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HAND-BOOK

OF THE

State of North Carolina,

EXHIBITING

ITS RESOURCES AND INDUSTRIES.

PREPARED UNDER THE DIRECTION OF

THE BOARD OF AGRICULTURE.

RALEIGH:

ASHE & GATLING, State Printers and Binders.

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1883.

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DEPARTMENT OF AGRICULTURE,

COMMISSIONER'S OFFICE,

RALEIGH, February 8, 1883.

HON. T. J. JARVIS,

Ex-Officio Chairman of the Board of Agriculture :

SIR: The new Hand-Book of North Carolina, prepared by order of the Board, is herewith submitted. The injunction of the Board, that nothing should be admitted into the book except what relates to the material interests of the State, has been strictly observed.

A desideratum, the want of which has been long felt, has been attempted to be supplied in this volume. From 1824 to 1876, each included, several reports upon the geology of the State have been made. They were all the work of men eminent in that science, to wit: Olmsted, Mitchell, Emmons and Kerr. The surveys and accompanying reports were made at a cost, in the aggregate, but little if at all less than an hundred thousand dollars. They were made for the purpose of bringing before the world the material resources of the State. And yet to day scarce any of these books can be had. Of the reports of Dr. Olmsted and Dr. Mitchell, there are very few copies in existence, none are on sale. Of the report of Dr. Emmons upon the geology of the State proper the number of copies is so small that it sells at an extraordinary price; of that made by Prof. Kerr not more than twenty copies remain. The results of so much scientific labor and of such large expenditure are thus practically lost. The privation is keenly felt at the present period, when inquiries and investments in mineral properties are tenfold more active than before. To supply this want has been one of the aims of this book. All these reports have been diligently studied, and the attempt made to separate the economic geology—that which bears upon the industrial necessities of life—from that which is purely scientific in character and aim.

The former has been embodied in this volume, according to the best ability of the writer, so as to present the rich stores now locked up in these reports in such a manner as not only to interest the general reader, but to meet the demand for specific knowledge upon such subjects. It will be a proud thought to the writer if the labor thus

bestowed shall tend to diffuse among our own people a better knowledge of the State; for such knowledge can only result in a higher appreciation and a greater love of it.

It has been an object throughout to bring the subject matters treated of in the volume within moderate limits; but the hope is indulged that upon the points of climate, soils, productions, natural and cultivated, of the State, her government, her institutions—indeed, upon every point of interest to an intending immigrant, satisfactory information may be had.

A part of the volume—that containing the very valuable body of statistics relating to almost every interest of the State, with the matter introductory thereto—is the work of Mr. P. M. WILSON, the Secretary of the Board.

In parting with a work which in its researches and inquiries has afforded a grateful employment for several months, when not engaged in office business, I would be untrue to my own feelings, if I failed to express my high sense of the patriotic devotion of the members of the Board to the great interests of the State confided to their charge, and my grateful acknowledgment to yourself personally for every facility given for the execution of the task committed to me.

I have the honor to be, with great respect,

Your obedient servant,

M. McGEHEE,

Commissioner.

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HAND-BOOK

OF THE

State of North Carolina.

GENERAL SKETCH.

The State of North Carolina is bounded on the North by Virginia, East by the Atlantic Ocean, South by South Carolina, and West by Tennessee. It is included nearly between the parallels 34° and $36\frac{1}{2}^{\circ}$ North latitude, and between the meridians $75\frac{1}{2}^{\circ}$ and $84\frac{1}{2}^{\circ}$ West longitude.

The extreme length of the State from East to West is $503\frac{1}{4}$ miles, its average breadth is 100 miles; its extreme breadth is $187\frac{1}{2}$ miles. Its area embraces 52,286 square miles, of which 48,666 is land, and 3,620 is water.

Its topography may be best conceived, as has been observed before, by picturing to the mind's eye the surface of the State as a vast declivity, sloping down from the summits of the Smoky mountains, an altitude of 7,000 feet, to the level of the Atlantic Ocean. The Smoky mountains constitute a part of the great Appalachian chain, which here attains its greatest height; the greatest, indeed, in the United States, East of the Rocky mountains. This slope is made up of three wide extended terraces—if that term may be allowed; the first a high mountain plateau—distinguished as the Western or Mountain Section; the second, a submontane plateau, distinguished as the Middle Section, of which the western half is further distinguished as the Piedmont Section; the third, the Atlantic plain, distinguished as the Low Country or Eastern Section, and that part from the head of the tides downward as the Tide-water Section. From the first to the second section there is a sharp descent through a few miles only of not less than fifteen hundred feet; from the middle to the low country a descent of about two hundred feet; through the two latter, however, there is a constant downward grade.

The State is traversed by two ranges of mountains. The first the Blue Ridge, a grand and lofty chain, which, conforming to the trend of the Smoky mountains and that of the coast line, runs in a direction N. E. and S. W. entirely across the State. The Brushy and the South mountains are bold offshoots of this chain. The second, the Occoneeche and Uwharrie mountains, a range of much inferior elevation—whose rounded summits and sloping outlines present themselves in forms alike graceful and pleasing—crosses the State in a parallel direction near its centre.

The State is watered by numerous rivers, many of which have their rise on the flanks of the Blue Ridge. Those which flow West empty into the Mississippi, breaking their way through the Smoky mountains, plunging headlong for miles through chasms from three to four thousand feet in depth, the walls of which are perpendicular to the height of one thousand feet. Some of these gloomy passages have never been explored; no boat could live in such a current, and no foothold can be found along the sides. Of those which rise on the Eastern flank only one, the Roanoke, reaches the sea within the borders of the State. The rest, following the line of the softest rock, meander first towards the Northeast, then sweeping round with bold curves, flow to the sea through South Carolina. The principal rivers which reach the sea within the State limits take their rise in the Northern part of the middle section, and on the Eastern flank of the Occoneeche range near its Northern termination, and of these only one, the Cape Fear, flows directly into the ocean. Many of the rivers in every part of the State are noble streams in their middle course; some of those that flow into the sounds swell to majestic proportions, spreading out to a width of from three to five miles. The eastern rivers are navigable from fifty to one hundred and fifty miles.

By reference to the mean parallels of latitude of the United States it will be seen that North Carolina is situated nearly midway of the Union; and inasmuch as those States lie entirely within the temperate zone, it follows that North Carolina is situated upon the central belt of that zone. This position gives to the State a climate not excelled by any in the world. She is exempt from the extreme cold which prevails in the Northern States, and to a considerable extent from the early frosts which visit the States immediately North of her, on the one hand; and from the torrid heat and malarial influences which prevail in the States to the South of her on the other. Other causes apart from its position concur to produce this result. On the West

the lofty Appalachian chain interposes its mighty barrier between the bleak winds of the Northwest and the general surface of the State. On the East the coast is swept by the Gulf Stream, the meliorating effect of which is felt far inland. From these causes combined the temperature of the seasons ranges within moderate limits. The Spring comes in with less of those fickle variations which mark its advent elsewhere on this continent. The Summers are not oppressive, even in the low country, or if so, for a few days only. But in the Autumn nature here exhibits herself in her most benignant mood in her most favored zone. From the incoming of October to the latter part of December there is an almost uninterrupted succession of bright, sunny days, during which the air is dry, crisp and pure—a season equally favorable to the ingathering of the crops and to active exertion of every kind. The reign of Winter as respects cold and wet is short, and field labor is carried on throughout that season, with the exception of two or three days at a time. Frost makes its appearance about the fifteenth of October, and sometimes, as in the present year, there is not enough to nip the tender vegetation until the end of November. From the Blue Ridge to the seaboard, ice rarely forms of a thickness to be gathered except in localities overhung and deeply shaded by high southern bluffs. When snow falls it covers the ground for only a few inches, and is quickly dissipated by the sun. Fogs are of rare occurrence, and then mainly in the form of a belt of light vapor marking the course of the larger streams in the latter part of Summer and during the Autumn months. The average rainfall throughout the State is fifty three inches, which is pretty uniformly distributed through the year.

Dr. Kerr, in his Geological Report, classes the climate of the different sections of North Carolina with reference to their isothermal ranges, as follows: "Middle and Eastern North Carolina correspond to Middle and Southern France, and Western North Carolina to Northern France and Belgium. And all the climates of Italy, from Palermo to Milan and Venice, are represented."

For a thorough understanding it will be necessary to take a survey of the different sections more in detail. It has been seen that the divisions of the State are founded on natural and physical peculiarities.

Eastern Section.

The whole eastern portion of the State belongs to the quaternary system, with frequent exposure along the rivers, ravines, and ditches of the cocene and miocene epochs of the tertiary. It consists of a vast plain, stretching from the sea coast into the interior of the country, a distance of from one hundred to a hundred and twenty-five miles. Travelling this section from North to South are tracts of country which vary little from a perfect level. The Wilmington and Weldon Railroad has a stretch of forty miles where there is neither curve, excavation nor embankment. From East to West the surface rises by easy gradations at the rate of a little more than a foot to the mile. The rise, however, is not perceptible to the traveller. But though level in parts, it is in general relieved by slight undulations. In its extreme Western part in the county of Moore, it attains an elevation of above five hundred feet.

The Western boundary may be roughly defined by a line extending from the Western part of Warren, through Franklin, Wake, Cumberland, Chatham, Moore, Montgomery and Anson. This line marks what, at an early period of the earth's history, was a line of sea beach. Over this whole section the primitive rocks are covered with a deep stratum of earth, principally sand. Along the Western border there is a broad belt of unequal width, but generally from thirty to forty miles across, where granite, slate and other rocks are sparingly distributed: they are also found near water courses in the interior of this section. The belt of primitive rock here mentioned extends to the Wilmington and Weldon railroad, from the Virginia line to Goldsboro, and from thence to a line drawn through Averagesboro to the South Carolina line about where the Pee Dee enters that State. From the line there indicated to the sea coast, not a stone of any size, scarcely a pebble, except at a few points, is to be met with. There is a rock peculiar to this section formed by the combination of the calcareous element of sea shells, and the silicious matter of sand. It is full of cavities—the prints of decomposed shells—and is used to some extent as mill stones.

