PERITYLE CILIATA (Dewey) Rydb. (*Laphamia ciliata* Dewey). Rare but widely distributed in Arizona. Collected near Prescott, Yavapai Co., by Kearney in 1926 and previously by D. T. MacDougal near Pine, Gila Co., by J. W. Toumey in the Tucson Mts., Pima Co. and by J. B. Leiberg on Elden Mesa, near San Francisco Mt., Coconino Co.

LAPHAMIA GILENSIS Jones. This plant, known previously only from the type collection by M. E. Jones on the Gila River,[46] was collected in Devils Canyon in Pinal Co. by Harrison in 1926 and subsequently in Fish Creek Canyon at the eastern end of Maricopa Co., by Peebles, Harrison, and Kearney.

HYMENOTHRIX LOOMISII Blake. The type was collected by Loomis near Ashfork, Yavapai Co., in 1926, although the species had previously been obtained by several other collectors in northern and northwestern Arizona.[46] In 1930, *H. Loomisii* was found by us growing in considerable abundance 30 miles south of Prescott, in Yavapai Co., this station being the southernmost yet known.

PLUMMERA AMBIGENS Blake. The type and only known collection of this species was on the lower slopes of Mt. Graham, Graham Co., by Kearney, Harrison, and Peebles in 1927.[47] It occurs abundantly on a dry, unshaded slope at that locality.

**PECTIS URCEOLATA (Fernald) Rydb. (*P. prostrata* Cav. var. *urceolata* Fernald). Collected near Nogales, Santa Cruz Co., by Harrison and Peebles in 1927, and considerably farther north, in the Sierra Ancha, Gila Co., by Kearney and Harrison in 1928. It had been collected previously by E. A. Mearns south of Bisbee, Cochise Co., but apparently the occurrence of this species in Arizona and in the United States has not hitherto been recorded. *P. urceolata* ranges from southern Arizona through Sonora and Chihuahua to El Salvador.

PALEONTOLOGY.—*The mastodon of Thomas Jefferson.*[1] MARGARET R. HITCHCOCK, University of Virginia. (Communicated by C. WYTHE COOKE.)

The upper and lower jaw bones of a *Mastodon americanus* (Leidy) do not, in themselves, constitute a rare fossil. The species has been well described by writers for many years, and the work on the Proboscidea, which is in progress, under the direction of Dr. Osborn at the American Museum of Natural History, would, of course, cover many descriptions of such remains. The bones described below, however, are interesting for two reasons, first, because of the historical significance attached to them, and second, because of an unusual position of the teeth in the lower right jaw, which resulted in a real malformation.

The fact that Thomas Jefferson, in addition to being a law giver, architect, educator, and inventor, was also a paleontologist, has been

[46] S. F. Blake in Proc. Biol. Soc. Wash. **40**: 49, 50. 1927.

[47] S. F. Blake in Journ. Wash. Acad. Sci. **19**: 276–278. 1929.

[1] Received January 13, 1931.

brought to our attention again quite recently by Dr. Osborn. In an address delivered in Washington in 1929, Dr. Osborn[2] brought out the keenness of Jefferson's interest in paleontology, and the persistency with which he pursued his studies. From his letters we can see that

