the normal temperatures at Blue Hill Observatory from October, 1898, to February, 1899, are plotted, it appears that the minimum temperatures of October, December, January and February occurred very near the times of new moon, the intervals between the minima thus approximating the length of a synodic period of the moon. This paper presents also a summary of a few of the important results reached by European investigators along this same line.

LAKE LEVELS AND PRECIPITATION.

UNDER the title *Variations in Lake Levels and Atmospheric Precipitation*, there has been issued by the Weather Bureau, a report by A. J. Henry, upon the results of a study made by him in connection with the work of the Weather Bureau on the Great Lakes. The conclusions reached are that it seems possible to indicate the level of the Lakes approximately by closely observing the precipitation in the various watersheds, especially the amount of snow and the manner of its disappearance. All inferences as to the probable effect of precipitation on the Lake levels must, however, be contingent upon the maintenance of a constant cross-section and slope in the present connecting channels.

SALT BUSHES IN CALIFORNIA.

SOME interesting experiments have been carried on during the past 18 years at the California Agricultural Experiment Station, in connection with the adaptability of the Australian salt bush to the climate and soils of California. It appears (Univ'y of Cal., Agr. Exp. Sta. Bull. No. 125) that the *atriplex semibaccata* grows on strong alkali soil, furnishing a very large amount of satisfactory pasturage and fodder, and that it also thrives on arid non-alkaline uplands, even where wells have to be sunk 200 feet to water, and where the annual rainfall has been less than five inches. This salt bush cannot endure too heavy summer rains, nor the moist atmosphere of many warm countries, and seems thus singularly well adapted to growing on the deserts and alkaline wastes which are somewhat too common in the southwestern portion of the United States.

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RECENT ZOOPALEONTOLOGY. 2.

These notes upon recent papers in zoloogy and paleontology will be continued serially.

Triassic Life in Germany.—Under the title, *Die Bildung der germanischen Trias, eine petrogenetische Studie*,* Professor Fraas of Stuttgart, contributes an extremely readable and valuable paper upon the relation between the geography and the fauna during the Triassic period of Germany. This is a model of the best modern mode of treatment in which the geology, geography, zoology and botany of a newly discovered region, are all considered together. It is well shown, that the Trias was preëminently a period in which prominent characters of the great orders of reptiles were fixed. The transition from fresh water to marine conditions by the invasion of the sea, and the corresponding transformation of land and coast forms into free living marine forms is clearly correlated. The changes in the marine and fresh water forms are not only traced in a sketch of the evolution of the invertebrates, but of the vertebrates as well. One suggestion which catches the eye has long been in the mind of the reviewer, namely, that the so-called *Placodontia*, an order of extremely doubtful relations and affinities, known only from the skull, are not at all related to the group of Theriodonts with which they have been placed, but that they represent a branch of the turtles living along the sea coasts, and retaining both in the upper and lower jaw large teeth for the purpose of crushing the shells of small mollusks.

A Triassic Chelonian.—Another very important paper by the same author is upon *Proganochelys Quenstedtii* Baur, a recently discovered example of this Chelonian from the Keuper, or upper triassic rocks of Germany. This is by far the oldest known type of the order. The first remains were apparently discovered in 1863, but not clearly defined until 1887, by Baur. This specimen which was received in the Stuttgart museum in 1897, is far more complete, and enables Professor Fraas to give a description of the dorsal and ventral shields. These show that *Proganochelys* was a true land and swamp dweller, related to the modern

*Separat-Abdruck aus Jahreshefte D. Ver. F. Vaterl. Naturkunde in Württemberg, 1899.

Pluerodira. The structure of this animal is especially interesting and surprising, "since we should expect in such an old representative of the Chelonia, a low stage of development, whereas, this type presents directly the opposite. The Pleurodira are generally regarded as the most specialized and highly developed group of Chelonia, yet this form shows all the characteristics of the family in their most complete development. The uncertainty which surrounds the origin and the evolution of the tortoises, is not therefore removed by this discovery, but on the other hand, is increased."

The Newburgh Mastodon.—The mastodon discovered about two months ago at Newburgh, N. Y., has now been more fully uncovered, but thus far proves to be an incomplete skeleton. The parts preserved are the skull, much injured by removal, both upper tusks, the vertebræ beginning at the last cervical and extending to near the tip of the tail, 18 ribs on each side out of 20, a right scapula and a complete pelvis, and portions of the foot bones. No traces of the limbs have been found thus far, although extensive excavations have been made. Fortunately, Mr. Schaefer, the owner, has removed the bones with care, and treated them skillfully. Many very interesting observations could be made by a careful study and exploration of this locality. During a visit by the present writer, the following observations were made, partly with the aid of Mr. Schaefer. The deposition is in three levels, the two upper being separated by a smooth clearly defined surface, and by slight differences in the character of the soil, which is largely dark and thoroughly decomposed vegetable matter, intermingled with few stones and very numerous remains of trees of various sizes. Examination of the latter gives abundance evidence of the existence of beaver in this hollow in the period of the mastodon, and we can easily imagine, that the different soil levels, were due to the building of successive beaver dams. When the dams were first comple ed the back flow of the water caused temporarily an interruption of the deposition of vegetation and may account for the differences of level above alluded to. The locality has been visited by a large number of people, including several well-known paleontologists. H. F. O.

SOUTH AMERICAN LANGUAGES.

A DILIGENT and careful collecting of quaint and idiomatic words as found in the vernacular dialects is springing up in many countries of America, and there are already a considerable number of printed records of this character. They are made to include also English, French and Spanish words which are evidently of an origin other than European. In many of them the Indian element is well marked, and even in countries where no longer spoken, words of Indian origin are remarkably frequent. Vocabularies and glossaries of this sort were composed by Pichardo for Cuba, by Membreño for Honduras, and the *Journal of American Folklore* contains many articles contributing knowledge for the same purpose. Recently the linguist Samuel A. Lafone Quevedo, M.A., has published "*Tesoro de Catamarqueñismos;* nombres de lugar y esclabones aislados de la lengua Cacana," Buenos Aires, 1898, octavo, pp. 379, a work which adds considerably to our insight into the ethnography of northwestern Argentinia in our century as well as in former periods of history. There may be 3,000 names and vocables of the Catamarca provincial dialects discussed etymologically in Lafone's volume. While some are pure Spanish, others belong to one of the Kechhua dialects, as Amará or Kechhua; others to Guaicuú dialects, whose domain is in and about the Gran Chaco. Others are supposed to belong to Uro, with main seat in the Bolivian plateaux and studied by Dr. Max Uhle; and a number are assigned to Cacán, an extinct language which Lafone has long endeavored to reconstruct. It is, however, uncertain, whether Lule (with Tonocoté) or Allentiac, or Chilean dialects are represented in the names and vocables of the collection of this industrious investigator. We must confess, moreover, that a North American finds his way only with immense trouble through the maze of Andean languages and dialects of which not one half has as yet been reduced to grammatic rules.

Another linguistic volume issued in the same year is due also to the efforts of Lafone-Quevedo. This is the publication of a manuscript grammar of the *Toba language*, spoken in the Gran Chaco, along the Paraguay River. It was composed