This section is made up of beds of clay and sand with vast quantities of shells imbedded in them. The soil varies in character to the extent that the one or the other predominates; and to the extent that the shells when intermixed with it, have undergone decomposition.

The upland soil is for the most part a sandy loam, easily accessible to the sun's rays, easily worked, and very productive in the crops there cultivated. There are, however, extensive areas of country where sand predominates to such a degree that the surface to a considerable depth is a bed of white sand. Yet this kind of land is the favorite habitat of the long leaf pine. When cleared it yields good crops of corn and cotton for a few years without manure, and always with slight help from proper commercial fertilizers. There are other extensive areas where clay enters so largely into the soil as to form a clay loam. The counties on the North side of Albemarle Sound—a very fertile tract of country—are examples of this class. The alluvial lands of this section—lands always in the highest degree productive from the fact that all the elements of fertility are intimately intermingled by having been once suspended in water—are of unusual extent and importance. The grain grown there supplies food not only for people of other parts of the State, but large populations in other States. There are other extensive areas where the shells of the Eocene era of the Tertiary formation—and which have been decomposed by time—crop out to the surface and impart to the soil a high degree of fertility. This is the case from the eastern part of Jones county to the Cape Fear. The greater proportion of the good lands in Jones depends upon the fact that this formation is largely developed there. The rich lands of Onslow, and of Rocky Point, in New Hanover, owe their excellence to the same cause. Another class of land in point of fertility equaling any in the world is that reclaimed from some of the lakes of this section. To two of these the process of drainage has been applied—lake Mattamuskeet, and lake Scuppernong (Phelps). By canals dug from the lake to the nearest stream which afforded the necessary fall a wide margin entirely round the lake has been brought into cultivation. These lands seem to be absolutely inexhaustible. The cultivation of three quarters of a century has made no change in their productive capacity. To the lands reclaimed from the borders of marshes—so frequent near the sea shore—the same remark may be strictly applied.

Another class of land remains to be mentioned which will be a resource of inestimable value in time, perhaps not distant. Bordering on the sea and sounds are extensive tracts of country designated as swamps. Though so-called they differ widely in their characteristic features from an ordinary swamp. They are not alluvial tracts, neither are they subject to overflow. The land covered by many of

them lies for the greater part quite low ; but this remark seldom applies wholly to any of them—to some does not apply at all. On the contrary many of them occupy the divides or water sheds between the rivers and sounds, and are elevated many feet above the adjacent rivers of which they are the sources. These latter are susceptible of drainage, and when reclaimed have every element of the most exuberant and lasting fertility. Bay river swamp, between Pamlico and Neuse rivers, and Green swamp in Brunswick and Columbus counties may be mentioned as examples. The elevation of the latter is forty feet above the sea level. The work of drainage is simple. From the border of the swamp which is always the highest land, the bottom slopes in every direction gradually, almost imperceptibly to the centre. A canal cut through this border into the swamp and carried to some neighboring stream, lays bare an extensive belt along the entire border. The aggregate territory in the State known as swamp lands is between three and four thousand square miles. When drainage shall be properly carried out over this great territory—a work which, on account of the slight difficulties to be encountered as compared with those which they encountered and overcame would be deemed trifling by the laborious North German and the indefatigable Hollander—hundreds of square miles of land of surpassing fertility will be added to the area now in cultivation.

Throughout this entire section cotton, corn, oats, sorghum, peas, potatoes, especially sweet potatoes, are the staple crops. Upon the rich alluvions and the reclaimed lake and swamp lands, corn, with peas planted in the intervals between the corn, forms the exclusive crop. Occasionally on the broad low-grounds of the Roanoke, wheat is grown to a considerable extent. In the counties on the North of Albemarle sound it is one of the staple crops. On the low-grounds of the lower Cape Fear rice has long been the staple crop, and during recent years its culture has been extended northward along the low lying lands of the rivers and sounds. The upland variety of rice has been introduced within a few years past with entire success. The cultivation of jute also has been the subject of experiment with like success ; and it only needs proper encouragement to be grown to any extent. This section is every where under laid with marl—a mixture of carbonate of lime and clay formed by the decomposition of the imbedded shells—sufficient in quantity, when raised and applied to the surface, to bring it to a high pitch of fertility and maintain it so. Its metallic substances will be elsewhere noticed.

If the indications of nature are to be relied on, North Carolina was plainly marked out as the land for vineyards. In the sober narrative of the voyage of Amadas and Barlowe made in 1584 to North Carolina, then an unbroken wilderness, the author tells us: "We viewed the land about us, being where we first landed very sandy and low towards the water side, but so full of grapes, as the very beating and surge of the sea overflowed them, of which we found such plenty as well there as in all places else, both on the sand and on the green soil, on the hills as in the plains, as well on every little shrub as also climbing towards the tops of high cedars, that I think in all the world the like abundance is not to be found; and myself having seen those parts of Europe that most abound, find such difference as were incredible to be written." Upon the visit of the voyagers to the house of the Indian King on Roanoke Island, wine was set before them by his wife. It is further mentioned that, "while the grape lasteth they (the Indians) drink wine;" they had not learned the art of preserving it. Harriot, a distinguished man in an age of distinguished men, of whom it was justly said that he cultivated all sciences and excelled in all, visited the same coast in 1586, where he was struck with the abundance of grape vines, and he was impressed with the fact that wine might be made one of the future staples of the State. "Were they," he writes, "planted and husbanded as they ought, a principal commodity of wines might be raised." This State has proved to be far richer in this respect than it is probable even he suspected. Grape vines were found in equal profusion in the original forest throughout the State. They often interlaced the trees to such an extent that they were a serious impediment to the work of clearing away the forest, catching and suspending the trees as they were felled. At this day if a tract of forest is enclosed, and cattle of every kind excluded, they spring up spontaneously and thickly over the land. Some of the finest wine grapes of the United States, the Scuppernong, the Isabella, the Catawba and the Lincoln, are native to this State. But it was long before the bounty of nature in this regard was improved. This was probably due to the fact that the State was settled almost wholly by emigrants from the British isles, who knew nothing of the culture of the vine. It was planted here and there to yield grapes for table use; but it was not until within thirty years that a vineyard was known in the State. Within that period several of large and a great number of small extent have been planted. Grapes in season are abundantly supplied for domestic consumption, and shipped in

hundreds of tons. The wines of the established vineyards are held in high and just repute.

All the cultivated fruits and berries grow here in great perfection with the exception of the apple. This, though by no means an inferior fruit, is yet not equal in size and flavor to that of the Middle and Western sections. Among the swamps the cranberry is found in profusion. The melons are of every variety and of peculiar excellence.

An industry peculiar to this section is what is known as the "trucking business." It consists in rearing fruits and vegetables for the Northern markets. The principal centres are Goldsboro and Newbern; but it is probable that the farmers along the line of the Norfolk and Edenton railroad will become successful competitors for this business. All the conditions for success are found there—a fertile soil and quick transportation.

Each section of the State embraces a great number of trees largely used in building and the domestic arts not mentioned here; only those are here mentioned the timbers of which are exported beyond the State, or which have become the subject of extensive home industries. For a complete list of the timber trees of each section the reader is referred to the table on a subsequent page. Some of them are known by different names; the botanical name is therefore added for the purpose of identification. The trees used for shade and for the adornment of pleasure grounds are omitted altogether.

In speaking of the timber trees of this section the first place is due to the *long-leaf pine*. It is the most valuable of all trees. Apart from its products—turpentine, tar, rosin and the spirits distilled from the turpentine—its uses in civil and naval architecture defy enumeration. The timber and its products were long, and are to-day, among the chief articles of export from this State. It alone has brought, and now brings, ships from every port of the world to Wilmington, the chief seaport town of the State. Considerable inroads have been made upon these forests contiguous to railroads and navigable streams. A vast reserve, however, remains for the use of future generations; it still covers a wide area in this section.

The *cypress* is next in importance. It is found everywhere in the swamps of the eastern part of this section. The axe has been diligently plied in the cypress forest for three-quarters of a century or more; its timber being amongst the most valuable for the frame and woodwork of houses, for shingles, for fencing and for water-pipes. Yet the margins of the swamps only have been cleared. Beyond this

margin is an immense forest of these trees which has been scarcely encroached upon. Its height is from sixty to one hundred feet, with a circumference above its swollen base of from twenty to thirty feet—often much larger.

The *white cedar*, commonly called juniper, is also abundant in the swamps. For the many uses to which the timber of this tree is applied, as for building, for water vessels, &c., these forests have been as much cut into, and for as long a time, as that of the cypress; but the supply is inexhaustible. The tree is from seventy to eighty feet high, with a diameter of two to three feet.

The *live oak*, so highly prized for ship building, is found all along our coast, though most abundant from Hatteras southward. It is commonly forty to fifty feet high, and one to two feet through the trunk.

The mainland terminates not at the sea, but at large bodies of water termed sounds. These sounds answer very slightly to the sense in which that word is employed by geographers. As employed by them the word *sound* designates a strait between the main land and an isle, or a strait connecting two seas, or connecting a sea or lake with the ocean. These sounds are properly narrow seas. They are separated from the ocean by a barrier of sand, called "The Banks," which stretches along the whole coast, except at Beaufort, and at the mouth of the Cape Fear. Between these sounds and the ocean are a few narrow passes termed inlets.

The largest of these sounds are Pamlico and Albemarle; the former about seventy-five miles long, and fifteen to twenty-five miles wide; the latter in length about fifty, and in breadth from five to fifteen miles. These sounds abound in fish of the finest varieties, but the principal fishing stations are in Albemarle sound. The volume of water poured in at the head of this sound by the Roanoke and Chowan rivers renders its waters fresh, except at its eastern limit. Here the migratory fishes—especially the herring, shad and rock (bass)—repair at the spawning season in such numbers as to rank it among the best fishing grounds on the Atlantic coast. The business is conducted with an enterprise, system and outlay of capital proportioned to its magnitude. The seines are from a mile to a mile and a quarter long, and are carried out and drawn in by steam power. From eighty to a hundred thousand, and some times two hundred thousand and more are caught at a single haul. The shad and rock are packed in ice and exported to the Northern cities. The herring are cured in salt and stored in barrels for the home and distant markets. Along the southern

coast of the State other varieties of fish are taken in great quantities. The mackerel, the mullet, the sheepshead, the trout, the blue fish and pig fish are among those most esteemed for their flavor. All kinds of shell fish are abundant and fine.

