

Terms that save men's time and nervous energy are helpful and welcome; those that consume time and energy without adequate return are 'useless incumbrances.' For this is a pretty busy world, and as many of us are anxious to keep pace with what is going on in geology and geography we often feel impelled to say to contributors, as we do to callers at the office during business hours: "Be plain; be brief."

Local names serve good purposes with students who are obliged to get their ideas of geology from local illustrations, but such names should be kept at home; in the general literature of the subject they are what the European geologists call them.

One's feeling the need of a new term, or his having found one 'serviceable in his lectures during the past winter,' are certainly not of themselves sufficient reasons for introducing them to the public.

Technical names are a necessary evil, and new ones cannot be avoided; but it is our duty to increase this evil as little as we can, and only after duly weighing the pros and cons of each case.

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NOTES ON SOME FOSSILS OF THE COMANCHE SERIES.

THE description and figure of *Turritella leonensis* given by Conrad in the Report of the Mexican Boundary Survey implies that all of the whorls of the shell in that species are rounded. In my 'Description of Invertebrate Fossils from the Comanche series in Texas, Kansas and Indian Territory' (Colorado College Studies, V), I described *Turritella denisonensis* from the Choctaw limestone of northern Texas, noting its resemblance to *T. leonensis*, but separating it from that species on the ground of the much enlarged and angulated, or shouldered, body-whorl. In 1895 Mr. R. W. Goodell brought some fragmentary but interesting specimens of *leonensis* from the Trans-Pecos region of Texas, whence came Conrad's types of the species. One of these shows the body-whorl to be enlarged and shouldered as in *denisonensis*. I therefore suspect the latter to be

a synonym of *leonensis*. As the northern specimens have been found in both the Choctaw and Grayson members of the Denison formation, while there is reason to believe that Mr. Goodell's specimens are from the Washita formation, it is probable that *Turritella leonensis* ranges throughout the entire Gainesville division.

In 1893, in the Fourth Annual Report of the Geological Survey of Texas (Part II., page 232), the writer noticed a shell that had been collected by Mr. L. S. Williams from 'drift,' in northern Texas, briefly characterizing it as a variety of *Turritella seriatim-granulata* and assigning to it the name *ventrivotuta*. Our first positive knowledge of the stratigraphic place of this shell is afforded by a fine specimen which the writer found in 1893 (only a few months after the original notice of the shell had been published) near Belvidere, Kansas, in the lower part of the Kiowa shales, viz., the Fullington beds, which correspond more or less nearly with the Kiamitia of Texas. The specimen is complete, and the half which is free from the matrix affords an apertural view of the shell in its entire length. The ornamentation is well preserved and, taken in connection with the other characters, shows that the shell is very distinct from *T. seriatim-granulata*. Like the latter species, it belongs to the subgenus *Mesalia*, and should be known as *Turritella (Mesalia) ventrivotuta*.

Turritella belviderei, sp. nov.—Shell of medium size in the genus, consisting of ten or more flattened or somewhat convex whorls; suture feebly impressed; aperture round-rhombic, slightly elevated; whorls ornamented with about six subequal to unequal, abruptly elevated revolving ribs whose summits are beaded, each bearing a rather closely-set series of oblique to transverse prominent granules; the intercostal intervals square-bottomed, those of the upper spire-whorls and of the lower parts of the body-whorl and first spire-whorl wider than the ribs, those of the upper parts of the body-whorl and first spire-whorl respectively less than and about equal to the ribs; upper rib and tubercles of each whorl usually coarser than the others, especially so in the case of the body-whorl, in which the large tubercles are sometimes distinctly arcuate (concave on the side away from

the aperture), an attenuated rib, or raised line, (sometimes two) developed just above it, about on the suture, the second rib above this being also sometimes smaller than the average.

Measurements.—Height 45 to 60 mm. ; breadth of body-whorl 17 to 20 mm. ; divergence of spire-slopes (variable) commonly between 18 and 23 degrees.

Occurrence.—In the Kiowa formation at Belvidere, Kansas. It is the common *Turritella* of this formation, and is very abundant and well preserved in limestone bands in the Fullington horizon at that locality. Specimens preserved in the carbonaceous clay-shale parts of this horizon are usually found crushed.

This shell has hitherto been cited generally under the name, *Turritella seriatim-granulata*, but is distinct from that species as described and figured by Roemer.

I have elsewhere listed as '*T. marnochi*' and '*T. seriatim-granulata*, var. *marnochi*,' a large *Turritella* which is common in the Champion shell-bed at Belvidere. Recently, I submitted to Mr. T. W. Stanton, of the United States Geological Survey, specimens of the shell so listed. Most of these were returned without comment ; but one, whose only differences from the others seem to fall within the individual variation of the species, was returned with the comment, "This specimen is more like Roemer's type of *seriatim-granulata* than any other I have seen, the chief difference being its larger size. Comparison was made with a squeeze from the original." Since all of these specimens agree in general character of ornamentation with *seriatim-granulata* as represented by Roemer in his *Kreidebildungen von Texas*, and since, at the same time, there is in many of them a tendency to that elongation of the granules which Dr. White represents for his *Turritella marnochi*, it seems altogether probable that the original *marnochi* and the large *Turritella* of the Champion shell-bed that I have hitherto referred to *marnochi* represent one and the same species, the *Turritella seriatim-granulata* of Roemer.

A careful study, recently made, convinces me that the common *Turritella* of the Kiowa shales, to which, in Bulletin No. 11 of the Washburn College Laboratory of Natural History, I ap-

plied the varietal name, *belviderei*, should be recognized as a species distinct from *seriatim-granulata*, and I have accordingly described it as such under the name thus early applied to it.

