

George H. Babcock; vice-presidents, Joseph Morgan, jun., Charles T. Porter, Horace S. Smith; managers, Frederick G. Coggin, John T. Hawkins, Thomas R. Morgan, sen.; treasurer, William H. Wiley.

—It is announced that the British government has taken possession of the island of Socotra, in the Indian Ocean, heretofore belonging to the imamat of Muscat. For many years the British government had subsidized the governor of the island, but had had no direct control over it. Socotra lies about 120 miles east of Cape Guardafui, near the entrance to the Gulf of Aden, and in the direct route of vessels passing between Suez and India. The island is 70 miles long by 20 miles broad, with an area of about 1,000 square miles, and a population of nearly 5,000, mostly Arabs, negroes, and Portuguese. A range of granite and limestone mountains extends through the middle of the island, rising in places to a height of 5,000 feet. The low coast-lands are fertile, producing aloes, dragon's-blood and other gums, tamarinds, dates, and tobacco.

—Snow hall, for the uses of the natural history department of the University of Kansas, at Lawrence, was formally dedicated on Nov. 17.

—The government of Queensland is taking vigorous measures to guard that colony against the rabbit-plague mentioned in *Science* of Nov. 12. A rabbit-proof fence of wire netting will be erected along the boundary-line between Queensland and New South Wales, with an extension of a hundred miles northward along the boundary of South Australia. For this purpose, 2,550 miles of fencing wire and 450 miles of wire netting have already been purchased in England.

—While the question of the advisability of women studying medicine is being discussed, the women are settling it for themselves by entering the medical schools in no inconsiderable number. At Zurich twenty-nine are now pursuing that study; in London, forty-eight; and at Paris, one hundred and three. At the latter eighteen have obtained their diplomas of doctor during the past seven years.

—An unsinkable lifeboat recently patented by a gentleman in Buffalo, N.Y., possesses some novel features. The entire lower part of the boat is filled with sheets or slabs of cork, set up edge-wise and fastened together. Above this is a filling of rushes, set up vertically and having their ends rendered water-proof. Above the cork and rushes is a water-tight deck, which separates the lower half of the boat from the upper half, where seats are provided for crew and passengers.

LETTERS TO THE EDITOR.

Fort Ancient, Warren county, Ohio.

HAVING recently, in company with Messrs. W. H. Holmes and Charles M. Smith, visited some of the more noted ancient works of Ohio, among them the one mentioned above, I have concluded that a few words in regard to its present condition might be of interest to general readers as well as to archeologists.

This work has been so often described, that most readers interested in our antiquities are familiar with it. The first notice and plan were given in the 'Portfolio' (1809). Both plan and description were copied by Caleb Atwater in his memoir in the first volume of the Transactions of the American antiquarian society (1820). About twenty years later it was carefully surveyed by Prof. John Locke, his description and plat being published in the Transactions of the Association of American geologists and naturalists (1843). This plat was copied by Squier and Davis in 'Ancient monuments,' and is the one from which all subsequent figures have been taken. It is quite accurate in the main; so nearly so, in fact, that another complete survey may be deemed unnecessary. Some slight corrections might be made; but these, with two exceptions, which will be named, are of minor importance.

As remarked by Squier and Davis, this is "one of the most extensive, if not the most extensive, work of this class in the entire west." It is also one of the best preserved, the main portion having suffered but little from the plough; the surrounding wall being uninjured save at the points where the turnpike cuts through it, and at a few places where ravines have been recently formed. As earthen walls change but little so long as they are covered with vegetation, it is more than probable that we see this great structure (with the exceptions hereafter noted) as it was when abandoned by those last occupying and using it. For example: the wall at *d* (Squier and Davis's figure), in the north-eastern corner, although in an open field, shows no signs of material wearing; the height being now a little over nineteen feet, and width at base sixty-seven feet, — almost exactly the measurements given by Atwater. Growing on the top are some large trees whose roots are not at all exposed. With the exception of a short stretch at the point mentioned, the wall throughout is still in the unbroken forest.

Evidences of wearing are observable at some of the ravines it crosses, and a few of the smaller gullies appear to have been worn since the wall was built (a fact also mentioned by Atwater), though in most cases the adaptation of the wall to the slopes shows that these existed when it was thrown up. Professor Locke states that the "embankment is in several places carried down into ravines from fifty to one hundred feet deep, and at an angle of thirty degrees, *crossing a streamlet at the bottom*, which, by showers, must often swell to a powerful torrent. But in all instances the embankment may be traced to within three to eight feet of the stream." Although our visit was during an unusually dry season, when the ravines contained no water, the indications observed did not bear out what seems to be implied by Professor Locke's language, — that the wall originally crossed the ravines: on the contrary, they appear to show that the wall stopped on the sides at the points reached by the streamlets in time of highest water. It is true that at some points it has been