The sounds are the resort also of vast quantities of water fowl, notably ducks and geese; but it is in Currituck sound that they are found in greatest quantity. A number of small islands dot the shallow waters of the eastern side of this sound, where the wild celery and many kinds of grasses flourish in profusion. These are the favorite haunts of the mallard, red-head and canvas-back ducks. They frequent these islands and shallow waters in incredible numbers. When feeding they cover this part of the sound for miles; when they take wing they present the appearance of a vast black cloud. Hunting these fowls (which command a high price) gives profitable employment to many people. This region is the paradise of the amateur sportsman, and clubs of Northern gentlemen have lodges there, to which they regularly repair at the proper season for hunting.

The inlets connecting the sounds with the ocean have shifted very much since the country was first settled. Some that were navigable for vessels of considerable size have closed; and those that remain are navigable for vessels of slight burden only. The effects of these changes operated formerly as a great restriction upon the commerce of the northern half of our coast. These obstructions have at length given way before the spirit of enterprise and the progress of invention. A canal now connects the waters of Albemarle sound with Chesapeake bay, and steamers ply to every point from Newbern to Norfolk. This region of country, though once locked up, is now fully laid open to commerce; few indeed possess such ample facilities for transportation. In addition to this line of steamers there is another by the Chowan and Blackwater rivers, connecting with the Seaboard and Norfolk railroad. Lastly, a line of railway has been constructed within the present year from Edenton to Norfolk.

The Banks, as has been said, girdle the whole coast of the State, a distance of over three hundred miles. Though they shoot out from the northern extremity as a long narrow peninsula, they are broken in their course into a number of islands. They vary in breadth from one hundred yards to two miles, and in height from a few feet above the tide-level to twenty-five or thirty feet. Consisting as they do of pure sand, there is little cultivation of any sort. A few stunted trees are scattered over the more elevated parts, and occasionally, as at a

point a few miles North of Nag's Head, there are forests of long-leaf pine covering hundreds of acres that compare in size and height with any on the mainland. The subsistence of the inhabitants is generally derived from fishing, in which they are bold and expert. They do not shrink from an encounter with the whale. In the early history of the State its coast was noted as one of the resorts of the whale. Lawson, who lived many years in the Eastern part of the State, in the early part of the last century, says: "Whales are very numerous on the coast of North Carolina." A few still visit it, and a season rarely passes without one or more being harpooned by the fishermen of Shackleford's Banks.

The possessions of these islanders consist mainly of flocks and herds. Some proprietors own several hundred head of sheep and large numbers of horned cattle. Many own large herds of horses which roam the sands in a state almost as wild as on the prairies of the West. The latter receive little attention from the owners except at the "penning season," when they are driven together and branded with the mark of the proprietor. Like the other animals they forage at will upon the coarse though abundant grasses of the salt marshes. It is a breed of great spirit and bottom. Many of them are finely formed, and on account of their docility when well broken, and their powers of endurance, high prices are paid for them.

Formerly, when commerce was carried on exclusively in sailing vessels, this coast was justly dreaded, for shipwrecks were frequent. Large profits were then occasionally realized by these islanders, though at great personal risk, in the way of salvage on goods rescued from the sea. But the introduction of steam vessels, and the establishment of signal stations, have rendered navigation so safe that a shipwreck is rarely heard of.

Middle and Piedmont Section.

The Middle Section extends from the Western boundary of the tertiary formation or Eastern Section to the Blue Ridge mountains, the western half of which, as already said, is distinguished as the Piedmont Section. It comprises nearly one half of the territory of the State.

In passing from the Eastern to the Middle Section there is a marked change in the general aspect of the country, in its natural and cultivated productions, and in other respects. The great Atlantic plain

is left behind, which, on account of the uniformity of its surface, partakes of monotony, even where most fertile. Here on the contrary is an endless succession of hills and dales. Every step brings to view some new charm in the landscape—some new arrangement of the rounded hills, some new grouping of the tracts of forest which still cover so large a part of the country. The hills indeed in their gracefully curving outlines present lines of beauty with which the eye of taste is never satiated. These are attractions which depend upon permanent features of the landscape, and which, though infinitely heightened in their effects by the verdure of Spring and Summer, are only brought into fuller relief by the nakedness of Winter. The variations of surface, though less defined at first, become more marked towards the West, and towards the Blue Ridge the country assumes a bold and even rugged aspect.

The long-leaf pine, so conspicuous in the Eastern Section, disappears, and is replaced by all that range of forest growth for which the State is so noted—a range in which there is scarce a tree that belongs to the temperate zone proper that is not only found, but found in abundance. If the two sections are viewed at the season when the crops are growing, the contrast is striking. Along with the long-leaf pine, the cotton crop, except on the eastern and southern border, has nearly disappeared also. Wheat, corn, sorghum, oats, buckwheat, barley and tobacco occupy the cultivated fields. In the Eastern Section hay and pasture crops have not been enough cultivated to impart any distinguishing aspect to the country. In the Middle Section clover and other grasses clothe the hills more or less; the larger bottoms are laid down in meadows; and commonly the narrow flats between the hills, made by the little branches or rivulets are sown in grass and present belts of richest verdure. The change is seen in the streams: those of the lowland are dyed to a sable hue by the decaying vegetation with which the soil there is charged; those of this section are as clear and pure as they flowed from their fountains, mirroring in their pools and longer reaches every object on their banks. A difference in the summer and autumn is felt in the air of the two sections. That of the lowlands, though kindly and not unhealthy, disposes somewhat to lassitude and inaction; that of this section is invigorating and wholesome, (being kept in perpetual motion at that season by gentle gales) and favors active exertion.

The hand of improvement is more visible in this than in any section of the State. This is chiefly due to two causes: 1st, Agriculture here was less dependent upon slave labor than in the Eastern Section.

The number of slaves was less, and in many communities within its limits—as those made up of the Society of Friends or Quakers—there were none. Hence agricultural industries which were prostrated there by the shock of the civil war—a shock from which it did not recover before years had elapsed—here sustained only a partial disturbance, and that for no long period.

2d. No part of this section was occupied for any length of time by hostile troops, and at the end of the war its means of subsistence were comparatively undrained. A basis was left for the resumption of industries. To this is to be added another advantage, the facility with which lands of the best class could be rented after the break up of the old plantation system. All the large proprietors after the loss of their slaves had more land than they could cultivate; the only use they could make of it was to let it to rent. To young and energetic men a golden opportunity was thus offered. They went to work stimulated by the desire to redeem the time lost during their service in the army, and by the hope of acquiring lands of their own. But every one had lost heavily; the impulse to repair those losses was universal; labor from the predominance of the white race here was not greatly inadequate to the demand; hence every kind of business was pressed on with spirit and zeal. The effect in a few years was to obliterate all the deeper traces of the war; then the work of improvement began, and has been steadily carried on. This section is now dotted over with thriving villages and towns. The homes every where indicate a high degree of thrift and comfort; an unusual proportion are built in modern style and tastefully painted. Nestled amidst yards and gardens enclosed with neat painted palings, flanked with orchards of fruit trees, in which a space is generally allotted to choice grape vines, they give abundant proof of ease, plenty, and in many instances of no small degree of luxury.

In this section nature has distributed her blessings with a bounteous hand. Its salubrity, the variety and value of its productions, its mineral wealth, its manufacturing facilities, mark it out as one of the most desirable abodes for man, and a future centre of great wealth and population. No where do the conditions which are friendly to health, to the finest physical development, to the successful exertion of industries of every kind, and to rational enjoyment, exist in greater abundance than here. Those bounties are visible only in part. The earth is stored with coal, iron, gold and other metals, ores and minerals. Explorations have demonstrated that these exist in such quantity that

localities in this section will become the seats of Mining and Manufacturing industries on a large scale when population and capital shall favor their full development.

Of the extent of these ores, metals and minerals full information will be given hereafter in this pamphlet.

The descent of the slope formed by the surface of the State is greatest in this section ; through its entire extent, from one thousand to twelve hundred feet. The rivers in their eastward flow down this descent make their way with a lively current varied with long reaches of comparatively tranquil water. Often times they force their way through huge barriers of primitive rock and there occur rapids and falls which afford the finest water powers.

These have been utilized to some extent by the erection of grist and flouring mills in every neighborhood, and cotton and woollen mills on some of the rivers. Within the last few years the number of cotton mills has largely increased. Those erected lately are spacious buildings, and equipped with the best machinery. Within the same period all or nearly all of the older ones have been enlarged, and new machinery put in. The day is not distant when this branch of industry will attain a great development here. In no other form have investments paid heavier dividends. The fact begins to be more and more recognized that within the cotton States there are advantages for the manufacture of that staple that cannot be found elsewhere. Here the cotton is at the door of the manufacturer, and the prime cost of the material is therefore less. Wages are less here than in the Northern States, and a lower rate of wages here affords a more comfortable living than a higher rate there ; for the necessaries of life are cheaper, and less of food, clothing and fuel are required. Less fuel, too, is required for heating the mill in Winter. The laborer can make substantial additions to his means of subsistence from his garden, which is always allotted here to the head of a family. Here there is no obstruction to machinery from ice in Winter, and no greater suspension of work from drought in Summer ; for our rivers are as long as those of New England and have as many tributaries. The original cost of the site and of the building here is very much less than the same cost there. The force of these reasons cannot be long resisted.

Woollen mills also have been established in this section, and though this branch of manufacture is yet in its infancy, the success which has attended the experiments that have been made, cannot fail to invite in-

vestments in this direction. Sheep husbandry cannot be said to have made even a beginning in this State. Sheep are a part of the domestic animals on every farm, but are reared for domestic supplies of meat and wool; the surplus only is sold. Yet the supply of wool would suffice for scores of such factories as are here. No pursuit would pay better than sheep husbandry in this State. The natural pasturage of the Mountain Section cannot be surpassed, particularly in the northwestern part of the State. Some of the most valued cultivated grasses are indigenous there, and all flourish with the greatest luxuriance. The quality of the goods turned out from the woollen mills of Salem, Bethania and Elkin show that the wool is adapted to the finest fabrics.

