp. 47B-52B. (New Zealand.)

Harvey, P. A., 1939, pp. 1-41. (California, *Kalotermes minor.*)

Holdaway, F. G., and Hill, G. F., 1936, pp. 135-136. (Australia, arsenical powders in mounds of *Eutermes exitiosus.*)

Hunt, R. W., 1949, pp. 959-962. (California, *Kalotermes minor.*)

Jepson, F. P., 1929a, pp. 307-311. (Ceylon, *Calotermes* attacking tea bushes, poison dusts.)

1929b, pp. 1-11. (Ceylon, *Calotermes* attacking tea bushes, poison dusts.)

1930a, pp. 191-195. (Ceylon, *Calotermes* attacking tea bushes, poison dusts.)

1931a, pp. 67-69. (Ceylon, mound-building termites, Cyanogas dust effective when fresh, but not otherwise.)

Keck, C. B., 1953, pp. 187-194. (Hawaii, poison dusts, paris green, DDT, chlordane.)

Kelsey, J. M., 1946b, pp. 65-100. (New Zealand, dusts effective.)

King, C. B. R., 1938, pp. 195-205. (Ceylon, *Neotermes militaris,* tea bushes, paris green.)

Kofoid, C. A., and Williams, O. L., *in* Kofoid, 1934, 2d ed., pp. 477-479. (Toxicity of dusts.)

Mamet, R., and Durocher-Yvon, F., 1941, pp. 59-61. (Mauritius, arsenic trioxide (As_2O_3) 40%, potassium antimoniate 5%, borax 2%, iron trioxide 53%, pulverized and kept dry; one application 5 to 10g.; repeat application after 10 days. Exposure furniture to sunlight several times after treatment.)

Morril, A. W., 1953, pp. 274-275. (Philippines and Japan, 10% DDT dust blown into tunnels subterranean termites where soil poisons could not be used, U.S. Army installations.)

Newell, R. E., 1952, p. 67. (U.S., ChlorKil 5 dust, subterranean termites.)

Pangga, G. A., 1936, pp. 233-265. (Philippines, dusting paris green into bodies workers and soldiers, whole colony killed by one treatment.)

Petty, B. K., 1946, pp. 1-16. (South Africa, dusts containing 4% DDT or benzene hexachloride unsatisfactory in field owing to inadequate penetration nests of *Trinervitermes havilandi.*)

1948, pp. 1-15. (Residual toxicity of DDT and BHC.)

Randall, M., and Doody, T. C., *in* Kofoid, 1934, 2d ed., pp. 463-476. (California.)

Ratcliffe, F. N., and Cummins, J. E., 1939, pp. 221-228. (Australia.)

Smith, R. H., 1930, pp. 557-560. (Historical, arsenicals, calomel; paris green, California.)

Snyder, T. E., 1929b, pp. 17-28. (Mid-Pacific area.)

1929j, pp. 1-15. (Pacific area.)

1929m, pp. 5-11. (California.)

1934a, p. 18. (Arsenicals, U.S.)

1935e, pp. 152, 160. (General.)

1948, p. 191. (General.)

1950d, p. 15. (Arsenicals, DDT, sodium fluosilicate, U.S.)

Snyder, T. E., and Zetek, J., *in* Kofoid, 1934, 2d ed., p. 344. (Poison dusts, carton nests, Panama.)

Tempany, H. A., 1933, pp. 297-309. (Malaya, paris green effective when used under proper supervision, rubber trees.)

Tu, T., 1954, pp. 423-429. (Formosa, subterranean termites break tubes, powdered poison, white arsenic—lime placed on right-angle parts with plinth course for posts.)

Van Zwaluwenburg, R. H., 1916, pp. 42-45. (Puerto Rico, *Eutermes morio,* arsenicals, london purple quicker than paris green—more finely divided particles, p. 43.)

Wolcott, G. N., 1924, pp. 3-15. (Puerto Rico, paris green, arsenate lead, calomel effective in control *Nasutitermes morio.*)

POPULATION

Andrews, E. A., 1911, p. 204. (Jamaica, *Eutermes ripperti,* 631,878 termites in nest.)

Andrews, E. A., and Middleton, A. R., 1911, pp. 26-34. (Jamaica, *Nasutitermes* population and activity, ½ million, "traffic" 8,000 per hour.)

Anonymous, 1935, p. 178. (Australia, weighing population mound nest, calculated colony held 1,561,400 workers, 201,000 soldiers, 44,100 nymphs.)

(Banks, N., and) Snyder, T. E., 1920*, pp. 113-115. (U.S., proportionate number castes in colonies.)

Beebe, W., 1916, pp. 114, 116. (Fauna 4 sq. ft. jungle debris.)

Bodenheimer, F. S., 1937, pp. 393-430. (*Neotermes tectonae,* population problems, social insects.)

Brues, C. T., 1946, pp. 23-24. (3 million termites in one carton nest in South America; *Nasutitermes* in Jamaica half million, 'traffic" in and out of nest amounts to about 8,000 termites per hour at time greatest activity—shortly after midnight.)

Emerson, A. E., 1939a, pp. 287-300. (Population social insects.)

1945, pp. 14-19. (Population genetics.)

1947, pp. 337-345. (Populations undergo evolution to supraorganisms.)

1949, *in* Allee et al., p. 722. (Termite populations.)

Gay, F. J., and Greaves, T., 1940, pp. 145-149. (Australia, *Coptotermes lacteus* mound colony in winter.)

Grassé, P. P., 1939b, pp. 251-262. (Proportion males and females, number soldiers in a termitary.)

Gupta, S. D., 1953, pp. 697-704. (*Odontotermes obesus,* India, proportion workers 49%, soldiers 7.7%, nymphs 43.3% colony in non-mound-building months; in latter 66.5% workers, 5.5% soldiers, 28% nymphs. Population fungus-combs has higher proportion nymphs than elsewhere.)

Holdaway, F. G., Gay, F. J., and Greaves, T., 1935, pp. 42-46. (Australia, estimated population 4 mounds, *Eutermes exitiosus;* temperature factor in seasonal concentration, largest 1,806,500 at lowest temperature, smallest 484,300 when weather warmer—mounds of equal size.)

Lamotte, M., 1947, pp. 88-90. (Population density of a savannah in Guinea less in dry season due to absence of Collembola; latter predominated, followed by ants and termites.)

Sabrosky, C. W., 1952, pp. 1-7. (U.S., colony ¼ million (*Reticulitermes*); South America, 3 million (*Nasutitermes surinamensis*); Australia, nearly 2 million (*Nasutitermes exitiosus,* pp. 5-6.)

Skaife, S. H., 1954a, p. 126. (*Amitermes atlanticus,* South Africa, 40,000 in mound.)

Snyder, T. E., 1935e, p. 53. (United States.)

1948. (General, in Tropics, several million, p. 76; U.S., ½ million (*Reticulitermes,* p. 84.)

PREDATORS

Adams, C. C., 1915, p. 208. (Ant, *Aphaenogaster fulva,* preying on *Termes flavipes,* Illinois.)

Adamson, A. M., 1943a, pp. 1-12. (Termites enemy honeybee (*Apis mellifera*), Trinidad.)

Anderson, D. A., 1946, p. 29. (Dragonflies, U.S.)

Andrews, E. A., 1911, p. 202. (Jamaica, *Eutermes ripperti, Camponotus hannani,* yellow red ant, predator.)

Andrews, H. E., 1936, pp. 11-12. (*Tachys termiticola,* n. sp., in nest *Macrotermes gilvus,* Java.)

Arnold, G., 1914, pp. 25-32. (Ants, South Africa.)

1915, p. 45. (*Paltothyreus tarsatus,* foraging ant preying on termites, South Africa.)

(Banks, N., and) Snyder, T. E., 1920*, pp. 118, 120-121. (General and ants.)

Baranov, N., 1936, pp. 646-651. (India, maggots of *Termitoloemus marshalli,* n. sp., Calliphoridae, predaceous on termite workers.)

Bates, H. W., 1861, pp. 69-71. (Great and small anteaters, Amazon River.)

Beebe, W., 1914, pp. 1141-1145. (Pangolin.)

1918, pp. 1561-1566. (Silky anteater, British Guiana.)

1918a, pp. 158, 233. (Birds; termites immune from attack by army ants, British Guiana.)

Bequaert, J., 1925, p. 294. (Ponerine ant (*Neoponera commutata*) preying on workers *Syntermes,* Amazon.)

Bingham, C. T., 1903, pp. xix+506. (*Lobopelta,* ant, feeding on termites, British India.)

Blake, C. H., 1941, p. 38. (Alates of *Reticulitermes flavipes* at Lincoln, Mass., captured by ants—*Crematogaster lineolata, Aphaenogaster fulva aquia, Lasius niger,* var. *americanus, Formica rufa integra, F. neogagates,* and *F. nitidiventris;* 2 other ants are recorded as probably plesiobiotic (symbiotic) in termitaries.)

1941a, pp. 91-110. (U.S., termites taken by birds.)

BROMLEY, E. H., 1948, pp. 93-95. (Birds, Malaya.)
BRUES, C. T., 1947, pp. 167-168. (Winged termites.)
BUGNION, E., 1922, pp. 173-225. (Ants.)
1927, pp. 1-44. (War between ants and termites.)
CARPENTER, G. D. H., 1919, pp. lii-lviii. (Fly, *Bengalia depressa,* attacking wingless termite.)
CARVALHO, A. L. DE, 1942, pp. 57-89. (Central Brazil, *Peripatus heloisae,* n. sp., lives in termite hills, eats termites.)
CHAMPION, F. W., 1934, pp. 24-33, pls. 10-13. (Pangolin, *Manis pentadactyla,* plains and foothills India, digs out termites, p. 138, pl. 57, sloth bear digs in ant hills.)
CLELAND, J. C., 1918, p. 15. (Birds, Australia.)
COLLART, A., 1927, pp. 249-253. (Congo, *Megaponera foetens,* when pillaging termite nest led by single individual, combats with *Myrmicaria* when returning with plunder.)
COSAR, H. G., 1934, p. 72. (Africa, ants, birds, *Manis, Orycteropus.*)
D'ABREU, E. A., 1919, p. 861. (Birds, Central Provinces, India.)
DISTANT, W. L., 1892, pp. 48-50. (Transvaal, toads, frogs, birds, dog preying on *Termes angustatus.*)
DITMARS, R. L., 1905, pp. 246-248. (Odd mammals.)
1907, p. 322. (Subterranean serpent *Glauconia albifrons* from Trinidad lives mostly in ant hills where it feeds on young or workers.)
1910, p. 217. (Subterranean serpent *Glauconia albifrons* from Trinidad lives mostly in ant hills where it feeds on young or workers.)
DRACOTT, C. H., 1919, pp. 873-874. (Scorpions, India.)
DUPLESSIS, C., 1931, pp. 1-2. (Birds and animals, South Africa.)
EWERS, H. H., 1927, pp. 173-179, 1 pl., pp. 180-209, 1 pl., 1 text fig. (Ants and termites, thieving ants.)
FITCH, A., 1858, p. 694. (*Termes frontalis,* association with black and red ant, *Formica rufa,* nursed and protected by this ant.)
FLETCHER, T. B., and INGLISH, C. M., 1920, p. 236. (India, bird eating termites, spotted owlet (*Athene brama.*)
FORBES, H. O., 1879, pp. 4-5. (*Termes lucifugus* kept in captivity by *Formica nigra.*)
FOREL, A., 1901, pp. 389-398. (Termite-eating ants, lestobiosus, *Atta tardograda,* subgenus *Euponera;* 2 n. sp. in *Monomorium, Pheidole.*)
1911*, *in* Escherich, pp. 215-228. (Ceylon, association ants and termites.)
FULLER, C., 1918, pp. 16-20. (*Eutermes* and *Cubitermes* and the ant *Plagiolapsis custodiens.*)
1919a, p. 303. (South Africa, aardvark, *Hodotermes.*)
GADOW, H., 1901. (*Myobatrachus* (Mexico) and *Rhinophyrnus* termite-eating amphibians, p. 166; *R. dorsalis* (Mexico) eats termites, p. 185; subfamily Engystomatinae, family Engystomatidae eat ants and termites, p. 225; South African *Breuiceps mossambicus* modified for purpose feeding on termite, p. 232.)
GRANT, C., 1948, p. 14. (Snake in nests termites, West Indies, Australia, British Guiana.)
GREEN, E. E., 1906-1907, pp. 183-184. (Fly *Bengalia* hunting winged termites at night.)
GURNEY, A. B., 1947, pp. 154-156. (Immature stage Neuroptera, *Lomayia* with termites, U.S.)
GWINEY, J. H., 1860, pp. 7234-7235. (African anteater *Orycteropus.*)
HAGEN, H. A., 1879, p. 118. (15 different species birds feeding on swarm *Termes flavipes,* U.S.)
HARPER'S FAMILY LIBRARY, 1831, p. 149. (Africa, ants, birds, reptiles, insects.)
HEGH, E., 1922, pp. 539-593. (General.)
HILL, G. F., 1915*, p. 110. (Larva of a Tachinid fly predacious on *Rhinotermes,* Australia.)
HINGSTON, R. W. G., 1932, pp. 79, 292-317. (Termites, p. 79; ants and termites in Guiana, pp. 292-317.)
HORNE, C., 1869, p. xii. (Termites eaten by birds, frogs, lizards, India.)
IHERING, H. VON, 1896, p. 451. (Termites collected by wasps, Brazil.)
JANVIER, H., 1928, pp. 1748-1749. (Chile, near Loncoche, peripatid *Opisthopatus blainvillei* devours *Calotermes.*)
JARVIS, E., 1927a, pp. 18-23. (Queensland, *Camponotus nigriceps,* var. *dimidiatus, Iridomyrmex detectus,* and a third ant predacious on *Mastotermes.*)
JOSEPH, C. H., 1928, pp. 223-226. (*Peripatus blainvillei* in Chile.)
1928a, pp. 285-298. (*Peripatus blainvillei* in Chile, preying on *Calotermes chilensis* in galleries in wood.)

JUDD, S., 1902, pp. 34, 41. (Termites 1.07% food birds, Maryland farm; Aug. 3, 1898, 2 bank, 2 barn, and 3 white-bellied swallows ate 320 termites.)

KALMBACH, E. R., 1943, p. 41. (Termites comprised 30.5% by volume stomach content armadillo in Texas.)

KALSHOVEN, L. G. E., 1955, pp. 273-278. (Java, elaterid *Oxynopterus mucronatus* Ol., predator on *Neotermes tectonae*.)

KELLOGG, R., 1932, p. 138. (Tree frog, *Diaglena spatulata,* found in nest in tree at Venodio, Mexico.)

KING, G. B., 1897, pp. 193-196. (*Termes flavipes* and association with ants, U.S.)

KNIGHT, P., 1933, p. 24. (Termites 1.0% food of birds, Maryland.)

1939, p. 35. (Termites 1.0% food of birds, Maryland.)

KNOWLTON, G. F., and HARMSTON, F. C., 1946, p. 384. (6 termites in 194 stomachs mountain bluebirds, U.S.)

KNOWLTON, G. F., MADDOX, D. R., and WOOD, S. L., 1946, pp. 382-383. (185 termites in 2,191 stomachs sagebrush swift lizards, U.S.)

MCCOOK, H. C., 1879, p. 155. (U.S., *Formica exsectoides* preying on *Termes flavipes*.)

MCKEOWN, K. C., 1944, rev. ed., p. 68. (Australia, ant *Iridomyrmex detectus* attacks and exterminates mound nests.)

MARLATT, C. L., 1953, p. 305. (Java, toads preying on winged termites attracted to light, climbed steps from garden to balcony.)

MASON, C. W., 1912, pp. 1-327. (India, food of birds.)

MÉHELŸ, L. V., 1904, p. 207. (Termite-eating frog, *Dermatonotus mulleri*.)

MOREAU, R. E., 1935, p. 41. (Usambara, Tanganyika, termites most abundant in Lowland Zone; Guineafowl scratch at their workings to eat them; mostly eaten by smaller birds during flight, often on damp evenings. Birds not usually insectivorous will gorge on termites. Orioles, drongos, starlings, geelgats, and Falconidae noted taking flying termites until dark.)

MYERS, J. G., 1935, pp. 11-22. (Birds receive protection in termite nest, but to disadvantage of termites.)

NANGLE, K. E., 1905, p. 747. (*Bengalia,* predacious fly, India; hawking flying termites 9:30 p.m., flies in large numbers, makes loud noise.)

NEGI, P. S., 1933, p. 1020. (India, usefulness *Solenopsis geminata rufa* in destroying termites.)

OVIEDO, DE, G. F. DE VALDÉS, 1851-1855, p. 410. (*Myrmecophaga,* great anteater, Santo Domingo.)

PARKER, B. M., and GREGG, R. E., 1941, pp. 1-35. (Foes termites.)

PEMBERTON, C. E., 1928, p. 147. (Thysanuran predatory on eggs and immature stages termites, Borneo, *Termes* in dead wood.)

1928a, pp. 148-150. (Nematodes associated with termites in Hawaii, Borneo, and Celebes.)

PRELL, H., 1911, pp. 243-253. (Ants and termites, East Africa.)

PYCRAFT, W. P., Ed., 1931, pp. 226-236. (Larva of an African elaterid, *Tetrolobus flabellicornis,* inhabits termite nests, often mistaken for queen, p. 309.)

RICHARDS, O. W., 1953, p. 125. (Ponerine ant *Lobopelta,* India, raids nests with military precision.)

ROMANIS, R., 1883, pp. 214-215. (Toads and bats eating termites, Rangoon.)

ROTHNEY, G. A. S., 1919, pp. lxiv-lxvi. (Barrackpore, winged termites preyed on by mammals, reptiles, birds, frogs, insects, etc.)

SANTSCHI, F., 1914, pp. 43-148. (Ants, East Africa.)

SCHMIDT, H., 1950, pp. 1-37. (General.)

SMYTHE, E. G., 1919a, p. 138. (*Eutermes morio,* Porto Rico, enemies.)

SNYDER, T. E., 1929a, pp. 40-46. (General.)

1935e, pp. 27, 120-127. (General; *Peripatus,* Panama, list native birds preying on termites.)

1948, pp. 139-145. (General; list native birds preying on termites, pp. 23-24, 34, 110, 139-140.)

SURCOUF, J., and GUYON, L., 1912, p. 427. (*Bengalia,* predacious fly, west Africa.)

USINGER, R. L., 1942, p. 159. (Termitaphididae.)

VERNER, S. P., 1917, p. 1575. (Ant-eating animals.)

WALLACE, A. R., 1853 (ed. 1895), p. 283. (Army ants (*Eciton*) eating termites, Amazon.)

WASMANN, E., 1897a*, pp. 276-279. (*Polybia scutellaris* collecting swarming termites.)

1910b, pp. 97-102, 129-138, 161-181.

1915, pp. 1-413. (Living together, ants and termites.)

WEBER, N. A., 1948, pp. 31-35. (Termite eating ant larvae (*Pheidole*), Africa.)

1949, pp. 1-9. (The ant (ponerine), *Centromyrmex,* probably an obligatory predator on termites, Equatorial Africa.)

WHEELER, W. M., 1910, (Development soldier caste depends on vitamin T; ponerine

ants, p. 233; *Lobopelta elongata* larvae, p. 235; *Ophthalmopone ilgii,* p. 240; *Lobopelta distinguenola,* p. 242.)
1918. (Ants, p. 298; *Paedalgus termitolestes,* n. sp., living in termite hills, predacious, p. 301.)
1919, pp. 174-175. (*Metapone* possibly termitophagous.)
1921-1922, pp. 1-1139. (Ants of Congo predacious on termites.)
1936, pp. 159-243. (Relations ponerine and other ants to termites; termitotharpagy, cleptobiosis, termitoxeny, termitolesty, list termitolestic ants.)
Williams, F. X., 1928a, pp. 1-179. (Oriental ants prey on termites, *Odontoponera transversa* noteworthy, but colony little affected by attacks of these large ants.)
Zietz, A., 1872, pp. 301-304. (*Myrmecophaga jubata,* "ant bear.")

PROTOZOA

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Andrew, B. J., 1930, pp. 449-470. (Method and rate of protozoan refaunation in *Zootermopsis angusticollis,* cannibalism and eating feces as they drop.)
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1925c, pp. 309-326. (Effects of oxygenation and starvation on symbiosis between *Termopsis* and its intestinal Protozoa.)
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1927, pp. 189-222. (Amoebae, *Endamoeba, Endolimax* and *Gregarina* from *Mirotermes;* small amoebae in 4 other Termitidae and small flagellates in 8, including those with amoebae. These amoebae show closer relationship to those of cockroaches.)

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1929, pp. 417-432. (*Snyderella* and *Coronympha,* two new genera of multinucleate flagellates from termites.)

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1932, pp. 349-476. (Flagellates of the genus *Trichonympha* in termites (111 species), genus has undergone but little modification during the phylogeny of termites.)

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(1938) 1939, pp. 1-25. (Polymastigote flagellates of the genus *Foaina* and *Crucinympha* and *Bullanympha*, new genera in *Glyptotermes* and *Neotermes*.)

1939a, pp. 207-220. (Flagellates in the genera *Coronympha* Kirby and *Metacoronympha* Kirby, new genera.)

1939-1940, pp. 407-430. (Microorganisms associated with flagellates of termites.)

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1946a, p. 513. (Displacement structures in flagellates.)

1947, pp. 214-228. (Flagellate and host relationships of trichomonad flagellates.)

1947a, pp. 274-278. (Same as 1946a.)

1949, pp. 319-422. (Devescovinid flagellates of termites. Genus *Hyperdevescovina* and genus *Bullanympha*. MS. genus *Proglyptotermes* Emerson discussed; Emerson later decided that this is *Kalotermes* and not valid; still later decided *Proglyptotermes* to be valid. Protozoa mostly from Australian termites.)

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1926, pp. 285-300. (*Oxymonas projector, Glyptotermes perparvum*, British Guiana, 2 other species.)

