has been born there. The period of gestation was 401 days; in another instance it was 395 days. The little tapirs have been strong and were raised with comparatively little trouble.

NOTES ON ENTOMOLOGY

THREE more volumes have been issued by the Indian government in the series "The Fauna of British India." Two are on the Coleoptera. Volume I. is on the Cerambycidæ, by C. J. Gaham (329 pp., 107 figs.), and deals with nearly one half of the longicorn beetles of India. They are arranged in four subfamilies—Cerambycinæ, Lepturinæ, Disteniinæ and Prioninæ. Nearly 400 species are described. Vol. II. (Coleoptera), on the Chrysomelidæ, is by the late Martin Jacoby (534 pp., 172 figs., 2 colored plates). He arranges the forms in five divisions: Eupodes, Cyclica, Camplosomes, Trichostomes and Cryptostomes. The species of the last two divisions are not treated in this volume; the Trichostomes include the Halticinæ and the Galerucinæ. Over 900 species are described, many of which are new. Volume IV. of the Rhynchota (Homoptera and appendix, 501 pp., 282 figs.) is by Dr. Distant. It contains the families Membracidæ, Cercopidæ and Jassidæ; the appendix is mostly on the Pentatomidæ. In this volume 665 species are described, bringing the total number of Hemiptera described from India up to 2,768.

MR. EDWARD CONNOLD has published on the British oak galls a companion volume to his work on British vegetable galls.[1] There are chapters on the growth of galls, characters and habits of the Cynipidæ, the British oak, and collecting and mounting oak galls. There is, under each species, a succinct statement comprising the English name of the gall, the position of the gall, the manner of growth, color, size, time of year, whether with one or many larvæ, where larva pupates, time of issuance of fly and parasites and inquilines. The insects are not described. Fifty-four galls of Cynipidæ are treated, and two of other insects. The plates are photographs of the various galls, often showing much variation in shape.

MR. R. E. TURNER has completed a revision of the Australian species of a peculiar family of Hymenoptera, the Thynnidæ.[2] This family is extremely abundant in Australia, about 400 species being known, over 120 of which are described as new by Mr. Turner. Very little is as yet known of their life history; a few bred from underground pupæ of Lepidoptera or Hymenoptera. The author severely criticizes the classification of Ashmead, but adopts most of the genera of Guèrin and Westwood. The characters at present used for the genera are found mostly in the sexual organs; a better classification must await the discovery of characters associating the sexes. Mr. Turner excludes from this family the genus *Anthobosca,* which he considers more related to *Myzine.* With the exception of the genus *Ælurus* the South American Thynnidæ are of different genera than the Australian.

PROFESSOR WHEELER has written a most interesting comparative study of the ants of Europe and North America.[3] He shows that there are fully twice as many kinds of ants in the United States as in Europe. In both countries the ant-fauna is composed of two elements, the boreal and the tropical. The former is very similar in the two regions, but the latter is very divergent, owing to different origins. The difference in nidification of similar ants in Europe and North America is considered due to the amount of sunshine; and it is shown that nests are more abundant in the interior of our country than in the eastern states. There is a summary of the fossil ants of the two countries; a chapter on the parasitic ants of Europe and on the myrmecophilous insects.

MR. W. SCHULTZE has an interesting article on the young of certain leaf-beetles of the

[1] "British Oak Galls," London (Adlard & Son), pp. 170, 68 plates, 1908.

[2] "A Revision of the Thynnidæ of Australia," *Proc. Linn. Soc. N. S. Wales,* XXXII., pp. 206–290, 1907; XXXIII., pp. 70–256, 1908.

[3] "Comparative Ethology of the European and North American Ants," *Journal f. Psychologie u. Neurologie,* XIII., pp. 404–435, 1908, 2 double plates.

family Cassididæ.[4] Many larvæ of these beetles have peculiar lateral expansions of the body, and a long spiny or bristly tail, which accumulates excrement and cast-skins, and is recurved over the body. When disturbed the larvæ erect and wave these tails. He concludes that these structures are used principally as a protection against parasitic enemies. The eggs are enclosed in a case, frequently one in each case, and these cases are often covered with excrement.

Mr. H. S. Smith has published a most useful work on the Hymenoptera of Nebraska,[5] a synoptic and descriptive catalogue of the Sphegoidea of that state. There are tables to the genera and species, and descriptions of fifteen new forms; altogether over 200 species are recorded from the state. It is hoped that some eastern hymenopterists will follow the example.

Professor E. B. Poulton has published a detailed museum study of our butterflies of the genus *Limenitis*,[6] tending to show the influence of *Anosia plexippus* and *Danaida berenice* upon *L. archippus*, and its varieties. He also considers that *L. californica* is the model of *L. lorquini*. Although he brings out many interesting points about coloration and pattern, one can not fail to notice the paucity of field observations which alone are of determining importance in these matters. The author considers that *Papilio philenor* is mimicked by three other species of the genus —*P. troilus*, *P. asterius* (female) and *P. glaucus* (female), which would hardly be suspected by any one familiar with these butterflies in the field.

Mr. W. Lundbeck has published the second part of his book on Danish diptera.[7] As with the preceding part, this is a most excellent treatment of the subject. The structural characters are given in great detail; there is a good account of habits and life-history; and under the Asilidæ are numerous records of their prey, showing that there is no mimicry of their prey by these ferocious flies. Although the species known from Denmark are very few, the author's treatment of the genera and families is so full as to make the work a most useful one to the American dipterist.

Attention should also be called to the recent catalogue of Argentine Diptera by Dr. J. Brèthes.[8] He lists the flies of Argentina, Patagonia, Uruguay and Paraguay, 650 species in all; mostly in the Asilidæ and Syrphidæ. There are 23 species of mosquitoes.

Nathan Banks

[4] "Life Histories of some Philippine Cassididæ," *Phil. Journ. Sci.*, III., pp. 261–271, 6 pls. 1908.

[5] "The Sphegoidea of Nebraska," *Univ. Studies*, Vol. VIII., No. 4, October, 1908, pp. 88, 1 plate.

[6] "Mimetic North American Species of the Genus *Limenitis* and their Models," *Trans. Ent. Soc. Lond.*, 1908, pp. 447–488, 1 plate.

[7] "Diptera Danica; Genera and Species of Flies Hitherto Found in Denmark." Part II., Asilidæ, Bombylidæ, Therevidæ, Scenopinidæ. Copenhagen, 1908, pp. 162, 48 figs.

[8] "Catalogo de los Dipteros de las Republicas del Plata," *Anales Mus. Nac. Buenos Aires* (3), IX., pp. 277–305, 1908.

SPECIAL ARTICLES

CONCERNING THE EXISTENCE OF NON-NITRIFYING SOILS

It is believed by agricultural specialists as well as by bacteriologists that soils generally have the power to convert organic or ammoniacal nitrogen into nitrate nitrogen, *i. e.*, to nitrify. Nitrifying organisms are supposed to abound to such an extent that any stratum not possessing them would soon become inoculated with them by air, soil, manure, water or other means.[1]

Filter beds, originally non-nitrifying, soon become vigorous nitrifiers without inoculation; sewage nitrifies freely in running streams; nitrate as saltpeter is of almost universal natural occurrence. A surface soil which can not nitrify would be regarded as a rare anomaly, therefore, and that many such non-nitrifying soils exist, could not be expected from the generally assumed conditions.

During our work of the past few years, we have, however, been repeatedly confronted with the fact that many of our soils do not nitrify. The first evidence of the existence of non-

[1] Le Far, "Handbuch der Techrischen Mykologie," III., 147.