of the usual numbers of individuals of normal size were born, but the young either starved to death or were killed by the mother. The difficulty was not characteristic of vitamin E deficiency but seemed attributable to lack of milk production by the mothers. It is striking that the females manifesting this apparent failure in lactation were almost all of the fifth generation on the stock diet. Cod-liver oil given in addition to the ration did not have a noticeably beneficial effect. On the other hand, when the above ration is used after weaning there results the same rapid growth already described.

The present communication does not invalidate the data of the previous publication but does call attention again to the differences in the nutritional demands for growth and for lactation. Moreover, in view of the wide use of the whole wheat-whole milk powder ration in its various modifications, our observations may be significant in calling attention to possible cumulative deficiencies in such restricted food mixtures for reproduction and lactation.

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SPECIAL CORRESPONDENCE

STANFORD UNIVERSITY SCIENTIFIC EXPEDITION

A SCIENTIFIC expedition in the interest of the geological sciences from Stanford University into the regions of Lower California and Sonora, Mexico, was made possible through the generosity of Mr. W. L. Valentine, member of the national board of the university. President Ray Lyman Wilbur officially sanctioned the expedition and actively supported its plans. The cooperation of both the United States and Mexican governments was obtained. All arrangements were made and permits secured through the proper official channels.

The party, composed of W. W. Valentine, E. R. Valentine, D. F. Hamelin and L. Wm. Wiedey, all of the Stanford University department of geology, left Los Angeles harbor in January aboard the yacht *Volador,* prepared to carry on for three months field exploration, shore collecting, dredging and bottom sampling. The itinerary scheduled visits at all places along the Pacific and Gulf of California shores of Lower California where favorable anchorages were obtainable. This plan was to be followed throughout, in so far as time permitted. Captain Putta, master of the schooner, possessed a fund of information about the entire region that was a constant source of aid during the progress of the exploration.

The expedition visited most of the large bays and many of the more interesting islands on the Pacific side of the peninsula. The gulf shores, previously having been little visited or explored in this manner, received greater study and attention. After reaching gulf waters and after frequent stops at some of the islands, the party sailed for Guaymas, Sonora, for supplies. Several localities adjacent to that seaport were visited before again crossing the gulf to La Paz. From this most beautiful Mexican village reconnaissance work was carried northward to San Marcos Island. Another trip to the Sonora coast and the seaport of Guaymas was necessary. From that point the expedition returned to the peninsula shore of the gulf at Santa Rosalia. It had been planned on the northward survey to return to the most interesting localities encountered, so frequent stops were made southward from that port. As had been the procedure throughout, runs from one locality to another were made during the night to have the maximum of daylight ashore. Upon reaching the Pacific side once more, fair weather lasted for only a short period and was followed by very severe northwest winds. After anchoring at Cedros Island local, heavy, but intermittent, rains fell about the base of the high peak at the southern end of the island. Few stops were permissible on the return to Los Angeles because of persisting strong winds. The last of March brought to a close much fruitful exploration.

During the expedition many formations were observed. Sediments little metamorphosed of pre-Cretaceous age were developed in a great thickness on Cedros Island. The Cretaceous strata near Ensenada, at Santa Catarina Landing, and on Cedros Island were in each case studied. The Eocene beds were accessible only at Santa Catarina Landing. Oligocene sediments were not recognized at any point. Miocene strata, very similar to those of southern California, are exposed in the vicinity of Turtle Bay and on Cedros Island. A shale facies suggestive of the so-called "Monterey shale" of California is found at both places. The Pliocene marine strata are everywhere abundant, notably on Cedros Island, at Turtle Bay, on Carmen Island, at Pulpit Point, at Conception Bay, on San Marcos Island (near Santa Rosalia) and at Santa Rosalia. In every case fossils were quite common. However, thicknesses of these Pliocene sediments seldom exceeded several hundred feet, in contrast to the many thousands of feet of such strata in southern California. Pleistocene faunas were secured at San Quentin Bay, at Rosarita Bay, at Magdalena Bay, at Pulpit Point and at Conception Bay. It may be explained that marine strata were the first object of our search. As a consequence, efforts were concentrated upon them.