Koidzumi, M., 1921, pp. 235-309. (Intestinal Protozoa in termites of Japan.)

Kudo, R. R., 1942, pp. 307-333. (On the microsporidian *Duboscquia legeri*, parasitic in *Reticulitermes flavipes*, invades adipose cells closely associated with mid-intestine, biology; other *Duboscquia* examined.)

Leidy, J., 1877, pp. 146-149. (Intestinal parasites of *Termes flavipes*.)

1881, pp. 425-447. (Parasites of termites.)

1904, pp. 1-281. (Researches in helminthology and parasitology.)

Lewis, W. W., 1933, pp. 77-96. (New species of *Proboscidiella* and *Devescovina* from *Kalotermes occidentis*, Lower California.)

Light, S. F., 1926, pp. 121-140. (*Hoplonympha natator*, n. gen., n. sp., a non-xylophagous hypermastigote from *Kalotermes simplicicornis* characterized by biradial symmetry and a highly developed pellicle.)

1926a, pp. 141-158. (*Metadevescovina debilis*, n. gen., n. sp., a xylophagous poly-

mastigote from *Kalotermes hubbardi,* relationships, phylogeny.)

1927, pp. 467-492. (*Kofoidia loriculata* xylophagous flagellate from *Kalotermes simplicornis,* California, differs from other termite flagellates, in agreement with *Lophomonas* of the cockroaches; development, relationships, phylogeny.)

1934, *in* Kofoid, 2d ed., p. 203. (Few Protozoa in *Amitermes.*)

Light, S. F., and Sanford, M. F., 1927, pp. 95-96. (Are the protozoan fauna of termites specific?)

1928, pp. 269-274. (Experimental transfaunation of termites, Protozoa from *Termopsis angusticollis* can live in hind gut *Kalotermes hubbardi* for 3 months.)

Lund, E. C., 1930, pp. 81-96. (Effect of diet on intestinal fauna *Termopsis.*)

Mackinnon, D. L., 1926, pp. 173-189. (*Holomastigotoides hemigymmum* in *Leucotermes tenuis* morphology.)

Mansour, K., 1936, pp. 233-241. (Enzymes of wood-eating insects, significance of intestinal microorganisms in nutrition.)

Mansour, K., and Mansour-Bek, J. J., 1934, pp. 363-382. (Role of microorganisms in the digestion of wood.)

Maria, G. G., *in* Visintin, 1941-1942, pp. 19-40 (1942.) (*Trichonympha of Reticulitermes lucifugus.*)

Masatake, Y., 1937, pp. 211-224. (Intestinal Protozoa of termites. III, Distribution of glycogen in bodies of intestinal flagellates of *Reticulitermes speratus* and *Coptotermes formosanus.*)

1937a, pp. 225-235. (Intestinal Protozoa of termites. IV, Glycogen in body *Trichonympha agilis,* var. *japonica,* under experimental conditions.)

May, E., 1941, pp. 281-292. (Behavior of intestinal Protozoa of termites at time last ecdysis in *Zootermopsis* spp. and *Kalotermes minor,* Protozoa confined within shed intima and carried over into the adult alate.)

Montalenti, G., 1927, pp. 529-532. (Intestinal Protozoa of termites, rearing without the Protozoa of the caecum.)

1931, pp. 30-44. (Process of excretion of flagellates of order Ipermastigini.)

1932, pp. 859-864. (Degenerate enzymes and the absorption of soluble substance in the intestine of termites.)

Montandon, A. L., 1910, pp. 444-452. (Neuters produced by castration of young by a special diet.)

Nurse, F. R., 1945, pp. 305-314. (Protozoa from New Zealand termites.)

Pierantoni, U., 1936, pp. 169-171. (Physiological symbiosis between xylophagous termites and their intestinal flagellates.)

Porter, J. F., 1897, pp. 48-68. (*Trichonympha* and other parasites of *Termes flavipes.*)

Powell, W. N., 1928, pp. 179-200. (3 new species *Pyrsonympha* from *Reticulitermes hesperus,* California, highly modified Trichomonad.)

Rogick, M. D., 1946, p. 30. (Pictorial representation symbiosis between termites and their intestinal Protozoa.)

Saleem, M., 1952, p. 65. (Abstr., taxonomic studies on termite flagellates, Pakistan.)

Schmidt, H., 1947, pp. 2 and 17. (Intestinal symbiosis of wood-eating termites.)

1949, pp. 344-350. (Flagellate symbiosis of wood-eating termites; originally even higher forms showed symbiotic relation to flagellates, now possess no symbionts.)

1950a, pp. 360-363. (Plant and animal microorganisms in termites.)

1950b, pp. 535-544. (Intestinal flagellates of termites: I, *Joenia annectens* in *Calotermes flavicollis.*)

Semans, F. M., 1936, pp. 315-320. (Distributional and ecological study of protozoan parasites of some Ohio Orthoptera.)

Simmons, W. J., 1890, pp. 57-59. (Parasites of the white ant, order Holotricha, Calcutta.)

Snyder, T. E., 1926f, pp. 522-552. (General.)

1929a, pp. 40-46. (General.)

1931*, pp. 551-556. (Directions for preservation.)

1935e, pp. 17-18, 80-83. (General.)

1948, pp. 93-101. (General.)

Strong, R. P., 1925, pp. 97-107. (Protozoa in termites as true symbionts; spirochaetes, *Treponema* spp., in intestines as saprophytes, not pathogenic in mice and guinea pigs.)

Sutherland, J. L., 1933, pp. 145-173. (Protozoa from Australian termites, 4 new genera, 6 new species.)

Swezy, O., 1923, pp. 391-400. (Pseudopodial method of feeding by trichonymphid flagellates parasitic in wood-eating termites.)

Trager, W., 1932, p. 1762. (A cellulose from the symbiotic intestinal flagellates of termites and the roach *Cryptocercus punctulatus.*)

1934, pp. 182-190. (*Trichomonas termopsidis* unable to utilize any carbon source (carbohydrate) other than cellulose; secretes glucose which is used by host, *Termopsis angusticollis*.)

Visintin, B., 1941, pp. 393-406. (*Calotermes flavicollis* fed with compressed yeast free of cellulose substances eliminates normal fauna of flagellates present in caecum; in consequence loses normal power digesting cellulose; this alteration confirmed through serial determinations respiratory quotient on normal starving and partially defaunated groups of termites.)

1947, pp. 290-300. (Starch in nutrition utilized as carbohydrate food, enzyme active in intestines partially free of Protozoa.)

Visintin, B., et al., 1941-1942, pp. 27-44, 55-62, 157-159, 13-17, 19-40. (Digestion of cellulose in termite *Kalotermes flavicollis* due to activity flagellate Joenidae.)

Yamasaki, M., 1930, pp. 19-26. (Studies on the intestinal Protozoa of termites. Starvation experiments on *Leucotermes speratus* Protozoa, classified on resistance to starvation, heat hastens disappearance all kinds.)

1931, pp. 179-188. (Studies on the intestinal Protozoa of termites. *Leucotermes speratus*, Protozoa. Oxygenation experiments under the influence of temperature.)

1937, pp. 211-235. (Distribution glycogen in intestinal flagellates *Reticulitermes speratus* and *Coptotermes formosanus*, reserve glycogen in 14 forms of flagellates. The mode of the change in the distribution of glycogen granules under experimental starvation, incubation, oxygenation in low temperature and abrupt rise in temperature was determined. Anterior body main region consumption, posterior region of supply. Explains problem of defaunation of intestinal Protozoa by oxygenation.)

Zeliff, C. C., 1930, pp. 714-739. (Cytological study of *Oxymonas*, a flagellate, including the description of 11 new species from American Kalotermitidae.)

1930a, pp. 740-742. (Canal Zone, *Kirbyella zeteki* (Oxymonadidae) from *Calcaritermes brevicollis*.)

RACKET

Anonymous, 1936g, pp. 20-21. (Termite "racket" presents a problem and an opportunity; pp. 44-45, termites controlled by construction methods.)

1936h, p. 9. (More about the termite racket.)

1936i, p. 43. (Filing the teeth of termites, "rackets.")

1936j, p. 18. (Termites and lumber—termite racket.)

1936k, p. 18. (The termite fad.)

1936l, pp. 8-9. (Termite question further discussed.)

1937h, p. 8. (Comment on article in Architectural Forum recommending steel to replace wood joists.)

1953d, pp. 29, 34. (Atlanta, Ga., officials warn public against poor termite control work.)

1953e, pp. 29-30, 32, 34. (Kansas Pest Control Assoc. battles "fly-by-night" termite control operators.)

Berger, B. G., 1953, 2d ed., pp. 1-44. (U.S., how to avoid racketeers.)

1953a, pp. 42, 50. (U.S., how to avoid racketeers.)

Hagen, H. A., 1876a, p. 408. (Known capacity for destructiveness by "white ants" was used by rogues to cover thievery; a very large property stored by the Government in Isle de France was reported as destroyed; the ministers sent to the officers a box containing files with the strict orders to file off the teeth of each ant or resign the post.)

Hayward, P. A., 1936, p. 43. (Termite damage in U.S. grossly overestimated; press release U.S. Dept. Commerce.)

Jorgenson, M. G., 1936, p. 173. (Quackery in termite control.)

Snyder, T. E., 1931a, pp. 116-117. (U.S., scientists warn of termite control racket.)

1935e, pp. 128-130. (Racket in New York City in early 1930's and earlier elsewhere.)

1948, pp. 157-159. (Racket in New York City in early 1930's and earlier elsewhere.)

Turner, N., 1937, pp. 94-98. (Relation of State workers to commercial termite control companies.)

REARING

Adamson, A. M., 1941, pp. 411-414. (Laboratory technique for the study of living termites, between glass plates, filled with wood and soil.)

(Banks, N., and) Snyder, T. E., 1920*. (*Reticulitermes,* pp. 169-172; *Kalotermes,* p. 209 and pl. 19.)

Bugnion, E., and Ferrièrre, C., 1911a, pp. 104-105. (*Coptotermes flavus,* Ceylon in captivity.)

Cleveland, L. R., 1925e, pp. 32-40. (Breeding experiments, U.S.)

1928, pp. 231-237. (U.S., satisfactory method keeping termites alive in laboratory.)

De Long, D. M., and Keagy, R. J., 1949, pp. 114-116. (Various types culture chambers for use in laboratory.)

Forbes, H. O., 1879, pp. 4-5. (Termites kept in captivity in England.)

Gösswald, K., 1943, pp. 297-316. (*Calotermes flavicollis,* small colonies reared in shell vials, lacquer-coated corks, large, in battery jars covered with glass, 50 individuals favorable nucleus. Diastase added to wood hastened development. Air admitted through tubing or holes. Humidity maintained by layer plaster paris or moist filter paper over air inlets.)

Goetsch, W., 1936, pp. 490-560. (Glass vials, *Calotermes, Reticulitermes.*)

Haviland, G. D., and Sharp, D., 1896, pp. 589-594. (Termites in captivity in England.)

Hepburn, G. A., 1954, pp. 219-221. (So. Africa, *Cryptotermes brevis,* wood blocks on which glass plates are glued.)

Holdaway, F. G., 1935, pp. 34-35. (Standard laboratory colonies of *Eutermes exitiosus,* Australia, for timber testing under controlled conditions.)

Hsiu, C., 1935, pp. 618-620. (Improved breeding apparatus for termites.)

Imms, A. D., 1913, p. 241. (Exhibition of living termites.)

Jucci, C., 1936, pp. 302-306. (Rearing *Reticulitermes lucifugus* in test tubes.)

1937a, pp. 28-29. (Rearing *Reticulitermes lucifugus* in test tubes, in adult stage.)

Light, S. F., and Weesner, F. M., 1947, pp. 131-132. (Methods of culturing termites, sawdust, agar in small jars; dependent on fungi.)

Lüscher, M., 1949, pp. 158-165. (Adamson's rearing device, *Reticulitermes, Zootermopsis, Kalotermes.*)

1949a, pp. 269-271. (Laboratory rearing technique, in waterproof nests between glass plates, constant high humidity.)

1950b, p. 357. (Colony formation, *Pseudacanthotermes spiniger, Microcerotermes edentatus,* and *Anoplotermes* sp., 8 months in laboratory in shallow glass cages; flight, courtship, egg laying, hatching, number individuals, young colonies.)

1951, reprint, pp. 1-6. (Reagent jars, glass slides.)

1951b, pp. 404-408. (Removal adult sexual pairs *Kalotermes flavicollis* for 24 hours results in development substitute sexual forms from 7th stage larvae and nymphs. Sexual adults secrete substance which suppresses normal development substitute forms.)

Mathur, R. N., 1950, p. 224. (Tortricid larvae destroying fungus garden in laboratory, India.)

Skaife, S. H., 1951, pp. 44-52. (Artificial nest, *Amitermes atlanticus,* South Africa.)

1954a, pp. 123-133. (Same, mound on glass plate base.)

Snyder, T. E., 1915, pp. 20-22. (Outdoor termitarium rearing *Reticulitermes,* small tin boxes, vials, glass jars, between glass slides.)

1920*, *in* (Banks and) Snyder. (Glass jar, p. 170; block wood, dry-wood termites, pl. 19.)

1920a, pp. 135-145. (Breeding and cross-breeding of *Reticulitermes* in laboratory.)

1931*, pp. 554-556. (Breeding and cross-breeding of *Reticulitermes* in laboratory, Erlenmeyer flasks, pl. 27, fig. 24.)

1935e, pp. 59-63. Breeding and cross-breeding of *Reticulitermes* in laboratory.

1948, pp. 68-72. (Breeding and cross-breeding of *Reticulitermes* in laboratory, progeny all types reproductives and crosses within species same—true in nature.)

Snyder, T. E., and Popenoe, E. P., 1932, pp. 153-158. (Breeding and cross-breeding of *Reticulitermes* in laboratory, progeny all types reproductives and crosses within species same—true in nature.)

Sweeney, R. C. H., 1948, pp. 164-166. (Artificial termitaria.)

REGENERATION

Richard, G., 1950, pp. 13-16. (*Calotermes flavicollis*, regeneration of feet.)

Weyer, Fr., 1935, pp. 648-672. (Regeneration of epithelial tissue in midgut *Microcerotermes amboinensis* and *Macrotermes gilvus*.)

RESISTANT WOODS

Adamson, A. M., 1937, pp. 141-149. (Trinidad, British West Indies.)

Aguilar, L., 1941, pp. 247-256. (Resistance to decay and termites determined by "graveyard tests" in Philippines, 182 species. Ipil (*Intsia bijuga*) taken as standard, with relative durability of 100 and average life of 11.5 years. Ten woods more durable than ipil and 2 equally so; 25 very durable species—80% and up; 26 durable—40 to 79%; 34 moderately durable—21 to 39%; 47 perishable—10 to 20%; and 50 very perishable—10%.)

Ahern, G. P., 1901, p. 91. (Philippines, "dinglas," "molave," "ipil," "yacal" resistant; California redwood and white cedar resistant after 30-day test.)

Andrew, D., 1919, pp. 203-204. (Australia.)

Anonymous, 1919b, p. 18. (World.)

1921, pp. 290-295. (Australia.)

1934c, pp. 337-341. (Indian timbers.)

1934-1953, 1953, pp. 7, 9, 11, graphs 6, 8, 10. (State Highway Dept., Mississippi, guard rail untreated, native guard rail 8" to 10" round posts, eastern red cedar (*Juniperus*), service 1937-1953, 60% serviceable, another series, 1939-1953, 80%; black locust 1938-1953, 80% serviceable.)

1936d, pp. 12-13. (Australia.)

1936m, p. 309. (North Rhodesia, "Kajatenhout" (*Pterocarpus angolensis*) and "umkusu" (*Baikiaea plurijuga*) resistant.)

1943a, pp. 1-18. (Insect defects in timber for aircraft, etc.)

1945b, pp. 22-37, ("Iroko" (*Chlorophora excelsa*) and "opepe" (*Sarcocephalus diderrichii*) resistant to termites, p. 35.)

1946a, pp. 195-197. (N.S. Wales, jarrah (*Eucalyptus marginata*), cypress pine (*Callitris* spp.), and California redwood (*Sequoia sempervirens*) resistant.)

1949l, p. 54. (Australia, 5 native hardwoods in order decreasing resistance to *Nasutitermes exitiosus: Tristania conferta, Eucalyptus acmenioides, E. microcorys, E. maculata*, and *E. pilularis*, laboratory tests.)

1950, pp. 1-4. (Australia, denser Eucalypts; cypress pine.)

1950a, pp. 166-170. (South Africa.)

1950d, p. 62. (Australia, in order of decreasing resistance to *Coptotermes lacteus* were same hardwoods as tested in 1949, laboratory tests.)

1950e, pp. 1-5. (U.S., comparative resistance to decay.)

1951c, pp. 64-65. (Australia, *Eucalyptus alba*, in laboratory tests, showed same resistance to *Nasutitermes* and *Coptotermes* as *E. resinifera;* in order of decreasing resistance are: *Syncarpia laurifolia Eucalyptus paniculata, E. tereticornis, E. crebra, E. grandis*, and *E. micrantha*.)

1952d, p. 67. (Australia, timber grown in plantations of exotic pines such as *Pinus radiata, P. taeda, P. patula*, and *P. caribaea* all very susceptible to termite attack.)

Ardagh, F. D., 1930, pp. 341-350. (India..)

Assmuth, J., 1913a, pp. 372-384. (India, teak.)

Baterden, J. R., 1908, pp. 267-268. (General, pp. 267-268, cypress pine resistant in North Australia, some eucalypti somewhat resistant.)

Bates, H. W., ed., 1864, p. 186. ("Acapù," Amazon.)

Bathellier, J., 1933, pp. 747-750. (Indo-China, camphor, jak fruit (*Artocarpus*) immune; rosewood, teak, ebony, most dipterocarps, and cypress, resistant.)

Bavendamm, W., 1948, p. 327. (Teak.)

1948a, pp. 137-144. (Resistance tropical woods.)

Berry, A. G. V., and Cater, J. C., 1941, pp. 179-180. (*Manilkara bidentata*, "balata," and *Tabebuia serratifolia*, "poui," two most durable woods in Trinidad, becoming scarce.)

Bianchi, A. T. J., 1932, pp. 101-147. (Resistance Dutch East Indian timbers.)

Blake, C. H., and Russell, H. D., 1944, pp. 1-356. (List of woods by countries immune to termite attack.)

Brooks, R. L., Adamson, A. M., Baker, R. E. D., and Crowdy, S. H., 1941, pp. 101-119. (Trinidad, most durable woods balata and poui becoming scarce, 34 species tested against decay and termites, most resistant balata, bois mulatre, guatecare, poin, and redwood, most destructive termites *Heterotermes* and *Coptotermes.* No evidence association termites and fungi in destruction, independent agents.)

Brush, W. D., 1939, pp. 1-11. (Philippines, the Luans, also similar woods from other countries.)

Buhay, R., 1936, pp. 160-178. (Relative durability some American woods.)

Cachan, P., 1950, pp. 14-15. (Madagascar.)

Carter, W., 1936, p. 132. (Redwood (sapwood) from high-pressure water pipe buried in ground seriously damaged by *Coptotermes formosanus,* Hawaii.)

Chamberlin, W. J., 1949, pp. 11-27. (U.S.)

Cosar, H. G., 1934, pp. 68-70. (Africa, large series native woods.)

Cox, C. L., 1935, p. 23. (Kaduna, Nigeria.)

Dadswell, I. W., and Dadswell, H. E., 1931, pp. 208-216. (Relation between durability and extractives of the cypress pines (*Callitris* spp., Australia.)

Dammerman, K. W., 1919, p. 42. (East Indies, *Eusideroxylon swageri,* Borneo teak, *Afzelia nalembanica,* and *Cinnamomum camphora* resistant to most termites.)

Dance, C. D., 1881, p. 159. (*Simaruba amara* not attacked by wood ants, British Guiana.)

De Leon, D., 1952, pp. 84, 89. (Pacific Coast termites in redwood and bigtree.)

Dover, C., 1931, pp. 341-351. (Comparative resistance Indian timbers to termites.)

Dover, C., and Mathur, R. N., 1934, pp. 3, 20. (Method testing susceptibility timbers to termite attack, India.)

Duff, C. E., 1935, pp. 69-75. (Durability trials native timbers copper belt, North Rhodesia.)

1944, pp. 160-162. (Durability trials native timbers copper belt, North Rhodesia, 7 local timbers sound, untreated for 11 years.)

Ehrhorn, E. M., 1934, p. 364. (*Coptotermes formosanus* and *Cryptotermes piceatus* eating redwood, Hawaii.)

Ellis, B. R., 1936, p. 22. (Tidewater red cypress resists termites for over 300 years at St. Augustine, Florida.)

Erdtman, H., 1949, pp. 305-310. (Insect repellent properties heartwood extractives of conifers, pinosylvin, Scotch pine; sesquiterpene ketone, *Cedrus; Podocarpus,* Taxodiaceae, *Sequoia, Cryptomeria, Cunninghamia,* Cupressaceae, *Taxus, Torreya,* durable, contain toxic compounds.)

Foxworthy, F. W., and Wooley, H. W., 1930, pp. 1-60. (Durability Malayan timbers, no wood tested immune to termites; 21 species tested over 10-year period.)

French, C., 1893, p. 141. (Australia, *Cedrus deodar,* India, and *C. atlantica,* North Africa, immune, red less susceptible than white.)

Froggatt, W. W., 1905, pp. 632-656, 753, 774. (Australia.)

1905a, pp. 43-44. (Red pine more resistant than clear, "jarrah" resistant, sawed desert cypress, Australia.)

Fuller, C., 1921, pp. 142-147. (South Africa.)

1924a, pp. 81-104. (South Africa, resistance tests timbers.)

Groenou, H. B. van, Rischen, H. W. L., and Berge, J. van den, 1951, pp. 19-20. (List resistant woods.)