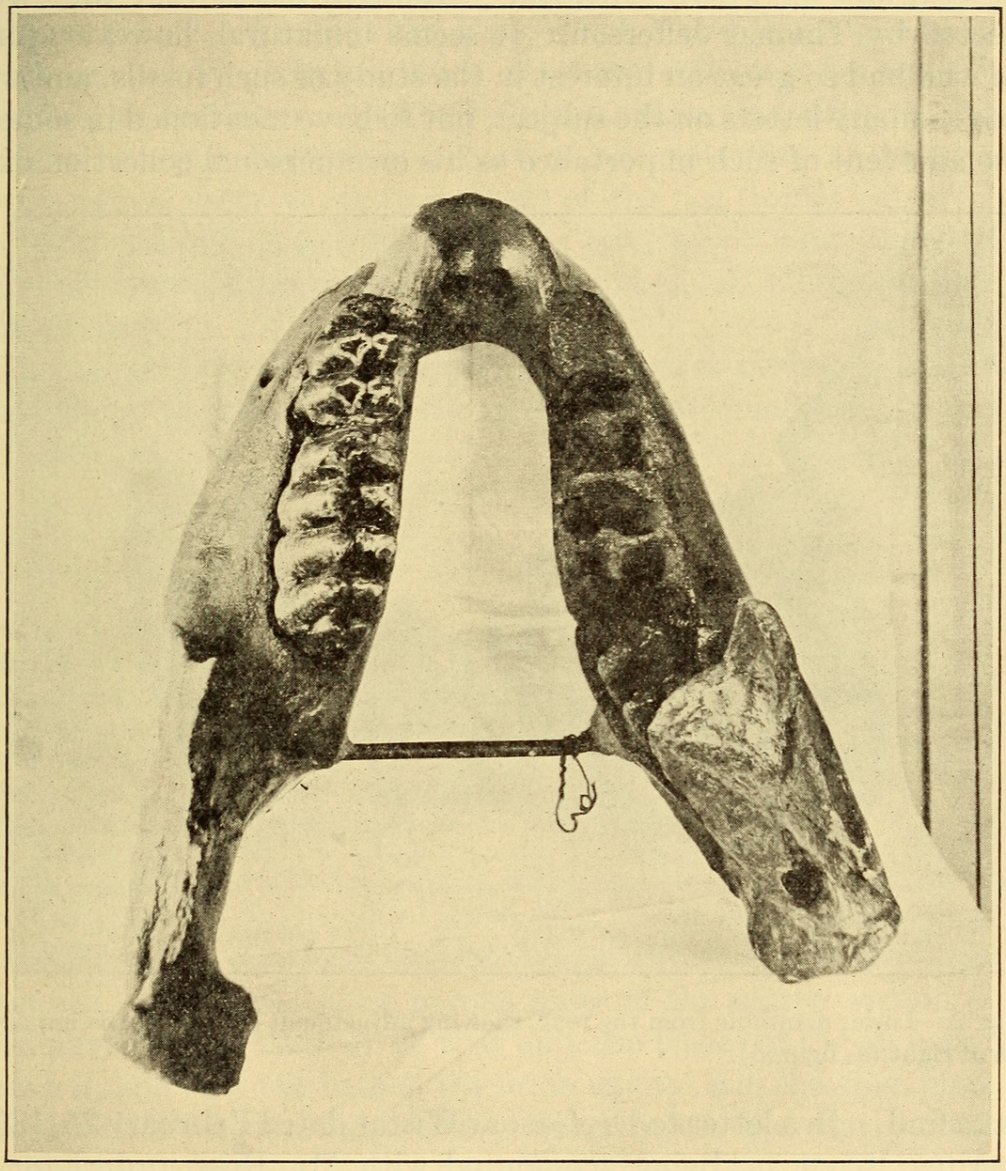

Fig. 1.—View looking down on the lower mandible, showing the differences in the two sides.

interest marching along side by side with the affairs of the nation, for on the same day letters were written dealing with fossil remains, and others with national policies. A proof of this avocation of his rests

[2] H. F. Osborn. *Thomas Jefferson, the pioneer in American paleontology.* Science, n.s., **69**: 710–713. 1929.

at the University of Virginia which he planned and founded. In the museum there are the jaw bones of a mastodon which were probably given to the School of Natural Science by Jefferson himself.

There is some question as to the locality from which these bones were collected, and by whom collected. Tradition has it that they were collected by Thomas Jefferson. It seems unnatural, however, for a man who had so great an interest in the study of such fossils, and who wrote so many letters on the subject, not to have mentioned in some of these an event of such importance as his own personal collection of so

