

tained by instruments. It has, however, been estimated by Mr. Tiffany, at 140 feet above the plane of the Chatauque lake. This may however be too little, as the high lands on the southern shore of lake Erie are from 1,000 to 1,300 feet above its surface; and most of the streams which originate on it, are from 600 to 1,000 feet above the lake. If the latter be correct, it would give a rise of 276 feet above the Chatauque lake, and the distance being 16 miles from Jamestown, the average ascent would be about 17 feet per mile.

77. The route from the sources of Goose creek, follows the valley of the French creek to Waterford in Pennsylvania; passes through Meadville, and enters the town or Kinsman, in Ohio, and through the villages of Warren and Ravenna, and ends at Akron, on the portage summit of the Ohio canal.

78. In the last distance, the route unites with the proposed canal to the harbor of Erie and is projected from the portage summit of the Ohio canal to Pittsburg, and by their means with the whole of the State improvements of Pennsylvania, and the city of Washington, by the route of the Potomac and Ohio canal, and by the Ohio canal with the whole extensive valley of the Mississippi and its tributaries.

79. The States of Ohio and Pennsylvania, and the United States, have made very extensive surveys for canal improvements in the last section of the route described, which completely demonstrates the practicability of the road from the sources of the French creek at Akron.

80. The La Boeuf lake is 1,218 feet; the Conneaut lake is 1,085; the source of the Mahoning and Grand rivers, is 912 feet. The Big Beaver river, at Warren, is 854 feet; and Champion's swamp, in its vicinity, is 1012 feet. The summit near Ravenna is 1,073 feet, and the Portage level is 974 feet, above tide. The fall, therefore, from the sources of Goose creek to La Boeuf lake, is 352 feet; the difference in level of the La Boeuf and Conneaut lakes, is 133 feet; and between the Conneaut lake and Champion's swamp, only 6 feet. The Ravenna summit is 67 feet above Champion's swamp, and 99 feet above Akron. The distance from the sources of Goose creek to La Boeuf lake, is 29 miles; and from the last point to Warren 65 miles, and to Akron 38 miles. The average slope of the road will not, therefore, in the first reach, exceed 13 feet per mile; and the remainder of the route might be graded less than three feet per mile.

81. The whole length of the road, if properly located, will not be more than 546 miles. Stationary engines will not be required at more than four places on the route, viz. at the Ramapo, Deer Park gap, between the Delaware and Susquehanna rivers, and between the Canistota and Angelica creeks. The total elevations and depressions of the route, will not exceed 6,507 feet. The streams crossed by the route, present no great width or difficulties. It will moreover, unite with ten extensive Rail-road and Canal improvements completed, and ten others projected, and with nine rivers navigable at certain periods of the year.

82. The elevations and distances as given, are believed to be correct, as they have been carefully collected from the official reports of civil engineers and surveyors, and from other public documents relating to State improvements.

83. If a Rail-road should be made from Elmira, on the Chemung river, to Williamsport, on the west branch of the Susquehanna, and continued so as to join the Rail-road leading to Philadelphia and Baltimore, it would open a more direct communication with those cities, than any other route suggested or completed, and would be one of the links in a great line of Rail-road communication extending from New Orleans to Buffalo. The distances to Philadelphia and Baltimore, would not exceed 270 miles, while the present route to the first point is 374 miles, and the latter 394 miles, and are embarrassed with a dangerous and uncertain navigation.

84. In the course of a few years, it is not unreasonable to expect a Rail-road communication between the cities of New York, Philadelphia, Baltimore, and Washington; and, in conjunction with the works we have been considering, numerous mail avenues will be opened throughout the country. If the United States should not, therefore, be able to secure an interest in those works, or be able to control them, the transportation of the mail will be monopolized by private companies who will secure their own terms, or the community will be placed under great inconvenience by the Government permitting the mail to be carried in less time and certainty than it can be on those roads.

85. The resources of the country, in the sphere of the route of the proposed road, is very great.— Judge Wright, in a report, in alluding to the canal line in the valley of the Delaware river, says: "My opinion is, if a canal was carried no further than Deposit, it would be, in a very short time after being completed, a very profitable work."— From a personal examination, a few years ago, of the valley of the north branch of the Susquehanna, I am fully sensible of its fertility and its capability of sustaining almost any reasonable improvement. Judge Bates, in alluding to the Chemung valley, and its resources to sustain a canal which would cost one million of dollars, says: "In less than five years after its completion, it will yield a surplus revenue beyond the interest on the capital and the repairs of the work." Judge Geddes, in his report on the Chemung canal, alludes, in high terms,

and New York; and William H. Bull, in his report on the Crooked Lake and Bath canal, says: "It will accommodate a country 70 miles in length extending from the east line of Alleghany county to Geneva, and also the country bordering on the Crooked Lake, containing a population of more than fifty thousand inhabitants." Judge Roberts, in speaking of the Genesee and Alleghany canals, says: "It would accommodate a large section of our country, whose superfluous productions are equal in quantity and qualities to those of any portion of the State." Doctor Whipple, and other engineers, speak in high terms of the Alleghany valley, and the country between it and Lake Erie. The best opinion of the fertility of the western States, may be formed from the numerous improvements projected or commenced to convey its surplus productions to the Atlantic cities. But if lateral improvements will produce such great results as are anticipated, how much more profitable will be one which passes from the east to the west, and communicates with them all?