Hadden, F. C., 1928, pp. 13-14. (*Odontotermes formosanus* attacking camphor, Formosa.)

Hagen, H. A., 1855*, pp. 1-144. (European cypress, *Cupressus sempervirens,* attacked by termites, Rochefort, France, p. 133.)

Hagen, W. von, 1942a, pp. 539-542. (Termites bore in heartwood mahogany trees from roots to top branches; over 40% trees on Mosquito Coast affected.)

Haines, H. H., 1938, p. 32. (Ten species termite-resistant woods, American Tropics.)

Hawley, L. F., Fleck, L. C., and Richards, C. A., 1924, pp. 699-706. (Relation between durability and chemical composition of wood.)

Henius, F., 1942, pp. 390-394, 426. (Oriente, durable woods, mahogany (caoba aguana, not *Swietenia*); red cedar, itauva (stone tree), compares with teak. Huagapu not attacked by insects; marupa, bitter taste, not eaten by ants. Paulo de sangre, but has twisted grain.)

Hill, G. F., 1932, pp. 7-28. (Australia.)

Hopkins, A. D., 1903, pp. 39-40. (Redwood not attacked by termites at Manila, P.I.)

Howard, C. W., and Thomsen, F., 1907-1909, pp. 85-93, 1907; pp. 512-520, 1909; pp. 86-87, 1909. (Untouched by termites for 3 years in Distr. Pretoria, Transvaal: Leadwood, *Combretum prophyrolepsis,* black ironwood, *Olea laurifolia,* and "vaalbosch," *Brachylaena discolor.*)

Hubert, E. E., 1931, p. 464. (Relation durability to specific gravity.)

Humphrey, C. J., 1915, pp. 204-209. (Tests on durability of greenheart.)

1916, pp. 80-92. (Tests on durability of greenheart, in laboratory.)

HUTSON, J. C., 1932, pp. D111-D121. (Ceylon, California redwood attacked; *Hopea odorata* and *Xylia dolabriformis* not attacked.)

JACK, R. W., 1913, pp. 1-16. (Rhodesia.)
1913a, pp. 393-407. (South Rhodesia; "mopani," *Copaifera mopani,* resistant.)

JACKSON, W. F., 1954, pp. 207-208. (Malaya.)

KALSHOVEN, L. G. E., 1952a, pp. 188-190. (Java, *Coptotermes, Macrotermes, Odontotermes, Microtermes,* and *Eutermes* preferences for cardboard, *Ricinus,* manihot, and maize stalks, newspaper and split bamboo; teak bark not attacked.)

KAMESAN, S., 1936, pp. 93-113. (India.)

KANEHIRA, R., 1914, pp. 23-41. (Relative resistance woods to termites, Formosa.)

KEMP, P. B., 1951, pp. 122-123. (Susceptibility woods to termites, East Africa.)

KIRKPATRICK, T. W., 1944, pp. 1-31. (Insect damage to East African timbers.)

KITAJIMA, K., 1933, pp. 100-102. (Laboratory tests on durability of Japanese coniferous woods against decay: *Thujopsis dolabrata* most durable, *Larix leptolepis, Cryptomeria japonica, Chamaecyparis obtusa, Pinus koraiensis* very durable.)

KOFOID, C. A., and BOWE, E. E., *in* Kofoid, 1934, 2d ed., pp. 517-539, 554-563. (Termite resistivity, chemical extractives in wood in relation to termite attack, extractive tests, U.S.)

KRISHNA, S., and NARAYANAMURTI, D., 1951, p. 271. (India, sal (*Shorea robusta*) resistance due to chemical extractives in heartwood, soluble in hot water and alcohol. Tests of 200 species of Indian timbers indicate that they can be divided into 5 different classes of resistance. *Artocarpus gomiziana* from Andamans and teak (*Tectona grandis*) also resistant to marine borers, former 10 years at Chatham, latter 5 to 9 years according to location.)

LAGRIMAS, M., 1939, pp. 259-265. (Philippines, seasoned heartwood redwood in ground had life 6½ to 35⅓ months; average only 656 days, 15.6% as durable as ipil (*Intsia bijuga*), in termite-infested ground.)

LEVER, R. J. A. W., 1934, p. 13. (Solomon Islands, local resistant timbers.)

LIGHTFOOT, G., 1938, pp. 21-22. (Australia, technique used in testing resistance material to attack by termites.)

MACGREGOR, W. D., 1950, pp. 33-39. (Africa, British West Indies. Guiana, Honduras, Fiji, Malaya, North Borneo, Sarawak.)

MANSOUR, K., and MANSOUR-BEK, J. J., 1934, pp. 363-382. (Use free-living intestinal microorganisms directly as food, not as aids in digestion of wood.)

MARCHÁN, F. J., 1946, pp. 135-151. (Lignin, ash, protein content 43 species temperate, subtropical, tropical woods, relationship between lignin, ash, and protein content and resistance to termites.)

MILLER, N. C. E., 1941, pp. 23-25. (Dry-wood termites attack on sepetir, *Sindora* spp., used for furniture, Malaya.)

MOLL, F., 1948, pp. 497-498. (Is teak wood immune to termites?)

OSHIMA, M., 1919, pp. 347-374. (Formosa, termite resistant woods, relationship to resistance physical properties wood and chemical extractives.)

PAINTER, R. H., 1951, pp. 487-488.

PARKER, W. B., 1911, pp. 422-423. (California redwood attacked by *Termes lucifugus,* California.)

PESCOTT, E. E., 1947, p. 6. (Australia, cypress pine, brush box, raspberry jam wood (*Acacia acuminata*) termite resistant.)

POPHAM, E. J., 1931, pp. 62-69. (Durability timber, India.)

RATCLIFFE, F. N., and CUMMINS, J. E., 1939, pp. 221-228. (Food preferences Australian Rhinotermitidae, Mastotermitidae, and Termitidae.)

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1932a, p. 27. (Food (wood) preference.)
1935e, pp. 91-92, 150. (General.)
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1940a, pp. 1-10. (Relative resistance, grouping of woods.)
1945, pp. 115-129. (The algarrobo (*Hymenaea courbaril*) more resistant to *Cryptotermes brevis* than mahogany.)
1946, pp. 1-29. (Use resistant woods in construction.)
1946a, pp. 121-134. (Factors in natural resistance, high lignin content, high resin content.)
1946b, pp. 329-334. (Relative resistance grouping.)
1947, pp. 124-129. (Teak and mahogany have high lignin content (not digestible), cypress contains repellent gum.)
1948, pp. 53-54. (Resistance Central American woods to *Cryptotermes brevis.*)
1950b, pp. 1-26. (An index to the termite-resistance of woods.)
1951, pp. 263-264. (Extractives from teak, pine, tectoquinone (beta-methylanthaquinone) and pinosylvin.)
1951a, pp. 17-18. (Pinosylvin (3, 5-dihydroxystilbene), stilbene toxic to termites, "Toxaphene" (Hercules Powder Co.) contains minute pinosylvin-chlorinated camphene, southern pine heartwood; "Ryania" from Venezuelan tree or shrub, *Ryania speciosa* (Merck and Co.), toxic to termites.)
1953, pp. 374-375. (Pinosylvin is a stilbene, toxic to termites.)
1953b, pp. 224-227. (Neither hardness nor high lignin content renders wood resistant to dry-wood termites, but some specific chemical constituent.)
1954, pp. 115-122. (Puerto Rico, bald cypress, Osage orange, U.S., West Indian mahogany.)
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RESPIRATION, See GASEOUS ENVIRONMENT

REVIEWS

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1936r, p. 72. ("Our enemy the termite," T. E. Snyder, 1935.)

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1936v, p. 15. ("Our enemy the termite," T. E. Snyder, 1935. Practical handbook.)

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1936x, p. 818. ("Our enemy the termite," T. E. Snyder, 1935.)

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1936z, p. 352. ("Our enemy the termite," T. E. Snyder, 1935. Problem increasing; paragraph on anthropocentrism antidote to romantic biologists.)

1936a′, p. 9. ("Our enemy the termite," T. E. Snyder, 1935. Useful to building contractor.)

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1948g. ("Our enemy the termite," T. E. Snyder, rev. ed., 1948. Based on long experience.)

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enemy the termite," T. E. Snyder, 1935. Best comprehensive account.)

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RHYTHM, COORDINATED

Andrews, E. A., and Middleton, A. R., 1911, pp. 26-34. (Rhythmic activity in termite nests (*Nasutitermes morio*) Jamaica, "traffic" in and out of nest, 8,000 per hr. at time greatest activity—shortly after midnight.)

Bryk, F., 1927, pp. 1-3. (Children make rhythmic noise by hammering with sticks upon wood, producing sound as of pattering rain to lure *Odontotermes* to swarm into trap for food for natives in East Africa, at foot of Mount Elgon.)

Bugnion, E., 1913c, pp. 125-139. (Sound produced in rhythm, India.)

Buxton, P. A., 1923, pp. 271-273. (Freetown, Sierra Leone, altitude 500 feet, small numbers winged termites emerging at 1 p.m. from subterranean nest under stones in shady spot, June 18. Ground near mouth of nest covered with thousands of small soldiers and small numbers large soldiers—over radius 3 feet. All were making a rhythmical sound, resembling noise made by sand falling on brown paper, by tapping their heads on dead leaves on which they were standing. Sound produced in perfect time at rate of 48 beats per minute. *Acanthotermes militaris.* Impulse auditory, not due to a mechanical vibration in case termites standing on many different dead leaves over a considerable radius.)

Connor, F. P., 1933, p. 1018. (Rhythmic sound, termites at work, India.)

Gounelle, E., 1900, pp. 168-169. (Sounds produced by large number termites tapping heads on dried leaves of Bromeliads in Brazil, like a pinch of sand hitting paper.)

Snyder, T. E., 1926f, p. 536. (Rhythmic synchronous swarming of termites, *Reticulitermes,* U.S.)

Thyagaraju, A. S., 1934, p. 745. (India, rhythmic sound.)

Williams, C. B., 1922, pp. 173-176. (Discusses Gounelle's note and states that the movement (tapping) is apparently not rhythmic, p. 174.)

SECRETIONS

Anonymous, 1933, pp. 8-9. (Chemical warfare by termites.)

Bathellier, J., 1922a, pp. 399-403. (Nature of the glue of *Eutermes.*)

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Bidie, G., 1882, p. 549. (Erosion of glass by termites.)

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Bugnion, E., and Popoff, N., 1910*, pp. 107-108. (*Coptotermes travians,* Ceylon, secretes a latex in frontal gland soldier.)

Cook, O. F., 1900, pp. 516-521. (Nasutiform termite secretes camphor, isonitriles.)

Emerson, A. E., 1929a, pp. 722-727. (Odor and sound means communication.)

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Ghidini, G. M., and Moriggi, M., 1939, pp. 345-353. (Pericardial concretion.)

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Haldane, J. B. S., 1924, p. 676. (Growth-regulating substance in termites, physogastry of insects feeding on termites or their secretions.)

Hanstroem, B., 1940, pp. 227-235. (Internal secretory organs head *Mastotermes darwiniensis, Zootermopsis angusticollis,* and *Termes gilvus.*)

Hegh, E., 1922, pp. 221-224. (Food by regurgitation and defecation.)

Hingston, R. W. G., 1928, pp. 717-725. (India, *Eutermes biformis,* soldier, sticky clear fluid in beak for defense.)

Holmgren, N., 1909*, pp. 190-203. (Exudate theory, relationship between amount exudate tissue and the care a termite receives, as licking and feeding.)

Jucci, C., 1921a, pp. 213-215. (Presence of deposits of uratics ("uratici") in the fatty tissue.)

1932, pp. 1422-1429. (Presence of bacteriocytes ("batteriociti") in fatty tissue.)

Light, S. F., 1944a, pp. 413-454. (Ectohormonal control of the development of supplementary reproductives in *Zootermopsis.*)

McIndoo, N. E., 1923, pp. 367-381. (Glandular structure of abdominal appendages of the termitophile *Spirachtha.*)

McLachlan, R., 1878, p. xii. (Acid liquid from cephalic process *Termes ripperti,* Cuba.)

Mukerji, D., and Raychaudhuri, S., 1943b, p. 167. (Bearing of exudate organs on postadult growth, *Termes redemanni,* India.)

Nasonoff, N. V., 1893, pp. 700-702. (Salivary glands nasuti and soldiers.)

Oshima, M., 1919, pp. 337-338, 347-374. (Acidulous secretions from frontal gland soldier *Coptotermes formosanus* dissolves lime mortar, Formosa.)

RANDALL, M., and DOODY, T. C., *in* Kofoid, 1934, 2d ed., pp. 99-104. (Hydrogen-ion concentration in termite intestine.)

SNYDER, T. E., 1915, pp. 18-41. (Head gland of *Eutermes*.)

1924c. (Exudate as food, p. 5; secretions for defense, p. 9.)

1926f, pp. 533-534. (Secretions from frontal gland soldier for defense; evolution of glands.)

1928c, p. 381. (*Coptotermes* dissolves lime mortar by secretions from frontal gland.)

1935e. (Secretions, pp. 4, 19, 29, 62, 92; "proctodeal" food from anus; pp. 56, 85; "stomodeal" food by mouth from stomach, p. 85; "trophallaxis" or exchange of nourishment, p. 86.)

1948. (Secretions as in 1935e, pp. 63, 65, 102; protective secretions, exudates for food, U.S., pp. 23, 34, 70, 153; disintegration lime mortar by *Coptotermes*, Formosa.)

1920*, *in* (Banks and) Snyder, pp. 94, 112. (Exudate for food, "trophallaxis" or exchange of nourishment.)

WEALE, J. P. M., 1878, p. ix. (*Termes trinervius*, Cape Colony, distils an acid liquid from cephalic process, protective against ant predators.)

WHEELER, W. M., 1918, pp. 293-343. ("Trophallaxis," or exchange of nourishment, mother and brood; also other insects such as termitophiles; source of the social habit.)

SENSE ORGANS

BUGNION, E., 1913c, pp. 125-135, 136-139. (Sound perception.)

CHILD, H. J., *in* Kofoid, 1934, 2d ed., pp. 76-79, 79-81. (Peripheral sense organs, eyes *Zootermopsis*, central nervous system.)

DROPKIN, V. H., 1941, pp. 200-202. (Cooling termites of various species (and odors) in refrigerator enables them to live together peacefully afterward.)

EMERSON, A. E., 1929a, pp. 722-727. (Odor, contact, and sound as means communication.)

EMERSON, A. E., and SIMPSON, R. C., 1929, pp. 648-649. (Odor, contact, and sound as means communication.)

GRASSI, B., and SANDIAS, A., 1897, pp. 267-269, 313-315.

HANSTROEM, B., 1930, pp. 732-733. (Brain *Termopsis nevadensis*.)

1940, pp. 227-235. (Sense organs and nervous system head *Mastotermes darwiniensis, Zootermopsis nevadensis*, and *Termes gilvus*.)

HARTWELL, R. A., 1924, pp. 131-162. (Olfactory sense.)

HEATH, H., 1927, pp. 387-419. (Eyes, *Termopsis*.)

HILTON, W. A., 1937, pp. 88-91. (Nervous system, summary of brain.)

HOLLANDE, A., CACHON, J., and VAILLANT, F., 1952, pp. 365-395. (Larvae of termitophilous Muscidae, Calliphoridae, Oestridae, Tineidae, Melandryidae, with appendages, purpose sensory, not glandular.)

JOERSCHKE, H., 1914, pp. 153-280. (Compound (faceted) eyes.)

JORG, M. E., 1933, pp. 93-102. (Eyes, *Eutermes* sp.)

MARCUS, H., 1947, p. 42. (Stridulation organ in nasuti between thorax and abdomen, Bolivia.)

1949, pp. 44-51. (Postantennal organ.)

1952, pp. 24-28. (Chordotonal organs head nasute and new sensillae described, in head; one with statolith for equilibrium, one for humidity, another to perceive shock.)

1953, pp. 1-16. (Chordotonal and equilibrium organs in *Anoplotermes* and *Nasutitermes*.)

MARSHALL, G. A. K., 1896, pp. 46-47. (Senses of insects.)

NOYES, B., 1930, pp. 259-286. (Peripheral sense organs *Termopsis angusticollis*, 3 types on antennae, mouthparts, legs, cerci, and abdominal styles.)

PACKARD, A. S., 1889a, pp. 222-233. (Epipharyngeal organs taste in mandibular insects.)

RICHARD, G., 1948, pp. 356-357. (Phototropism, *Calotermes flavicollis*.)

1949a, pp. 77-84. (Distribution of sensillae on feet of *Calotermes flavicollis*.)

1950a, pp. 65-83. (Innervation sense organs in feet *Calotermes flavicollis*.)

1951, pp. 485-603. (Phototropism in relation to sense organs.)

1952, pp. 397-412. (Innervation sense organs in mouthparts *Calotermes flavicollis*.)

1953, pp. 415-421. (Role of sense organs in certain phases of behavior, geotropism, phototropism.)

ROSEN, K. VON, 1913a, pp. 625-664. (Eyes studied as contribution to knowledge of brain.)

SNYDER, T. E., 1915, pp. 31-32. (General, relation between convulsive movements—sudden jerking of body—and sense organs, odor.)
1919, p. 99. (Odor.)
1924c, p. 8. (Perception by brachypterous reproductive forms.)
1926f. (Stimulus to swarm; sex odor, amatory procedure, pp. 535-536; convulsive movements and sense organs, chordotonal organs, vibration unfavorable, pp. 540-541.)
1935c, pp. 4-5. (Senses of feeling, smelling, tasting, hearing, and seeing; tropisms reversed during and after swarm.)
1935e, pp. 49-52. (Odors of sex and nest, contact stimuli, chordotonal organs, convulsive movements, method of communication.)
1948, pp. 56-59, 123. (Tropisms, odor, sound, vibration in railway ties, factory timbers unfavorable, experiments.)
1952d, pp. 33-34. (History of the use of microphones.)

STOKES, A. C., 1893, 1894, pp. 273-276. (Sense organs on legs *Termes flavipes*.)

THOMPSON, C. B., 1916, pp. 553-603. (Brain and frontal gland *Leucotermes flavipes*.)
1922, pp. 495-535. (Eyes, *Termopsis*.)

SHIELDS,[2] METAL BARRIERS

ADAMSON, A. N., 1937, pp. 141-149. (Trinidad.)

ANONYMOUS, 1931a, pp. 1-4. (South Africa.)
1936b, pp. 43-44. (U.S., model house.)
1936d, pp. 12-13. (Australia.)
1937e, pp. 1-11. (U.S. and Panama.)
1937f, p. 4. (U.S.)
1939, pp. 133-138. (U.S., Master Specifications, Home Owners Loan Corp.)
1939a, pp. 1-24. (Federal Housing Administration, U.S.)
1939b, pp. 1-14. (Brick buildings, Adelaide, South Australia.)
1941c, pp. 1-11. (U.S., copper shields, diagrams show installation.)
1942, pp. 18, 19, 28-33. (U.S. Dept. Agriculture, types and gages metal, revised 1949.)
1948, pp. 11, 16. (U.S. Dept. Agriculture, types and gages metal; revised 1951.)
1950, pp. 1-4. (Australia.)
1950a, pp. 69-73. (South Africa, ineffective in protecting against mound builders.)

BEESON, C. F. C., 1934, pp. 64-78. (India, p. 72.)

CLARK, A. F., 1941-1942, pp. 23B-32B. (New Zealand, shields required by law.)

CLEMENTS, W. B., 1952, pp. 29-30. (Florida, effective only if properly designed and installed, rarely the case.)

COATON, W. G. H., 1949a, pp. 1-89. (South Africa, shields, while effective in protecting against subterranean termites, cannot stop mound-building termites.)

COX, C. L., 1935, p. 19. (Kaduna, Nigeria, Public Works Dept.)

CRAIGHEAD, F. C., 1950, p. 45. (Buildings, U.S.)

DUPLESSIS, C., 1931a, pp. 1-7. (South Africa, Natal, concrete floors suspended—not built on earth filling, a course of 24-gage galvanized sheet iron, lapped, riveted, and soldered at seams, covers whole of sleeper walls, built into foundation walls on all sides and under all floors, is bedded in 5:1 cement mortar; in Transvaal, Orange Free State, and Cape Province a termite-proof course is built into foundation walls as in Natal, but concrete floors are laid on earth filling, since termites are not so troublesome.)

FROGGATT, W. W., 1905, pp. 632-656, 753, 774. (N.S. Wales, Australia.)
1905a, pp. 1-47. (N.S. Wales, Australia.)
1913, pp. 1-46. (N.S. Wales, Australia.)

FULLAWAY, D. T., 1926, pp. 68-88. (Hawaii.)

FULLER, C., 1901, pp. 84-86. (In Australia sheets of galvanized iron or zinc cover tops of piles supporting houses to check passage of termites, suitable for Natal, South Africa.)

HAMILTON, M. J., 1933-1934, pp. 337-344, 25-30. (U.S.)

HARTNACK, H., 1943, p. 37. (U.S.)

HORNER, A. C., BOWE, E. E., PUTNAM, W., and CHASE, G. E., *in* Kofoid, 1934, 2d ed., pp. 599-642. (Protection buildings, p. 626, shields.)

HORNER, A. C., and BOWE, E. E., *in* Kofoid, 1934, 2d ed., pp. 735-739. (Protection lumber storage piles; shields, p. 736.)

JACK, R. W., 1913, pp. 1-16. (Rhodesia.)

JEPSON, F. P., 1929, pp. 22-26. (Ceylon.)

JOHNSON, R. P. A., and DAVIS, E. M., 1935, p. 5. (Recommend use, U.S.)

[2] Also included under "Control" in other papers.

