Year.	Marcs.	Year.	Marcs.
1830 . .	6,659	1842 . .	82,840 3
1831 . .	5,997	1843 . .	69,199 6
1832 . .	32,774 3	1844 . .	122,994 3
1833 . .	94,149 2	1845 . .	153,447 3
1834 . .	82,782 1	1846 . .	160,793 5
1835 . .	84,700 5	1847 . .	204,104 4
1836 . .	17,204 3	1848 . .	261,105 1
1837 . .	58,449 1	1849 . .	342,239 5
1838 . .	63,615 4	1850 . .	387,019 7⅞
1839 . .	103,765 2	1851 . .	353,719
1840 . .	19,248 7	1852 . .	395,695
1841 . .	82,112 1	1853, 4 months,	117,468
	Total, . . .		3,362,184 2⅞

THE PRICES OF ORES, ETC.

The price of copper ore of 20 per cent. is 15 reals per quintal, and decreases one real for each one per cent. down to ten, and increases in the same proportion up to 25 per cent.; above this, the increase is 15½ cts. per each one per cent.

One of the most serious embarrassments of the miners is the lack of water, and the high price it consequently commands.

The remainder of the Report treats of several legal enactments relative to the mines, and passes to notice the general necessities of the province. These it is not necessary to enter upon in these pages. The inexhaustible character of the mineral wealth of South America is wonderfully magnified in the mind by contemplating the active scenes in a single province of Chili.

ART. V.—A SKETCH OF THE GEOLOGY OF THE STATE OF MISSISSIPPI.—BY OSCAR MONTGOMERY LIEBER, LATE GEOLOGIST TO THE STATE OF MISSISSIPPI.

IT is now very nearly three years since I was elected Geologist to the State of Mississippi; for though I became nominally Assistant Professor of Geology at the State University, the duties were entirely confined to the geological survey. My connection with this office was somewhat brief; for, finding various specialities exerting an irksome influence on myself as well as the survey, I resigned, after having been occupied for seven months only, so that my examinations could but be of a cursory nature. Notwithstanding this, as I extended my survey over the whole State, omitting only the entirely unimportant portion, in order that I might be able to decide in what part of the State special investigations would be most necessary, I shall be able to give a very correct general view of the geology of that State, which was at

the time the extreme boundary of proper geological inspection. I am rather late in making this report, but still it is better than to allow the whole to pass into oblivion; for no report of mine was printed, and hence, there is little known of the geological features of Mississippi. It may appear strange that this article has been tendered to the Editors of this valuable Magazine, since mining, except possibly for coal, will scarcely find a field in that State, as the carboniferous limestone, or possibly a Silurian limestone, is the oldest formation to be found; but the subject is of sufficient interest, I believe, to merit its insertion.

Before proceeding to the report itself I would remark, that my investigations tally accurately with my esteemed and valued friend, Professor M. Tuomey's report of Alabama, dovetailing, if I may be permitted to use the term, in every respect into his; while this is by no means the case with regard to Dr. Troost's reports and map of Tennessee. In my opinion, the survey by the latter has created a very incorrect opinion of the geology of our South-western States. In his map we find almost the whole western half of Tennessee occupied by the cretaceous rocks, with no tertiary or alluvium whatsoever. In Mississippi there is no outcrop of the cretaceous in the northern portion of the State west of the eastern portion of Tippah, and, surely, geological formations cannot be supposed to take their course from the political boundaries of States! Dr. Troost may have discovered cretaceous limestone beneath the tertiary deposits in deep excavations or Artesian wells; but this does not afford sufficient grounds for omitting the superincumbent rocks in his map; for then we might place New Orleans on the cretaceous, because, in boring an Artesian well in that city recently, they are said to have penetrated this formation. Dr. Troost was, doubtless, misled by the fact that all this northern portion of the tertiary contains no fossils—at least, I was unable to discover any—and he may have regarded it as a recent accumulation of clay and sand, and, as such, may have thought it not worth while to allow it a place on his map.

I shall commence my report with the older rocks, and then gradually proceed with those of a more recent geological date, until we arrive at the alluvial deposits which form such a magnificent soil for the unsurpassable cotton plantations along the great "father of rivers."