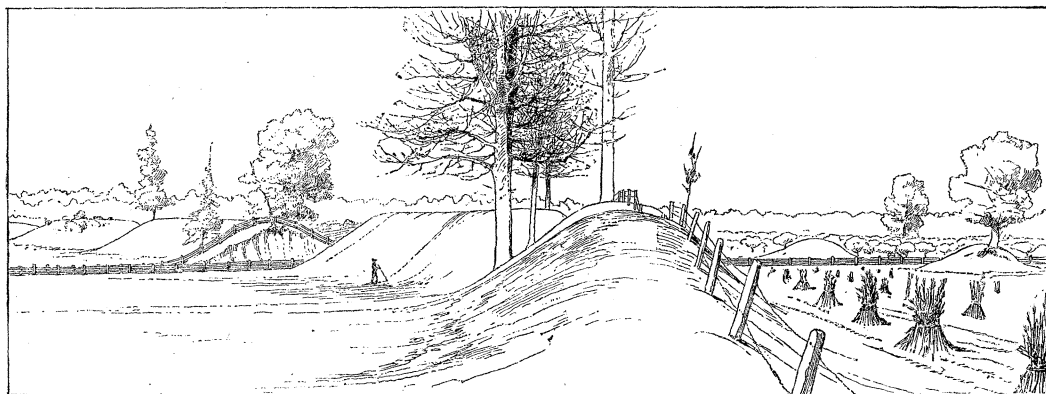
broken through by the pressure of water accumulated behind it, but in all these cases it is apparent that the ravines have been formed since the wall was built. At only one point did we observe a break made since Professor Locke's survey. This is through the long, curved stretch directly east from where the so-called 'two large mounds' are represented on the plat.

If these ravines were defended, as is quite probable, it must have been by some other means than a wall of earth, which could not have withstood the pressure through a single rainy season.

Although the wall is built chiefly of earth (composed largely in most places of clay) gathered from the adjacent surface, and from the interior ditch where it exists, it is partially underlaid at numerous points with stones, which in some cases were laid up loosely. This was noticed at the north-western corner, where the wall has been cut through to make way for the turnpike, and also at the extreme south-eastern corner. At almost every point where a slight cut has been made for a farm-road or other purpose, stones were observed.

generally crossed at the upper terminus by a wall of the ordinary height, the ridge immediately outside being cut down several feet so as to present a steep slope corresponding with the outside of the wall. This gives the appearance of a terrace on the hillside a few feet below the wall. On the other hand, where similar ridges form approaches to the south portion, and also, at some places, to the north portion, the defences are formed by raising the wall considerably above the ordinary height.

The isthmus, or point where the opposite walls approach nearest to each other, just north of the so-called 'two large mounds,' is undefended, though on the right or east side the ascent is by no means difficult: the declivity on the west forms a sufficient defence without a wall. The plat at this point is slightly erroneous, as the wall on the west side does not extend quite so far north as represented. It is possible that this extension was made theoretically, on the supposition that the wash which is apparent here (shown in Atwater's figure) had carried away the wall. That a small portion of the extreme end was carried down, is true, but the ridge on which it



WALL OF FORT ANCIENT.

Mr. George Ridge, who lives near the two mounds at the north-eastern corner, and who has for years studied the fort, insists that the wall is to a considerable extent underlaid with stone. This fact is also mentioned by Squier and Davis, who state that "they are *water-worn*, and seem for the most part to have been taken from the river." This is certainly an error, as they are almost entirely of flat pieces of limestone, showing no indications of having been water-worn, such as could be obtained on the surface or immediately below the brow of the hill.

The two points at the isthmus, or neck, marked on the plat '*two large mounds*,' are not 'mounds' properly so called, but the elevated terminations of the walls on the sides, the opening here being an important gateway. The point at the extreme south-eastern corner, marked on the plat '*mound*,' is only an elevated portion of the wall thrown up to defend an easy approach at this point.

One of the most interesting facts observed, of which mention has not heretofore been made, is the different methods adopted of defending the more easy approaches. On the north, these approaches, which are usually narrow, ascending ridges, are

runs never crossed the gap. Besides, in the original plat, as given in the 'Portfolio,' the wall is represented as extending *up* to the so-called 'wash' (which is not a 'wash,' but a small land-slide), and stopping there. The wall never existed along the top at this point.

The parallel walls starting out from the two mounds near the north-eastern corner, represented in 'Supplementary plan A,' Squier and Davis's figure, are entirely obliterated except at the fence crossings, where slight traces of them are visible. The included mound at the east end is yet distinctly visible. Mr. Ridge informed us that he has discovered, at a depth of about eighteen inches, a pavement of stone reaching from wall to wall, and from the mounds eastward over a hundred yards. We had an opportunity of inspecting this at only one point, and know nothing further in regard to it than his statement, which I believe to be trustworthy.

Some of the problems presented by this work are very difficult to solve, though others can be, in a measure at least, satisfactorily determined without resort to mere speculation.