JOHNSTON, H. R., 1943, pp. 386-392. (U.S., in laboratory tests no type shield was 100% effective; as supplement to good construction, properly made and installed shields give high percentage protection.)
JONES, N. L., 1929, pp. 810-812. (N.S. Wales.)
KECK, C. B., 1953, pp. 187-194. (Hawaii, thick tubes *Coptotermes* pass by shields.)
(LEWIS, B., and) SNYDER, T. E., 1944, pp. 16-20. (Length life 26-gage galvanized iron shields, Louisiana, over 16 years.)
LIGHT, S. F., 1925, p. 287. (Pacific area.)
1925a, suppl. p. xiv. (Metal shield in masonry.)
1934, *in* Kofoid, 2d ed., p. 348. (Philippines.)
MACGREGOR, W. D., 1950, pl. 7, pp. 23-29. (British colonies.)
MUIRHEAD, D. M., 1937, pp. 87-91. (U.S., several types buildings.)
OSHIMA, M., 1919, pp. 342-343. (Barriers, Formosa, concrete drains or gutters.)
PAULL, J., 1917, p. 782. (Southern Australia.)
POMEROY, A. W. J., 1927, pp. 1-21. (Accra and Achinota, Gold Coast.)
ST. GEORGE, R. A., 1939, p. 15. (Buildings, U.S.)
SNYDER, T. E., 1926c, pp. 10-11, 14. (Metal collar around pipe sunk in concrete; shields, guards, caps, U.S. 1930 revision, pp. 10-11: Shields, guards, metal caps. 1934 revision, pp. 11-12, 14: Shields, guards, metal caps. 1937 revision, pp. 11-12, 14: Shields, guards, metal caps. 1939 revision, pp. 11-12, 14: Shields, guards, metal caps.)
1927a, pp. 290-291. (Metal shield for poles.)
1927b, pp. 316-321. (Building foundations, U.S.)
1929k, pp. 210-230. (Building foundations, U.S.)
1929l, pp. 1-5. (Building foundations, U.S., pp. 3-5.)
1929o, pp. 268-277. (Building foundations, U.S., pp. 3-5.)
1929 (1931)*, pp. 542-543. (Building foundations, U.S., pp. 3-5.)
1933b, pp. 5-6, fig. 1. (Building foundations, U.S.)
1934b, pp. 5-6. (Buildings, U.S.)
1935a, pp. 70-78. (Buildings, U.S.)
1935c, pp. 1-6. (Buildings, U.S.)
1935d, pp. 5-6, 7-8, 28-30. (Buildings, U.S.)
1935e, pp. 135-136, 144, 169-170. (Buildings, U.S.)
1938, pp. 6-9. (Buildings, U.S.)
1939, pp. 7-9. (Buildings, U.S., Panama.)
1948, pp. 165-168. (Buildings, U.S., Panama, different types, bread pan, strip, etc.)
1949d, *in* Burton, pp. 264-272. (Buildings, U.S., Panama, different types, bread pan, strip, etc.)
1951, p. 28. (Buildings, U.S.)
1951a, p. 250. (Buildings, U.S.)
1952g, pp. 14, 16, 18. (Buildings, U.S.)
SNYDER, T. E., and REED, W. D., 1949, p. 9. (Buildings, U.S.)
SNYDER, T. E., and ZETEK, J., *in* Kofoid, 1934, 2d ed., p. 346. (Panama.)
TURNER, N., 1937, pp. 94-98. (Buildings, U.S.)
1939, pp. 16-17. (Construction shields, U.S.)
TURNER, N., and TOWNSEND, J. F., 1936, pp. 209-242. (Buildings, U.S.)
1939, pp. 1-14. (Buildings, U.S.)
TURNER, N., and ZAPPE, M. P., 1938, pp. 208-217. (Effectiveness shields in Connecticut.)
TURNER, N., ZAPPE, M. P., and TOWNSEND, J. F., 1937, pp. 392-396. (Buildings, U.S.)
WILSON, H. B., 1946, pp. 261-268. (Victoria, Australia.)

SOIL POISONS, POISON BAITS, REPELLENTS

ANONYMOUS, 1921, pp. 290-295. (Australia.)
1925, pp. 739-745. (Australia, sugarcane protected by poisoned (arsenical) molasses bait.)
1926a, pp. 4-5. (*Mastotermes darwiniensis,* Queensland, Australia, poisoned bait—arsenic 4 parts by weight, caustic soda 1 part, mixed dry, water gradually added until dissolved, for every pound arsenic add 2 gal. molasses; dehydrated tar and paradichlorobenzene as repellents; also clear timber from vicinity where sugarcane is raised.)
1927a, pp. 86-88. (Queensland, *Coptotermes acinaciformis,* sugarcane pest, benzine and Cyanogas control.)
1935e, p. 2. (Zinc chloride.)
1936b′, pp. 189-211. (Metallic and inorganic weed-killing compounds.)
1937i, pp. 154-156. (St. Helena, soil poisoning, chemical insulation.)
1942, pp. 34-37. (U.S. Dept. Agriculture recommends as soil poisons: Sodium arsenite, coal-tar creosote in fuel oil, orthodichlorobenzene, trichlorobenzene, pentachlorophenol; dosages, methods application; revised 1949.)
1945c, pp. 1-2. (U.S., protection buildings.)

1946e, pp. 195-199. (Australia, *Coptotermes,* paradichlorobenzene protects roots plants.)

1948, pp. 23-24. (U.S. Dept. Agriculture recommendations for soil poisons in order of effectiveness: Sodium arsenite, trichlorobenzene in fuel oil, DDT in fuel oil, pentachlorophenol in fuel oil, and coal-tar creosote in fuel oil; dosages in relatively increasing amounts, methods application; revised 1951.)

1949l, p. 73. (Australia, creosote and 5% pentachlorophenol in oil at rate of 0.5 gal. per cu. ft. gave complete protection for 1 year; lead arsenate and white arsenic (2 oz. per cu. ft.) failed.)

1950, pp. 1-4. (Australia, creosote oil, 1 gal. to 5 cu. ft. in trench.)

1950a, pp. 86-104. (South Africa, pentachlorophenol less dangerous, more effective than sodium arsenite; copper sulfate useless.)

1950d, p. 62. (Australia, creosote and 5% pentachlorophenol (0.5 gal. per cu. ft.) have given complete protection for 2 years as soil poisons; 5% sodium pentachlorophenate and 10% sodium arsenite gave 1 year protection.)

1950f, pp. 1-4. (South Africa, "pestrol" soil solution, "B" or "S.S.B.")

1950i, pp. 1-2. (DDT recommended by U.S. Bur. Ent. and Plant Quar. for control subterranean termites.)

1951c, p. 65. (Australia, third annual examination soil poison tests around mounds of *Nasutitermes exitiosus,* creosote and pentachlorophenol effective 3 years, 5% sodium pentachlorophenate and 10% sodium arsenite (0.5 gal. per cu. ft.), 2 years, 5% DDT, 1 year; lead arsenate and white arsenic (4 oz. per cu. ft.) failed, 1 year.)

1952d, p. 67. (Australia, third annual examination soil poison tests around mounds of *Nasutitermes exitiosus,* creosote and pentachlorophenol effective 3 years, 5% sodium pentachlorophenate and 10% sodium arsenite (0.5 gal. per cu. ft.), 2 years, 5% DDT, 1 year; lead arsenate and white arsenic (4 oz. per cu. ft.) failed, 1 year; 4th annual examination, same results as 3d and 2d; in similar tests against *Coptotermes lacteus* 5% pentachlorophenol, 5% DDT, and creosote have all given complete protection for 1 year.)

1953p, p. 16. (U.S. Dept. Agriculture's tests at Beltsville, Md., and Gulfport, Miss., prove chlordane an effective soil poison; emulsion will not kill vegetation.)

Ballou, H. A., 1912, pp. 150-151. (West Indies, sugar and arsenic or strychnine poison bait.)

Bates, G., 1926, pp. 4-5. (*Mastotermes darwiniensis,* Queensland, poison bait, arsenic and molasses to protect sugarcane; mix dry 4 parts arsenic by weight, 1 part caustic soda, add water gradually until dissolved; for every pound of arsenic 2 gal. molasses is added.)

Bates, H. W., 1864, p. 186. (Arsenical soap, wall space filled, Amazon.)

Beeley, F., 1934, pp. 160-175 (Malaya, chemical dusts about roots rubber trees.)

Behr, E. A., 1949, pp. 19-20, 22. (Pentachlorophenol as a soil poison, U.S.)

Brittain, W. H., 1925, pp. 82-87. (Calcium cyanide in the control of mound-building termites, Bengal, India.)

1926, pp. 45-48. (Calcium cyanide in the control of mound-building termites, Bengal, India, Ceylon.)

1928, pp. 115-124. (Control of scavenger termites in India and Ceylon by Cyanogas, calcium cyanide.)

Caresche, L., and Nguyên-Huu-Hanh, 1937, pp. 213-216. (Toxicity of sulfur anhydride to termites, Indo-China.)

Chopra, R. L., 1928, pp. 67-125. (Sugarcane sets dipped for 5 min. in 2.5% solution bichloride mercury and 1% arsenic, Punjab, India. Soil treatment to protect chillies (Capsicum)—6.5 oz. arsenic and 8% paris green per 100 sq. ft. mixed with ashes to secure even distribution and prevent injury to plants.)

Christian, M. B., 1945, p. 20. (Chlorinated phenols as soil poisons, U.S.)

Ciampolini, M., and Zocchi, R., 1954, pp. 309-325. (Tuscany and Firenze, damage and control *Reticulitermes lucifugus* in buildings—soil poisons, wood preservatives.)

Coaton, W. G. H., 1941, pp. 1-4. (Poison baits to protect building in South Africa against *Macrotermes, Odontotermes,* and *Hodotermes.*)

1943, pp. 1-5. (South Africa, *Hodotermes,* poison bait, soak cut grass half inch long in solution 1 lb. sodium arsenite, 8 lb. brown sugar, 8 gal. water, used dry.)

Craighead, F. C., 1950, p. 46. (Soil poisons to protect buildings, U.S., same as in Anonymous, 1942, 1949.)

Décamps, M., 1936. (St. Helena, liquid harm-

less to man used as soil poison about foundations, Napoleon's residence.)

Delaplane, W. K., Jr., 1951, pp. 31-32. (U.S., new chemicals.)

Dews, S. C., and Morril, A. W., Jr., 1946, pp. 347-355. (5% DDT in oil effective for 2 years at army installations, Fourth Service Command, creosote in diesel oil failed.)

Dietz, H. F., and Snyder, T. E., 1924, p. 301. (Panama, fumigation mound nests with hot volatile fumes arsenic and sulfur pumped into galleries, poison baits, soil poisons.)

DuPlessis, C., 1931a, pp. 1-7. (Soil poisons and baits, South Africa.)

1935, pp. 423-425. (Soil poisons and baits, South Africa.)

Ehrhorn, E. M., *in* Kofoid, 1934, 2d ed., pp. 330-333. (Hawaii, paris green, carbon bisulfide.)

Evans, R., and Hassler, K., 1954, pp. 34, 36, 38, 40. (U.S., EDB (ethylene dibromide), advantages and disadvantages as a soil poison; effective.)

Feytaud, J., 1951, pp. 223-225. (France, toxic mixtures against subterranean termites.)

1953, pp. 135-143. (France, CS_2, sodium arsenite, chlorinated phenols, naphthalenes, DDT, chlordane.)

Fletcher, F. W., 1945, pp. 15-16, 18, 20, 22, 24, 26, 28. (U.S., orthodichlorobenzene.)

Froggatt, W. W., 1920, p. 46. (Australia, poison baits, 1 oz. arsenic to 1 lb. treacle or substitute sodium arsenite, dissolve in hot water, mix with treacle, percolate through damaged floors or joists.)

Fuller, C., 1912a, pp. 345-369, 543-571. (Natal, South Africa, fumigate nests in ground, "Universal Ant Exterminator," mixture 7 lb. arsenic to 3 lb. sulfur, or 8 to 2, results same when sulfur portion is reduced; in Philippines, use 3 parts sulfur to 1 arsenic; solution arsenite as soil poison.)

1919a, pp. 301-305. (South Africa, poison fumes from cylinders under pressure and arsenical poison baits, *Hodotermes.*)

Hassler, K., 1953, pp. 37-38. (Ethylene dibromide, slab type house, U.S.)

1953a, pp. 31-32, 36. (Ethylene dibromide, slab type house, U.S., three more cases where EDB was a successful soil fumigant.)

Hatfield, I., 1944, pp. 10-14. (Results of tests soil poisons in West Virginia, Mississippi, and Florida; pentachlorophenol and a mixture of this with trichlorobenzene most effective; none completely effective over 5-year period.)

Hazelhoff, E. H., 1927, pp. 57-82. (Java, *Termes gilvus* in sugarcane fields controlled by stomach poisons.)

Headlee, T. J., and Jobbins, D. M., 1939, pp. 638-640. (Acid lead arsenate effective soil poison in control *Reticulitermes flavipes* in New Jersey; minimum dosage 0.05 lb. per cu. ft. soil as effective as maximum or 0.4 lb. per cu. ft.)

Hetrick, L. A., 1950, pp. 57-59. (Organic insecticides, effectiveness against *Reticulitermes flavipes,* Eastern U.S.)

1952, pp. 235-237. (Organic insecticides, effectiveness against *R. flavipes,* eastern U.S., more than 5 years testing gamma benzene hexachloride and chlordane, more toxic than pentachlorophenol, sodium pentachlorophenate, toxaphene, DDT, and its analogs. Aldrin, dieldrin, and heptachlor very promising after 2 years test.)

Hill, G. F., and Holdaway, F. G., 1934, pp. 169-172. (Zinc chloride, 3¼ oz. per sq. ft. and penetration 1 in., effective in controlling mound-building *Eutermes exitiosus,* Australia.)

Hockenyos, G. L., 1939, pp. 147-149. (Laboratory evaluation soil poison, U.S., poisons mixed with air-dried soil, moistened slightly. Trichlorobenzene and polychloropentane markedly superior to orthodichlorobenzene.)

1939a, pp. 16-17. (U.S., leaching of sodium arsenate through soil.)

1940, p. 10. (U.S., properties of soils related to termite control.)

1940a, pp. 7-8. (U.S., how long will soil poisons remain effective?)

Howell, J. L., 1951, pp. 31-32. (U.S., importance of soils in termite control.)

1952, p. 27. (U.S., safety in control.)

Hussain, M. A., 1929, pp. 65-66. (Lahore, Punjab, India, poisons to control termite damage to crops and buildings.)

Jarvis, E., 1926a, p. 6. (Australia, *Mastotermes darwiniensis* damage to sugarcane, control: poison baits applied to infested stumps, roots, posts, etc., digging out nest, killing queens, burning old logs and trees in vicinity; also dipping ends sets in dehydrated tar—used effectively in India.)

1926b, pp. 13-14, 49-52. (Queensland, fumigation of ground with paradichlorobenzene, carbon disulfide, calcium cyanide; poison baits: arsenic and molasses, poi-

soning sugarcane sets, paris green, lead arsenate, and arsenate of copper.)

1927a, pp. 18-23. (Queensland, *Mastotermes* rated 4th of 29 insects of major importance to sugarcane; dipping ends sets in dehydrated tar before planting *not* effective; sodium arsenite best poison bait, pieces split cane soaked in 10% solution; mortality secured in 24 hr.)

Jepson, F. P., et al., 1930b, pp. 6-14. (Ceylon, gasoline (petrol) used as poison.)

1931a, pp. 67-69. (Ceylon, mounds leveled, hole in center area and a circle of holes about center 18 in. apart, one oz. petrol per hole, 10 to 12 oz. per nest, disintegrate the fungus combs.)

Johnston, H. R., 1954, pp. 24, 28, 46. (With pressure 50 lb. per sq. in. where space under slab 2 to 4 in. good treatment 3 ft. from nozzle, voids of 1 in., spread of chemical for maximum of 2 ft., U.S.)

Kofoid, C. A., et al., *in* Kofoid, 1934, 2d ed., p. 582. (Lists soil poisons, U.S., precautions where arsenic used.)

Kowal, R. J., 1954, pp. 12, 14, 16, 18. (Soil poisons under slab construction, 1 pt. per sq. ft., U.S.)

1954a, p. 6. (U.S., water suspensions or powder not as effective as solutions or emulsions as soil poisons.)

Kowal, R. J., and St. George, R. A., 1948, pp. 112-113. (Preliminary results soil poison tests, 3 to 4 years, Beltsville, Md., Canal Zone, Panama; dry lead arsenate, sodium arsenite and liquid trichlorobenzene, and combination trichlorobenzene and 5% pentachlorophenol most effective.)

Laan, P. A. van der, 1951, pp. 33-35. (DDT as a soil poison.)

Langford, G. S., 1953, pp. 36-37. (Southern U.S., chlordane.)

(Lewis, B., and) Snyder, T. E., 1944, pp. 16-20. (Soil poisons, U.S.)

Littig, K. S., 1949, p. 45. (U.S. Third Army posts, 5% pentachlorophenol in fuel oil, 1 to 2 gal. per 5 lin. ft.)

Luke, W. J., Jr., 1952, pp. 1-7. (Dominican Republic, sugarcane, aldrin or "Octalene" or "Aldrex" most effective, 2 lb. per acre, after soil was plowed and knifed.)

McCauley, W. E., 1939, pp. 9-12. (Need for standardized method of testing soil poisons.)

1943, pp. 165-166. (Testing soil poisons, *in* Campbell and Moulton, 1943, pp. 1-206, reprint of mimeographed outline of standard procedure issued by U.S. Dept. Agriculture, Bur. Ent. and Plant Quar., Forest Insect Investigations.)

Madrid, V. J., 1934, pp. 604-612. (Philippines, immersion of seeds and cuttings from a few minutes to 1 hr. in a 1:10 solution of coal-tar kerosene emulsion effective; does not affect viability.)

Martin, G. C., 1950, pp. 61-63. (Rhodesia, crop (tobacco) spray as a repellent.)

Mossop, M. C., 1948, pp. 114-118. (Rhodesia, control harvester termites, *Hodotermes* and *Microhodotermes* spp.; 6½ bu. dry bait per acre spread evenly; soak dry grass up to ½ in. in length in solution 1 lb. sodium arsenite to 8 gal. water, dry bait before using; do not graze cattle until after soaking rains.)

Narayanan, E. S., and Lall, R., 1952, pp. 21-30. (Crops, India.)

O'Kane, W. C., and Osgood, W. A., 1922, pp. 1-20. (½ of 1% solution Phinotas oil in water.)

Osborn, E. H., 1926, pp. 707-708. (Australia, giant white ant, sugarcane, arsenic-molasses bait, poison fences, stumps.)

Oshima, M., 1919, p. 342. (Formosa.)

Paoli, G., 1929, pp. 273-281. (Sodium cyanide solution for destruction nests.)

Randall, M., and Doody, T. C., *in* Kofoid, 1934, 2d ed. (Ground treatments, U.S., pp. 502-513; poison dusts and baits, U.S., pp. 463-476.)

Rossi, R. T., and Snyder, T. E., 1934, pp. 755-756. (Soil poison tests about radio poles at Riverhead, Long Island, N. Y., U.S. Dept. Agriculture in cooperation with R.C.A.)

St. George, R. A., 1939, p. 14. (U.S.)

1952, p. 20. (U.S., new insecticides for termite control, DDT, chlordane, benzene hexachloride, aldrin, dieldrin; chlordane 2% emulsion not injurious to vegetation.)

1952a, pp. 36, 32. (History soil poison tests in U.S. and comparative effectiveness chemicals.)

1954, pp. 24, 26. (U.S., 1 and 2% chlordane in No. 2 fuel oil and 2% chlordane emulsion, at ½ and 1 pt. per sq. ft. of soil surface effective for 5 years; emulsion does not injure plants.)

Secrest, H. C., 1952, pp. 88-89. (New insecticides to control subterranean termites—0.8% gamma isomer benzene hexachloride in kerosene and 8% DDT in No. 2 fuel oil effective for 5 years, dosage 2 gal. per 5 cu. ft.)

1954, p. 99. (Mississippi, BHC, chlordane, and DDT emulsions caused no plant injury.)

1954a, pp. 1-5. (Gulf Coast, U.S., stake tests, 1 to 1¼ gal. to 5 cu. ft., 5.36 lb. benzene hexachloride in 100 gal. kerosene effective for 8 years; DDT in kerosene, 63.5 lb. in 100 gal. fuel oil effective for 5 years; sodium arsenite 9% in water, 2 gal. to 5 cu. ft. effective for 6 years (at Beltsville, Md., and Canal Zone effective for 9 years); trichlorobenzene 1 part to 3 parts No. 2 fuel oil, effective for 6 years. Groundboard tests, benzene hexachloride 0.4 and 0.8% gamma concentration, 1 pt. dosage per sq. ft., effective for 6 years; chlordane in No. 2 fuel oil, and 2% emulsion, 6 years; dieldrin in water emulsion 0.25, 0.5, and 1%, 5 years; Toxaphene in No. 2 fuel oil, 5% concentration, 6 years. Buildings, sodium arsenite 10%, 6 years.)

Shelford, V. E., 1949, p. 541. (Aqueous solution chlordane.)

1950, p. 107. (Aqueous solution chlordane.)

1952, p. 127. (Aqueous solution chlordane, 1% solution effective after 3 years at Urbana, Ill., soil about a building.)

1952a, p. 544. (Aqueous solution chlordane, 1% solution effective 4 years at Urbana, Ill., soil about a building.)

1953, pp. 527-528. (Aqueous solution chlordane, 1% solution effective 5 years, since early Sept., 1947, at Urbana, Ill., soil about a building.)

Shibata, K., 1934, pp. 250-255. (Effect of naphthalene on behavior of termites, Formosa.)

Skaife, S. H., 1954a, p. 130. (South Africa, lime, salt, etc., repellents.)

Smith, L. E., 1942, p. 19. (Synthetic organic compounds.)

