

lands, for a people with no metal implements, answers this question beyond any controversy.

There is, however, a perfectly plain geological record throughout this region, which answers the question as to the reason for this migration, and as well answers the question why no important number of people can live in this region to-day, which is apparently one of the healthiest forest regions which the writer has ever had an opportunity of visiting during twenty years spent in Central and South America.

An explanation of this record must be prefaced by a description of the peculiar conditions which exist within this region, making it unique among all tropical regions of similar size in the western hemisphere. This is summarized by saying that while there is a heavy annual rainfall there is little or no surface water except for a few principal rivers around the edges of this region, and scattered small lakes or "cenotes," with no surface outlets. This entire peninsula is composed of porous limestone, ranging in age from Lower Cretaceous to upper Tertiary; but all alike in the one respect of being filled with underground channels through which all fresh-water drainage takes place seaward. Occasionally during the rainy season a surface stream is seen following a shallow bed, but it will be found soon to disappear in the limestone and can not be picked up again except by inference at one of the great springs along the coast line or near one of the main branches of the Usamacinta River.

The comparatively large Lake Peten, in central Peten, has no outlet. This lake, as well as all smaller pools and "cenotes," seems to have a uniform watertable, without reference to the rainy seasons. However, all the larger lakes such as Peten have definite terraces and high level dry beds of previous tributary basins. There are innumerable dry "cenotes" or deep sink holes, which previously contained water. The great temple city of Tikal is located beside what was once an extensive lake, of which only a small stagnant pool remains. The geological record thus shows a progressive tilting of the land from the south, which has raised the surface above the permanent watertable in the cavernous limestone bedrock, draining the lakes and "cenotes" from the bottom progressively northward, until there are only remnants of their number remaining. These are not enough in number or size, with a few notable exceptions, to support a large population. In spite of the rainfall, in traveling through Peten and Yucatan, one is forced to carry drinking water from one water hole to another, which in some cases are several days journey apart.

With the diminution of the water supply, and a large population, the nature of these stagnant pools

remaining, plus the lack of knowledge of sanitation on the part of the people, plus perhaps their custom of throwing sacrificial victims into the same or connecting bodies of water, might easily have caused epidemics. "The gods are angry, and we must move"—and always northward, the direction of the progressive tilting. Once crowded to the tip of the peninsula, and their numbers and their virility depleted by both lack of food sources and by epidemics, they were easy victims to the raids of the Toltecs.

L. G. HUNTLEY

PITTSBURGH, PA.

LANCETILLA EXPERIMENT STATION

THREE years ago the United Fruit Company established Lancetilla Experiment Station on the north coast of Honduras, near the port of Tela. This station, under the direction of Wilson Popenoe, is one of the several branches of the research department of the company. Its purpose is the introduction and testing of new agricultural products which may be grown successfully in tropical America, and the study of conditions affecting banana production, the chief and only important industry of the Atlantic coast of Central America.

Lancetilla Station, situated six kilometers south of Tela, is reached by a tram line over which motor cars are operated. The site lies in a narrow valley at an altitude of nineteen meters. On each side rise densely forested hills, with a maximum elevation of six hundred meters. The lower ground of the valley formerly was planted with bananas, but the hills, except for a few clearings made by squatters, retain their primeval vegetation. They are intersected by many swift streams of clear water.

At the station there has been assembled a large collection of economic tropical trees, including the best representation of tropical Asiatic trees to be found anywhere in America. All the trees are still small, but they are growing rapidly, and in a few years will make an impressive showing.

There has been established at Lancetilla, also, the Serpentarium of the Antivenin Institute of America, maintained by the Tela Railroad Company, the Museum of Comparative Zoology of Harvard University and the H. K. Mulford Company. The serpentarium prepares serum from the Honduran rattlesnake and the *barba amarilla* for use in tropical North America.

