the papaw in the Mississippi Valley overlooks the occurrence of this tree at a point much farther north. The writer has noted its occurrence in the valley of Carroll Creek near Mt. Carroll, Ill., about five miles north of the forty-second parallel of latitude, or nearly one hundred miles farther north than the limits given by Dr. White, *and the tree there bears fruit.* A letter received to-day from A. B. Hostetter, of Mt. Carroll, states that the fruit seldom ripens, but that in favorable seasons members of his family have gathered and eaten the ripened fruit. The papaw in that locality seems to be restricted to the rocky gorge of Carroll Creek, a situation somewhat sheltered.

It may be of interest to note in this connection that the papaw has been reported by Wesley Bradfield, of the United States Forest Service, to extend as far north as Grand Traverse Bay in Michigan, or to about latitude forty-five degrees, and it is of common occurrence as far north as Grand Rapids, Mich., in latitude forty-three degrees.

Frank Leverett.

Ann Arbor, Michigan,
May 17, 1906.

After having read the communication from Dr. C. A. White in Science for the eleventh of May this year, relative to the northern limit of the papaw tree, I deem it my duty to inform the readers of your journal that this tree grows under a high bluff of sandstone on the south side of the Mississippi in the west end of Rock Island County, near a place known as Drury Landing.

Two weeks ago I saw these trees in bloom. I sought information regarding the ripening of the fruit and the testimony was unanimous by the residents in the neighborhood that the fruit may and does ripen even in this northern locality. It is known to have been offered for sale on the market in Muscatine, on the opposite side of the river. So far as the distribution of this plant along the Mississippi is concerned, it does not seem necessary to account for this by a hypothesis involving human agency, although we may take it for granted that man has been an agent of some consequence in the dispersal of its seeds.

J. A. Udden.

Rock Island, Ill.,
May 21, 1906.

SPECIAL ARTICLES.

Parallel Development in Brachiopoda.

'Brachiopod Homœomorphy: *Pygope, Antinomia, Pygites.*'—The writer has presented a paper with the above title to the Geological Society of London, and it was read on March 21. It deals with the diphyoid Terebratulæ, of which so many species have borne the name *Terebratula diphya* (Colonna). It is noted that this name is pre-Linnean, and can, therefore, only date from the time when it was revived by L. von Buch, 1834. Prior to that several names had been given to these shells. The first were *Terebratula cor* and *T. pileus* given by Bruguière in 1792 in the *Journ. Histoire Naturelle.* This paper has been entirely overlooked by workers on these shells. Bruguière's names indicate a perforate and an imperforate species, respectively. Consideration is then given to the synonymy of certain diphyoid species: *T. triangulus,* Valenciennes in Lamarck, which was actually founded on Bruguière's own figures of his *T. pileus,* reproduced in 'Encyc. Meth.'; *T. triquetra,* Parkinson, which includes two species, a perforate and an imperforate; and *T. antinomia,* Catullo, which covers various species. These and others all antedate *T. diphya,* von Buch.

Terebratula diphya is not the type of the genus *Pygope,* as all text-books say; for Link, the author of the generic name, referred only to *T. antinomia,* Catullo. Reasons are given for taking as the type of *Pygope* one of the forms of *T. antinomia* which is considered to be the same species as *T. deltoidea,* Val. Then the later generic name *Antinomia,* Catullo, is discussed. The genus was founded on five species; and one of them is now selected as the type — the genolectotype. This is *A. dilatata,* Catullo, supposed to be equivalent to *T. antinomia,* Catullo, that is, to what is now selected to be the type of that species. In that case the species would bear the name *Antinomia*

antinomia (Cat.). The two generic names *Pygope* and *Antinomia* are employed, because they are supposed to indicate two independent parallel genetic series, whose members differ in size and position of the perforation, and in characters of the lateral margin. But there is yet another series of diphyoids, typified by *Terebratula diphyoides,* d'Orb. It is pointed out that, although the species covered by the name *diphyoides* are very like *Pygope* as now used, yet they all differ in having particular characters in the preperforate stage — a dorsal ridge and a ventral sulcus. For this series de Haan's MS. name *Pygites* is used; and it is supposed that there are three genetic series of diphyoids which have developed independently, and that the remarkable perforate form, with its two lobes joined, has been evolved three times over. The three series develop from the glossothyridoid, to the bifidate, to the perforate (ordinary *T. diphya*) stage; and two series are supposed to finish by losing all trace of the perforation, the lobes completely coalescing (the imperforate stage), represented by *T. pileus,* Brug. = *T. triangulus,* Val. in Lamarck.

In compiling synonymies of the species in the three genera there have been found two other papers overlooked by Brachiopod bibliographers—one by E. Newman in the *Zoologist,* 1844, p. 679, naming *T. Duvali,* and one by Catullo.

S. S. BUCKMAN.

GEOLOGICAL SECTION OF NEW MEXICO.

UNTIL within the past year no connected view of the geological formations of the New Mexican region has been possible. From the literature alone little of an exact sequence of geological formations could be made out. Since the work of the geological and mineral survey of New Mexico, under the direction of the School of Mines, at Socorro, has been undertaken much new and much-desired information has been obtained, until now a very satisfactory and correlated scheme of the rock succession has been constructed. The section is instructive on account of—(1) its completeness, (2) its easy parallelism with the better known sections of other parts of the continent, (3) the great development of certain of the major formations, and (4) the many great unconformities which represent long erosion intervals.

Nearly every one of the twenty-five larger formations, those having a taxonomic rank of series, are separated by marked unconformities. The recognition of these erosion intervals explains many hitherto unsolved phenomena regarding the relationships of the various formations, and enables exact correlations to be made in a way that is impossible among the terranes of most other localities, and largely without the use of organic remains. The section is as follows:

GENERAL GEOLOGICAL SECTION OF NEW MEXICO.

	Age.	Series.	Thickness.	Rocks.
Cenozoic	Quaternary		200	Gravels.
	Tertiary	Llano Estacadan	200	Shales.
		Arriban	500	Sandstones.
		Wasatchan	1,700	Sandstones.
		Nacimientan	800	Shales.
Mesozoic	Cretaceous	Laramian	3,600	Sandstones.
		Montanan	1,500	Shales.
		Coloradan	1,000	Shales.
		Dakotan	500	Sandstones.
		Comanchan	100	Sandstones.
	Jurassic	Morrisonian	200	Shales.
		Zunian	1,200	Sandstones.
	Triassic	Shinárumpan	1,500	Shales.
Paleozoic	Carboniferous.	Cimarronian	1,000	Shales.
		Guadalupan	2,500	Limestones.
		Maderan	1,000	Limestones.
		Manzanan	1,000	Limestones.
		Ladronesian	200	Shales.
		Socorran	300	Limestones.
	Devonian		400	Limestones.
	Silurian		100	Limestones.
	Ordovician	El Pasan	1,200	Limestones.
	Cambrian		300	Sandstones.
Proterozoic			3,000	Quartzites.
Archeozoic			5,000	Schists.

The most noteworthy features are the great development of the Tertiary and Cretaceous deposits, the presence of rocks of the Jurassic horizon, the completeness of the Carboniferous sequence, the representation of all systems of the Paleozoic, and the differentiation of the