1942a, pp. 1-4. (Phenoxathiin a promising insecticide):

Concentration	Hours	Percent kill
1:1,000	24	100
1:3,000	24	97
	48	100
1:5,000	24	80
	48	100

Smith, M. W., 1940, pp. 19-20. (Diphenylamine promising soil poison.)

Snyder, T. E., 1915, p. 79. (Drenching soil under cut-off infested timbers in cellar with kerosene oil, or carbon bisulphide, U.S.)

1916, pp. 28-29. (Drenching soil under cut-off infested timbers in cellar with kerosene oil, or carbon bisulfide, U.S.)

1916a, pp. 15-16. (Drenching soil under cut-off infested timbers in cellar with kerosene oil, or carbon bisulfide, U.S.)

1919a. (Drenching soil under cut-off infested timbers in cellar with kerosene oil, or carbon bisulfide, U.S., also under origin shelter tubes, pp. 12-13; carbon bisulfide in holes in soil and soaking soil with kerosene emulsion to kill termites attacking flowers and greenhouse plants, precautions in use carbon bisulfide, pp. 15-16.)

1926c, p. 6. (Pretreatment soil before building, U.S., sodium cyanide, sodium arsenite, creosote and kerosene, carbon disulfide emulsion and lye.) 1930 revision, p. 6. (Pretreatment soil before building, U.S., sodium cyanide, sodium arsenite, creosote and kerosene, carbon bisulfide emulsion and lye.) 1934 revision, pp. 7-8. (Orthodichlorobenzene added.) 1937 revision, pp. 7-8. (Orthodichlorobenzene added.) 1939 revision, pp. 7-8. (Orthodichlorobenzene added.)

1929b. (Pretreatment soil before building, p. 22; mound-building termites Pacific area killed by calcium cyanide and poison gases, pp. 25-26; sugarcane dipped in kerosene oil, sodium arsenite before planting, calcium cyanide and carbon bisulfide treatment soil, p. 26; poison baits: arsenic and molasses, sawdust soaked with sodium arsenite, p. 26.)

1929j, pp. 6-12. (Pretreatment soil before building; mound-building termites Pacific area killed by calcium cyanide and poison gases; sugarcane dipped in kerosene oil, sodium arsenite before planting, calcium cyanide and carbon bisulfide treatment soil; poison baits: arsenic and molasses, sawdust soaked with sodium arsenite. Soil poisons, Hawaii, p. 12.)

1929m, p. 9. (Soil poisons for buildings and poles, U.S.)

1929o. (Pretreatment soil before building, pp. 271-272; gases and soil poisons for control mound-building termites, p. 275.)

1931*, pp. 545-546. (Pretreatment soil before building; gases and soil poisons for control mound-building termites; carbon bisulfide and paris green for underground carton nest building termites attacking poles, Hawaii, p. 546.)

1933b, pp. 6-7. (Orthodichlorobenzene soil

poison, temporary stoppage, still experimental, dosage and methods application.)
1934b, pp. 5-6, 12. (U.S., buildings.)
1935a, pp. 70-78. (U.S., buildings.)
1935b, pp. 115-119, 128. (U.S., buildings.)
1935c, pp. 1-6. (U.S., buildings.)
1935d, pp. 5-6, 28-30. (U.S., buildings.)
1935e, pp. 130, 132, 144-145, 156, 166-167. (U.S., buildings, in experimental stage, temporary stoppage damage; orthodichlorobenzene most promising; dosages, methods application; poles.)
1936, pp. 92-94, 103. (U.S., buildings.)
1936a, pp. 395-396. (U.S., buildings.)
1937, pp. 26-33. (Louisiana, coal-tar creosote and petroleum oil, dosage, method application.)
1938, pp. 6-9. (Buildings, U.S.)
1939, pp. 7-9. (Buildings, U.S.)
1939a, p. 1. (U.S., results soil poison tests, U.S. Dept. Agriculture.)
1947b, p. 147. (U.S., buildings.)
1947c,. p. 12. (U.S., chemical insulation of buildings in Nat. Pest Control Assoc. 1, 2, 3 and 3½ principles for control subterranean termites.)
1948, pp. 155, 162-163, 172-177, rev. ed. 1935e. (Soil poisons for temporary relief and supplement structural repairs, sodium arsenite, pentachlorophenol, orthodichlorobenzene, trichlorobenzene, coal-tar creosote diluted in fuel oil, monochloronaphthalene, DDT in petroleum oil; dosages, methods application about buildings; about utility poles, p. 109.)
1949c, p. 24. (U.S., DDT, chlordane, benzene hexachloride effective soil poisons.)
1950, pp. 12-14. (Maryland, sodium arsenite sprayed under buildings (against walls) where insufficient clearance for crawl space, effective, cheap; 2% chlordane emulsion effective, does not kill vegetation.)
1951, p. 28. (Chemical barriers or soil poisons, buildings, U.S.)
1951a, p. 250. (Soil poisons supplement structural changes in control subterranean termites, U.S.)
1952b, pp. 34, 48. (Sodium arsenite cheap, noninflammable, effective soil poison, can be used with safety in U.S.)
1952f, p. 30. (Wood preservatives not necessarily effective soil poisons.)
1953b, p. 30. (Sodium arsenite, DDT, and benzene hexachloride emulsions recommended as soil poisons under concrete slabs before pouring concrete, must be well distributed in soil.)

Snyder, T. E., and Reed, W. D., 1949, p. 10. Buildings and wood boxes on ammunition dumps, protected in U.S. and Tropics by soil poisons: sodium arsenite, benzene hexachloride, chlorinated phenols and benzenes, monochloronaphthalene and DDT.)

Snyder, T. E., and Zetek, J., 1924, pp. 23-24. (Panama, placing paradichlorobenzene in openings in mounds, or in underground galleries; sodium cyanide sprayed on ground after mounds have been leveled.)
1934, *in* Kofoid, 2d ed., p. 346. (Panama, soil poisons, poisoning mound and carton nests, poison dusts.)

Swingle, M. C., Gahan, J. B., and Phillips, A. M., 1941, pp. 9-11. (Phthalonitrile tested as soil poison by Hockenyos method in laboratory, U.S.:

Concentration	Hours	Percent kill
1:3,000 (parts soil)	24-28	100, not repelled, penetrated soil to usual depth.
1:4,000	3 days	93
1:5,000	3 days	93
1:10,000	5 days	12

Orthodichlorobenzene at concentration of 1:1,000 repelled termites, preventing penetration soil, but caused no mortality within 4 days.)
1945, pp. 1-23. (Preliminary tests synthetic organic compounds.)

Swingle, M. C., Mayer, E. L., and Gahan, J. B., 1944, pp. 672-677. (Synthetic organic compounds tested as soil poisons, relative toxicity, U.S.)

Swingle, M. C., Phillips, A. M., and Gahan, J. B., 1944, pp. 1-134. (Synthetic organic compounds tested as in 1941 as soil poisons, termites, pp. 3, 5, 8, 10-25, 28-70, 72, 81, 85, 88, 102, 114, 122-123, 130, 132-133.)

Turner, N., and Zappe, M. P., 1938, pp. 208-217. (Efficiency of soil poisons in Connecticut.)

Uichanco, L. B., 1931, pp. 601-603. (Philippines, water and oil treatments soil-inhabiting termites.)

Von Schrenck, H., 1938, pp. 290-306. (Soil poison tests at Florissant, Mo.)
1945, pp. 142-168. (Trichlorobenzine effective in Missouri soil poison tests.)

Wahl, R. O., and Powell, A. R., 1927, pp.

125-140. (Importance of nest structure in control certain South American termites with Cyanogas, calcium cyanide.)

WHITE, A. N., 1952, p. 18. (Texas, soil poisoning may be used to control termites.)

WOLCOTT, G. N., 1947a, pp. 1-18. (Termite repellents, BHC, DDT, etc.)

ZACHER, E., 1914, p. 35. (Tropics, preventive injury to root crown, mixture 5 parts petroleum, 2½ parts soap, and 100 parts water stirred hot; to poison balls of thick paste, 1 part arsenic, 2½ parts soda, 6 to 8 parts molasses or syrup mixed with meal and laid near nests as poison bait.)

SOUND

ANONYMOUS, 1923, p. 53. (Soldiers warn by rapping heads on floor, East Africa.)

BUGNION, E., 1913c, pp. 125-135, 136-139. (Sound-producing termites, India.)

BUXTON, P. A., 1923, pp. 271-273. (Two further cases coordinated rhythm.)

CONNOR, F. P., 1933, p. 1018. (Rhythmic sound produced by termites at work, India.)

EMERSON, A. E., 1929a, pp. 722-727. (Communication among termites; discussion by N. A. Kemner included.)

EMERSON, A. E., and SIMPSON, R. C., 1929, pp. 648-649. (Communication among termites.)

GOUNELLE, E., 1900, pp. 168-169. (Sound produced by two species American termites.)

MARCUS, H., 1947, pp. 39-44. (Stridulating organs in nasute termite, Bolivia.)

SNYDER, T. E., 1935e, pp. 28, 32, 51. (Communications, signals, by sound.)

1948, pp. 57-58. (Communication and sound production.)

1952d, pp. 33-34. (History of microphones.)

THYAGARAJU, A. S., 1934, p. 745. (Sound produced by termites at work, harsh grating, "bur bur bur," India.)

WILLIAMS, C. B., 1922, p. 174. (Quotes Gounelle, 1900, sound produced by large number termites, Brazil, tapping their heads on dried leaves bromeliads, not rhythmic, "like pinch of sand hitting paper.")

SPERMATOGENESIS

GRASSÉ, P. P., 1937a, pp. 1677-1679. (Aberrant spermatogenesis in the Metatermitidae.)

GRASSÉ, P. P., and BONNEVILLE, P., 1936, p. 1009. (Abortive or atypical spermatogenesis in *Bellicositermes natalensis.*)

STEVENS, N. M., 1905, pp. 1-32. (Spermatogenesis in *Zootermopsis* with special reference to the accessory chromosomes; male nymphs diploid chromosomes number 52.)

SUPERORGANISM, SUPRAORGANISM, COLONY AS

ALLEE, W. C., 1943, pp. 517-525. (Cooperative principle the central point in "grand strategy of evolution.")

ALLEE, W. C., et al., 1949, pp. 420, 435, 692-695, 698, 718-729. (Supraorganism.)

BOUVIER, E. L., 1918, p. 299. (Superorganism.)

EMERSON, A. E., 1939b, pp. 182-209. (Social coordination and the superorganism.)

1942a, pp. 163-176. (Basic comparisons of human and insect societies.)

1947, pp. 337-345. (Populations undergo evolution to supraorganisms.)

1949, *in* Allee et al., p. 698. (Termites.)

1952a, *in* France, pp. 333-354. (Supraorganismic aspects of the society, comments by other isopterists.)

LÜSCHER, M., 1953, pp. 74-76, 78. (If colony regarded as a superorganism, caste determination is an embryological problem.)

MAETERLINCK, M., 1927, pp. 1-238. (Colony may be regarded as one living creature subject to one central law, the "spirit of the colony.")

MARAIS, E. N., 1937, pp. xv+184. (Soul of the white ant.)

NOYES, H., 1937, pp. xlv+289. (Habits of *Macrotermes natalensis* and man.)

SNYDER, T. E., 1948, pp. 6-7. (Quotes Emerson, 1939, and Maeterlinck, 1927; and authors of several popular books who regard the termite colony as a whole—as is the human body, workers represent red blood corpuscles, soldiers white, outer surface nest the skin, and the queen the brain. (The worker would appear to be the brain.) Emerson believes the social organismic analogies more comparable with the primitive multicellular animals, as the sponge.)

WEISMANN, A., 1893, pp. 309-338, 596-610. (The all-sufficiency of natural selection.)

WHEELER, W. M., 1911a, pp. 307-325. (Colony as an organism, ant.)

TAXONOMY (LIVING)[3, 4]

AHMAD, M., 1949, pp. 1-11. (*Cyclotermes* placed in synonymy with *Odontotermes*.)

1950, pp. 39-86. (Phylogeny of genera based on imago-worker mandibles.)

1952, p. 71. (India, Pakistan, *Cryptotermes bengalensis* synonym of *C. havilandi*.)

1953a, pp. 37-41. (*Coptotermes emersoni*, *Odontotermes* (*Hypotermes*) *winifredi*, n. spp., Ceylon, winged *Nasutitermes ceylonicus*.)

ANONYMOUS, 1925b, p. 198. (South Africa, new species, not named.)

ARAUJO, R. L., 1954, pp. 181-189. (Brazil, *Paracornitermes*, n. spp., *emersoni* and *hirsutus*.)

BLANCHARD, C. E., 1840*, pp. 46-47. (*Termes obscurum*, *morio*, *flavicolle*, *lucifugum*.)

BRUES, C. T. MELANDER, A. L., and CARPENTER, F. M., 1954, pp. 121-125. (Keys to families.)

CACHAN, P., 1949, pp. 177-275. (Madagascar, new species: *Neotermes isaloensis*, *concavifrons*; *Glyptotermes longiceps*, and sp.; *Microtermes sakalava*; *Microcerotermes longiceps*, *unidentatus*; *Cubitermes subinteger*; *Microtermes incisus*; *Eutermes milloti*, *canaliculatus* (=*laticeps*), 3 forms, *neonanus*; *Coarctotermes pauliani*, *beharaensis*, keys.)

1951, pp. 1-18. (Madagascar, descr. *Proneotermes delphinensis*; *Glyptotermes alaotranus*; *Gibbotermes* in Microcapritermitinae for *Cubitermes subinteger* Cachan, with *G. mandibularis*, *longiceps*, *minor*, *major*, and *sakarahensis*; *Nasutitermes vadoni*.)

COATON, W. G. H., 1949b, pp. 13-77. (South Africa, Hodotermitidae and Kalotermitidae; new species: *Kalotermes capicola*, *munroi*, *mkuzii*, *sibayiensis*; ? *Glyptotermes umtatae*, ? *G. sordwanae*.)

1950a, pp. 3-32. (South Africa, *Cryptotermes naudei*, Zululand, keys.)

DESNEUX, J., 1950, p. 735. (*Apicotermes* of tropical Africa, *A. arquieri*, n. sp., nest only described.)

EHRHORN, E. M., *in* Kofoid, 1934, 2d ed., p. 323. (Key to Hawaiian termites.)

EMERSON, A. E., *in* Snyder, 1949b, pp. 1-490. (New genera, pp. 374-377: (*Acorhinotermes*, *Dentispicotermes*, *Planicapritermes*, *Procornitermes*, *Triacitermes*, *Parvitermes*, *Bulbitermes*, and *Paracornitermes*; new names or new species, *Kalotermes hilli*, n. name; *Schedorhinotermes holmgreni*, n. sp.; *Speculitermes proratus*, n. sp.; *Cylindrotermes parvignathus*, n. sp.; *Orthognathotermes aduncus*, n. sp.; *Termes medioculatus*, n. sp.; *Odontotermes* (*O.*) *nilensis*, n. sp.; *Cornitermes silvestrii*, n. sp.; *C. snyderi*, n. sp.; *Armitermes silvestrii*, n. sp. and *Convexitermes nigricornis*, n. subsp. *junceus*.)

1950, pp. 1-15. (South America and Madagascar, new genera: *Glossotermes*, *Genuotermes*, *Spicotermes*, *Quasitermes*, *Cornicapritermes*; *Glossotermes oculatus*, *Genuotermes spinifer*, *Spicotermes brevicarinatus*, *Quasitermes caprinus*, and *Cornicapritermes mucronatus*, Rhinotermitidae and Termitidae.)

1952a, *in* France, p. 342. (Comparison *Apicotermes* nests.)

1952b, pp. 479-539. (*Procornitermes* and *Cornitermes*, genera, species—including 2 and 7 n. spp., respectively, keys.)

1953, pp. 101-121. (Africa, *Apicotermes*, discussion phylogeny, 2 new species, *A. desneuxi* and *A. porifex*.)

1955, pp. 1-3. (Ecological and physiological species.)

ESSIG, E. O., 1942, pp. 159-173. (Families termites, keys.)

FEYTAUD, J., 1950, pp. 380-381. (*Reticulitermes flavipes*, *santonensis* (subsp. or var.); several species or subspecies present in France confused under *R. lucifugus*.)

GAY, F. J., 1955, pp. 177-181. (Australia, *Coptotermes brunneus*, n. sp., wing. and sold.; *Ahamitermes inclusus*, n. sp., queen, sold.)

GRASSÉ, P. P., 1949, pp. 408-544. (Family Termopsidae for *Termopsis*, *Porotermes*, and *Stolotermes*.)

GRASSÉ, P. P., and NOIROT, C., 1948, pp. 735-736. (Nest *Apicotermes arquieri*, n. sp., described.)

1950, p. 138. (*Odontotermes magdalenae*, n. sp., described.)

1952, pp. 291-342. (*Macrotermes ivorensis*, n. sp., described, p. 333; *Microtermes usambaricus*, n. sp., described, p. 338.)

HAGEN, H. A., 1866a, pp. 219-220. (Synonymy.)

[3] Papers cited in Snyder, T. E., 1949, Catalog of the Termites (Isoptera) of the World, Smithsonian Misc. Coll., vol. 112, pp. 490, Nov. 1, are not relisted.

[4] See also Taxonomy (Fossil.)

HARRIS, W. V., 1951, pp. 25-28. (East Africa, *Pericapritermes gloveri,* n. sp., described.)
1953, pp. 13-14. (*Heterotermes perfidus* Silv., a synonym of *H. platycephalus* Frogg. (Emerson, 1951, in litt.)
1953a, pp. 261-262. (Belgian Congo, *Microtermes pallidiventris,* n. sp.)
1954a, pp. 493-496. (Socotra, Indian Ocean off Africa, *Procryptotermes* and *Amitermes,* n. spp.)
1954c, pp. 127-137. (East Africa, *Microcerotermes masaiaticus,* im., sold., Kenya; *M. nemoralis,* im., sold., Tanganyika; *Pericapritermes dumicola,* sold., Tanganyika; *Microtermes luteus,* sold., Tanganyika; *Nasutitermes kempae,* sold., Tanganyika; *Grallatotermes africanus,* im., sold., Tanganyika.)

HILL, C. A. GIBSON-, 1947, pp. 56-57. (Christmas Island, Indian Ocean.)
1950, pp. 149-165. (Cocos-Keeling Island, *Prorhinotermes canalifrons* (Sjöstd.), *Kalotermes,* n. sp.)

LAL, R., and MENON, R. D., 1953, pp. 1-94. (Catalog Isoptera India, including Burma and Ceylon.)

LASH, J. W., 1952, pp. 1-7. (Jerusalem, Palestine, *Reticulitermes clypeatus,* n. sp.)

LIGHT, S. F., *in* Kofoid, 1934, 2d ed. (Key to families, pp. 120-124; keys to American *Amitermes* and *Gnathamitermes,* pp. 203-205; keys to Kalotermitidae, pp. 206-209, 215-216; key to Mexican termites, pp. 337-338; key to Philippine termites, p. 350.)

NEWMAN, E., 1853, pp. clxxxi-cciv. (Neuroptera divided into two classes.)

NICHOLS, E. R., 1931, pp. 1-2. (Classification species by mandibles workers and nymphs.)

PACKARD, A. S., 1863, pp. 590-603. (Synthetic types.)
1883, pp. 326-329. (Systematic position in relation to other orders.)

PICKENS, A. L., 1954, pp. 71-74. (Intraspecific problems in the taxonomy of insect caste, in *Reticulitermes flavipes* winged of two sizes produced.)

RATCLIFFE, F. N., GAY, F. J., and GREAVES, T., 1952, pp. 50-124. (Australian termites, keys, generic, distribution, habits.)

ROONWAL, M. L., 1953, pp. 115-118. (*Heterotermes gertrudae,* n. sp., North India.)

SNYDER, T. E., 1948, pp. 231-235. (U.S., keys to genera.)
1949b, pp. 1-490. (New genera, pp. 374, 378: *Dolichorhinotermes* Snyder and Emerson, *Parastylotermes* Snyder and Emerson—fossil; new names or new species, Snyder and Emerson: *Kalotermes seeversi,* n. name; *Eucryptotermes wheeleri,* n. name; *Anoplotermes bequaerti* and *A. hageni,* n. names; *Termes lighti* and *T. winifredae,* n. names; *Odontotermes* (*O.*) *grassei* and *O.* (*O.*) *holmgreni,* n. names; *Ancistrotermes wasmanni,* n. name; *Nasutitermes glabritergus,* n. sp., *N. kemneri* and *N. lighti,* n. names; *Bulbitermes neopusillus,* n. name; *Trinervitermes hilli,* n. name. 1,932 species cataloged.)
1950a, *in* Craighead, pp. 88-90. (Eastern U.S., keys to species.)
1952h, pp. 303-305. (*Rugitermes unicolor,* n. sp., Guatemala.)
1953c, pp. 40-41. (*Gnathotermes* synonym *Macrotermes; Hodotermes japonicus* is a damaged earwig.)
1954b, pp. 1-64. (U.S. and Canada, keys to species.)
1954e, p. 38. (Determination termites introduced into U.S.)

STROUD, C. P., 1953, pp. 76-92. (*Kalotermes,* measurements of 14 characters, factor analysis, shows evolutionary trends, existence *Proglyptotermes* demonstrated.)

VAN ZWALUWENBURG, R. H., 1952, p. 351. (*Calotermes curvithorax* Kelsey is synonym of *Kalotermes immigrans* Snyder.)

WEIDNER, H., 1955, pp. 63-68. (Anterior Asia, *Microcerotermes gabrielis,* n. sp., wing., sold.)

WILKINSON, W., 1954, pp. 75-82. (East Africa, *Kalotermes kempae,* im., sold., *Glyptotermes kawandae,* im., sold., *G. reticulatus,* im., sold., n. spp.)

WILLIAMS, R. M. C., 1954, pp. 215-227. (East Africa, *Crenetermes umbraticola,* im., sold.; *Cubitermes umbratus,* im., sold.; *Procubitermes goliathi,* sold.; *P. planifacies,* sold.; *Noditermes wasambaricus,* im., sold., n. spp.)