The wide range of the forest trees of North Carolina long since attracted the attention of botanists. It includes all those employed in the useful and many of those employed in the ornamental arts. Indeed, nearly all the species found in the United States, East of the Rocky Mountains, are found in North Carolina. Her wealth in this respect will be appreciated when the fact mentioned by that eminent botanist, Dr. Curtis, is brought to mind, that there are more species of oaks in North Carolina than in all the States North of it, and only one less than in all the Southern States East of the Mississippi. For the range of her forests the reader is referred to the lists embraced in this pamphlet. Those only are referred to here the timber of which, or their manufactured products, are exported from this section.

Of these the *white oak* is the most prominent, as being in most general use and most extensively serviceable. It is found from the coast to the mountains, but it is most abundant in the Middle Section. It is valuable for frame houses, for mills and dams, vehicles, agricultural implements, cooper's ware, ship building, and for all purposes where strength and durability are required. Tanners prefer the bark of this species of oak for preparing leather for saddles and other similar objects. It rises to the height of seventy or eighty feet, with a diameter of two to three feet.

The *white hickory*, too, is found in the forests from the coast to the mountains; but that of the Middle Section for weight, tenacity, strength, and for its capacity for receiving a high polish, is pronounced by experts to be superior to any in the world. It is used for mill cogs, screws of presses, handspikes, capstan bars, bows, hoops, spokes and handles of tools. There are large establishments here for the manufacture of spokes, rims and handles, which are sent everywhere. The

mature tree is about sixty feet high and eighteen or twenty inches in diameter.

The *white ash* is found in both the Mountain and Middle sections, but is manufactured for exportation chiefly in the latter. It furnishes the common timber used in light carriages, for the shafts, frames, and parts of the wheels. Flat hoops, boxes, and the handles of many instruments are made of it. It is the only material of oars, blocks of pulleys, cleats, and similar naval implements, in places where it can be obtained. It is fifty to seventy feet high, and two to three feet through.

The *elm* is found in each section, though most abundantly in the middle. For ship blocks it is of the highest value; for hubs of wagon wheels it is preferred to any timber. It is from thirty to fifty feet high, and twelve to eighteen inches through.

The *maple* is found throughout the State, but from its superior facilities for transportation, the timber is chiefly obtained in this section. The wood in old trunks is full of minute irregularities, like knots. These, if cut in one direction, exhibit a spotted surface, to which the name of *bird's eye* maple is given; while if cut in another direction, they produce a wavy or shaded surface, called *curly* maple. It is used in cabinet work, particularly for inlaying mahogany. The tree attains a height of fifty to eighty feet, and a diameter of two to three feet.

The *beech* is common here, and grows luxuriantly; but is most abundant in the Mountain Section, and will be reserved for particular notice under that head.

The *tulip* tree, or poplar—the wood of which is so highly esteemed for carving and ornamental work, for some kinds of furniture, and for coach panels—is native to all parts of the State, but is not so common in the lower section as the others. It is mentioned here because its lumber is chiefly cut and prepared in this section. It will claim consideration again under the head of Mountain Section.

The *persimmon* is found in all parts of the State; but it is here only that it is obtained to any considerable extent. It is employed for screws and many other implements. It is usually from thirty to forty feet high, with a diameter of eighteen to twenty inches.

The *black walnut* is most abundant in this section. It is used for furniture, for gun-stocks, for hubs, and in house and ship building. It is a majestic tree, and grows to exceptional size in the Mountain Section, under which head it will be referred to again.

The *yellow pine* is sparingly found in the Eastern Section, but enters largely into the composition of the upland forest through the Middle and Mountain Sections. Its uses are so familiar and universal as to need no enumeration. It is from forty to sixty feet high, with a circumference of four or five, and even six feet.

The *mulberry* tree though not valued for its timber, is so important in another respect as to deserve mention. It grows in all parts of the State, but is least abundant in the lower section. In the Middle Section it occurs so commonly that nature may be said to have laid the broadest foundation for the cultivation of silk there.

This does not exhaust the list; but it will serve to give a clearer idea of the timber resources of this section. But though the materials for this branch of manufacturing abound here, a beginning only has been made. There are establishments for making wagons and pleasure vehicles, excellent both for material and workmanship; but great numbers of these are still brought in from other States. One branch of wood manufacture is prosecuted here with spirit and success—that of spokes and rims for carriages, and bobbins and similar implements used with the machinery of Cotton and Woollen Mills. These are sent off in great quantities to distant parts of the United States, and to Europe and Australia.

The branch of manufacture which has been most fully developed here is that of tobacco. The kind of tobacco chiefly used in these factories is known as the *golden leaf*. It is a unique product which originated in this section and is still mainly grown here; though its cultivation has been widely extended into the mountain section. The effects of this industry have been striking. Villages and towns have grown up at short intervals within a few years on the principal lines of railroad where the large warehouses and factories, the handsome churches, school-houses, residences and stores give evidence of high prosperity. In some of these towns almost the whole business consists in prizing and manufacturing this commodity into different forms for the markets of the world. Of the productions of the State none are manufactured at home to the same extent as tobacco. The fruits of it in the general prosperity which the factories have diffused around them, give proof of what the State will be when its various commodities shall be even partially manufactured within its limits.

The cultivation of fruits of all kinds has been long pursued in this section with skill, energy and judgment. Its wonderful adaptation for fruits was early discovered, and many nurseries were established for

rearing the young trees. Here the native fruits were perfected; choice foreign kinds introduced; and new kinds originated. The enterprise of the nurserymen has planted the finest fruit trees—as the apple, the peach, the pear, the apricot and the cherry—about every dwelling in this section, and widely beyond it. Nor have the garden fruits—as the fig, the currant, the raspberry and the like—received less attention. The supply of every kind for home consumption is unlimited; that of peaches and apples such that large quantities are fed to hogs. Here too as in the eastern section the grape is an object of special culture. They are grown for the table at home, and for the market. There are in this section several vineyards, some of which have an established reputation for their wines and brandies. Grapes are, however, grown mainly for the market. The genial soil and climate of this State enables the growers to put this and other fruits in the northern markets some weeks in advance of the same fruits grown there, and at a season when the appetite for fresh fruits has been whetted by abstinence, and when they bring the highest price. When dried also they are a staple article of export. The process of drying was formerly effected entirely by the heat of the sun. This process is still partially in use, but within the last two or three years has been in a great measure superseded by mechanical appliances. Wild berries whose bushes spring spontaneously and cover every cleared spot not in cultivation, have given rise to an important industry here. The business of gathering and drying blackberries gives employment to many persons, especially children, whose services would not be available on the farm. They are shipped in quantities inconceivable by those unacquainted with this branch of trade. The demand for them is large and increasing, and the incomes derived from this source are in the aggregate very considerable.

This section supplies with free hand much in the way of comfort and profit. Wheat, oats, &c., are cultivated to such extent that the country teems with small game, especially partridges. Every farmer *can with his net*, with little loss of time, have his table supplied with this most delicate of luxuries, and they offer boundless sport to the lovers of such amusements. They are made a considerable article of trade. The quantity sent to the city markets amounts to tons. The rabbit which abounds here is also an article of trade as game, and this animal together with the otter, minx and raccoon furnish no inconsiderable amount of furs.

The different areas over which the cultivated crops of this section

grow are well defined. Tobacco is the staple crop in the northern counties, though the cereals enter into the rotation; in the central counties the cereals are the principal crops; in the southern counties cotton is the staple crop, but in all of them the cereals are also cultivated.

There are many watering places in this section which have long been favorite resorts for health and recreation.

Western Section.

The Western Section is commonly called the Mountain Section, a name which on account of its prominent physical features is strictly applicable. It lies enclosed between the Smoky range on the West, and the Blue Ridge on the East; on the North and South it extends to the Virginia and South Carolina lines. In form it resembles an ellipse. Its width is from twenty-five to fifty miles; its length is about one hundred and fifty miles. It consists of a lofty plateau, the general level of which is from two to two thousand seven hundred feet above the level of the sea. This plateau forms a base, upon which is clustered together a great number of the loftiest mountains to be found in the United States East of the Rocky Mountains. The mountains which reach a height of 6,000 feet can be counted by scores; the number of those of an elevation but little inferior is almost countless.

On the Eastern side of the plateau the mountains are massed together without any of that orderly arrangement common to most mountain systems. They are scattered, indeed, in wild disorder. On the Western side a definite arrangement may be observed. The Watauga, the Nolchucky, the French Broad, the Big Pigeon and the Hiwassee flow nearly at right angles to and through the Smoky range. Between each of these rivers runs a chain of mountains parallel to them, and forming the divide between them. The mountains are clothed, with few exceptions, with trees to their tops. The exceptions mark a singular caprice of nature. Through these chains of mountains are found many upon whose broad summits not a tree is to be seen, and hence designated as *Balds*. They are covered to the height of a horse's knee with grasses that afford the finest pasturage.

The view from these lofty summits is inconceivably grand and beautiful. There is little of sternness; nothing of desolation in anything that meets the eye. Nature presents herself in her kindlier mood. The vast mountains loom up on every hand, but they are clothed with

vegetation from base to summit. The element of color is not wanting. It is dispensed indeed with liberal hand. The lighter hues of the leaves of deciduous trees about the base and sides of the mountains are succeeded by the darker foliage of the pine and fir in the upper tiers, and the sombre foliage of the balsam on the highest tiers. Throughout the Fall, when the color of the trees is constantly changing, the different hues of the almost endless variety of the forest growth array the mountains in a glory that is indescribable. The view from one of these summits, at one season only, stirred the mind of Dr. Mitchell—a devotee of science and little given to emotion—to a burst of poetic expression, as when he speaks of the “green ocean of mountains raised in tremendous billows immediately around,” referring to the view from the top of the Roan. This section is a land where all the elements of beauty and grandeur are everywhere combined in a way to astonish and delight the beholder.

The forests of this section include most of the trees of the Middle Section, and many that belong to high Alpine latitudes—the same timber trees, and some that are peculiar to this section. The *wild cherry* is found in each section, but here only does it acquire its full dimensions or occur in quantity. On the rich and cool declivities of the mountains it attains a height of from sixty to eighty feet, and a diameter of two to three feet.