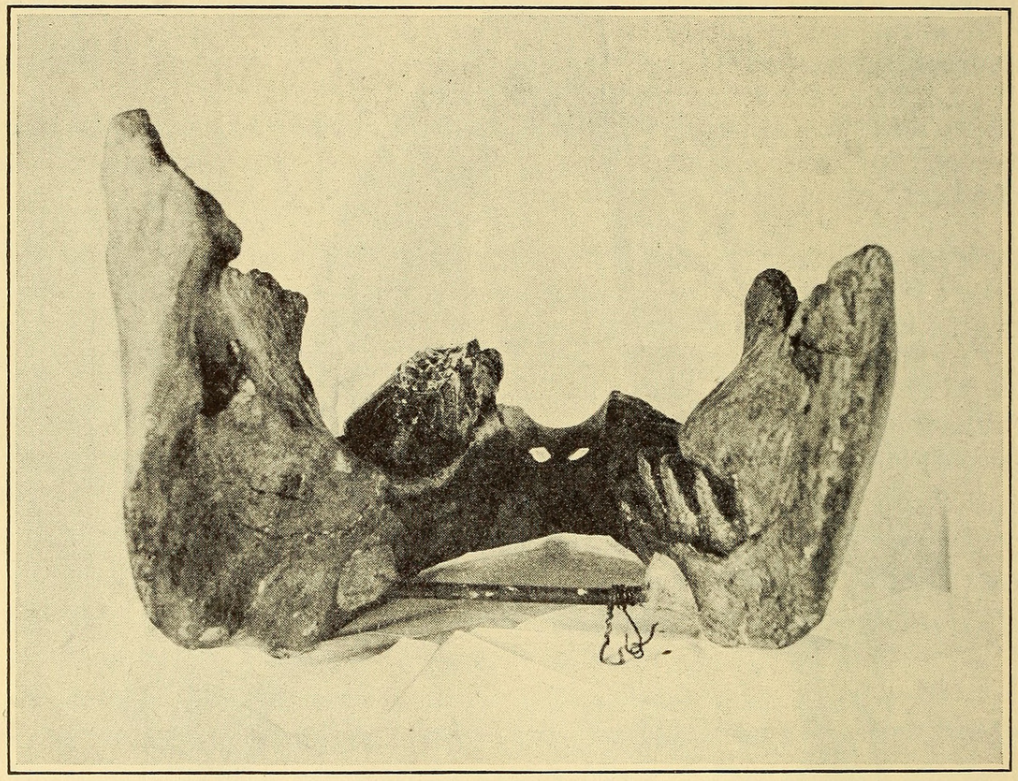

Fig. 2.—Lower mandible from the rear, showing adjustment caused by the impacted tooth at right (as figured).

great a find. In a letter to Dr. Caspar Wistar dated February 25, 1807, he writes, ". . . . Being acquainted with Mr. Ross, proprietor of this big bone lick, I wrote him for permission to search for such particular bones as the society might desire, and I expect to receive it in a few days. Captain Clarke (companion of Captain Lewis) who is now here, agrees, as he passes through that country, to stop at the lick, employ labourers and superintend the search at my expense, not that of the society, and to send me on the specific bones wanted, without further trespassing on the deposit. . . . . But send me the list if you please without delay, as Captain Clarke returns in a few days, and

we should lose the opportunity."[3] Later in the same year there is a letter to General George Rogers Clarke, thanking him for sending on the bones which have been collected, and another to Dr. Wistar in which the list of bones is again discussed, and in which Jefferson's cabinet at Monticello is mentioned, as a few of the bones were especially gathered for it.[4] Whether the jaws, which are in the museum at the University of Virginia are some of those collected by the Clarke brothers, or had been owned by Jefferson before that time, we may be fairly certain that they were a part of his collection at Monticello, for George Tichnor wrote from there of the "os frontis" of a "mammoth" in the "cabinet," and that they were given from there to the University, where they are another evidence of his interest in the natural sciences.

The upper jaw with a portion of the skull is probably the better preserved of the two members as far as teeth are concerned, but in the

TABLE 1.—DIMENSIONS OF THE LOWER JAW

	Left side	Right side
	cm.	*cm.*
Length of jaw	65	68
Width of jaw in front of front molar	8	13
Width of jaw behind first molar	15	19
Length from the inside of the symphysis to the beginning of the coronoid process	35	38
Width at the beginning of the coronoid process	14	14
Height of the coronoid process from the top to the jaw bone.	14	13[a]

[a] The original length of the broken process must have been a little greater than 16 cm

consideration of the bony structure as a whole, it is a less complete specimen. All of the more porous parts of the upper portion of the skull have been broken off, so that only the traces of the air cells have been left, and only the base of the brain cavity, still showing, however, the processes which divide these. Nevertheless the fine porosity of the bones is well shown and an excellent idea of the general structure of the skull may be obtained. The length of this piece is about 50 cm., while the width is between 35 and 40 cm.; there are two molars in place on each side. Of these the front ones are the most worn, and so well worn that there are no cusps, but ridges, while only the front two cusps are worn on the back ones. All the transition stages can be seen from the well worn in front to the perfect cones in back, which must have

[3] The writings of Thomas Jefferson. 9: 158. 1907.
[4] The writings of Thomas Jefferson. 9: 403, 405. 1907.

been still covered by the gums. On the right side, the bony process in front has been broken off until it shows the long curved roots of the first molar. The right side seems to have had more use, as the teeth are more worn down than those on the left side, and this seems to be connected with a slight warping of the upper jaw, which might otherwise have been considered a result of the replacement accompanying fossilization, but which seems to correspond with a malformation of the lower mandible, which does away with that conjecture.

As the lower jaw is not symmetrical and has been broken, it presents several problems. The break occurs just to the right of the symphysis but owing to the recency of the mending of this, very probably within the last twenty years, it would seem to be surely one complete lower jaw, and not the patched up fragments of the jaws of two different individuals. It seems necessary to decide this fact because of the lack of similarity of the two sides, in several ways (see figures 1 and 2). This difference is, perhaps, best brought out in a comparison of the measurements taken of the two sides, listed in Table 1.