TAXONOMY (FOSSIL)[5]

PIERCE, W. D., 1948, pp. 136-143. (La Brea asphaltum and McKittrick asphalt fossils, California, Pleistocene.)

SNYDER, T. E., 1949a, pp. 164-165. (*Ulmeriella latahensis,* n. sp. Miocene, Washington State.)

[5] Papers cited in Snyder, T. E., 1949, Catalog of the Termites (Isoptera) of the World, Smithsonian Misc. Coll., vol. 112, p. 490, Nov. 1, are not relisted.

1949b, p. 378. (*Parastylotermes* Snyder and Emerson, n. gen., Miocene, Washington State.)

1950b, pp. 190-193. (U.S. fossils and their living relatives.)

1953c, pp. 40-41. (Fecal pellet *Cryptotermes brevis* from Peru, described as Foraminifera.)

1955a, p. 32. (*Parastylotermes frazieri*, n. sp., from Miocene, California, U.S.)

1955c, pp. 79-80. (California, U.S., *Parastylotermes frazieri* Sny.)

Stone, B., 1950, p. 17. (Recent termite pellet described by W. Berry in 1928 and included in Catalog of Foraminifera as *"Lagena samanica,"* Upper Eocene, NW. Peru.)

1951, p. 139. (Synonym—*Lagena samanica* is a fecal pellet of the recent termite *Cryptotermes brevis*.)

TEMPERATURE

Abe, Y., 1937, pp. 463-472. (Relations between temperature and distribution oriental *Coptotermes formosanus*.)

Beall, G., 1931, pp. 33-35. (*Termopsis* freezing and thawing, British Columbia; 2 species, *Termopsis angusticollis* and *nevadensis*, tolerant to water and cold.)

Castle, G. B., *in* Kofoid, 1934, 2d ed., p. 286. *Zootermopsis* and temperature.)

Cook, S. F., and Smith, R. E., 1942, pp. 211-219. (Metabolic relations, Protozoa symbiosis, temperature effects.)

Ebner, R., 1926, pp. 75-76. (Anglo-Egyptian Sudan, *Termes bellicosus*, temperature 27° C. in nests, 56° in sun, 43° in shade.)

Ehrhorn, E. M., *in* Kofoid, 1934, 2d ed., p. 330. (Use of heat chambers to control dry-wood termites infesting wooden railroad cars, Hawaii.)

Emerson, A. E., *in* Kofoid, 1934, 2d ed., p. 117. (Map world showing distribution isotherm limits.)

Geyer, J. W. C., 1951a, pp. 36-43. (In a supplementary fungus garden of *Termes badius*, South Africa, at depth 18 in. temperature fluctuated 13.1° C. and 13.9° C. in surrounding soil; temperature in garden not constant, followed that of soil at equal depths but always a few degrees warmer.)

Holdaway, F. G., and Gay, F. J., 1948, pp. 464-493. (Temperature mound *Eutermes exitiosus*, Australia, not constant, varies with time of day and environmental temperature; temperature of nursery continuously higher than air or soil, follows seasonal change in air temperature. Temperature of occupied mound higher (14.5° to 18.6° F.) than unoccupied due to metabolism termites. Fewer termites in mound in summer than winter. Presence alates raises temperature 10° to 13° F. Mound temperature enables determination difference between populous and nonpopulous nests; i.e., vitality of colony can be checked by temperature variation.)

Holdaway, F. G., Gay, F. J., and Greaves, T., 1935, pp. 42-46. (Australia, temperature factor in seasonal concentration population in mounds *Eutermes exitiosus*, smallest during warmer weather.)

Kofoid, C. A., 1934, 2d ed., pp. 17, 19. (Temperature and termites of U.S.; p. 20, *Coptotermes formosanus*, Hawaii.)

Morgan, A. H., 1940, pp. 176-177. (Animals in winter.)

O'Kane, W. C., and Osgood, W. A., 1922, pp. 1-20. (Supplementary steam piping in hospital, Dover, N.H., raised temperature to 135° F. for 48 hours, and Phinotas oil soil poison, controlling *Reticulitermes flavipes*.)

Snyder, T. E., 1915, p. 45. (Center of activity termite colonies species *Reticulitermes* in Eastern U.S. changes with seasons; in spring and autumn, southern exposures favorable for developing young, in summer heat more deeply buried in ground; in winter, cold forces termites deeper in ground.)

1916, pp. 4-5. (Center of activity termite colonies species *Reticulitermes* in Eastern U.S. changes with seasons; in spring and autumn, southern exposures favorable for developing young, in summer heat more deeply buried in ground; in winter, cold forces termites deeper in ground, in arid regions deep in ground; heat of sun or oven to kill termites infesting books or other stored material.)

1916a, p. 18. (Use heat to kill termites in books, etc.)

1919a, p. 15. (Use heat to kill termites in books, etc., temperatures over 160° F. will be fatal.)

1920*, *in* (Banks and) Snyder. Nest location varies with temperature (*Reticulitermes*), p. 91; in southwestern U.S. during dry seasons when earth is caked and

cracked *Nasutitermes* ("*Eutermes*") deep in soil, p. 92; in winter colonies *Reticulitermes* in ground below frost line, p. 110.)

1926c, pp. 6-7, 18. (Location colony *Reticulitermes* in U.S. varies with season. Dry-wood termites *Cryptotermes brevis* in southern Florida killed in furniture in attic with glass skylight where sun's rays caused temperatures 17° to 24° F. higher than the maximum outdoor temperature. Temperatures of 120° F. are lethal.)

1931*, p. 535. (Heat chambers for control dry-wood termites infesting railroad cars and furniture, Hawaii, 150° F. for 1½ hours.)

1935e. (Heat chambers for control dry-wood termites infesting railroad cars and furniture, Hawaii, 150° F. for 1½ hours, p. 152; utility poles U.S. infested dry-wood termites, effective heat treatment, p. 157.)

1948, pp. 12, 81, 88, 192-194, 201. (*Kalotermes* in Virginia pass winter in interior wood dead trees; *Zootermopsis* Pacific Coast, North America, and *Archotermopsis,* North India, inhabit ice- and snow-covered logs and stumps in winter. Temperatures ranging from 80° to 90° F. most favorable for tube building by *Reticulitermes;* heat of 150° F. maintained for 1½ hours or 140° for 4 hours will raise the interior of wood furniture to 120° F., lethal to termites; use heat in Hawaii, freezing at 16° to 27° F. for 4 days will kill dry-wood termites in furniture; heat and cold used to kill termites infesting books, etc.)

Volk, H. O., 1952, pp. 41-43. (Climate foundation in termite nest, fungus growers.)

TERMITOPHILES [6]

Anonymous, 1926b, p. lxvii. (*Termitoxenia,* India, with *Odontotermes obesus.*)

Assmuth, J., 1910, pp. 1-55. (*Termitoxenia assmuthi,* anatomy, India, Dipt.)

1913, pp. 187-316. (*Termitoxenia assmuthi,* anatomy, India, Dipt.)

Bacon, G., 1913, p. 113. (Collembola, *Entomobrya binoculata,* California.)

Barnard, K. H., 1932, p. 212. (South Africa, terrestrial isopod *Schöblia fulleri* (*Termitoniscus* Silvestri), Trichoniscidae.)

Belt, T., 1873, p. 222. (Parrots in termite nests, plains of Nicaragua.)

Bernhauer, M., 1927, pp. 225-240. (Africa, Staph., Col.)

1927a, pp. 366-385. (Africa, Staph., Col., *Termitolara opacella,* p. 366.)

1932, p. 157. (Belgian Congo, Staph., *Termitogerrus,* subgen. in *Termitodiscus,* based on *T. burgeoni,* from nest *Termes natalensis.*)

1938, pp. 119-126. (Two new genera African Staphylinidae.)

Bickhardt, H., 1916, pp. 1-112. (Histeridae.)

Börner, C., 1913, pp. 274-284. (New Collembola.)

Böving, A. G., 1927, pp. 51-62. (Anobiidae, *Nevermannia dorcatomoides* larva, Costa Rica.)

Borgmeier, T., 1923, pp. 323-346. (Phoridae, Brazil.)

1924, pp. 167. (Phoridae, Brazil.)

1935, pp. 488-495. (Blind phorid *Cryptophora coeca,* p. 490, with *Syntermes,* Brazil, near *Termitophorides.*)

1950, pp. 625-676. (Brazil, n. sp. in *Termitonilla* n. gen., *Abroteles, Termitopelta,* n. gen., *Termitonusa, Termituncula, Xenogaster,* and *Termitophya.* Col., Staph.)

1954, pp. 201-214. (Brazil, Psel., Col., *Termitotyrus,* n. gen., *Syrmocerus, Hamotus, Apharus,* and *Neotyrus,* n. spp.)

Boucomont, A., 1936, pp. 229-231. (Three new Acanthocerinae (Scarab.) from Costa Rica.)

Brauns, H., 1900, pp. 164-168. (A new aphodier, Scarab., Col., *Gorythoderus marschalli* with *Termes tubicola,* Orange Free State.)

Breddin, G., 1903, p. 75. (A termitophilous Lygäide, Hemiptera.)

Breddin, G., and Börner, C., 1904, pp. 84-93. (*Thaumatoxena wasmanni,* phorid, Dipt.)

Brown, C. B., 1876, p. 154. (Trogan nesting in termite nest, British Guiana.)

1916, p. 433. (Trogan nesting in termite nest, British Guiana.)

Brown, J. M., 1920, pp. 480-482. (Collembolan, West Africa.)

Bruch, C., 1930, pp. 31-42. (*Termitolister köhleri* from nest *Cornitermes similis,* Argentina, p. 39.)

1931, p. 389. (Argentina, *Termitozophilus*

[6] (Including casual seekers of shelter; some may be predacious on the host termites, or parasites.)

laetus from nest *Cornitermes similis*, Col., Staph.)

1937, pp. 125-133. (Col., Hist., Staph., Argentina.)

Brues, C. T., 1902, p. 184. (Texas, *Termitogaster texana*, Col., Staph., with *Eutermes cinereus*.)

1906, pp. 16-17. (Phoridae, *Termitoxenia*, and *Termitomyia*.)

1908, p. 942. (Hermaphroditic phorid *Termitoxenia*, and embryology certain degenerate Phoridae.)

1923, p. 432. (Braconid *Termitobracon emersoni*, Hymen., in nest *Nasutitermes ephratae*, British Guiana.)

1932, pp. 134-138. (Phoridae, Trinidad.)

1932a, pp. 139-144. (Phorid, *Ptochomyia* sp., from nest *Macrotermes natalensis*.)

Bugnion, E., 1913a, pp. 121-123. (*Termitoxenia*, Dipt.)

1914e, pp. 218-220. (*Termitoxenia*, Dipt.)

Bugnion, E., and Popoff, N., 1913, pp. 23-44. (*Termitoxenia* Dipt., histology.)

Burgeon, L., 1946, pp. 225-226. (*Stenovalgus*, n. sp., Col., Scarab., Ivory Coast, Africa.)

Cain, S. A., 1944, p. 370. (*Nasutitermes guayanae* harbors 4 beetles: *Termitophya amica*, *Xenopelta cornuta*, *Thyreozenus major*, and *Eburnicola leucogaster*; *N. similis* harbors *Termitophya punctata* and *Xenopelta tricornis*; difference in termitophiles led Emerson to establish physiological race *similis*, although structural differences are minor.)

Cameron, M., 1919, pp. 83-87. (New Staphylinidae from Rhodesia.)

1926, pp. 171-191. (New Staphylinidae from Rhodesia, from India, p. 171, *Termitodiscus minutus*, p. 172; *Doryloxenus*, 3 new species.)

1927, pp. 222-224. (India, Staph., *Rhopalinda termitophila* and *Demerinda termitophia* devouring young termites.)

1930, pp. 419-421. (Belgian Congo, Staph., *Termitobia burgeoni*, *Termozyras*, resembling *Termitopaedia*, based on *T. politus*.)

1936, p. 184. (Java, new Staphylinid *Termitodonia*, subgenus of *Zyras*, *Z. flavus*.)

1952, pp. 323-332. (Belgian Congo, new Staphylinidae, *Termitusa*, etc.)

Caporiacco, L. di, 1936, p. 84. (Fezzan, *Scorteccia termitarum* (Corinniinae) from termitarium, spider.)

Casey, T. L., 1889. (New genus termitophilous Staphylinidae, pp. 384-387; termitophilous Coleoptera from Panama, pp. 39-198.)

1890, pp. 307-504. (Termitophilous Thysanura.)

Chamberlain, R. W., 1943, pp. 39-48. (*Isotoma spatulata*, n. sp., a termitophilous Collembola with *Termopsis angusticollis*, Eugene, Ore., p. 43.)

Chamberlin, R. V., 1923, pp. 411-421. (Four termitophilous millipeds, British Guiana.)

Champion, G. C., and Wasmann, E., 1923, pp. 569-581. (New Aphodiid (Scarab.. Col.) beetles from British India, with *Odontotermes*.)

Chopard, L., 1927, pp. 225-228. (Cricket, *Eugrylloides pomeroyi*, n. sp., Gold Coast, Africa.)

1938, pp. 105-107. (Orthoptera, crickets, roaches, earwig.)

1946, pp. 114-116. (Gryllid, *Phaeophilaenis grassei* in nest *Protermes minutus*, West Africa.)

Costa Lima, A. da, 1952, pp. 163-170, 313-351. (Coleoptera, Brazil, bibliography.)

Cowles, R. B., 1930, pp. 1-31. (Nile monitor, *Varanus niloticus*, in termite nests in Natal, South Africa.)

Cushman, R. A., 1923, p. 55. (*Ypsistocerus manni* (Braconidae) in nest *Nasutitermes ephratae*, Bolivia, and *Y. vestigialis* in nest *Nasutitermes corniger*, Bolivia.)

Delamare-Deboutteville, C., 1947a, pp. 456-458. (Biology Collembola, ecological conditions microclimate nest determine what species are present, new ecological classification.)

1948c, pp. 90-91. (Collembolan—*Calobatinus grassei* rides on head soldiers *Bellicositermes*, seizes food when worker feeds soldier, leaps off instantly if termite is disturbed.)

1948d, pp. 261-425. (Collembola: family Cyphoderidae contains most termitophiles, diagnoses and keys. Progressive specialization due to isolation in termite nests. Degree of relationship to host: accidental commensals, preferent, obligatory and historic obligatory. Obligatory group highly specialized, live on exudates from queen, secure food from workers or feed on fungi. All occur with the Termitidae except *Megacyphoderus silvestrii* which is associated with *Reticulitermes lucifugus* in France.)

Dennis, J. R., 1942, pp. 1-19. (New Collembola, *Cyphoderus*, n. spp., *Calobatina*, n. sp., *Cyphoderinus*, n. gen.)

Ditmars, R. L., 1907, p. 322; 1910, p. 217. (Reptiles, Glauconidae in tropical "anthills.")

1951, p. 126. (Leptotyphlopidae in ant hills.)
DONISTHORPE, H. ST. J. K., 1900, pp. 41-43, 72-75, 87-89, 110-119, 147-150, 204-206. (Guests.)
DUCKE, A. (1902) 1903, pp. 285-328. (Stingless bee *Melipona* (*Trigona*) *dallatorreana* in termite nest, Para, Brazil.)
DYBAS, H. S., 1955, pp. 561-577. (Neotropical beetles, Ptiliidae Trichopterygidae.)
EBNER, R., 1926, pp. 75-76. (Anglo-Egyptian Sudan, gecko, rhynchotid, myriapod, and coleopteron, *Tmesiphorus* sp.)
EDWARDS, F. W., 1927, p. 359. (Java, *Termitosciara ? megacantha,* Mycetophilidae.)
ELTRINGHAM, H., 1935, pp. 49-51. (Nyasaland, larva *Passalactis tentatrix,* Lepid.)
EMERSON, A. E., 1923, p. 160. (Classification nests, guests.)
1929b, pp. 1008-1009. (British Guiana, ecological relationships.)
1935, pp. 369-395. (Termitophilous distribution and quantitative characters as indicators of physiological specification in British Guiana termites; 6 Staphylinidae indicate 2 physiological species *Nasutitermes guayanae* and *similis.*)
1949, *in* Allee et al., p. 422 (figure of physogastric aphilinid near queen in royal cell), 429, 430, 615, 665, 675, 698, 718-721, 722.
1952b, pp. 489, 510. (With species *Procornitermes* and *Cornitermes,* South America.)
ENNIS, M. W., 1946, p. 186. (Mounds, use by bees, Ovimbundu, Portuguese West Africa, went in and out of abandoned mound through chimney.)
ESCHERICH, K., 1905, p. 164. (Lepismids.)
1906, pp. 739-749. (Thysanura.)
1908b, p. 33. (Termitophiles, Erythrea.)
FAGE, L., 1936, pp. 83-87. (*Andromma bouvieri,* n. sp., Arachn., Aran.)
1938, pp. 369-376. (Costa Rica, Arachn.)
FISHER, W. S., 1927, pp. 49-50. (Anobiidae, *Nevermannia dorcatomoides,* Costa Rica.)
FOLSOM, J. W., 1923, pp. 383-402. (Apterygota (Collembola), British Guiana.)
FRANSSEN, C. J. H., 1933, pp. 337-338. (*Termitoxenia.*)
1934, pp. 15-17. (Eggs, larvae, pupae, Javanese Termitoxeniidae.)
1936, pp. 62-65. (Eggs, larvae, pupae, Javanese Termitoxeniidae.)
FROST, S. W., 1942, pp. 252-255. (About 1,200 species of small Crustacea and arthropods inhabit the nests of social insects.)
FULLER, M. E., and LEE, D. J., 1938, pp. 75-80. (New phorid, *Diploneura gynaptera,* N.S. Wales.)
GESTRO, R., 1890, pp. 903-907. (Burma, *Chaetopisthes termiticola; Termitopisthes,* Col., Scarab., relationship.)
1900, pp. 743-744. (Eritrea, new genus Rhysopaussidae.)
1911, pp. 5-7. (Rhysopaussidae.)
GOELDI, E. A., 1897, p. 648. (Reptile, *Tupinambis nigropunctatus,* laying eggs in termite nest.)
GOSSE, P. H., 1851, p. 118. (Jamaica, inhabitants deserted nest, yellow-bellied parroquet (*Conurus flavientus*) and pallette-tip gecko (*Sphaeriodactylus agrus.*)
GRASSÉ, P. P., 1939c, pp. 831-832. (Habits and relationships *Troctontus appendiculatus,* Col., Meland., and *Microcerotermes fuscotibialis,* observations colony, beetle larvae fed by termite workers, Africa.)
1949, pp. 252, 528; Coleoptera, pp. 949, 963, 982, 1001, 1020, 1040, 1048, 1052, 1054, 1057.
GRASSÉ, P. P., and JEANNEL, R., 1941, pp. 135-149. (New carabid (*Perigona termitis*) from tropical Africa.)
GRASSÉ, P. P., and LESPERON, L., 1938, pp. 463-486. (*Troctontus silvestrii,* n. sp., biology.)
GRASSÉ, P. P., and POISSON, R., 1940, pp. 82-90. (Relationship between the staphylinid *Termitodiscus lepidulus,* n. sp., Col., Staph., and *Bellicositermes natalensis* in termitaria on the Ivory Coast, Africa.)
GRIDELLI, E., 1925-1928, p. 403. (*Termitobia paolii,* Col., Staph., in termitarium *Termes bellicosus,* Italian Somaliland.)
HAGMANN, G., 1906, pp. 307-316. (Eggs of reptiles *Gonatodes humeralis* and *Tupinambis nigropunctatus.*)
1907, p. 39. (Amazon, birds' nests in termite structures.)
1909, pp. 273-504. (*Tupinambis nigropunctatus,* reptile, laying eggs in nests termites, Amazon.)
HANDSHIN, E., 1924, pp. 13-28. (South America, Collembola.)
HASEGAWA, H., and KUBOTA, M., 1944, pp. 84-86. (Japan.)
HEGH, E., 1922, pp. 608-644. (General.)
HILL, G. F., 1921a, pp. 216-220. (Diptera, N.S. Wales.)
HINTON, H. E., 1934, pp. 340-342. (Costa Rica, *Termitodius peregrinus,* Col., Scarab.)