The *white pine* is found in this section of the State, and in this only. It forms peculiar and handsome forests in the rich elevated valleys of Ashe and Yancey. It is from sixty to seventy feet high, with a proportional diameter.

The *cucumber tree* in this State grows only on the mountains, particularly of Ashe, Yancey and Burke, in moist, fertile soils of declivities and on the banks of torrents. It is from sixty to eighty feet high, and from four to five feet in diameter.

The *hemlock* is also confined to this section. It grows on the borders of torrents and cold swamps, but extends down to the very base of the mountains. The bark is extensively and almost exclusively used for tanning in New England. Though inferior to oak bark, it is said that the two united are preferable to either alone.

The *black birch*, or mountain mahogany, is found in this State only in the Mountain Section. It affords a firm, compact, dark-colored wood, much valued for furniture, and is sometimes used for screws and implements requiring strength.

The *white walnut*, used in light cabinet work and in the hubs of

carriages, is found upon bottom land and river banks in the valleys of the mountains. It attains a height of fifty feet, with a diameter of three feet or more.

The *chestnut*, though found sparingly in the Middle Section, is confined chiefly to the mountains, from Ashe to Cherokee. It is invaluable for fencing—the rails split out straight and easily and are said to last fifty years. It is also used for shingles and for cooperage. Its usual height is from fifty to seventy feet, and stocks are sometimes met with which, at six feet from the ground, measure fifteen or sixteen feet in circumference.

The *beech*, though found in the Middle Section, occurs here in greatest abundance, and here only attains its proper size. It rises from fifty to eighty, and even one hundred feet, with a diameter of two and three feet. It is used for plane stocks, lasts, card-backs and the handles of mechanical instruments.

The *locust* extends along the mountains from the northern to the southern boundary of the State. In civil architecture this timber is not extensively used in buildings, but is employed for railroad ties and sleepers when it can be had, In naval architecture it is used to as great an extent as the supply will admit. It is also largely used by turners instead of box.

The *linn* or *lime tree*, so well adapted for turner's work and so extensively used for the manufacture of wooden-ware, is common in this section. It seldom exceeds forty feet in height, with a diameter of twelve or eighteen inches.

In respect to those timber trees found here in common with the other sections, the mountain section has the advantage of possessing an unbroken forest. In comparison with the extent of forest lands the clearings here are mere patches.

There is little hazard in saying that there is no where in any of the States an equal area of land covered with timber trees of such various kinds, and of such value. The walnut, tulip trees (poplars), and oaks attain a size that would hardly be credited by one who had not seen them. The preservation of this magnificent forest is due to the fact that it has hitherto been inaccessible to transportation. Within the past two years much of it has been brought into connection with the markets of the world. One railroad line passes entirely through this section, and another branching off at Asheville, and leading to the extreme southwest of the State, is in great part already graded. In to the

northwestern part of the State, also a railroad has been completed and others projected of which two are partially graded.

The cultivated productions of this section are the same with those of the middle section, cotton and rice excepted. Its garden vegetables are the same; but the cabbage and the Irish potato grow here to a degree of perfection that cannot be excelled anywhere. Among the fruits its apples are noted for size and flavor. Peaches and grapes grow well generally; but for their highest perfection nature has made provisions by a suspension to some extent of her ordinary laws. Throughout the mountains in certain localities and at certain elevations there are horizontal belts where frost is never known. Such localities are found not only in this section; but in the South mountains and in the Brushy range. They constitute an unfailing source of supply of these fruits, and in process of time will be occupied by establishments for canning fruits for the markets of the world.

The climate of this section differs less from that of the Middle Section than would be inferred from its higher altitude. The difference is more perceptible in Summer than in Winter. In the former season its cool and bracing air; together with its varied scenery; its mineral waters—sulphur, chalybeate and thermal; made this section one of the favorite resorts of the people of the South and Southwest when it could only be reached by private conveyances. Since it has been penetrated by railroads, the influx of health and pleasure seekers has increased an hundred fold, and in future will add very largely to its resources.

It is the resort too of people from the far North in Winter. It is protected by the range of mountains which form its boundaries from all the cold winds—the northeast, north and the northwest. The degree of cold is therefore temperate. A pinching season may come at long intervals; it is, however, of short duration, being quickly succeeded by weather of a moderate temperature. Such seasons are not unwelcome by way of contrast. The quantity of snow that falls here very little exceeds that of the middle section. Even in the high mountain ranges, cattle are excluded from pasturage by the snow only once in about seven years.

The soils of the basins of the great rivers of this section, and its mountain valleys, are noted for their fertility. The capacity for the production of cereals and hay grasses is equal to those of any lands. As might be inferred from the heavy forest growth with which the

entire surface is covered, the mountain sides are susceptible of profitable cultivation up to their summits.

Apart from its forests, nature has been prodigal to this section in shrubs and flowering plants. It has always been a favorite resort of the botanists. It is a field that has been assiduously cultivated by many of the most distinguished professors of that science. It was from these mountains that Bartram, the Michaux—father and son—Fraser, Delile, Lyon, Nuttall, Von Schweinitz, Mitchell, Gray and Curtis, drew much of the material of their valuable contribution to botanical science. It was here that some of the most beautiful flowers that adorn the gardens of Europe and of this country were first discovered. It still yields rare flowers to the explorer, which though not conspicuous for their beauty, are deemed rare treasures by botanists.

This section has also been one of the chief sources of supply of medical herbs. Immense quantities are gathered and shipped to the Northern cities and to Europe. In travelling through the mountains bales of these herbs may be seen collected about the country stores as bales of cotton are seen in the Middle and Eastern Sections. Ginseng in great quantities is shipped to China. The trade in medical herbs has grown into a large business.

The mineral wealth of this section is varied and abundant. These will be simply mentioned here, as each will form, in a subsequent part of this pamphlet, the subject of a separate notice. Marbles of the finest quality and of various colors compose whole mountains, so to speak, in Macon and Cherokee.

Corundum abounds in Macon, Clay and many other counties. Mica is abundant in Mitchell and Yancey, and those counties yield a large part of the world's supply. The largest and finest sheets of it seen at the World's Fair at Vienna were from the Ray Mine in Yancey.

This section is rich in iron ores of the best grade. That of Cranberry possesses such excellence for making iron for special purposes—steam boilers for example, and steel of the finest quality, such as is adapted to making surgical instruments and the like—that a railroad forty miles long has been constructed through one of the most rugged parts of the mountain territory to reach it. Copper also is prominent among the metals of this region. The most noted mine is that of Ore Knob, in Ashe. It has been extensively developed, and the business in all its branches is conducted with intelligence, skill and energy.

The effect of these mining enterprises upon the prosperity of this

section has been marked. Labor has found profitable employment, a home market has been furnished to the farmer, and there has been a general appreciation of property of every kind.

The last three years have been remarkable for the success with which the difficulties presented by the want of transportation in this State have been grappled with and overcome. These achievements at once great and beneficent, will make this period a memorable one in the history of the State. Railroads are now entering the Northwestern part of the State in several directions. The completion and connection [of these, and the opening up of this region, so rich in elements of undeveloped wealth, is now regarded as the first and most imperative duty of the statesmen of North Carolina.

The soils of the Middle and Mountain Sections may be treated of in one view, since they owe their origin to the same cause. The rocks of this part of the State were brought into the position they now occupy at an early period of the earth's history; the soils that have been formed upon them have resulted from their disintegration and decay. No stratum of foreign matter has been brought in from abroad in either of these sections, that which has been caused by rain water rushing down the sides of hills and flowing along the beds of streams alone excepted. The rocks are chiefly of the primitive formation, granites, schists, slates, &c. The soils vary in chemical composition and fertility, according to the character of the rocks from which they are derived. The rocks range with the sea-shore and the mountain chains, and run uniformly in a direction from North-east to South-west. A brief notice of the principal formations of rocks is here subjoined, and the characters of the soils of each discriminated in a general way.

West of the Eastern section—in our early geological reports termed *Tertiary*, and by the latter distinguished as the *Quaternary*—there occurs, in the counties of Northampton, Halifax, Johnston, Nash, Franklin, Warren, Granville, Wake and Cumberland, a body of ancient primitive rock largely covered by sand. Amongst these granite prevails more extensively than any other, and when the tertiary sand is absent, there is a fertile soil.

The next formation of rocks going west is the sandstones. It commences in Granville, three or four miles south-west from Oxford, and passes through Orange and Wake, Chatham and Moore, Montgomery, Richmond and Anson; but through a part of Moore, Montgomery and Richmond, it is covered by tertiary sand and clays. The principal constituent of this formation is a fine-grained, greenish or reddish

sandstone, whose particles are connected together by a mixture of clay and oxide of iron. This produces by its decomposition a soil favorable to the growth of corn, cotton, oats, and especially sweet potatoes; but is not so well adapted to that of wheat.

The next formation is that of the transition and slate rocks. These occupy a large space in North Carolina. The principal body of these rocks traverses the State in a northeasterly and southwesterly direction immediately west of the great sandstone formation, occupying a breadth of about thirty miles. This formation includes the western part of Granville, the eastern part of Person, the central part of Orange, more than half of Chatham, nearly the whole of Randolph, the whole of Montgomery (what is called sandstone excepted), the whole of Stanly, the southern corner of Davidson and Rowan, the northwestern part of Anson, and southwestern part of Mecklenburg. The most common and abundant constituent of this formation is a compound of silica and alumina; a simple argelite or clay slate. This prevails especially near its two extremities; in Granville and Person on its northern, and in Anson, Mecklenburg and Stanley on its southern extremity. The slate undergoes decomposition slowly, and has not to this day covered itself with any great depth of earth. The soil is never of a very high degree of fertility, but with good cultivation excellent crops are obtained. The adaptability of these lands to the growth of fine yellow tobacco has very much enhanced their value.

Throughout this body of slate, nowhere very thick, the granite occasionally penetrates and rises to the surface in tracts larger or smaller. In the southern part of Person, in Orange, Chatham, Randolph and Davidson, there are large patches of granite; and there results a much higher degree of fertility in the soil.