That it was built and intended as a work of defence is so apparent, that it is scarcely possible there

should be conflicting opinions on this point. The situation chosen, and the character of the work, seem sufficient to place this conclusion beyond doubt. Yet there are few, if any, satisfactory indications, aside from the character and extent of the work, that any portion of the enclosed area was occupied for any considerable length of time as a village site. That a work of such magnitude and extent could have been hastily cast up for temporary protection by a savage, or even by a semi-civilized people, is incredible. Moreover, there are reasons for believing that the whole fort was not built at one period of time, but was progressive. The southern part was apparently built first, the northern section being a subsequent addition, made possibly because of increase in the population, most likely by the incoming of parties or clans seeking protection.

On the other hand, the evidences of long-continued occupation, such as are seen in and about other works, — as, for example, the Etowah and Messier groups in Georgia, the Cahokia group in Illinois, and several of the works in south-eastern Missouri, — are wanting. This is also singularly true of several other noted works of Ohio. The refuse and *débris* of a populous village, occupying for a long time a comparatively limited area, could not, as is proven by the instances referred to, be entirely dissipated by sixty years of cultivation, even though carried on continuously. The areas forming the sites of some of the mound-builders' villages of south-eastern Missouri, are yet, after half a century of constant cultivation, a foot or more above the surrounding level.

What is the explanation of this singular fact? I can think of but one which seems at all satisfactory, and that is, that these works were built by a populous tribe, which was being pressed step by step before a victorious foe.

The defensive works of Ohio present to me no evidences of great antiquity: indeed, the indications are in the opposite direction; and, in my opinion, we are not warranted in assigning to them an age antedating the latest possible period which we are justified in fixing upon as that at which the Indians first entered this territory.

I give herewith a figure, from a sketch by Mr. Holmes, showing that part of the wall which crosses the field near the two mounds at the north-eastern corner, including the part where the turnpike cuts through, marked *d* by Squier and Davis.

There is evidently a very great mistake in Dr. Locke's estimate as to the amount of earth in the embankment. If we take the length of the wall at four and one-half miles, the average height at ten feet, and the average base at thirty-five feet, the volume is about 154,000 cubic yards, or less than one-fourth the amount given by Dr. Locke, his estimate being 628,800 cubic yards. If there is any error in my figures, it is such as will overrun the true amount, rather than fall below it.

CYRUS THOMAS.

Milk-sickness.

In the milk-sickness district, referred to in my letter in *Science* of Nov. 26, the belief prevails, and assertions are made, that the disease disappears so soon as the land is cleared and cultivated, and some cite instances where denuding the land of its forest-growth has caused the disease to cease: so it may be

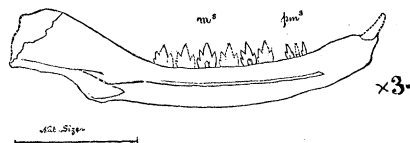
set down as a fact, with considerable credibility, that, as a general rule, clearing and cultivating the land removes the cause of the disease, and anything to the contrary will be an exception to the rule. I can refer definitely to only one of these exceptions, yet I have heard of a few others. Dr. W. S. Sims of this place tells of a farmer in Hamburg township, Jackson county, N.C., who has a half-acre lot enclosed with his dwelling. In this enclosure are fruit-trees and some of the native grasses, and the place has been under cultivation for twenty years or more, and yet whenever cattle are turned upon that lot during grazing season they are sure to die with the disease in a few days. From what I learned in Macon county, N.C., if they were not practising on my credulity, I am satisfied that that section will afford isolated exceptions to the general rule. In the lot above referred to, there is no water obtainable except from a large creek of swift-running water, that bounds one side of the lot. In that immediate vicinity there is no milk-sickness outside the enclosed half-acre.

J. W. WALKER.

Pine Mountain, Ga., Dec. 2.

A new mammal from the American triassic.

In 1857, Professor Emmons (*American geology*, part vi. p. 93) described the left lower jaw of a small mammal from the Chatham coal-field in North Carolina, naming it *Dromatherium sylvestre*. His description was based upon one nearly perfect jaw and two fractured specimens. The first, or type specimen, is now in the geological museum of Williams college, and one of the others is in the collection of the Philadelphia academy. Through the kindness of Prof. Samuel F. Clarke, I have recently had an opportunity of comparing these rare specimens, and find that the Philadelphia fossil belongs to a genus quite distinct from *Dromatherium*, and unlike any thing hitherto described by Professors Owen or Marsh. The jaw is two thirds as long as that of *Dromatherium*, and much more slender. The symphysial and angular portions are broken away. A faint impression upon the matrix seems to indicate that



the coronoid process was low. The lower border has a downward process like that in *Peramus*. It is uncertain whether the inner or outer aspect is uppermost. The teeth are represented by two molars, probably the second and fourth, and two so-called premolars. The series as a whole occupy a greater linear space than those of *Dromatherium*. The premolars are simple, erect cusps, with a posterior basal cusp. The molars give the principal character to the jaw. Each has a central cone supporting two smaller cones on its anterior and posterior slopes. Hence, together with the slender character of the jaw, the fossil may be called *Microconodon tenuirostris*. In the drawing the dotted lines indicate the probable shape and position of the four missing molars.

HENRY F. OSBORN.

Princeton, N.J., Dec. 1.