classed as Miocene, and this determination of the age has been very generally accepted by the geologists. Professor Dall's critical studies of the fossils and stratigraphy of this region have since enabled him to give greater exactness and precision to Langdon's first outline by establishing several substages of the original Chattahoochee; by assigning the lower part of the original Miocene to the Oligocene, and the upper to the Chesapeake Miocene, etc.

Now, while the facts given by us certainly confirm the existence of Langdon's Chattahoochee beds, by whatever name now known, below the Grand Gulf in western Florida, and in Alabama and Mississippi, we do not see how they either confirm or contradict the conclusions of Professor Dall as to the true age of the different parts of the Chattahoochee series.

To summarize:

1. The Grand Gulf of 'Messrs. Smith and Aldrich' is the same fossiliferous formation which Hilgard has described by that name, and not merely 'the upper non-fossiliferous portion at the other end of Hilgard's section.' It is the same formation which Professor Dall calls the 'typical Grand Gulf' in his recent communication, and which he considers Oligocene, and a remnant of the heterogeneous Grand Gulf of Hilgard. We are compelled by the facts to believe that this typical Grand Gulf is not Oligocene at all, but that it belongs about a quarter of a mile vertically above the place in the geological scale to which it is assigned by Professor Dall.

2. There is also no Miocene Grand Gulf, as Langdon's discovery has proved and as has been confirmed by other geologists who have studied the Chattahoochee-Appalachicola section. We might perhaps more correctly say there is no Miocene Grand Gulf below the horizon of the Pascagoula, if that be certainly proved to be Miocene.

3. We think our facts prove that the Grand Gulf, all and singular, occupies a place in the geological column *below* the Lafayette and *above* the Pascagoula (which is the uppermost of the Tertiary formations as yet determined along the Gulf coast). This is all we have endeavored to show, and it was the *raison d'être* of our first note. We do not see wherein what we have there said in any way confirms Professor Dall's 'earlier determinations,' and, furthermore, we think that our view of the age of the Grand Gulf is new, and not a mere equivalent of the views of any other geologist.

Eugene A. Smith,
Truman H. Aldrich.

SHORTER ARTICLES.

THE REMAINS OF BEAR AND DEER ON THE SHORES OF ONONDAGA LAKE.

Through the courtesy of the firm of Will & Bauer, of Syracuse, the university received in March parts of the skulls of six bears (*Ursus americanus*); the leg bones of at least three bears (*Ursus Americanus*); and parts of the leg bones of three deer, the Virginia deer. The bones were identified through the kindness of Dr. Ablen, of the Natural History Museum of New York.

The find was made north of Syracuse, about one eighth of a mile east of Onondaga Lake, while the company was excavating for a trench. The land at this place is level, the surface soil is of a mucky character, varying in thickness from three to nine feet. Beneath the muck there is a bed of marl with here and there some quicksand.

The workmen noticed bones when they first began digging, but failed to bring the fact to the attention of the foreman until the work was nearly completed. A careful watch was maintained during the remainder of the excavations, with the above gratifying results. The bones were not taken from one place, but were found scattered over an area of several square rods, a skull being found at one place and the jaws at another.

A brief description of the bones may be of some general interest. The larger skull measured twelve inches from the occipital ridge to the premaxilla; nine and one half inches from the anterior side of the foramen magnum to the premaxilla; three and one half inches from the right zygomatic arch to the sagittal plane of the skull; the left

zygomatic arch was destroyed. Large portions of the occipital and parietal bones were missing, as if the skull had been crushed in killing; there was no evidence of recent change. The smaller skull was the more complete. The distance from occipital ridge to premaxilla was ten and one half inches; from the foramen magnum to the premaxilla, six and one quarter inches; the zygomatic arches were both broken and there was a hole in the occipital and left parietal, as if the animal had been shot. The complete mandible belonging to this skull was found.

In addition to these two skulls, which are of the black bear, there were parts of four different mandibles of the same variety, one of which was a full inch longer than the mandible of the larger skull. The incisors are present in this large mandible, and a number of rudimentary premolars were found in several of the mandibles.

The leg bones of the bears consist of the following: one pair of humeri ten inches long, incomplete, the proximal ends being absent. These two humeri are so similar that I believe that they belonged to the same animal. One right humerus nine inches long, having the proximal ends present; the distal ends of two left humeri; a left tibia and fibia which are united, and a right tibia that is so similar to the left one that they undoubtedly belonged to the same animal. Judging from the number of humeri, we have at least the remains of three bears and possibly a fourth.

The deer bones are one incomplete humerus and radius, eight and one half and nine and one half inches, respectively, in length, and a complete ulna eleven and five eighths inches long. These three bones articulate perfectly. One tarsal nine inches long, that articulates with the radius and ulna. A second set of leg bones that articulate also, indicating that they are from the same individual. One humerus eight and one half inches long, the proximal end absent; one radius nine and three fourths inches long, complete; one ulna five and one half inches long, incomplete; two broken humeri; three miscellaneous vertebræ; six ribs, and the part of an antler. This would give us the remains of at least two deer.

All these bones are recent and do not show any evidence of mineralization. The two skulls and the mandibles and leg bones of the deer still show evidence of animal oil, being slightly oily to the touch. The leg bones of the bears are drier than the others and the epiphysial joints are plainly evident when present, but in most of them the articular surface is lost.

It is difficult, with the few facts at our command, to estimate the age of these bones. I am inclined to think that they are not very old, possibly a hundred years. Until we possess more bones and know more of the geology of the place, any statement concerning their age must be mere conjecture.

As to the manner in which the bones reached this place, a few suggestions may be made. Onondaga Lake is of glacial origin, like most of the central New York lakes. At each side and south of it, the old valley is filled with glacial débris to a depth of several hundred feet, the present lake beach being some distance from the rock strata that limits the valley. Along the hillsides of the region about Syracuse there is evidence of beaches, showing the limits of the lake in prehistoric times. The place where the bones were exhumed probably represents a part of the lake previous to its last subsidence. From the scattered condition of the bones it is easy to imagine how they may have been washed down from the banks, being possibly the remains of an Indian feast.

The present collection is of sufficient interest to warrant some care in future excavations in the above area.

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May 1, 1903.

BOTANICAL NOTES.

THE STUDY OF WOOD.

WITH the rapid increase in interest in all matters pertaining to forestry, so notable in the past few years, there has been a corresponding increase in the number of books devoted to some phase of the subject. The