86. The country in the vicinity of the route, abounds in minerals of the most useful and valuable kinds. "The anthracite coal is found on a line extending from the head waters of the Lehigh and Schuylkill to the Susquehanna at Wyoming, and from thence nearly to the Blue ridge." Mr. Meredith calculates that, if the consumption of coal was one million of tons annually, it would require 647 years to exhaust it.

87. Anthracite coal can be used in the manufactories of salt, in distilleries, in furnaces, in cotton, and woollen manufactories, and by the blacksmiths. It is also valuable as fuel, and for culinary purposes.

88. At Belmont mines, Mr. Meredith states, that iron stones are found in circular masses, and weigh from 10 to 50 pounds, and will yield from 30 to 50 per cent. of metallic iron.

89. And in a very interesting paper, he says, "The transition region appears to extend from Berwick, 24 miles below Wilkesbarre, in a northerly direction, to the Otsego lake. Its length is nearly 160 miles, and its breadth from Nanakeating hollow, westward to the ridges of the Alleghany, will exceed 110 miles. In all this extensive region there is no limestone, no gypsum, no salines, in any quantity."

90. "A great part of the country, where the lime, the salt, and the gypsum will be used, is susceptible of a dense population, although it is at present thinly inhabited and badly cultivated; that a large part of its surface is covered with forest; that its streams are only navigable at one or two seasons of the year, and that it is destitute of all active trade and coal markets."

91. At Towanda, on the Susquehanna, and at Canal Port, on the Chemung river, and at Olean Point, on the Alleghany, and in the county of Portage, in Ohio, bituminous coal in large and rich mines are found and worked.

92. Iron ore, in extensive beds and masses, have been discovered at various places, and they have been pronounced by those who have examined them, to be equal in quality to any discovered in this country or Europe; and bismuth and copper, and galena, have been found, and gold and silver ores in small quantities, on Pine Creek near Canal Port.

93. On the north side of the mountain, near Canal Port; sulphate of iron occurs in the strata of coal. In the valley of the Genesee, silicious rock is found suitable for making glass of the finest quality; and quarries of stone of the most durable

and useful kinds, are dispersed over this interesting region. The forests are stored with trees of every description, suitable for ship building, for carpenters', and for ordinary and ornamental works. The soil is also rich for cultivation and for pasturage, and the climate is salubrious; and the country is capable of sustaining a dense and busy population, which must be the case whenever a secure and cheap avenue is opened from it to our tide waters.

94. This interesting region is, however, suffering great inconvenience from its sequestered condition: in an able address to the Legislature of the State of New York, some of them are exposed; and, as they have a strong bearing on the merits of the improvement and condition of the citizens in the northern counties of Pennsylvania, and the southern ones of New York, I shall quote from it.

95. "Those who reside in the vicinity of the canal now in full enjoyment of a permanent, safe, cheap, and easy route, for the conveyance of their produce to market at a cheaper rate than in former years; when the markets are favorable, they return home enriched; when they are unfavorable, they return without loss."

96. "But the situation of those who cannot use the navigable waters, are far different: it is in winter only, through storms and bad roads, they can venture with their produce to market. If the snows fail, which they often do in our variable climate, the surplus of their husbandry is lost, the toil and labor of the past year are gone for nothing. If transportation in wagons is attempted, it costs not only the expected profit, but the capital itself."

97. "By means of the Erie canal, Rochester, at the distance of 400 miles from the city of New York, has been brought nearer market than Delaware at 180 or 100, and its products are enabled, in consequence, to compete with the settlements of the south, and by the diminished expense of transportation, to drive their products almost wholly from that market."

98. It has been said by some few persons that the proposed improvement would injure the business of the Erie canal. Those who advance this opinion can have reflected but little on its solidity, as it could not injure, but must manifestly benefit that work: for the gypsum, salt and lime of the western counties of New York, would be exchanged for the minerals found on the Susquehanna and its tributaries. It has also been urged by many writers, that the Erie canal will, in the course of a few years, be unable to pass the immense trade which will be concentrated on it; and that a second improvement will be required by the public interest.

99. I cannot, however, but remark, that in the course of a few years the canal debt of the State of New York will be paid. It is then reasonable to be supposed that the tolls will be reduced on all freights. In that event, transportation will most probably be done cheaper on that work than on any new improvement in its vicinity, which will require a heavy expenditure of capital, and entering directly into competition with the canal. It is true, that a Rail-road would possess greater speed and certainty than the old work. But the former will be embarrassed by the outlay of six or seven millions of dollars, and will accommodate the same population and lands as the canal. Is it, therefore, unreasonable to apprehend that the new improvement will be unproductive to its proprietors, and that it will not accomplish the ends proposed by its construction.

100. The Rail-road, on the proposed route, is, happily, so far separated from the Erie canal, as to be beyond the reach of its influence on its prosperity, as it will benefit distant districts and populations.

101. A Rail-road in the vicinity of the Erie canal will not accommodate the country on the route examined. It would also, by ending at lake Erie, be embarrassed by ice in the spring and fall.—Freights would also be taxed with insurance against storms and casualties in the lake navigation, and troubled with transshipments, and uncertainty in arrivals and departures. The road would also present, at certain periods of the year, a broken line of communication, and would entail an increased distance in the travel between the east and the west, of more than one hundred and eighty miles.*

102. The above remarks are dictated in a spirit of sincerity, and from a conviction that the district traversed by the Erie canal does not require, at this day, any further improvement but lateral communications with that work, to promote its prosperity and business. If this opinion be erroneous, I shall

* Examined by George W. Hughes, Esq. U. S. Assistant Civil Engineer.
† See Mr Hughes' interesting geological report.

* If it should end or pass through Buffalo, N. Y.