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A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 26th. Mr. Philip Laurent, Director, presiding. Twenty-two persons were present.

Dr. Philip P. Calvert gave an informal account of his recent entomological researches in Costa Rica. Mrs. Calvert and he arrived in that country May 1, 1909, and left it May 9, 1910. In a brief sketch of the physical features of Costa Rica, mention was made of the considerable difference in elevation between the coasts and the central region, the abundance of rivers, the sharply-marked division of the year into wet (May to November) and dry (December to April) seasons on the Pacific slope while on the Atlantic side the dry season is not so pronounced, one effect of this contrast being conspicuously shown in the much greater abundance of epiphytes



on tree-trunks and branches on the Atlantic slope than on the Pacific.

The principal objects of the speaker's researches were to collect data on (1) the seasonal distribution of the Odonata, (2) their larval forms, and (3) their habits. Emphasis was laid on the fact that he at no time planned the gathering of a large collection of specimens or the making of a complete exploration of Costa Rica. Headquarters were established at Cartago, on the line of the railroad, at an altitude of 4750 feet on the Atlantic slope, three miles from the divide. Very comfortable accommodations were found in Weldon's Hotel in that town, managed by Mr. Joseph Weldon, formerly of Pittsburgh and McKeesport, Pennsylvania. The town was clean, healthy, lighted with electricity, was supplied with good water piped to the houses, and was drained by an underground sewer system.

In furtherance of the first object of investigation mentioned above, collections and observations were made at intervals in the same places and as nearly as possible in the same spots, and record was made each day of all species seen. The principal points at which this work was done were as follows:

On the Atlantic slope,

Banana River region, 50 feet, Nov.

Guapiles, 984 feet, June, Nov.

Peralta, 1088 feet, Aug., Mar.

Turrialba, 2000 feet, July.

Juan Viñas, 2500-4000 feet, June, Aug., Oct., Dec., Feb., Mar., April.

Cachi, 3600 feet, Mar.

Cartago, 4750 feet, every month.

Volcano Irazu, 4750-11,300 feet, July, Sept., Mar.

On the Pacific slope,

Tres Rios, 4260 feet, and La Carpintera to 5700 feet, Dec., Mar.

Alajuela, 3100 feet, Sept., Dec.

Turrucare, 1800-2200 feet, Aug., Dec., April.

Surubres, 800 feet, Oct.

Puntarenas, 10 feet, Feb.

Province of Guanacaste (chiefly near Liberia and Santa Cruz), 0-2200 feet, Jan.

At all of these places search was made for larvae and their exuviae as well as for the imagos. Living larvae were car-



ried to Cartago and placed, usually singly, in tumblers or bottles of water, and the attempt made to rear them to transformation. An acceptable food for them was found in blood-worms (Chironomid larvae) which could be obtained in abundance near the town. Larvae of a number of species of Odonata were successfully reared,\* including some from the eggs. The care of this living material involved the return of one or both of the investigators to Cartago at short intervals.

Collections of terrestrial Molluscs and Annelids, of Araneids, Orthoptera, Microdiptera, certain groups of Coleoptera and of Lepidoptera, and of bromeliadicolous animals were also made to a slight extent.

Gratifying progress in study of the Odonata was being made when, on April 13, 1910, severe earthquakes damaged houses, and even threw down some, in San Jose, Cartago, and other towns of the central plateau. The tremors continued during the remainder of the month, but were generally of decreasing intensity. On May 4, however, at 6.50 P. M., while Mrs. Calvert and the speaker were sitting in their room at Cartago, a most violent earthquake occurred, throwing them to the floor when they attempted to escape. The roof over them and three walls remained upright, but the fourth, of brick, crashed, partly into their room. When the shaking ceased for the time, they made their way over the debris to the window and escaped unhurt to the street, where they spent that night, the next, and the intervening day. The fallen wall destroyed and buried the larvae in rearing, but in the daylight all the other collections, notes, photographic negatives, etc., were recovered from the ruins.

Cartago and nearby villages were completely destroyed and offered no shelter. San Jose was badly damaged and the fear of renewed shocks drove people everywhere to tents and improvised huts in streets, parks and open places. With these unfavorable conditions and the approach of the rainy season, the investigators judged it best to return home to save themselves and their material from further loss.† They left Cartago May 6, on the first train to Limon, and sailed thence on May 9, three months earlier than planned and very much to their regret.

\*Cf. Ent. News for June, 1910, page 264.

†Prof. J. F. Tristan, writing from San Jose, C. R., May 26, 1910, states that earthquakes had continued up to that date.



They were not ill during their whole stay in Costa Rica and attribute their entire freedom from fever to the healthfulness of a great part of the region visited, to their always sleeping under mosquito nets and, when abroad, to covering the exposed parts of their bodies, wherever mosquitos were noticed, with a mixture of citronella oil and cocoa butter (suggested by Dr. Henry Skinner), an ample supply of which was taken with them. Neither of them took a single grain of quinine during the year. Drinking water was boiled, except when it was rain water directly gathered and filtered through charcoal, otherwise Apollinaris, procurable throughout the country, was substituted.

Grateful acknowledgment was made of the kind aid received from many friends, both Costa Rican and foreign, to whom much of the success attained is due.