Omitting common points, the two species may be characterized for determinative purposes as follows :

T. seriatim-granulata. (Including *T. marnochi*, apparently as an individual variation.)

Size large ; granules mostly well interspaced, coarse, appearing as small, low, rounded tubercles, or elongate with the trend of the revolving costellæ, both forms of granules often appearing on the same specimen and in variable proportion.

T. belviderei.

Size usually smaller ; granules finer, prominent, numerous and crowded, their greatest diameter either transverse to costellæ or oblique.

So far as I am aware, there is no conclusive evidence of inter-gradation of the two types, though there is variation in both.

But here arises the question of the relation of *Turritella belviderei* to Meek's *T. kansasensis*, of the Mentor beds. The latter species, which attains a much larger size than is credited in the original account of it, is described as if ornamented with simple linear revolving ribs. As usually indicated by the mould, it is so ornamented ; but in some instances there are traces of granules on the ribs, though only of feeble ones so far as yet observed. Aside from their summit-form, the ribs have the same characters as those of *T. belviderei*, viz., abrupt elevation, square-bottomed intervals, etc. The sinuous trend of the growth-lines in this species is found also in *belviderei* and *seriatim-granulata*. *T. kansasensis*, as now known, has the ribs plain or nearly so. But the moulds sometimes seem to be coated with a ferruginous film which may have obliterated distinct granules if such were originally present ; and the query arises whether new and better material might not show strongly granulated ribs, and *belviderei* so become a specific or varietal synonym of *kansasensis*. At the same time, it is certain that in many Mentor fossils the moulds preserve the impress of the surface-sculpture in its finest details.

An apparent difference of ornamentation like that between *Turritella kansasensis* and *T. belvi-*

derei exists between the Mentor fossil, *Margarita mudgeana* Meek, and the Kiowa species, *M. marcouana* nobis; and here also it remains to be shown whether the difference is genuine or due to unlike conditions of preservation.

I have recently identified *Nerinea acus*, Roem., from the Champion shell-bed at Belvidere, the markings shown as in Roemer's figure of the type. This, with the *Lithophagus* noticed below, brings the total number of Invertebrata known from this thin but remarkable shell-bed up to thirty-eight. This interesting occurrence of *Nerinea acus* further confirms Professor Hill's earlier and my own constant later reference of the Champion shell-bed to the Fredericksburg formation, and to the Comanche Peak limestone in particular; and the occurrence of the *Lithophagus* in both the Champion and the Kiowa not only adds to the former evidence of a closely successional time-relation of the two formations, but also tends to emphasize the conclusion I have elsewhere announced, that the Kiowa is about equally related to Fredericksburg and Washita.

The *Lithophagus* referred to is one of which I found several specimens in burrows in Serpula-knots in the Champion shell-beds, and which is assumed not to differ specifically from the '*Lithophagus* sp. nov.' of Stanton, reported (in Hill's 'Outlying Areas of the Comanche Series in Kansas, Oklahoma and New Mexico,' Am. Journ. Sci. 3rd Series, Vol. L), as occurring in Gryphæa-valves in the Hill and Gould collections from the Kiowa shales at Belvidere, borings similar to those in the Serpula having been found by the writer in Gryphæa-valves at the zone of transition from the Black Hill shale to the Fullington bed, a horizon intermediate in position between the two which have yielded the actual shells of *Lithophagus*.

In 1893 I collected in the Comanche Peak limestone of south-central and north-central Texas several specimens of an apparently undescribed, heavy-ribbed species of *Cyprina*, to which I have given the manuscript-name *Cyprina laticostata*. I now recognize as belonging to this new species the cast which, in my 'Study of the Belvidere Beds,' I referred to *Homomya alta*, Roem. Thus the evidence for reference of the Champion

shell-bed to the Comanche Peak limestone of the Fredericksburg division continually becomes clearer.

Stratigraphic Names for Caprina and Caprotina (or Requienia) Bearing Beds of Northern Texas. In defining the Barton Creek limestone, a member of the Fredericksburg formation (*American Geologist*, XVI., 385), I fell into the error of including in it both the Caprina limestone and the Caprotina limestone of Shumard, whereas it was the former only (whose fauna includes both *Caprina* and *Caprotina*, or *Requienia*, with other genera of *Chamidae* and *Hippuritidae*) that should have been included in the definition, and which was especially intended, this being the limestone that succeeds the Comanche Peak limestone, on Barton creek, in Travis county, Texas. It is the cap-rock of a number of buttes that carry remnants of the Fredericksburg formation in central and western Texas. The Caprotina limestone of Shumard is the Caprotina or Requienia bed that occurs in the upper Glen Rose, in the Brazos Valley, in the vicinity of Granbury, and which may be designated as the *Granbury bed*, to distinguish it from more or less similar beds elsewhere. Since proposing the name Barton Creek for the Caprina limestone of the creek thus named, I have observed that the name is quite similar to that of the Barton clays (Tertiary) of England. The similarity is the more unfortunate because increased by my inadvertently referring to the Texas bed in a shorter form, 'Barton,' in formally defining it, immediately after having defined it in table as 'Barton Creek.' Altogether, the considerations stated probably render either 'Barton' or 'Barton Creek' untenable, and both terms are therefore here abandoned in favor of another. The same bed of Caprina limestone that occurs on Barton creek may be seen overlying the Comanche Peak limestone, in Stonewall county, Texas (where, as Messrs. Dumble and Cummings have shown, and as the present writer has later observed, it forms the cap-rock of Double mountain); and the name *Stonewall limestone* is therefore here proposed for it.

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