The carboniferous limestone, or, possibly, a Silurian limestone, is the most ancient rock in the State. There is an outcrop of this limestone due south-east of Jacinto, the county seat of Tishamingo, where it is quarried for technical purposes. Unfortunately, I was unable to procure any fossils which might have enabled me to determine the exact geological position of this rock; and, as I proposed to make more accurate investigations afterwards, I contented myself with a cursory examination of

such places at the time. Judging from the nature of contiguous rocks, I should not hesitate to say that this is really the carboniferous limestone, and that the first outcrop of the Silurian group, which spreads so extensively over North Alabama, will be found further east and beyond the Alabama line.

The millstone grit has several outcrops, north-west, west, and south of the limestone just mentioned. Most of them are in Tishamingo, but some also in Itawamba county, the rocks being visible at the surface even at a considerable distance south of Fulton, the Court-house of that county. This outcrop I did not observe myself, but at the boundary line between the two counties, at Mackey's Creek, I saw this rock, and in such grand masses that it could not be mistaken by one who had just had the pleasure of enjoying a geological trip through North Alabama. The huge blocks of this rock are scattered along the bed of the creek; and thus the rushing water forms here and there beautiful cascades, and gives rise to the liveliest scenery of the kind in the State.

The coal measures have not yet been discovered in Mississippi, and I may pride myself on having been the first to call attention to their probable existence. It is impossible to say, without entering upon a more minute examination than I was able to do at the time, and perhaps even making use of borings, whether true coal may be found in Mississippi. The bearings, and the nature of the adjacent rocks—the millstone grit on the east, and the cretaceous deposits on the west—certainly prove to every geologist, that here coal may be expected to occur; but, as this part of the country is entirely covered by the continuation of that tertiary deposit which appears in Alabama, north of the cretaceous rocks, there is no surface evidence to prove whether or not the coal has given out at this point.* I drew the attention of the inhabitants of that part of Mississippi to the fact; but, having returned to South Carolina after resigning my office in Mississippi, I have been unable to ascertain whether my observations led to any useful results.

The older cretaceous, the green-sand, appears quite extensively, commencing at about the middle of Tishamingo, running almost due north and south through that county; on the one side passing into Tennessee, on the other into Itawamba county, where, however, it soon disappears under the tertiary, but must continue its course along the newer cretaceous to Alabama,

* I am particular in making this statement, partly because it is almost the only point of interest in the State for a mining periodical, partly because my reports, being ordered to pass through the hands of another officer, were so mutilated that, when read to the trustees of the University, I was made to say, that no coal could possibly be expected in Mississippi, although *it might be found in Alabama*, which every child in geology knows to be one of the richest coal States in the Union.

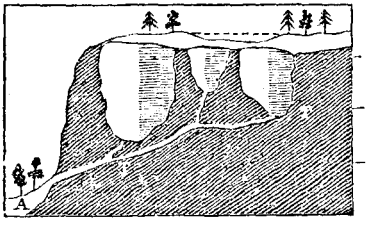
where it forms a northern fringe along the cretaceous limestone, running east and west through the State. Gentlemen residing in this portion of Mississippi informed me that they had discovered the valuable fertilizing qualities of the green-sand, and were using it in gardens, though, I believe, they had not extended its use to their fields, which, however, I urged them to do.

The cretaceous limestone, vulgarly termed the "rotten limestone," the rock of the prairies, embraces a very large portion of Mississippi; commencing in Tennessee, it enters Mississippi in the north-eastern corner of Tippah county and the north-western one of Tishamingo, and gradually widens towards the south, when it makes a curve and enters Alabama. The eastern boundary line in the county of Tishamingo is synonymous with the western margin of the green-sand, which is also the case in northern Itawamba. In the southern part of this county, where the green-sand is not visible, we find it adhering pretty closely to the banks of the Tombigbee, along which it passes through the counties of Monroe and Lowndes, and enters into Alabama east of Columbus. The western boundary of the prairie limestone takes a south-western course through Tippah, omits only a very small portion of Pontotoc and Chickasaw counties, grazes Yallabusha, divides Choctaw almost in the centre, includes nearly the whole of Winston and Kemper, a small angle of Neshoba, and a considerable portion of Lauderdale. The greatest breadth of this formation is between Choctaw and Lowndes counties. It is the richest in fossils in the State, if we take it in the aggregate; *exogyra costata*, and *gryphœa mutabilis*, being the most common. It furnishes some of the richest soils in the State, always excepting the alluvium of the Mississippi.