Hirst, S., 1911, pp. 256-257. (*Termitodermus lefroyi*, n. sp., millipede from Bengal.)
1927, pp. 25-27. (Samoa, mite *Uropoda* (*Uroobovella*) *samoae*, n. sp., on *Glyptotermes xantholabrum*, scavenger.)
Hollande, A., Cachon, J., and Vaillant, F., 1952, pp. 365-395. (Larvae of flies, moths, beetles; appendages in moth larvae sensory not glandular; *Paraplastocerus* and *Episthetosoma*, n. gen., North and French Equatorial Africa.)
Horn, G. H., 1888, pp. 19-21. (Larva of *Glyptus*, carabid in termite nests in tropical Africa, west coast.)
Hozawa, S., 1914, pp. 483-488. (*Ziaelas formosanus*, tenebrionid Rhysopaussidae, Formosa, in underground nest *Odontotermes formosanus*.)
Hubbard, H. G., 1877, pp. 267-274. (Bird, lizard shelter in carton tree nests, Jamaica.)
Hughes-McKenny, A. W., 1935, p. 51. (Host of *Passalactis tentatrix*, *Schedorhinotermes lamanianus*, Nyasaland.)
Ihering, H. von, 1902, p. 23. (*Trigona beileri* living in symbiosis in termite nests.)
1903, pp. 179-287. (Stingless honeybees' (meliponid) nests in termite nests.)
Jacobson, E., 1933, p. 114. (Cetonids as guests.)
Jaegerskiöld, L. A., 1903, p. 16. (Termitophiles described by E. Wasmann, Egypt and White Nile.)
Janssens, A., 1949, pp. 183-184. (Belgian Congo, Scarab., Col., *Afroharoldius ennearthrus*, n. gen., n. sp.)
Jeannel, R., 1941, pp. 149-150. (Three new *Perigona*, Carabidae.)
Kalshoven, L. G. E., 1931a, pp. 46-47: (Java, in *Nasutitermes* nest, bird, *Allecula* larvae (Col.) and Reduviidae.)
1933, p. 130. (Java, *Macrotermes* swarming in early morning and nest of *Alcedo* (bird) in *Nasutitermes* nest.)
Kemner, N. A., 1924, pp. 180-194. (Biology termitophile genus *Trochoideus*, Col., Endomychidae.)
1925a, pp. 107-126. (Java.)
1925c, pp. 1-24. ("Larva Eutermina," Java, physogastric Aleocharidae *Affinoptochus exclusus*, n. gen., n. sp.)
1925d, pp. 1-33. (Java, *Termitosuga* and *Euceroncinus*.)
1926, pp. 389-404. (*Termitoxenia*, rearing of a larva.)
1926a, pp. 133-170. (Staphylinidae, parasitic development of the true Aleocharidae.)
1927, pp. 1-33. (*Termitosuga* and *Euceroncinus* beetle larvae, Java.)
1929a, pp. 214-221. (Biology *Doryloxenus triarticulatus*, Col., Staph., Java, and Wasmann's hypothesis of its change of host; in nests *Termes javanicus* rides on heads of termites.)
1932b, pp. 17-29. (Morphology and biology Javanese *Termitoxenia*.)
1932c, pp. 1-6. (A termitophilous phorid which has lost its wings.)
1936, pp. 35-39. (*Termitoxenia jägerskioldi*, type of a new genus.)
1937, pp. 1-19. (Wings of Termitoxeniidae.)
1940, pp. 275-294. (Wings of Termitoxeniidae, comparison wings various genera Termitoxeniidae.)
Kolbe, H., 1909, p. 56. (*Termitoxenia heimi*, physogastric phorid.)
Kopstein, F., 1935, pp. 54-56. (Javanese reptiles.)
Kraatz, G., 1857, p. 13. (Staphylinidae *Philotermes*.)
Lea, A. M., 1893-1894, p. 438. (Insects inhabiting termite nests, N.S. Wales.)
1910-1912, pp. 116-230, 31-78. (Australian and Tasmanian Coleoptera.)
Lefroy, Maxwell, H., and Howlett, F. M., 1909, pp. 268-272. (India.)
Luederwaldt, G., 1911, pp. 405-413. (Lamellicorn Coleoptera, Brazil.)
McIndoo, N. E., 1923, pp. 367-381. (Glandular structure of a guest, British Guiana.)
Mann, W. M., 1921, pp. 54-56. (New genus guest, Fiji.)
1923, pp. 323-366. (Coleoptera, British Guiana.)
1926, pp. 151-155. (Three new beetles, British Guiana, Staphylinidae: *Poduroides bövingi*, with *Nasutitermes gaigei*; *Termitonicus mahout*, *Velocitermes beebei* *Termitospectrum thoracicum*, *N. gaigei*.)
Martinez, A., 1950, pp. 167-173. (*Termitodius*, n. sp., Neotropical Aphodiinae.)
Mergelsberg, O., 1935, pp. 345-398. (Africa, *Termitomyia gracilis*, *Termitostroma schmitzi*, and *Termitosagma henningsi* from the east African *Amplitermes natalensis* undergo extensive postimaginal development, 1st 5 abdominal segments expand enormously (physogastry) while the last 5 form the anal tube displaced ventrally, expansion results from rich nourishment. The salivary glands are situated in the abdomen. These Diptera are hermaphroditic. In addition to copu-

lation in early adult life, self fertilization occurs in later imagines.)

Meyrick, E., 1935, p. 49. (*Passalactis tentatrix* (Tineidae) inquiline in termitarium, Nyasaland.)

Michaelsen, W., *in* Escherich, 1911*, pp. 251-252. (Earthworm (*Notoscolex termiticola*) in mound *Termes obscuriceps*, Ceylon.)

Michl, E., 1911, pp. 53-60, 84-92. (Diptera.)

Mjöberg, E. G., 1912, pp. 121-124. (Histeridae, Col., *Eucurtia paradoxa*, n. gen., n. sp.)

1914, p. 98. (New representative family Termiticoridae Silv.)

Morrison, H., 1923, pp. 403-408. (Three new *Termitaphis*, British Guiana.)

Myers, J. G., 1924, pp. 273-274. (*Termitaradus guianae* and *panamaensis*, systematic position Termitaphididae.)

1932, pp. 366, 372. (Termitaphididae (Hemiptera-Heteroptera) and *Termitaradus jamaicensis*, n. sp., with *Heterotermes convexinotatus*, Jamaica, *T. australiensis*, with *Coptotermes acinaciformis*, redescribed *T. guianae*, description egg.)

Nomura, S., 1943, pp. 77-82. (Micronesia, *Termitodius esakii*, Aphodiidae, Col., Scarab.)

Oke, C., 1933, p. 135. (*Coptotermoicia*, type *alutacia*, p. 136, in nests *Coptotermes acinaciformis*, Victoria, Australia.)

Park, O., 1942, pp. 1-407. (Neotropical Pselaphidae.)

1943, pp. 171-226. (Mexican Pselaphidae.)

1944, pp. 227-267. (New and little known Pselaphidae from Brazil, Colombia, and Mexico.)

1945, pp. 277-327. (Pselaphidae of the Guianas.)

1945a, pp. 331-443. (Pselaphidae of Mexico and Guatemala.)

1946, pp. 445-451. (Pselaphid *Hamotocellus araujoi*, n. sp., Brazil.)

1946a, pp. 457-468. (Pselaphidae, Guatemala.)

1947, pp. 45-132. (*Batrisodes*, Pselaphidae east of the Rocky Mountains.)

1947a, pp. 27-42. (Pselaphidae, 4,800 beetles 0.7 to 5.5 mm. long with short elytra—15% live in nests ants and termites, from tolerated intruders to true guests. Setae produce secretion which is licked. Larvae and pupae are unknown.)

1948, pp. 137-169. (Checklist *Batrisodes*.)

1948a, pp. 181-192. (New and little known *Reichenbachia* (Pselaphidae) from Guerrero.)

1948b, pp. 203-221. (Japanese Pselaphidae.)

1949, pp. 251-266. (Pselaphid genus *Connodontus*, Ethiopian, with *Macrotermes*.)

1949a (with S. Auerbach and M. Wilson), pp. 267-276. (Pselaphid beetles from Illinois prairie, and the prairie peninsula hypothesis.)

1949b, pp. 315-343. (New nearctic pselaphid beetles and revision genus *Cedius*.)

1950 (with S. Auerbach and G. Corley), pp. 19-56. (Tree hole habitat pselaphid beetles.)

1950a (with R. A. Edgren), pp. 1-2. (Second record of predation on pselaphid beetles.)

1952, pp. 1-48, 1-150. (Revision neotropical Pselaphidae.)

1952a, pp. 53-150. (Revision neotropical Pselaphidae.)

1952b, pp. 1-60. (Pselaphidae, Oceania.)

1953, pp. 249-278. (New or little known pselaphid beetles of the United States.)

1953a, pp. 299-331. (U.S., discrimination of genera of pselaphid beetles.)

Parker, B. M., and Gregg, B. E., 1941, pp. 1-35. (Insect friends and foes.)

Paulian, R., 1947, pp. 134-136. (*Termitotrox monodi*, n. sp. (Scarab.) from the Ivory Coast.)

1948, pp. 15-17. (Madagascar, *Millotoca termitidis* from nest *Mirotermes*, Corotocini (Staph.).)

Pic, M., 1928, pp. 38-39. (Belgian Congo, Scaphidiidae, Col., *Termitoxidium longicolle*.)

Piepers, C., 1902, p. 167. (Larva of Bombycine moth, *Himantopterus fuscinervis*, in nests, Java.)

Poisson, R., 1937, pp. 201-208. (*Thaumatoxena wasmanni*, commensal Dipteron, French West Africa.)

1938, pp. 13-17. (*Ulopella termiticola*, n. gen., n. sp., commensal, Ulopinae, Hemiptera, Jassidae.)

Poulton, E., 1936, p. 98. (Tineid larva of genus *Passalactis*, Nyasaland.)

Purcell, W. F., 1904, p. 409. (Africa, isopod.)

Raffray, A., 1914, pp. 463-465. (New genera and species Pselaphidae.)

Rehn, J. A. G., 1926, pp. 1-24. (Blattidae, *Dyscologmaia wollastoni*, commensal, Central Africa.)

Reichensperger, A., 1913, pp. 926-928. (Different classes of symbiosis among guests.)

1915, pp. 1-20. (Natal and Zululand guests.)

1921a, pp. 279-288. (Biology, symbiosis, trophallaxis.)
1922, pp. 34-83. (Staphylinidae and Endomychidae, Africa.)
1923b, pp. 313-336, 243-252. (New South American Histeridae.)
1924, pp. 117-153. (New South American Histeridae, pt. 2.)
1925, pp. 351-357. (Histeridae from mounds *Eutermes* and *Odontotermes,* India.)
1929, pp. 132-137. (New beetle (Histeridae, Staph.) guests, p. 136, *Termitusa cameroni,* Tanganyika.)
1931, pp. 263-284. (New Histeridae.)
1931a, pp. 289-306. (Tanganyika, Termitoxeniidae (Dipt.) distinct from Phoridae; *Termitomyia gracilis,* p. 294; *Termitostroma,* resembling *Ptochomyia,* p. 297; type T. *schmitzi,* p. 299; *Termitosagma,* resembling *Termitosphaera,* p. 302; type *T. henningsi,* p. 303. New species occur as brood parasites in nests of *Amplitermes natalensis,* Tanganyika.)
1932, pp. 6-14. (Costa Rica, guests.)
1933, pp. 140-142. (Young form (stenogastric) of *Termitosagma henningsi* (Dipt.)
1936, pp. 382-383. (Termitoxeniidae (Dipt.), hermaphroditism.)
1936a, pp. 186-192. (Guests.)
1936b, pp. 222-242. (Brazil and Costa Rica, guests, pt. 4, Histeridae: *Cossyphodister schwarzmairi,* Brazil, with *Syntermes* sp.?, *Notocoelis satur,* Brazil, *Cornitermes similis.*)
1938, pp. 74-97. (Brazil and Costa Rica, guests, Histeridae, pt. 5.)
1939, pp. 97-137. (Brazil and Costa Rica, guests, Histeridae, pt. 6.)

Riley, N. D., 1935, p. 51. (Host of inquiline larva of *Passalactis tentatrix, Schedorhinotermes lamanianus,* Nyasaland, Fort Johnston.)

Roepke, W., 1919, pp. 34-45. (Java, *Trochoideus termitophilus,* Col., Endomychidae.)

Schimmer, F., *in* Escherich, 1911*, pp. 235-236. Ant-cricket termitophile, *Myrmecophila escherichi,* Ceylon.)

Schiödte, J. G., 1853, pp. 101-103. (Staphylinidae.)
1854, pp. 1-19. (*Corotoca* and *Spirachtha,* Staph.)
1856, pp. 169-183. (Viviparous Staphylinidae.)

Schmidt, H., 1950, pp. 1-37. (General.)

Schmitz, H., 1913, pp. 9-16. (Phorid, *Termitophora velocipes,* South India.)
1913a, pp. 268-278. (Phorid, *Bolsiusia termitophila,* n. gen., n. sp., East Indies.)
1915, pp. 281-284. (Sciaridae (Dipt.), *Termitosciara biarticulata,* lives in fungus gardens *Odontotermes obesus,* Khandala, Bombay, India.)
1915a, pp. 548-564. (The truth about *Thaumatoxena.*)
1915b, pp. 311-330. (Phoridae collected by Assmuth, South India.)
1916, pp. 211-266. (New Diptera, Termitoxeniidae and Phoridae, collected by v. Buttel-Reepen 1911-1912, East Indies.)
1924*, pp. 302, 304. (Three new Platyphorinae, Phoridae (Dipt.), and a new host termite *Eutermes processionarius,* Western Ghats.)
1926, pp. 15-16. (New phorid with *Odontotermes obesus,* India, *Puliciphora termitum.*)
1929, pp. 1-42. (Patagonia and South Chile, Phoridae in rotten logs with *Porotermes quadricollis, Gymnophora commotria,* Chile, p. 23; *Tropophleba varians,* Chile and Argentina, p. 29; *Dicranodeina extravagans,* Chile, p. 31; *Haplophleba nigricans,* Chile, p. 33; *Megaselia paricostalis,* Argentina, p. 42.)
1934, pp. 1-148. (Guests.)
1936, pp. 27-29. (Hermaphroditism in *Termitoxenia.*)
1936c, p. 216. (Reduced wings in Termitoxeniidae.)
1938a, pp. 22-40, 55-70, 132-146, 147-162, 13 figs. (Monograph on Termitoxeniidae.)
1939, pp. 53-63, 133-148. (Monograph on Termitoxeniidae.)
1940, pp. 9-15. (Systematics Termitoxeniidae, subfamily Phoridae.)
1940a, pp. 9-10, 22-24, 32, 48-50. (African Phoridae.)
1950, pp. 39-58. (*Thaumatoxena,* new species.)
1951, pp. 128-166. (Africa, Phoridae.)
1951a, pp. 65-86. (Termitoxeniidae.)
1951b, pp. 145-158. (Japanese Phoridae.)
1951c, pp. 254-266. (*Thaumatoxena,* new species.)
1952, pp. 113-116. (Connecting link between Phoridae and Termitoxeniidae found in Africa.)

Schött, H., 1917, pp. 20, 50, etc. (Termitophilous Collembola, Australia.)

Schubart, O., 1943, pp. 61-71. (Diplopod,

Vassununga termitophila, n. gen., n. sp., Brazil.)

Schwarz, E. A., 1880, p. 15. (*Trichopsenius depressus* and 3 other new Staphylinidae, with *Termes flavipes,* Texas.)
1889, pp. 160-161. (Coleoptera, North America.)

Schwarz, H. F., 1948, pp. 14-15, 78, 89, 219, 299-300, 310-312, 326, 333, 337-338, 352, 404, 409, 489, 495-496, 499, *Trigona.*)

Scott, H., 1932, pp. 169-172. (Seychelles Islands, Collembola, *Cyphoderus insularum* with *Arrhinotermes canalifrons.*)

Seevers, C. H., 1937, pp. 1-23. (New Staphylinidae, tropical America and Solomon Islands.)
1938, pp. 422-441. (Coleoptera, U.S.)
1939, pp. 1-19. (New genera and species neotropical physogastric Staphylinidae, Aleocharinae, Ecuador.)
1941, pp. 175-193. (New neotropical Diptera, Phoridae, Panama, Colombia, evolution apterous females.)
1941a, pp. 318-349. (Staphylinidae, Aleocharinae, and Trichopsinae.)
1951, pp. 657-762. (North American and European Staphylinidae, Gyrophaenae (Aleocharinae, Bolitocharini.)
1953, p. 38. (Correlation of evolution of guests with their hosts.)

Sellnick, M., 1926, pp. 29-56. (New mites (Uropodidae) associated with *Cornitermes* and *Eutermes,* Brazil.)

Sharp, D., 1899, pp. 205-206. (*Dioxeuta microps,* n. gen., n. sp., Staphylinidae, Borneo.)

Shelford, R., 1907, pp. 13-48. (Blattoidea, Kilimandjaro-Meru, Africa.)

Silvestri, F., 1901a, pp. 1-6, 1-24. (New termitophiles and relation to hosts.)
1902a, pp. 121-174. (Three species Meliponidae nesting in termite nests, Brazil.)
1902c, pp. 1-29. (South America.)
1903*, pp. 172-216. (South America.)
1910, pp. 37-39. (New genera of Staphylinidae from Singapore.)
1911, *in* Escherich, 1911*, pp. 237-247. (Thysanura, Myriapods, a new genus of termitophilous millipede and a new mimic Coleopterous larva, collected by Escherich in Ceylon.)
1911, pp. 401-418. (Termitophiles collected by Escherich in Ceylon.)
1911a, pp. 59-64. (Two new guests of *Termes malayanus,* Col., Staph., and Thysanura, Lepismat.)
1911b, pp. 231-236. (Systematic position genus *Termitaphis.*)
1912, pp. 204-221. (Thysanura, Mexico.)
1918, pp. 287-346. (Aptera, West Africa.)
1920, pp. 265-319. (West Africa.)
1920a, pp. 117-135. (Oriental Diplopoda, *Polydesmoidea,* subfamily Pyrgodesminae.)
1921, p. 71. (*Termitaphis annandalei,* n. sp., from India.)
1921a, pp. 1-23. (Staphylinidae from the oriental and Australian regions.)
1924, pp. 172-175. (New genus of Polydesmidae (Diplopoda) from Costa Rica.)
1927, pp. 252-254. (Arthropoda, China and Formosa, Coccidae (Hemiptera), two new species.)
1938a, pp. 32-40. (A new species of *Termitococcus* from Brazil, and a related new genus, *Eurhizococcus.*)
(1939)-1940a, pp. 344-353. (A new genus of Scarabaeidae from Brazil.)
(1941-1945) 1944, pp. 243-251. (New genera of Lepidoptera (Tineidae) from Brazil.)
1945a, pp. 515-519. (Guests of *Syntermes,* tropical America.)
1945b, pp. 299-334. (Staphylinidae, South America.)
1946, pp. 313-330. (Indo-China.)
1946a, pp. 1-22. (Corotocini (Staph., Aleocharinae), South America, with *Constrictotermes.*)
1947, pp. 281-295. (Phoridae, Brazil.)
(1943-1946) 1947a, pp. 123-149. (Termitodiscinae and Cephaloplectinae, Staph., Col.)
1947b, pp. 13-40. (Indo-China, second note.)
1947c, pp. 74-78. (*Allatelura hilli,* n. gen., n. sp. (Thysanura, Lepismat.) in nest *Mastotermes darwiniensis,* New Holland.)
(1942-1947) 1948, pp. 56-79. (New Staphylinidae from South America, with *Anoplotermes, Cornitermes, Subulitermes, Orthognathotermes,* and *Diversitermes.*)
1948a, pp. 1-32. (Diplopoda, South America.)
1949, pp. 32-39. (Thysanura, Lepismat., new species in *Metriotelura* and *Atopatelura.*)

Snyder, T. E., *in* (Banks and) Snyder, 1920*, pp. 118-120. (U.S., guests with *Termopsis, Reticulitermes, Prorhinotermes.*)

Snyder, T. E., 1929a, pp. 40-46. (General.)
1929e, pp. 84-87. (General.)
1935e, pp. 94-98, 176. (General.)
1948, pp. 105-110, 236. (General.)

Townsend, C. H. T., 1912, pp. 266-269. (Psocid, *Vulturops termitorum* in cov-

ered runways *Amitermes* sp. at Piura, northern Peru.)

Tragårdh, I., 1907, pp. 172-190. (Physogastric Aleocharini *Termitomimus*, n. gen., transl. Wheeler, 1918.)

1907a, pp. 1-17. (Tineid larva.)

1908, pp. 1-12. (*Thaumatoxena*, Dipt.)

Trimen, R., 1886, p. 461-463. (*Margarodes* in nests white ants, Cape Colony.)

Usinger, R. L., 1942, pp. 155-159. (*Termitaradus* and *Termitaphis* Hemiptera, biology, food habits, key to 8 spp. former and 1 sp. latter.)

Verhoeff, K. W., 1939, pp. 135-137. (African termitophile Isopod genera *Schöblia* and *Termitoniscus*, rare, distinct?)

Villeneuve, J., 1920, p. 153. (South Africa, Dipt., *Rhynchomyia braunsi*, n. sp., with *Hodotermes*.)

Warren, E., 1914, pp. 103-106. (Beetle *Corotoca*, South Africa.)

1919, pp. 93-112. (South Africa.)

1920, pp. 297-366. (Aleocharine, *Paraconotoces akermani*, South Africa, anatomy.)

Wasmann, E., 1890, pp. 56-58. (Staphylinidae, Brazil.)

1891, pp. 647-659. (New termitophiles, with a review of guests, Aleocharine, *Termitobia*, n. gen., *Xenogaster*, n. gen.)

1894*, pp. 1-231. (Arthropods, critical catalog.)

1895, pp. 111-114. (Arthropods.)

1895a, pp. 137-139. (Brazil.)

1895b, pp. 289-290. (Cicindelidae, *Thorictus*, North Africa.)

1896*, pp. 613-630. (New Rhysopausidae (Tenebrionidae) from India, *Rhysopausus*, n. gen., *Xenotermes*, n. gen.; Nachtrag *Azarelius singularis*, n. sp., pp. 149-152.)

1896a, pp. 273-324. (Brazil.)

1896c, pp. 1-4. (Collecting Coleopterous termitophiles.)

1896d, pp. 32-36. (Critical observations.)

1897, p. 278. (A new termitophile from German West Africa, *Myrmedonia* (*Rhynchodonia*) *leonina*.)

1897a, pp. 276-279. (Nests of *Polybia scutellaris*.)

1897b, pp. 28-31. (A new *Myrmedonia* from Burma.)

1898, pp. 145 etc. (Guests, adaptation characters, symphily.)

1899, pp. 245-249. (Haviland's observations on *Rhopalomelus angusticollis* in nests *Termes latericius*, Natal, other Carabidae.)

1899a, pp. 145-169. (Coleoptera, India, *Termitodiscus*, n. gen., 6 n. spp.; Staph., *Myrmedonia*, 3 n. spp., *Chaetopisthes*, *Corythoderus*, host *Termes obesus*; Tenebrionidae, *Hyperops dubia*, host unknown.)

1899b, pp. 172-173. (*Pogonoxenus*, a new Tenebrionid genus from Cameroon.)

1899c, pp. 178-179. (A new physogastric Aleocharine from Cape Colony, *Termitotropha o'neili*, n. gen., n. sp., host *Termes unidentatus*.)