West of the slate formation a vast body of granite rock traverses the State including in its area a large part of the counties of Person, Caswell, Orange, Guilford, Randolph, Davidson, Rowan, Cabarrus, Mecklenburg, Lincoln, Iredell, Davie, Stokes and Rockingham. Throughout this region mica, one of the usual constituents of granite is rare, and is replaced by chlorite or hornblende. The whole mass of rock with a structure more or less granitic, has an earthy aspect, indicating a recent origin. In consequence it decomposes readily and into a fertile soil. Two of the three constituents of the granite—mica and felspar—furnish by its disintegration valuable ingredients to the soil. Both contain a considerable percentage of potash, though from the refractory nature of the mica, the potash, that element so es-

sential to tobacco and the smaller cereals, is chiefly derived from the felspar. When chlorite replaces the mica it adds, upon the decomposition of the granite, another element, magnesia, its chief ingredient; an element indispensable to the healthy growth of the corn plant (maize). When mica is replaced by hornblende the latter supplies from its ingredients both magnesia and lime, and the presence of lime is a fundamental condition of fertility in all soils. And it is observable that of the region occupied by this formation—which is the great grain growing region of the State—the tracts where hornblende predominates in their composition, as in Cabarrus and Mecklenburg, are superior to the rest.

West of this formation are the most ancient primitive rocks. Here every form of granite is met with. The ternary compound of quartz, felspar and mica is most common, but with endless diversities, depending upon the proportion, color, size of the grains, and other character of the constituent minerals. There occur here also indefinite alternations of gneiss, hornblende and micaceous schists, and occasionally chloritic and talcose slates. There is a great variety of soil, subordinate however to that general uniformity which characterizes the same formation; for most of the above rocks are essentially granitic.

There is another body of transition slate in the western and north-western part of the State, adjacent to Tennessee. It ranges along the western half of the border counties, but through Yancey and Mitchell shoots off a long projection, extending quite across the Blue Ridge to the Catawba, in Burke.

The fertility of soils so far as it depends upon their own constitution and the character of the rocks from which they have been formed, is determined by other circumstances.

1. Their composition; as the principal rocks of the Middle and Mountain Sections are included under the term granite, this has been already explained.

2. Their susceptibility of disintegration by the action of the elements.

This depends very largely upon their position; if the position is horizontal, they present their surfaces only to the disintegrating agents and long periods of time are necessary to produce any effect. But the rocks of these sections have been upheaved by the forces of nature, and laid upon their edges. They have thus been exposed to their full influences. The rain water could easily sink along the lines of stratification, and the air find ready access. The result has been a decom-

position of the various strata to the depth of thirty, fifty, and even a hundred feet; as is proven in sinking wells, and illustrated in railroad cuttings. In this condition of things super-abundant moisture is absorbed, and the roots of trees and of vegetation range freely, and appropriate the lime, potash, soda and other mineral elements yielded by the decomposing rocks.

3. The amount of decayed vegetable or animal matter the soil may contain.

The uncleared land here has stood in woods for a period of time, it is impossible to reckon. Hence the soil is charged with vegetable matter from the annual fall of leaves, from the decay of successive generations of trees; and from the dying out of the annual native grasses. When the lands have been exhausted by cultivation, they quickly cover themselves with trees, shrubs and grasses, and the vegetable matter is soon replenished.

IRON ORES.

[Condensed from KERR'S GEOLOGY OF NORTH CAROLINA.]

The ores of iron are very widely distributed in this State, their occurrence being not only coëxtensive with the area of the Archæan (or Azoic) rocks, but extending over a part of the Mesozoic, and even into the Quaternary. And these occurrences include all the principal kinds of ore—Magnetite, Hematite, Limonite and Siderite, and most of their varieties and modifications. But as many of these forms occur in association or close proximity, it will avoid confusion to consider them by districts—to group them geographically. We begin with the most easterly occurrences.

Limonite Ores of the East.—The clayey, sandy and earthy accumulations of the Eastern Section, which have been previously described as Quaternary, contain in many places a rough, brown ore, more or less earthy, or sandy, either in beds two to three, or four feet in thickness, or more frequently in sheets, or layers of irregularly shaped lumps or nodules. One of the most considerable of these deposits occurs in the southern end of Nash county near the Wilson line. It lies on the margin of Toisnot Swamp. The thickness is two to three feet, and its extent horizontally about fifty yards by one hundred and fifty. It is known as the Blomary Iron Mine, from the fact that iron had been made from this ore in a Catalan forge, a few miles south, during the war of 1812. Iron was also made here during the Confederate war in a furnace erected on the spot.

An analysis gives Iron 42.73 This analysis places the ore among the best of its class.

A second deposit, reported to be abundant in superficial nodules and irregular lumps, is found in the southern part of Duplin county near Wallace, on the farm of D. T. Boney.

Another bed of the same character and appearance, except in the size of the nodules, which are rather small, occurs in a field about two miles north of Rocky Point, in Pender.

Hematites of Halifax and Granville.—On the hills fronting the Roanoke, less than a mile below Gaston, are several outcrops of hematite ore. There are two principal beds, of which the lower only has been opened. The ore is granular for the most part, and of the variety known as specular, but contains a considerable percentage of magnetic

grains disseminated through it. The principal bed is about twenty inches thick at the surface. It gave on analysis 63.76 per cent. of Iron, and 0.09 of phosphorus.

About five miles southward from the above locality the same bed makes its appearance on the farm of Mr. Hines; here, however, it is highly magnetic, fine grained and dense, although still showing the decidedly slaty structure of the first of the Gaston beds. At this point it is reported as three to four feet thick.

These ores are of conspicuous purity and obviously adapted to the manufacture of the higher grades of iron and of steel. And there is evidently a range of ore beds here of considerable extent.

Iron Ores of Johnston and Wake.—There is, according to Dr. Emmons, "a large deposit" of limonite four miles west of Smithfield.

Another "bluff" of limonite is referred to by Emmons as found at Whitaker's, seven miles southwest of Raleigh, in Wake county.

Iron Ores of Chatham and Orange.—One of the best known and most important iron mines of this region is on the borders of Harnett, the *Buckhorn Mine*. It is about seven miles below the forks of the Cape Fear, on a hill nearly two hundred feet high, overlooking the river from the left bank. It is massive at the outcrop, and breaks out in large angular blocks. Some parts of the bed are slightly magnetic. The thickness is about thirty-six feet at this point, and diminishes to twenty at the lower quarries, two hundred to three hundred yards distant.

The ore is properly described as specular. The character of this ore is very like that of the Iron Mountain, Missouri, and its extent and mode of occurrence strongly suggest the Pilot Knob. It is at least equal to either of these notable iron ore deposits in quantity, and is equally pure, and has the advantage of both in the presence of large percentages of manganese, and the capacity to produce *speigelleisen* without admixture of other ores.

About one mile north of the *Buckhorn Mine* is a small vein about one foot thick, of a highly magnetic ore. An analysis of this ore, by Mr. C. E. Buck, gave 56.57 per cent. of Iron and 1.51 of titanitic acid.

Besides the localities already mentioned, a number of additional outcrops of ore have been noted, mostly magnetic; one, for example, two miles north of Buckhorn (at Dewar's), yielding 57.77 per cent. of Iron, (no phosphorus or sulphur), and three or four others in a southwest direction, for ten miles, to the head waters of Little River.

Near Haywood, in the angle formed by the junction of the Haw

and Deep rivers, in the red sandstone of the Triassic, there has been opened a series of parallel beds of a red-oreous earthy ore, on the lands of Dr. Smith. The only bed exposed at the time of my visit was twenty to twenty-five inches thick, dipping southeast with the sandstone, 20° to 30° . The ore has a rough likeness to the "Clinton" or "Fossil ore" of New York, &c., and the "Dystone" of Tennessee, but has a much coarser and more irregular texture. The ore is partly limonite, but seems to be largely changed to red hematite.

This ore makes its appearance again about a mile from Sanford, some twelve miles distant, where it was opened and worked to some extent during the late war. Only one bed was exposed here, which is about twenty inches thick. The ore is easily dug and shoveled from the bed and crumbles into a heap of very coarse, reddish-brown gravel, a rough sort of *shot ore*.

The next ores demanding attention are the *Black Band* and *Ball ore*, or "kidney ore" of the coal measure. These are earthy and calcareous carbonates of iron, imbedded in the black carbonaceous shales which enclose the coal, or interstratify with the coal itself. These ores seem to be co-extensive with the coal on Deep River, outcropping everywhere with it, and at several places outside of its limits.

Emmons also speaks of another seam of argillaceous carbonate as occurring at the depth of two hundred and thirty feet in the shaft at Egypt, and four occurrences of it are indicated as ball ore in the Egypt section. Emmons says of this argillaceous carbonate: "It contains 33 per cent. of metallic iron; the surface ores being altered contain 50 per cent.," and he describes it as occurring "in balls, or in continuous beds." About the Gulf it occurs in rounded flattish masses, five or six to eight or ten inches in diameter. They are dense, uncrystalline and heavy, of a light gray to drab color, and are pretty thickly distributed in parallel layers of one to two or three feet thickness. An analysis of Prof. Schæffer, as given in Admiral Wilkes' report to the Secretary of the Navy in 1858, is as follows: Protoxide of iron, 40 per cent.; silica, 13; earthy matter, 13; carbonaceous matter, 34. This is evidently a black band ore.

The seam of *black band* between the main coal beds in the Egypt shaft, is stated by Wilkes to be sixteen inches, the lower one to consist of two thicknesses of three feet each, separated by a thin seam of coal between. An analysis by Schæffer for Wilkes gives only 17 per cent. of Iron, and 42 of carbonaceous matter; specific gravity 2.12.

The Evans vein is about six miles north of the Gulf, on the Graham road. It is six feet thick. This ore is a hematite.

But the most noted iron locality in Chatham county is known as *Ore Hill*. The ore is limonite, with the exception of one vein near the top and back of the hill, which is a hematite, (in part specular), and much resembling the Evans ore. There is much of this ore on the surface in scattered fragments, indicating a vein of considerable extent, which, however, had not been exposed. Most of the other veins have been opened, but the pits and tunnels were so much filled and fallen in that no accurate measurements could be taken. But it was easy to see that two or three of them were very large—ten, fifteen feet and upwards.