Of the tertiary there are two different fields; the one west of the cretaceous is, however, infinitely the most extensive, and embraces an area greater than all the other formations together. It stretches from Tennessee down to the coast of the Gulf of Mexico, and, in the southern portion of the State, extends from the Mississippi river to the Alabama line, except where, along the river, the alluvium encroaches upon it. The fossiliferous portion of this vast deposit seems to be confined to the bluffs near the river; and I have been unable to obtain a solitary fossil in the northern parts; still, the similitude between all these deposits and those of the far-famed locality of Vicksburg, as well as the majority of Southern tertiary rocks, leave no doubt of their geological date, nor is there any intermission, any material change, nor any other intervening formation. Ferruginous clays of a yellowish color seem to predominate; though, towards the south, there is a vast extent of sandy pine region. In the north, especially in the counties of Marshall, Tippah, and Lafayette, we find a very extensive and heavy deposit of a pure white pipe

clay. In some places it arrives at the immense thickness of seventy feet, but thins out towards the east. In this, or in close proximity with it, we find lignite, in more or less conspicuous quantities, and of a very dark color, so that it is not surprising that it should have been looked upon as veritable coal by those ignorant of geological facts and dates. In Attala county, at a place called Rockport, north-east of Kosciusko, we find a very substantial and firm tertiary sand-rock—a very fine-grained conglomerate, which differs considerably from the majority of the sand-rocks of this period, being far less loose in its construction. Nevertheless, from its position there is no possibility of its belonging to a more ancient formation.