It is interesting to note that the actual difference in length in the two jaws is only 3 cm., as the apparent difference is so great. This is most probably due to the more massive appearance of the left side, which is also the shorter side, and this tends to magnify the inequality. This shortness of the left side persists in all parts of the jaw, except in the tooth sockets, which seem to be the same size in all dimensions as those on the right. This, of course, has the effect of making them appear much larger in proportion. The vertical thickness of the two sides is so nearly the same that no measurements in this direction were taken until the coronoid process was reached. The shape of the two sides of the jaws differs greatly. The curve from the symphysis on the left side is quite abrupt, going into a fairly straight line almost immediately, while on the right side the curve is slower and continues to the coronoid process, where the bone narrows on both sides. This narrowing occurs to a certain degree in both sides, but on the right side it narrows quickly and leaves a decided angle on the inside of the jaw, while on the left side there is a slow and more rounded narrowing (see figures 1 and 2). The width of the two sides, just in front of this process and behind the second molar, is the same on the two sides. This is as it should be, but in this case, where the entire left side is smaller, it makes this side proportionately too broad at that spot. The massive appearance above mentioned is due to this swelling and the lack of angularity of curve behind it.

The height of the coronoid process varies on the two sides. The

right side of the specimen has been broken at this point, but even in that state, the right side measures 13 cm. while the left measures 14 cm., and the necessary additional height to complete the process on the right side would make that side at least measure up to 16 cm. This is the only great difference in vertical height in the two sides.

The teeth of the lower mandible are not all present, but those still in place are in a state of good preservation, and again show the different stages of wear, and are, in general, less worn than those of the upper mandible. The teeth of the right side are two in number, molars of three and five ridges or cones. The first molar, three-coned, is slightly worn down, the front cone as is natural being the most worn, and the second, the five-coned tooth, has no sign of wear on the back two cones. Even the slight depression into two cusps on the last cone of this tooth shows perfectly. These teeth are in place and there is apparently no room for any others between the last one and the coronoid process, and no spot in this process which is thick enough to conceal another later molar. The teeth of the left jaw which correspond to those of the right jaw are missing. These have very evidently been lost since the specimen was found. Perhaps they were given to other museums by Jefferson in the early days at Monticello, or they may have been misplaced since becoming the property of the University of Virginia. The sockets in which the roots of these teeth rested are perfectly clear and clean of any foreign material, which is not true of some of the air cells and cavities in the skull, which still contain small pebbles and sand, and have been broken and chipped away. These sockets show that they originally contained first a three-coned tooth, and second a five-coned tooth, exactly corresponding to the two on the other side, though they seem to have been placed a little farther forward on the jaw bone nearer the symphysis than those on the right side. In addition to these, there is, as a third tooth, a large molar, the first two cones of which are now visible in front of the coronoid process, the last three of which are beneath this and only visible from the inside of the jaw, where the bone has been broken away (see figure 2). This molar is as large as the one on the right side, which would correspond to the original second tooth on the left jaw, and is in perfect condition, not worn at all; in fact, it could never have appeared above the gum, as the top of the cones is still below the original surface of the slope leading from the jaw bone proper to the coronoid process. The bone of the process above it is much thicker through than the corresponding bone of the left jaw, and seems to have thickened and changed the angle of growth in order to accommodate this peculiar tooth. If the

curve of the connection between the jaw bone proper and the process were not broken, it would be possible to see how completely surrounded this tooth is by bone. As it is, a reconstruction of this material can be postulated and the line of the original bony material drawn which would cut the tooth at such an angle, that it would be impossible for the tooth ever to have appeared above the surface, either in a vertical or in an inclined horizontal direction. In the latter and only possible direction the bone which has recently been broken off would have intercepted and broken off the second cone of the tooth, which, of course, would have stopped its progress. This tooth, then, seems to be one which is completely misplaced, and which, due to this, has caused a thickening and changing of the shape of the process in which it is found. The changes in bone building necessary to accommodate this tooth would lower the coronoid process, causing the difference in vertical height between the process on the left jaw and the corresponding process on the right jaw. This difference probably amounted to as much as 2 cm., at least, and this, with the greater thickness, would throw the balance of the jaw to an entirely different center from the normal one of the right jaw. In this way may be explained the difference in length of the two jaws as well as their great difference in shape.

In addition to this, it is interesting to note that the upper mandible seems to be slightly warped and one-sided. As mentioned above, this seems to be a real malformation, and not an effect of fossilization, and appears to be an attempt of the upper mandible to conform to the distortion of the left lower jaw, in order to give as good occlusion as possible. In this way the occurrence of one tooth in the wrong position has caused the warping and malforming of the entire head of the mastodon.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

PHILOSOPHICAL SOCIETY

1011TH MEETING

The 1011th meeting was held in the Cosmos Club Auditorium on November 8, 1930, President LAMBERT presiding. The program consisted of six reports on various phases of the meeting of the International Union of Geodesy and Geophysics held in Stockholm, Sweden on August 15–23, 1930. The discussion of the papers was deferred until the end of the program.

W. BOWIE: *An outline of the organization and purpose of the Union, and Proceedings of the Section of Geodesy.*—The International Geodetic and Geophysical Union is one of the branches of the International Research Council.