This ore was worked on a considerable scale during the American Revolution, and again during the late civil war, and the iron is reported to have been of good quality; and it is obviously an ore very readily smelted. The presence of the hematite vein and the proximity of the ball ore, which was successfully used as a flux in the last working of the furnace, furnish admirable conditions for advantageous iron manufacture.

A fine quality of magnetic ore, dense, metallic and very pure, is found on the east side of Haw River and about two miles distant, at the foot of Tyrrell's Mountain on the farm of Mr. Snipes. The vein has not been fully exposed, but is reported to be three or four feet.

A very fine micaceous hematite is found near the mouth of Collins' Creek a few miles above, in Orange county. It has not been explored, but surface fragments are reported to be abundant.

But the most notable ore bank yet opened in this county is that at Chapel Hill. It is a very dense, steel-gray hematite (specular in part), with slight magnetic indications. The vein is found on a hill one mile north from Chapel Hill, and more than two hundred feet above the creek at its base. The vein proper is seven to ten feet at the main shaft, and suddenly enlarging near the summit of the hill, just beyond the second shaft, to twenty-five and thirty feet. The hill top is covered with angular fragments of the ore of all sizes, up to more than one hundred pounds weight.

There is a second vein of the same character five or six feet thick, crossing the main vein near the first shaft. The ore becomes poorer as the vein is followed beyond the summit of the hill northward, until at the distance of one hundred and fifty yards beyond the upper shaft, the quartzite predominates and the ore becomes poor. This mine

is at the terminus of the State University Railroad, and has all the transportation facilities that are desirable.

There are surface indications on the neighboring hills, both north and south, for several miles, which show that this vein has a considerable extension; and in fact it may be considered as a continuation of the hematite veins of Deep River. And a magnetic ore makes its appearance about twenty miles northeastward, three miles beyond the upper forks of the Neuse River in the southeast corner of Orange county, on Knapp of Reeds Creek, on the farm of Mr. Joseph Woods. The ore-bed outcrops at one point for a few rods, where it appears to be about three feet thick, and has a strike N. 40° E., and dips at an angle of 70° to the northwest.

At Mt. Tirzah, in the southeast corner of Person, near the Orange line, there is a vein of hematite (specular), from which iron was made to some extent during the war. The vein is described as about six feet thick. The specimen sent to the Museum indicates a very fine ore, resembling that at Buckhorn.

The ores of Montgomery and Randolph belong properly (geologically) to the Chatham range; they are found in the same great slate belt, (Huronian), that constitutes the most notable feature of the middle region of the State, both geologically and mineralogically. The best known of these ores is found near Franklinville, Randolph county. And another vein has been opened near Ashboro, both of specular hematite. Some of the strongest and most highly prized iron obtained during the war came from this locality. It was all devoted to the manufacture of shafts and other machinery for the steam rams (iron-clads) and the like. Dr. Emmons describes an occurrence of hematite of apparently considerable extent seven miles southwest of Troy, in Montgomery county; he says it is free from sulphur and a very pure ore. Another occurrence of ore—magnetite—is noted by him four miles north of Troy.

Iron Ores of Guilford County.—One of the most remarkable and persistent ranges of iron ore in the State crosses the county of Guilford in a northeast and southwest direction, passing about ten miles northwest of Greensboro, near Friendship. It extends from the head waters of Abbott's Creek, in Davidson county, entirely across Guilford to Haw River, in Rockingham, a distance of some thirty miles, making its appearance on nearly every plantation, and indeed almost every hillside in the range. The ore is granular magnetite, and

is everywhere titaniferous. There is a second, but much more interrupted range of ore parallel to the one just described, and lying a few miles to the northwest.

The length of the outcrop, air-line measure, is twenty-eight miles.

There is *another ore belt*, running parallel with the former and at a distance of three miles from it. This is called the Highfield or Shaw outcrop. Beyond Haw River the two belts approach each other, and are believed to unite in Rockingham county. The ore-bed is full six feet across, solid ore—a very green, chloritic, mica slate, rock ore. In a run of eight hundred yards, there are *apparently two hundred thousand tons above water level*, in the one six-foot bed. The outcrop runs along the top of a hill about one hundred feet above the bottom of Haw River Valley.

Dr. Lesley mentions beds of ochre of various sizes, “as one of the constituent elements of the whole formation. The largest exhibition of ochre which I saw, is on the L. Somers plantation on Brushy Creek. Here an ochre bed twenty feet thick rises, nearly vertical, out of a gully in a hillside covered with small pieces of fine, compact ore. The whole aspect of this place gives an impression of an abundance of ore beneath the surface, but no openings on the beds which have furnished these fragments have been made.”

This Guilford range of ores has not been traced to its termination in either direction, and doubtless other valuable beds will be discovered; and there are already indications that there are outcrops of the same kind of ore as far northeast as Caswell county.

There are also other iron ore localities in Rockingham, which do not belong to this range; for example, near the Virginia line, in a northeast direction from Madison; and again two miles below the mouth of Smith's river (Morehead's Factory), there is a bed of red hematite iron ore, about ten inches thick at the outcrop.

Iron Ores of Mecklenburg and Cabarrus.—No iron mines of any extent have been worked in these counties, but ore has been found in a number of localities. Some explorations have been made in the southern part of Mecklenburg at the same time, in the Sugar Creek neighborhood. Numerous blocks of a remarkably pure granular magnetic ore were found scattered over several acres of surface of an old field, and along the public road; and several trenches were cut, which exposed two or three veins of one to three and four feet in thickness. Some twelve or fifteen miles north of Charlotte, in the Hopewell neighborhood, a very notable quantity of surface fragments of large

size are found in an old field and skirt of woods adjacent. This is a specular ore in a gangue of quartzite, not unlike the Chapel Hill Ore.

Iron Ores of Gaston, Lincoln and Catawba.—In these counties is one of the most extensive ore ranges in the State. The ores are predominantly magnetic, with a variable percentage of hematite. The direction of this range of ore-beds is coincident with the strike of the slates, and is about N. N. E. from King's Mountain on the southern border of the State, to Anderson Mountain, near the Catawba River, in Catawba county. To Mr. G. B. Hanna, who has lately made an examination of many of the beds for the Survey, I am indebted for several valuable observations. He states that for a considerable part of the range there are two parallel beds, the more westerly being generally the larger and more productive, their thickness running from four feet (and sometimes as low as two feet) to twelve; the interval of twelve to twenty feet between them being occupied by talcose and chloritic slates, with a little ore in layers. The ore has been generally mined in a very rude and wasteful fashion, the operations seldom penetrating beyond water-level, fifty or sixty feet, and generally limited to surface openings. The range naturally divides itself into two groups of beds, the northern and southern, the one lying mostly in Lincoln, and the other in Gaston. The most considerable of the Lincoln beds and the one which has been longest and most extensively wrought is known as the *Big Ore Bank*. This is situated seven or eight miles north of the Carolina Central Railroad, and, as is usual with the outcrops of these beds, is on a hill or broad ridge. There are several beds evident, but the scattered and partially filled openings do not furnish the means of arriving at a satisfactory notion of their exact relations. The quantity of ore, however, seems to be very great, the thickness of the beds at some places being estimated at about eighteen feet. Several furnaces and a number of forges have been supplied with ore from this point for a long period. Following the compass course of the outcrops, about N. 20° E., a succession of ore-beds is encountered at intervals of one or two miles, to the southeastern base of Anderson Mountain—the Brevard Ore Bank, the Robinson Ore Bank, the Morrison Ore Bank, which last extends into Catawba county. The thickness of the beds is given by Mr. Hanna in the general statement quoted above, as ranging from four to twelve feet. The quality of iron manufactured from this range of ore beds has always been good; and all the furnaces on this

part of the range were put in blast after the war, for the purpose of supplying a high grade charcoal iron for the northern market.

Limestone for fluxing is found convenient, in the range of beds which accompanies these slates, one to two miles to the west, from King's Mountain to a point several miles beyond Anderson Mountain.

A few miles northwest of the last named mountain is a bed of limonite five or six feet thick.

Several miles further, in a northwesterly course, seven miles southwest of Newton, there is a series of ore deposits, known as the Forney Ore Bank, whose mineralogical character and geological relations are entirely different from those of the ore beds of Lincoln county. The ore is a remarkably pure magnetite, heavy, black, metallic and non-granular, for the most part. The iron manufactured from it in the forges of the neighborhood, particularly at Williams', was in much request before and during the war, being very malleable, tough and strong. All the blooms which could be procured at the **naval** works in Charlotte during the war were used for the manufacture of shafts for iron-clads, and bolts for the cannon of the coast forts.

At a point six or seven miles northeasterly from this, is the Bar-ringer Ore Bank, which is some two miles southeast from Newton. This ore is of the same character and geological relationships as the last. The ore is of the best quality; and the distance from railroad is only about two miles.

There is also another deposit in Lincoln county which does not belong to the series of beds above described. It lies about two miles east of Lincolnton on the plank road, and is traceable some hundreds of yards through the forests by the surface fragments, which are widely scattered. The ore is limonite.

The lower part of the great iron range under consideration is mostly found in the southern half of Gaston, as the upper was mainly limited to the northern part of Lincoln. These ore beds appear to constitute a double parallel range, the divisions much more widely separated than in Lincoln. The *Yellow Ridge Ore Bank*, on the most southerly out-crop, at the western base of King's Mountain, seems to belong to the eastern division. The bed here, which has been extensively wrought, and was penetrated to a depth of one hundred and twenty feet, is reported by Mr. Hanna and others to be sixteen feet thick (occasionally forty), with a steep westerly dip. Hanna says of the ore, "it is notably magnetic but more highly peroxidized than that class of 'gray ores' gen-

erally." At the western base of Crowder's Mountain, in a northeasterly course, on this range, is the Fulenwider ore bed.

There are other beds or veins of iron ore on the east side of Crowder's Mountain, one of which is about a mile distant, but no openings have been made here.

There are three notable ore beds on the western division of this part of the range, on the lands known as the "High Shoals." They are the *Ferguson*, the *Ellison* and the *Costner* ore banks. The first is the most southerly. It is a granular magnetic ore, with much iron pyrites, which has been superficially changed to limonite. This bed has been long worked, but the sulphur has always lowered, more or less, the quality of the iron made from it. The Ellison ore bank is about a mile northeasterly on the range. This has been worked for a great while, and has furnished an immense amount of ore. Its quality is very high.