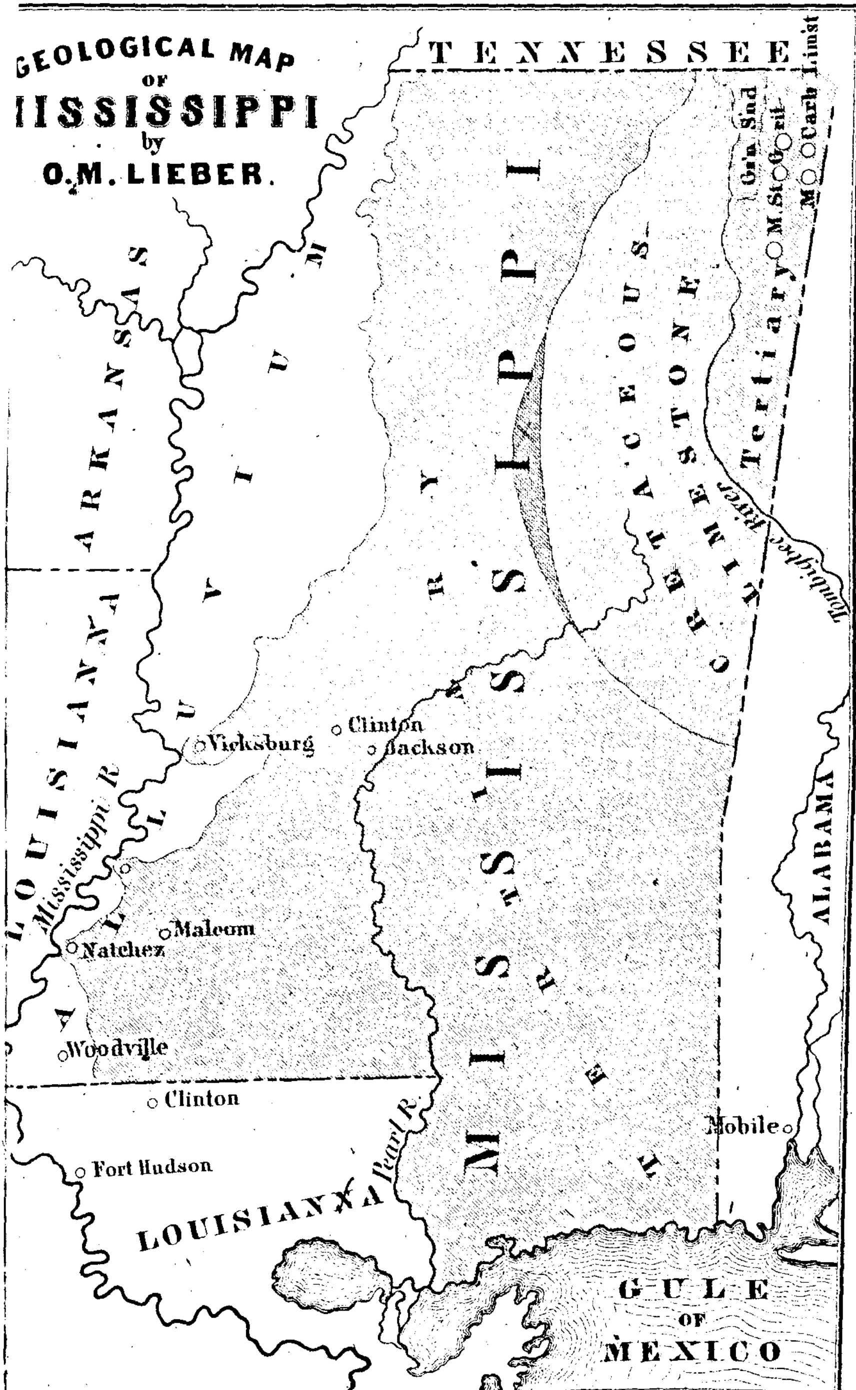
Along the boundary of the tertiary, in Tunica county, I observed a very remarkable geological phenomenon. For about one to two hundred feet from the precipice there occur immense basins of greater depth than width in most cases, and with almost perpendicular sides, a narrow, and very even and regular ridge running round them, so that the whole presents the appearance of a gigantic honeycomb. Some of these I roughly estimate as over a hundred feet deep. I can only account for the excavations by the water, which might accumulate in slight depressions, finding or making subterranean channels, like those represented in the figure, through which gradually the earth was carried along. In the figure, "T" represents the tertiary, and "A" the alluvium.



The alluvium of the Mississippi river covers a very large extent of country, the chief bulk of which, in the State we are discussing, lies in the northern half, and consists principally of an island, bounded on the west by the Mississippi, on the north by the Yazoo Pass, on the east by the Tallahatchee and one of its tributaries, and on the south-west and south by the Yazoo river. This embraces the counties of Tunica (almost entirely), Cochoma, Bolivar, Sunflower, Washington, and Issequena. The alluvium, however, extends beyond this island, and includes a portion of Tallahatchee, Carroll, Holmes, Yazoo, and Warren, where the northern alluvium is bounded by a peninsula of the tertiary, which forms a bluff at Vicksburg. Then we have three smaller portions of the alluvial deposits; the first commencing in Warren, south of Vicksburg, and ending in Claiborne; the second beginning at the Rodney bluff, in Jefferson, and ending at the Natchez bluff, in Adams; the third commencing south of Natchez, embracing the greater portion of Wilkinson, and thence passing into Louisiana.

The mineral wealth of Mississippi is confined to the possible existence of coal. Iron is there also, but not in sufficient quantities for practical purposes. Lead ore, in the shape of rich sulphuret, has been found; but with regard to this, I may refer to the same appearance of the metal all over our Southern States, where it is constantly met with in portions of the country where it is geologically impossible that it should naturally exist. Professor Tuomey, in his "First Biennial Report on the Geology of Alabama," page 43, makes the following remarks under the head of "lead ore:"—"Fragments of sulphuret of lead, or galena, are scattered throughout the State in a manner that would indicate some common origin. Had they been confined to the region of the Silurian or carboniferous limestones, one might refer them to the ruins of veins of this ore that are often found in these rocks; but they are equally abundant where this is impossible. I have specimens picked up on the surface of the coal measures, and others from Clarke county, where no such veins can occur. Pieces of considerable size are found in the vicinity of Indian mounds; and the belief is induced that the position of these scattered fragments may be traced to Indian origin." In a note, on the same page, he observes:—"All States from which Indians have recently departed have legends of lead and silver mines, that were known to, but afterwards hidden by them; and the tenacity with which these are believed and retained is truly surprising. Journeys have been undertaken to the West to ascertain the position of these mines, but hitherto without success. The Indians, being no geologists, located the mines—in the cases that have come to my notice—in the most unpromising positions. The men with mineral rods have been industriously on the trail. I must do them the justice to say, that where they indicated the presence of 'mineral,' the excavation was neither expensive nor difficult. The one I last saw was in an Indian mound, on Village Creek, where the miners had reached within one foot of the vein!" A hasty glance at the map will show that lead can only occur in a very small portion of the State.