The purpose of the present note is to direct attention to the suitability of Lancetilla as headquarters for research work in the natural sciences. Living conditions are exceptionally favorable, with good water, protection against malarial mosquitoes and all modern conveniences. The Tela Railroad Company

has been generous in supplying to visiting scientists every facility for the performance of their work, and the director of the station is keenly interested in the assembling and publication of information regarding the fauna and flora of the region.

From the first of December, 1927, until the end of March, 1928, the writer was engaged in a botanical survey of the Lancetilla Valley. During the same winter Messrs. Peters and Bangs, of the Museum of Comparative Zoology, made a comprehensive collection of the birds of the vicinity. It is expected that reports upon these collections will be published soon, thus making a substantial contribution to the knowledge of the local natural history.

For botanical work, I can testify that the Lancetilla Valley is unexcelled on the Atlantic coast of Central America. The flora is a rich and varied one, including representatives of most of the groups to be expected in the *tierra caliente*. The tree flora is unusually large, and there is a good representation of palms, ferns and cryptogams. Fungi are so conspicuously abundant that their study undoubtedly would have profitable results.

Virgin forest may be reached on foot in ten minutes from the station. On the hills three more or less distinct belts of vegetation may be recognized. Along the streams there is a profusion of aquatic plants, and about Tela there is an interesting strand vegetation, with a few mangrove swamps.

The whole of Honduras is practically unknown, so far as the fauna and flora are concerned, and any collector is certain to find here an abundance of new forms in any group. No better field for research work can be found along the Central American coast, and the choice of the Lancetilla Experiment Station as a base for field work can not be recommended too highly to those concerned in the study of the natural history of Middle America.

PAUL C. STANDLEY

FIELD MUSEUM OF NATURAL HISTORY

SCIENTIFIC EVENTS

SUMMER WORK OF THE GEOLOGICAL SURVEY

Forty or more members of the Geological Survey, with their assistants, are now scattered throughout the United States, making field studies to serve as a basis for determining the probable mineral character and value of the public domain which remains under the care of the Department of the Interior and that furnish other geologic information of use to the public.

Four geologic groups are in the State of Montana. Two of these, under the direction of geologists ex-

perienced in the field of metals, are conducting surveys in the region tributary to Helena. This project is supported by local cooperation. In southern and east-central Montana two geologic groups are mapping the coal fields of that portion of the state.

In central Idaho one geologic party is studying the deposits of metals which are associated with the great granite intrusions of the central part of the state. Another geologic party, in eastern Idaho, is continuing the mapping of the phosphate deposits.

In Nevada three areas are under examination—one, the Charleston Peak region west of Las Vegas; another, the Ivanpah region immediately to the south; and a third, the Silver Peak area west of Goldfield. Associated with the geologists engaged upon these projects are two survey paleontologists, who are collecting the fossil evidences of extinct life.

In northern California, in Plumas County, an examination of the copper deposits is under way.

In southeastern Utah systematic work is being done along the canyons tributary to the San Juan and the Colorado, extending westward to include Navajo Mountain. It is a part of the systematic study of the plateaus of the canyon region directed to a determination of the structure of the rocks underlying these plateaus.

The coals of the great San Juan Basin and other resources in New Mexico are being investigated. In the Magdalena mining district cooperative work is being carried on with the director of the State Bureau of Mines and Mineral Resources. Work on the Santa Rita mining district, begun some years ago, is being brought to completion, and attention is being given to the existence of potash deposits in the great salt basin of the southeastern part of the state.

In Colorado an extensive cooperative project, begun two or three years ago, is being continued energetically. The expenses of this work are shared between the state and the United States Geological Survey. Five geologists from the latter organization are assigned to the study and two topographers are making the base maps which the geologists need. In this work an attempt is being made to apply geologic research directly to the problem of ore finding.

In Texas progress is being made on the slow task of preparing a new geologic map of the state on a scale that will be adequate for the use particularly of the petroleum industry. This work was begun three or four years ago and may take as many more years for its completion. Texas is an empire in itself, covering more than 265,000 square miles. The preparation of a detailed geologic map is therefore a task of much magnitude.

In addition to the cooperative work on the state map in Arkansas, another cooperative project there