Many localities display the effects of varied igneous phenomena, such as the volcanic cones at Entrada Point, San Quentin Bay; enormous thicknesses of lava in the vicinity of Carmen and San José islands on the east side of the peninsula; an enigmatical mass of finely crystalline lava and volcanic glass composing the mass forming Pulpit Point; hot spring phenomena and lavas, with associated rocks, at San Carlos Bay, Sonora; tuffs, lavas and the like at Santa Rosalia. In addition, a wonderful variety of geological processes is seen to have worked elsewhere. The copper mines at Santa Rosalia, the gypsum deposits of San Marcos Island and the salt deposits of Carmen and San José islands were briefly studied.

The very steep shore-lines along most of the peninsula have been the subject of much comment. Some hold that the peninsula as a whole is a sinking unit, but there appear to be areas that have relatively risen. Contrary to the opinion of a few, it is believed that sufficient evidence exists to show the Pliocene strata not to have been contemporaneously deposited in many places. These observations may indicate that the peninsula has not acted tectonically as a single unit.

Represented among the material collected is apparently the first Pleistocene fauna from the entire Gulf of California region. Both the Pliocene and Pleistocene faunas collected have unprecedented richness in individuals and species and in perfection of preservation. These faunas have previously been very little known and may now be very fully known. Many new localities and their faunas are to be added to those already known from strata of various ages in this region. Species previously known only from Recent shells may now be reported as also occurring in the fossil state. Species new to science likewise are present. Variations among certain forms, temperature changes, relationships to other faunas and the like may be discerned. The marked tropical affinities of the faunas add to their interest. Besides new forms among the Recent shells collected, the ranges of a number of those previously described are to be extended. Correlations with California strata eventually may be more effectively suggested. Results of the nature above mentioned are now being traced. As work progresses these results will appear from time to time under the authorship of the writers of this account, or of others associated with them. The collections have been presented in their entirety to the department of geology, Stanford University, and are to be found there.

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SCIENTIFIC BOOKS

Geologie von Peru. By G. STEINMANN. 448 pp., 271 text figures, 9 plates and map. Carl Winters, Heidelberg, 1929.

THOSE who are interested in Andean geology have been looking forward for a long while to Steinmann's account of the geology of Peru. This may be regarded as the summation of his personal observations in South America, and of many years of study of collections by himself and his students, with the collaboration of Peruvian friends, especially Dr. Carlos I. Lisson, of Lima.

In the present work the map is credited to the latter, R. Stappenbeck contributes the account of the economic deposits and F. Sieberg the chapter on earthquakes.

The general plan is four pages of physiography forming Part 1; Part 2, comprising 278 pages devoted to the geological succession from pre-Cambrian to Quaternary; Part 3, of twenty-three pages devoted to geological history; Part 4, of sixteen pages devoted to the structure of the Andes; Part 5, of seventy-five pages devoted to economic geology; Part 6, of thirteen pages devoted to earthquakes.

To the pre-Cambrian are referred the gneisses, schists and granites as representing the Archean, although in most cases there is little satisfactory evidence of their age, and a second and supposed later series is termed the Phyllite formation and the suggestion is made that it may represent the Algonkian. This follows the traditional practice of geologists everywhere, but since similar rocks farther south in the Andes are both Mesozoic and Tertiary little credence can be given to these age determinations. For example, the Cerros de Amotape and Silla de Paita are mapped as Archean and the Cerro Illescas as Algonkian, and in all three cases the geological evidence is not more definite than that they are Carboniferous or older.

No Cambrian is known except east of the Andes. The so-called Silurian is Ordovician. Only lower Devonian has been recognized in Peru and this occurs near Huanuco and from Sicuani southeastward. Marine Carboniferous is found from the Amotapes to the Bolivian frontier. Continental Carboniferous on Paracas Peninsula, near Paita, in the Cerro de Pasco region, and near Abancai, is regarded as Lower Carboniferous (Mississippian), although much the most extensive collections known were made by the present reviewer, who regards their age as Upper Carboniferous (Pennsylvanian). No Permian is recognized.