Mississippi will never be essentially other than an agricultural State, and as such it takes precedence over most other States of the Union, and produces, in various places, a greater amount of cotton than can ever be made in older States. The richest soil is undoubtedly the alluvium. But of it we have two varieties, as already mentioned, an older and a newer one. The former is of a more bluish color, while the latter is of a deep chocolate brown, and for agricultural purposes the best. This, as a rule, is found nearer the river than the former. Next in value, as arable land, we have some of the superficial deposits above the tertiary—as near Vicksburg; but the surface consists of small, but very abrupt hills, so that the soil soon washes away. The original growth is cane, pecan, and ash. At one time this



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CONTINENTAL MINING COMPANY.

The following Board of Directors and Officers were elected by Continental Mining Company, on June 13th :—

Samuel W. Hill, Horatio Bigelow, A. H. Hanchett, W. F. Roelosson, E. P. Morgan, J. Venen Brown, and C. T. Harvey, Directors. Samuel W. Hill, President and General Superintendent. Horatio Bigelow, Secretary and Treasurer.

EMPIRE MINING COMPANY.

The following persons were elected Directors of said Company, on June 13th:—

Samuel F. Tracy, C. J. Stedman, D. Bethune Duffield, Sylvester Larned, and J. Venen Brown, Directors. Samuel F. Tracy, President. J. Venen Brown, Secretary and Treasurer.

RIPLEY COPPER COMPANY.

At the annual meeting of the stockholders of this Company, held at the Treasurer's office, Boston, May 17th, the following Board of Directors were unanimously elected :—

Henry Weld Fuller, of Boston; Stephen Ball, A. W. Spencer, Horatio Bigelow, and H. J. Bukley, of Detroit, Michigan. At a subsequent meeting of the Directors, H. Weld Fuller was re-elected President; H. Bigelow Secretary and Treasurer.

HOWARD MINING COMPANY.

At the annual meeting of this Company, held at their office, in Boston, June 5th, the following Board of Directors were unanimously elected :—

William S. Thatcher, of Boston; Benjamin F. Hallet, Benjamin Howard, Aaron Hobart, Jr., William E. Coffen, Edward F. Adams, and Luther W. Clarke, of Michigan. At a subsequent meeting of the Directors, W. S. Thatcher was chosen President, and Edward F. Adams Secretary and Treasurer. The stock is divided into 20,000 shares, the subscription price to which was $2.50 per share.

NEW ENGLAND COPPER COMPANY.

The annual meeting of the stockholders was held at the office of the Company, Nos. 9 and 11 Kilby street, Boston, June 5, when the following list of Directors was unanimously elected :—

G. P. Loring, of Boston; James W. Stone, William G. Howe, David Perkins, George S. Harris, Alvin Smith, of Enfield; Luther W. Clarke, of Michigan. At a subsequent meeting of the Directors, G. P. Loring was elected President, and G. S. Harris Secretary and Treasurer.

CLARK MINING COMPANY.

The following Directors were unanimously elected at the annual meeting, held at the Treasurer's office, in Boston, June 7th :—

John T. Heard, of Boston; Henry Mellus, J. W. Clark, H. Bigelow, and Walter A. Northup, of Michigan. At a subsequent meeting of the Directors, John T. Heard was chosen President, and Horatio Bigelow Secretary and Treasurer.