The inflection very early became fixed in the Marsupialia, as shown by the Jurassic forms *Spalacotherium*, *Phascolotherium*, and *Triconodon*. In the opossums (Didelphyidæ), which (excepting *Myrmecobius*) are the most primitive forms of to-day, the inflection exhibits a primary relation to the vertically acting non-sectorial teeth. The same may be said of the Dasyuridæ judging from *Dasyurus*. The thylacine, representing a predaceous carnivorous type, has not been available for examination. The kangaroos (Macropodidæ), which resemble the placental Ungulata, to a great extent, in tooth action and jaw structure, show no downward prolongation of the angle for the increase of the pterygoid insertion area such as is characteristic of the latter. The presence of the inflection makes it necessary to get the required increase in another way, and in such a manner as to substitute a transverse action of the muscle for a primitively vertical one. It is accomplished by a great excavation of the internal surface of the base of the inflected angle. In its interference with the downward prolongation of the angle, the inflection is detrimental; in other respects it is functional, since that part of the pterygoideus internus which is attached to its tip still acts vertically and also opposes the traction of the masseter on a weak symphysis. The phalangers (Phalangeridæ) take an intermediate position between the Didelphyidæ and the Macropodidæ. *Tarsipes*, which is unique in lacking the inflection, is degenerate in this respect, since it also lacks the coronoid process and has reduced teeth. The koala (*Phascolarctus*) shows a secondary straightening out of the angle associated with a deep auditory bulla. The wombats (Phascolomyidæ), and the bandicoots (Peramelidæ) show no points of special interest.

An examination of the available evidence leads to the following conclusions:

(1) The inflection of the angle is primarily associated with an exclusively vertical action of the teeth.

(2) It probably originated by a reduction of bony elements and of Meckel's cartilage on the inside of the jaw.

(3) The inflection became fixed in the Marsupialia, and is to be regarded throughout the existing series as a persistent primitive character.

(4) In primitive Marsupials, such as the Didelphyidæ, the inflection retains its original character, while in specialized types, such as the Macropodidæ, it becomes modified in an attempt to substitute a partly transverse muscular action for an exclusively vertical one.

(5) The inflection may be secondarily functional in many cases in opposing the traction of the pterygoideus internus to the lateral traction of the masseter on a weak symphysis.

B. ARTHUR BENSLEY.
COLUMBIA UNIVERSITY.

OKLAHOMA GEOLOGICAL SURVEY.

THE necessity for geological work in Oklahoma is the more obvious in view of the fact that the surveys of adjoining States have been in progress for a number of years. Kansas, Missouri, Arkansas and Texas have already published largely on this subject, while in Oklahoma nothing has been written except a few scattered articles.

During the past summer the initial work of the Survey has been accomplished. A sum sufficient to begin the work was appropriated by the last Legislature. Dr. A. H. Van Vleet, of the University of Oklahoma, had charge of the work and acted as zoologist for the Survey. Other members were C. N. Gould, geologist, Paul J. White, botanist, and Roy Hadsell, general assistant. The party traveled by wagon, being provided with tents and other necessary camping facilities.

It had been planned to spend part of the

season in the Wichita Mountains, but permission to enter the Kiowa reservation, in which the mountains are situated, not having been granted, the plan of the route was changed. From Norman, the seat of the university, the party went north to Perry and Stillwater, then west across the northern part of the Territory as far as Camp Supply, south to the Washita river, and east through Norman, across the Seminole and Creek reservations to Okmulgee, north past the Tulsa coalfields, through the Cherokee and Osage nations to the Kansas line and south again to Norman. In all about 1,500 miles were covered and every county in Oklahoma except three were visited.

Although the trip was of necessity little more than a reconnaissance, still the work as a whole was most satisfactory. The Red-beds—one of the most vexing of western geological groups—were studied throughout the Territory. Three large salt plains were visited; the ledge of gypsum which extends from Kansas to Texas was traced and mapped for several hundred miles; fossils were collected from five different localities representing as many horizons in the Red-beds. Numerous outcrops of *comanche* Cretaceous fossils were located in the western part of the Territory. Collections of considerable importance were made in the various formations, and the fossils are now being worked up in the Museum of the University. When these shall have been identified it is hoped that the question of the age of the Red-beds will be definitely settled. In the eastern part of the Territory the relation of the coal and oil fields of the Carboniferous to the Red-beds was investigated. Throughout the trip the question of water supply was given considerable attention.

Dr. Van Vleet made good collections of the animal life of the region, paying particular attention to snakes and birds. Mr. White's large collection of plants is of much interest in that it comprises several species that are probably new to science.

Mr. Hadsell devoted much time to collecting historical data, particularly that pertaining to Indians and old government trails and forts. About 150 photographs were taken illustrating the various phases of the work.

A report of the progress of the survey will be presented to the Governor before the meeting of the next Legislature. In addition, a number of short articles will be written setting forth the work in greater detail. It is confidently hoped that legislative appropriation will be sufficient to enable much more effective work in the future.

Charles Newton Gould.
The University of Oklahoma,
Sept. 18, 1900.

MOSQUITOES OF THE UNITED STATES.

For many years a few medical men have nursed the theory that mosquitoes may be carriers from man to man of the germs of human malaria. Quite recently physicians have produced evidence that makes this no longer a theory but a demonstrated fact. The result is that there is a great demand in all civilized countries for information regarding mosquitoes. This demand found the entomologists of the world illy prepared with definite facts about the lives and habits of the different kinds of mosquitoes. It was not until 1896 that any thoroughly satisfactory figure of a well-determined species of mosquitoes from the United States, or any account of its early stages, was to be found in the literature. Then Dr. L. O. Howard, U. S. Entomologist, published (Bull. 4, New Series, U. S. Div. of Entomology) a full and carefully illustrated account of *Culux pungens*, and also included a digest of his previous articles on remedies for mosquitoes and a tabulated statement regarding the different species in this