1899d, pp. 401-402. (*Termitodiscus splendidus*, n. sp., from Natal, host *Termes vulgaris*.)

1900a*, pp. 244-245. (Pselaphid, Australia, *Coptotermes raffrayi*, n. sp.)

1900b, pp. 65-68, 81-84. (Cetonidae, South Africa (Scarabaeidae), Nachtrag, pp. 103-104.)

1900c, pp. 599-617. (*Termitoxenia*, a new wingless, physogastric Dipteron from termite nests.)

1901, pp. 289-298. (*Termitoxenia*, a new wingless, physogastric Dipteron from termite nests; *Termitomyia* described, Dipt., Phoridae, subgenus *Termitoxenia*, p. 295.)

1901a, pp. 421-422. (True guest relationship among termite guests.)

1901b*, p. 744. (Development of termitophily and the manner of symphily.)

1902, pp. 79-80. (Termitophiles collected in Ceylon in 1899 by W. Horn.)

1902a*, pp. 260-265, 293-298, 340-345, 385-390, 422-427, 441-449. (Symbiosis between ants and termites; the appearance of termitophily in the Arthropods.)

1902b*, pp. 99-164. (Termitophiles collected in Ceylon by W. Horn.)

1902d, pp. 66-76. (Acarine termitophiles, Acarine riding termites.)

1902e, pp. 852-872. (*Termitoxenia*.)

1902f, pp. 95-107. (New insect termitophiles from South America.)

1902g, pp. 1-6. (Silvestri's new insect termitophiles from South America.)

1902h, pp. 267-268, 275-276, 282. (In 1894, 105 termitophile species, 87 Coleoptera, 59 Staphylinidae; Myrmedonini of East Asia and Africa 10 to 12 mm. in length.)

1903, pp. 63-72, 196-207, 233-248, 261-276, 298-310. (Symphily and guest relationship among termite guests.)

1903a, pp. 113-120. (The appendages of the thorax among Termitoxeniidae.)

1904a, pp. 1-21. (Termitophiles from Egyptian Sudan.)

(1904) 1905, pp. 436-449. (The phylogenetic metamorphosis of East Indian termite guests.)
1905a, pp. 199-200. (*Termitusa,* n. gen., Aleocharine (Staph.) termitophile, *T. sjöstedti.*)
1906*, pp. 565-580. (Species building.)
1906a, pp. 212-216. (Guests.)
1908a, *in* Schultze, 1908, p. 441. (*Termitotelus schultzei,* n. sp. (Staph.), a new guest of *Hodotermes,* also other guests of *Hodotermes,* western and central Africa.)
1909a, pp. 1-190. (Bibliography Wasmann's papers on termitophily.)
1910b, pp. 97-102, 129-138, 161-181. (Manner and origin of symphily.)
1911*, pp. 91-117, 145-176. (Termitophiles from Belgian Congo.)
1911b, *in* Escherich, 1911*, pp. 231-232. (Coleoptera, Ceylon.)
1911c, pp. 428-429. (Synopsis of *Termitophya* and *Xenogaster* species (Col.), with statement of value observations by N. Holmgren.)
1912*, pp. 70-115. (Termitophiles.)
1913, pp. 254-257. (Guests.)
1913a, pp. 16-22. (Revision Termitoxeniinae, East Indies and Ceylon.)
1915a, pp. 1-413, xx. (Association ants and termites.)
1916, pp. 169-210. (Coleopterous guests, East Indies.)
1918, pp. 1-23. (Coleopterous guests, Scarab., East Indies.)
1918a, pp. 37-41. (Histeridae.)
1920, pp. 80-82. (*Orthogonius assmuthi,* n. sp., from South India.)
1921, pp. 14-30. (Rhysopaussinen.)
1926, pp. 417-418. (Contribution made by study of termitophile biology to taxonomy.)
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Wheeler, W. M., 1918, pp. 314-316. (Exudate organs termitophilous beetle.)
1928, pp. 130-160. (Termitophiles.)
1936, pp. 159-243. (Ecological relations ponerine and other ants to termites.)
Womersley, H., 1934, p. 103. (Australia, Collembola, Entomobryoidea, *Isotoma termitophila,* associated with termites.)
1940, p. 350. (A new termitophilous Collembolan from South Australia.)
Zumpt, F., 1952, pp. 1-18. (Ethiopian Sarcophaginae (Dipt.); new genus, *Termitometopia.*)
1953, p. 37. (*Termitometopia,* a true guest.)

USES IN INDUSTRY, ARTS, AND RELIGION

Anonymous (J. M. C.), 1915, pp. 224-281. (Use in Australia brown secretion in nest structure of mounds for tennis courts.)
1938, p. 17. (Lime carbonite in mounds, Tanganyika, Africa.)
Berensberg, H. von P., 1907, pp. 757-762. (Natal, use in manufactures.)
Clausen, L. W., 1954. (Head-hunters of Amazon River purify widow before remarriage by inhaling smoke from burning termite nest, p. 150; natives of lake region, central Africa, chew clay from certain termite nests as Arabs of that region chew tobacco. Arabs suffered severe nausea when they tried it, pp. 150-151.)
Cowan, T., 1865, pp. 132-137. (Use of nests.)
Dietz, H. F., and Snyder, T. E. (1923), 1924, pp. 279-302. (Panama, nest material used for floors native huts, and tennis courts.)
Froggatt, W. W., 1903, pp. 726-730. (Earthlike material mound nests so fine is used by native jewelers to polish gems in Ceylon.)
Lips, J. E., 1947, p. 427. (South Seas, termites souls of men.)
Myers, J. G., 1938, pp. 7-8. (Sudan, termites used as oracles.)
Pax, F., 1950, pp. 264-271. (Practical use termites and their nests.)
Rohland, P., 1911, pp. 178-179. (Nest material in brickmaking.)
Snyder, T. E., 1915, p. 23. (As scavengers in the forest.)
1929d, pp. 143-151. (Tree nests (artificial of concrete), used as decoration in architecture.)
1935e, p. 64. (Natives of South Africa, according to C. Fuller in letter, have venerated mounds for many hundreds of years.)
1948, p. 75. (In Africa nest material is used for floors native huts.)
Taylor, J. E., 1942, p. 49. (Mounds used for manure.)

Tihon, L., 1946, pp. 865-868. (Grilled termites produce oil of high acidity, not sticky and yields clear, firm soap.)

Wolcott, G. N., 1945, pp. 115-129. (Carton tree nests of *Nasutitermes* and tunnels made of concrete and painted black to give authenticity to imitation rustic garden furniture and arbors.)

WATER TABLE

Elliot, G., 1904, pp. 505-523. (Termitidae in water 50 m. below surface, Niger-Chad boundary, pp. 515-516; go down in wells for water.)

Joffe, U. S., 1936, pp. 48, 110.

Richards, O. W., 1953, p. 172. (Desert-living termites extend vertical tunnels many feet to reach deep-lying water table.)

Snyder, T. E., 1935c, pp. 1-6. (Increased termite damage at New Orleans, La., due to lowering of water table by pumping system.)

1935e, p. 59. (Depth water table only limits penetration soil by termites.)

WOOD PRESERVATION [7]

Alliot, H., 1946, pp. 1420-1421. (Chemical protection wood.)

1947, pp. 1-3. (Chemical protection wood.)

1953, pp. 43-52. (Protection logs, Tropics.)

Alliott, A., 1949, pp. 200-201. (Protection wood.)

Allouard, P., 1948, pp. 415-426. (Simple and cheap process protection wood against termites and decay.)

Amadon, H. C., et al., 1945, pp. 74-81. (U.S., pole service records.)

Andrews, L. K., Gottschalk, E. W., and Johnson, J. P., Jr., 1941, pp. 54-80. (Service records Wolmanized lumber.)

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Anonymous, 1910, pp. 308-310. (Report on creosoted yellow pine poles in Norfolk-Washington and Montgomery-New Orleans lines Amer. Tel. and Tel. Co., U.S.)

1921, pp. 290-295. (Australia, chemical treatments of wood to protect against termites.)

1923, pp. 53-55. (East Africa, sodium arsenite, carbolineum.)

1925c, pp. 66-67. (India, protection wood against termites.)

1932, pp. 237-269. (Test treated poles in Norfolk-Washington, Montgomery-New Orleans lines, Amer. Tel. and Tel. Co., U.S.)

1934, *in* Kofoid, appendix A to chap. 49. (Results preservative treatment test poles in Norfolk-Washington and Montgomery-New Orleans lines, Amer. Tel. and Tel. Co., U.S.)

1934d, pp. 472-477. (India, chir and fir sleepers impregnated with creosote and liquid fuel oil reduces checking and end-racking, should give 19 years' service.)

1934-1953. (Reports of inspections of preservatives in the Mississippi State Highway Department's test garden, Jackson, Miss., and service records on guard rail posts, 1932-1953, 20th report 1953; coal-tar creosote, pentachlorophenol, and "Chemonite" were outstanding.)

1936m, p. 309. (Northern Rhodesia, 3 years in ground, wood treated with 3% arsenious oxide or 3% sodium arsenite immune to attack by termites.)

1936c′, p. 50. ("Permatol" developed by Western Pine Assoc.)

1936d′, pp. 44-51. (India, Ascu-arsenic and copper, design of portable wood preservation plant.)

1937, p. 19. (Treated timber mandatory in Los Angeles, Calif., 1936 building code—creosote and chromated zinc chloride for foundation lumber.)

1937a, p. 2. (Treated wood recommended in city building codes.)

1937b, p. 66. (Kansas City, Mo., ordinance makes treated lumber mandatory in city building codes.)

1937d, p. 21. (Proposal to require treated lumber in Kansas City building code defeated.)

1941, pp. 1-7. (Federal specifications, wood preservatives, U.S., TT-W-571b.) See 1950h.

1944, pp. 1-6. (Termite-proofing timber for use in the Tropics.)

1945d, pp. 1-5. (U.S., pentachlorophenol.)

[7] With particular reference to termites; also poisons for fabrics, fiberboards, and insulation.

1946c, pp. 46-47. (New Zealand, oil soluble preservatives brushed at rate 1 coat for every ¼ in. thickness timber prevented attack by *Calotermes brouni.*)

1946d, pp. 1-5. (U.S., salts sap stream treatment, green poles and posts; pentachlorophenol in oil for dipping seasoned poles, posts.)

1947g, pp. 1-2. (India, DDT as anti-termite treatment for timber, fabric, and cordage.)

1948, pp. 1-20. (U.S., treated wood in buildings to prevent decay and termite attack, U.S. Dept. Agriculture recommendations.)

1949l, p. 73. (Australia, phenol-formaldehyde resins more effective than urea-formaldehyde in bonding.)

1949n, pp. 1-11. (Kanpur, India, jute sacking treated with DDT and benzene hexachloride.)

1950, pp. 1-4. (Australia, superficial coatings with creosote or other preservatives, construction timbers.)

1950a, pp. 170-209. (South Africa, protection building timbers, general account preservatives and methods.)

1950d, p. 62. (Australia, impregnation with 0.06% Tanalith (based on oven-dry weight timber) gave almost complete protection (laboratory tests); addition 4% pentachlorophenol and 0.13% gamma isomer benzene hexachloride to the glue line of plywood not effective; cellulose acetate butyrate plastic susceptible to termites, polyvinyl chloride and polythene not attacked in tests.)

1950e, pp. 1-5. (U.S., factors influencing decay, durability.)

1950g, pp. 1-23. (U.S., methods applying wood preservatives.)

1950h, pp. 1-5. (U.S., Federal specifications wood preservatives and recommended treating practice, TT-W-571c; revision of TT-W-571b, 1941; pp. 1-7.)

1951, pp. 1-26, revision of 1948.

1951c, pp. 64-65. (Australia, telephone cables covered with polyvinyl chloride badly damaged, while polythene coverings only surface injured.)

1951d, pp. 1-28. (France, treatment wood, cryptogilsxylophenes.)

1952d, p. 67. (Australia, addition 4.8% crude or 2.0% gamma benzene hexachloride to the glue line of plywoods did not give adequate protection against termites; addition 2% pentachlorophenol or sodium pentachlorophenate to rubber cable sheathing renders it highly resistant; plastic cable sheathings of the polythene or polyvinyl chloride type give inadequate protection. Tests with *Coptotermes acinaciformis* showed it to be twice as voracious as *C. lacteus.*)

1953i, pp. 17-19. (U.S., 1952 amount chemically treated miscellaneous lumber and timber showed a 9% increase over 1951; creosote or creosote mixtures were used for 92.5% of all timber treated, gallons used were 3.5% more than in 1951.)

1953n, p. 13. (Buena Vista, Va., pressure-treated floor joists, sills, subflooring residence, southern yellow pine 0.75 lb. dry salt—copperized chromated zinc chloride per cu. ft., lumber air dried after treatment. 5,000 bd. ft. lumber in house; pressure treatment susceptible members adds 2% to total construction cost.)

1954, pp. 1-5. (U.S., Federal specifications wood preservatives and recommended treating practice, TT-W-571d; revision of 1950h, pp. 1-5; included are Boliden salts and copperized chromated zinc chloride, deleted are zinc chloride and ZMA.)

Baechler, R. H., 1934, p. 1336. (Corrosion of metal fastenings in zinc chloride treated wood.)

1939, pp. 56-63. (Corrosion of metal fastenings in zinc chloride treated wood, after 10 years.)

1949, pp. 390-397. (Corrosion of metal fastenings in zinc chloride treated wood, after 20 years.)

(Banks, N., and) Snyder, T. E., 1920*, p. 98. (U.S., treated timber for buildings.)

Barker, S. G., 1938, pp. 1227-1229. (India, "cuprinol" protected jute for 8½ months; cellulose acetate treated fabric, Ceylon; hessian treated with Bakelite varnish.)

Bateman, E., 1920, pp. 251-255. (Theory on mechanism of the protection of wood by preservatives.)

1920a, pp. 57-59. (Inaccuracy of treating records due to moisture in wood.)

1920b, pp. 359-360. (Relation between viscosity and penetration of creosote into wood.)

1921, pp. 506-514. (Mechanism of the preservative treatment of wood.)

1922, pp. 70-80. (Toxicity and solubility partition of a number of tar acids proof of the mechanism of protection of wood by preservatives.)

1924. (Solutions of zinc chloride and petroleum oils, pp. 114-117; toxicity of mix-

tures of creosote and petroleum oils, pp. 139-140.)

Bateman, E., and Henningsen, C., 1923-1925. (Theory on mechanism of the protection of wood by preservatives, pp. 136-144, 1923; pp. 33-37, 1924; pp. 22-28, 1925; toxicity of petroleums, pp. 57-61; treatment of posts, p. 245, 1925.)

Bates, H. W., 1864, p. 186. (Saturate wood with arsenicals, Amazon.)

Becker, G., 1942, pp. 523-527, 573-577. (Termite-proofing textiles.)

1950, pp. 62-76. (Effectiveness of wood preservatives against termites in the Tropics.)

1950a, pp. 93-101. (Effectiveness coal-tar creosote oil as a wood preservative.)

1950b, pp. 382-385. (Fluoride combinations in wood preservation, iron corrosion.)

1952b, pp. 348-350. (Pentachlorophenol effective against termites.)

Becker, G., Schulze, B., and Schulz, E., 1942, pp. 40-55. (Effectiveness against termites.)

Becker, G., and Sommer, H., 1946, pp. 247-251. (Termite-proofing fabrics under tropical conditions, *Kalotermes* used.)

Becker, G., and Thieden, G., 1954, pp. 11, 21-24, 48, 62, 66, 67, 68, 84. (Bibliography, termites and wood preservation.)

Becker, G., and Wiederholt, W., 1951, pp. 409-416. (Fluosilicates as wood preservatives and iron corrosion.)

Behr, E. A., 1949, pp. 19-20, 22. (Pentachlorophenol.)

1952, pp. 23-24, 26; pp. 40, 42, 46. (Pentachlorophenol, wood preservation for the pest control operator.)

Berliner, J. F. T., 1943, pp. 140-141. (Methylourea-treated wood.)

Berry, A. G. V., and Cater, J. C., 1941, pp. 179-180. (Copper and mercuric naphthenates as wood preservatives.)

1945, pp. 233-235. (Copper and mercuric naphthenates as wood preservatives.)

Betts, H. S., and Newlin, J. A., 1915, pp. 1-15. (Strength tests of structural timbers treated by commercial wood-preserving processes.)

Blew, J. O., Jr., 1945, p. 82, 2 tables. (Post service records.)

1947, pp. 26-41. (Comparison of preservatives in Mississippi fence posts after 10 years.)

1948, pp. 88-119. (Comparison of wood preservatives in stake tests.)

1949, pp. 285-293. (Post service records.)

1950, pp. 1-11, 2 tables. (Comparison of preservatives in Mississippi fence posts.)

1950a, pp. 1-7, 2 tables. (Comparison of preservatives in stake tests.)

1951, pp. 1-11, 2 tables. (Comparison of wood preservatives in Mississippi fence posts.)

1952, pp. 1-11, 2 tables. (Comparison of wood preservatives in Mississippi fence posts; untreated southern yellow pine posts had average life of 3.3 years. Posts impregnated with beta-naphthol in oil, borax-boric acid, 10% creosote and 90% crankcase oil, crankcase oil, and Osmoplastic (15-in. band application) had average life 11 to 15 years; posts treated with 21 other preservatives have lasted longer or should last longer, including steeping, osmose, double diffusion as well as pressure. Coal-tar creosote, pentachlorophenol, tetrachlorophenol, Celcure, coal tar, and copper sulfate and sodium arsenate (double-diffusion) are over 92% effective.)

1953, pp. 1-42. (Comparison of wood preservatives in stake tests; untreated southern yellow pine sapwood stakes had an average life of 1 year in the Canal Zone, Panama; 2 to 3 years at Saucier, Miss., Bogalusa, La., and Jacksonville, Fla.; 5 to 6 years at Madison, Wis. Untreated Douglas fir plywood stakes had an average life of 1 to 4 years at Saucier, Miss.; those glued with phenolic and urea-resin lasted longer than those casein-glued, which had an average life of 1 year. Douglas fir stakes had a life of slightly more than 2 years. Untreated yellow birch plywood stakes had an average life of 2 to 3 years. In the Canal Zone stakes impregnated with 0.5 to 1.0 lb. of chromated zinc chloride per cu. ft. lasted 5 to 7 years, with 1.5 lb. of zinc chloride 5 to 7 years, and with 0.6 lb. of Tanalith 12 years. At Bogalusa, La., stakes impregnated with 0.2 lb. of Tanalith and with 0.25 lb. of sodium tetrachlorophenate per cu. ft. have averaged 10 and 8 years respectively; in Panama 0.25 lb. of sodium pentachlorophenate or tetrachlorophenate have given life of 7 and 5 years respectively; 0.33 lb. (anhydrous) Boliden salt 9 years.

In Mississippi fire-retarding formulation of ammonium phosphate and sulfate plus borax and boric acid lasted 6 years. Southern pine stakes and Douglas fir plywood stakes brushed or briefly dipped in coal-tar creosote, solutions of pentachlorophenol, copper naphthenate, zinc naphthenate, and phenyl mercury oleate have had 1 to 4 years added life. Plywood stakes soaked 18 hours in pentachlorophenol or mixtures of chlorinated phenols have lasted 7 to 9 years in the Canal Zone. Pine stakes soaked in urea or urea formaldehyde solutions lasted 1 to 1½ and 3 to 4 years longer, respectively, than untreated ones in Mississippi. Pine stakes treated by the double-diffusion method with copper chromate and copper arsenate have lasted 11 years in Mississippi. Plywood stakes impregnated with phenolic resin (impreg) with a low resin content had an average life of 7 years. Laminated paper plastic made with phenolic resin averaged 6 to 8 years resistance to decay and termites. Heat-stabilized birch and maple plywood (staypak) lasted 4 to 6 years, veneer 1/16-in. thickness had better resistance than ⅛ in. because of better distribution of the phenolic resin. Acetylated birch (laminated veneer) resisted decay and termites in Mississippi for 8 years.)

1954, pp. 1-42. (Comparison of wood preservatives in stake tests; but little change since 1953.)

Blew, J. O., Jr., and Champion, F. J., 1952, pp. 1-33. (Open tank and other nonpressure methods of preservation, U.S.)

Blew, J. O., Jr., and Kulp, J. W., 1953, pp. 1-14. (Comparison of wood preservatives in Mississippi fence posts: but little change in results reported by Blew, 1952, sodium chromate treated posts had an average life of 11 to 15 years.)

1954, pp. 1-13. (Comparison of wood preservatives in Mississippi fence posts: posts pressure-treated with beta-naphthol in oil, borax-boric acid, sodium dichromate, sodium chromate, 10% coal-tar creosote and 90% used crankcase oil, and crankcase oil, and those treated at ground line and top with Osmoplastic have average life 12 to 17 years. Posts pressure-treated with chromated zinc chloride, coal tar, lignite coal-tar creosote, No-D-K (hardwood-tar creosote), P.D.A. (phenyldichlorarsine), Wolman salt (Tanalith), and zinc chloride; posts steeped in mercuric chloride; and posts treated full length with Osmosar are estimated to have an average life ranging from 18 to 26 years.

Posts pressure-treated with Celcure (acid cupric chromate), coal-tar creosote, 50% coal-tar creosote and 50% used crankcase oil, pentachlorophenol (approx. 5% and 3%) in used crankcase oil, tetrachlorophenol (approx. 5% and 3%) in used crankcase oil, water-gas tar, and zinc meta arsenite, and those treated by the double-diffusion process with copper sulfate and sodium arsenate have not yet shown a sufficiently high percentage of removals to warrant an estimate on possible average life. The failures of treated posts to date, on the basis of posts installed under the three site conditions, have been heavier in the dry and damp areas than in the swamps. In the installations showing more than 30% of failure, the percentage of failures in the swamps has been significantly high.)

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