The *Costner Ore Bank* is about three miles in a northerly course, on the same line, and one mile east of the furnace ("Long Creek.") The rock is granitic and syenitic, and one wall is a bed of crystalline limestone, twelve feet thick. The ore is a very dense, metallic and sub-crystalline magnetite, and is very free from impurities; and the bar iron made from it is very tough and strong. The vein is ten to twelve feet thick; and it is reported by the miners who last penetrated it, at a depth of over one hundred feet, to be above twenty feet thick.

There are two other important ore beds on this tract, "High Shoals," but they do not belong to the regular range of ore beds which we have been considering, being out of their line to the west, and of a very different character. The ore nearest to the line of the deposits last described is the *Mountain Ore Bank*. The vein is four to eight feet thick, associated with a heavy quartz vein, in a quartzo-argillaceous slate, and has a strike N. 35° E., and which does not vary more than 1° to 5° from the vertical (towards the west). It is remarkably pure and will no doubt become valuable in the manufacture of *Spiegeleisen*. The second vein, the *Ormond Ore Bank*, is in the slate belt also, and is probably a vein. The vein is reported to be eight to fifteen feet thick. This ore is manganiferous like the last, and is a hematite, which is partly hydrated and limonitic, (turgite?)

There are five furnaces on this range of ores.

Iron Ores of Yadkin, Surry and Stokes.—The ores of this region occupy

a relation to the Pilot and Sauratown Mountains, similar to that of the Gaston and Lincoln ores to the King's Mountain range. They are found along the base and among the spurs and foot hills of the range. And like them too, these deposits divide themselves into two groups, geographically, one in Stokes and the other in Surry and Yadkin. They are all magnetic and granular.

Another ore bed and two forges (Hyatt's), are found on the west side of Ararat River, near the mouth of Bull Run Creek. A third ore bed, which has been worked for many years, known as Williams's, is four miles northwest of Rockford. The iron made from the ores of Surry has a good reputation in the region; they are apparently very pure. On the south side of the river, there is a series of ore beds running from the river in a southwesterly course to Deep Creek, nearly across the county of Yadkin.

This range of ore beds extends southward across the South Fork of Yadkin River into Davie county, where the ore still preserves the same characteristics as in the above mentioned counties. One, the Rogers Ore Bank, is eight feet thick, and has been worked on a considerable scale; and an excellent iron was smelted in the furnace at Danbury during the war. Another bed reported to be ten feet thick has been opened about half a mile east of the last, and two beds, (one of them four feet thick, the other not opened), have been discovered at different times within three hundred and six hundred yards of it, on the west. The ores are all magnetites, with sometimes a small admixture of hematite.

The purity of these ores is conspicuous. Phosphorus is wholly wanting. Some samples contain a small percentage of pyrites. Manganese appears as only a *trace* in the analyses, but it must exist in larger proportions in some parts of the bed, as spiegeleisen is occasionally an accidental product. There are other other outcrops of magnetic ore in the county, a notable one on the south side of the Sauratown Mountains, among the head waters of Town Fork of Dan River.

Iron Ores of Burke, Caldwell, &c.—There are many valuable beds of limonite in a range extending in a northeast direction from the northeastern foot hills of the South Mountains into the Brushy Mountains, from Jacob's Fork of Catawba River, near the eastern border of Burke, across the Catawba, and by way of Gunpowder Creek, to the waters of Middle Little River near the eastern border of Caldwell; and beyond, near Rocky Creek, in Alexander, and even on the northern slopes of

the Brushy Mountains in Wilkes, the same ores occur, being undistinguishable in appearance, and of identical lithological relations.

There is a bed near the town of Hickory, reported to be five or six feet thick; and three miles west, at Propst's, are a number of pits from which a quantity of ore was obtained during the war; and at the distance of six miles, on the lands of Mrs. Townsend, a bed was opened some thirty years ago, and the ore, in considerable quantities, smelted in the Shuford furnace in the neighborhood.

Iron was also made on Gunpowder Creek, Caldwell county, thirty or forty years ago, from a similar series of limonite beds. The quantity of ore is reported as large. The beds on Middle Little River, twelve miles southeast of Lenoir, were worked nearly fifty years ago, and the ore hauled seven miles to Beard's furnace, on the Catawba River. The outcrops are traceable on the slopes of McIntyre's Mountain and Bald Mountain, near Mr. White's, on Miry Branch, for a distance of two to three miles, the outcrop on the former being about three or four feet, and on the latter eight or ten; and it is reported that at some points the thickness is more than double the above figures. There is every surface evidence of abundance of ore. Being a mountainous region, timber for fuel is abundant, and water power also.

A bed of superior magnetic ore occurs on Warrior Creek, not far from Patterson, Caldwell county, and within a mile of the bend of the Yadkin River. It is traceable hundreds of yards by large surface fragments of a fine grained, heavy, metallic ore, remarkably free from rocky admixtures; and a similar ore is reported as occurring in large mass a few miles west on Mulberry Creek. Another very fine ore, a shining metallic, slaty hematite, of great purity, is found a few miles above on the spurs of the Blue Ridge, flanking the Yadkin River, in a cove known as Richlands.

In the same neighborhood, on the farm of Mr. J. Curtis, on the banks of the Yadkin River, seven or eight miles above Patterson, is a heavy ledge of titaniferous iron ore. The exposure is not less than twelve to fifteen feet thick, and the surface is covered with heaps of angular fragments of all sizes, up to a hundred pounds or more.

Some ten or twelve miles northeast of this point, on the flanks of the Blue Ridge, near Cook's Gap, in the edge of Watauga county, occurs another outcrop of the specular (martite) schist of Richlands. The bed at this locality, which is called Bull Ruffin, is reported to be three or four feet thick at the outcrop.

In McDowell county there are several beds of limonite. These are

mostly aggregated along the top of Linville Mountain, southern part, and the western slope, near the foot, and in the spurs of the southern end. These Linville limonites made an inferior iron when worked alone, but mixed with the magnetite and hematites of the region, they would become available for the manufacture of good metal.

The limestone beds of the same belt, in North Cove and along the flanks of Linville, are conveniently located for furnishing a flux, and the forests of these mountains will furnish indefinite quantities of fuel.

Ore Mountain, one mile west of Swannanoa Gap, (and therefore just over the Buncombe line), is named from the occurrence on its flanks of a bed of limonite, which doubtless belongs to the iron ore range of Linville. The bed is not well exposed, but three or four feet of thickness are visible on the steep escarpment, and large masses which have broken off are fallen down to a lower point on the slope.

Iron Ores of Mitchell and Ashe.—In Mitchell county is found one of the most remarkable iron ore deposits in North America. It lies on the western slope of the Iron Mountain, (a part of the Great Smoky range), in the northwest corner of the county, three miles from the Tennessee line, and about a mile from the rapid torrent of Elk River, the principal affluent of the Watauga. It has been long known as the Cranberry Ore Bank, from Cranberry Creek, which flows at the foot of the steep mountain spurs, on which it outcrops.

The ore is a pure magnetite, massive and generally coarse granular, and exhibits strong polarity. The length of the outcrop is about fifteen hundred feet, and the breadth two to eight hundred.

The softness and toughness of this iron is very remarkable, and its tensile strength, as tested by the United States Ordnance Department, ranks with that of the best irons known. The blooms from the Cranberry forges have been extensively used in Baltimore for boiler iron, and commanded fifteen dollars a ton above the market. In quality it is unsurpassed by any iron in the world. And in regard to quantity, the bed much exceeds the great deposits of Missouri and Michigan, and at least equals anything in the Champlain region. So that it has not probably an equal in this country.

There are other magnetic ore beds in the neighborhood of less extent. One is said to occur along the face of the same (Iron) mountain between one and two miles eastward; and several others at the distance of six to ten miles in a southeast direction. Northwestward also, beyond the State line and within a few miles of it is a number of ore beds, mostly magnetic—one limonite; indeed it is evident that

there is an extensive range of iron ores in this region, which are of the highest quality, and must one day attract a large capital for their development. Deposits of ore are also found in other parts of the county; but like the last named, they are known only by their outcrops. One of these is a bed of magnetite, on the lower slope of Little Yellow Mountain, at Flat Rock. The ore is quite like the Cranberry, of equal purity apparently, and strongly polaric. Some large blocks are found on the surface, weighing several hundred pounds.

A bed of limonite occurs three or four miles northwest of Flat Rock, recognizable by a profusion of surface fragments, but no explorations have been made. On Rock Creek, beyond Bakersville, at the foot of the great Roan Mountain, are also several beds of magnetic ore, of which hand specimens resemble the Cranberry ore, and the geological associations are also the same. Of the size of the beds I have no definite information.

In Ashe county, in the northwest corner of the State, there are some important ore deposits, on the waters of North Fork of New River. They lie chiefly north and northeast of Jefferson, on Horse Creek, and Helton Creek.

On Helton, six or eight miles east of the last, are still larger deposits, of very pure magnetic ore, which has been long used in the forges of the neighborhood. The ore is a coarse grained and very pure magnetite, one of the beds of which is reported to be eighteen feet in thickness and another nine feet. This is manifestly an iron region, and worthy of a thorough investigation.

Iron Ores of the French Broad.—There are several localities on the western slopes of the Black Mountain, on the head waters of Ivy, in the eastern edge of Madison, where magnetite is found in considerable surface masses, though no explorations have been made. A bed also of titaniferous iron occurs here near the public road, and about midway between Asheville and Burnsville.

On Bear Creek below Marshall, near the French Broad, there are surface fragments of magnetite in hornblende slate, but no vein or bed has been exposed. On the eastern Fork of Big Laurel there is a large outcrop of a slaty granular magnetite at Mrs. Norton's, and near Jewel Hill a bed or vein of specular hematite in a reddish felspathic gneiss, the ore said to be abundant. About five miles west of Asheville a bed of limonite of several feet thickness has been opened.

In Haywood county, there is a larger massive outcrop of granular magnetite; it is in the northeastern part of the county, on Wilkins's

Creek. The bed is no doubt large, from the boldness of the outcrop, which projects in large masses above the surface.

There are also magnetites and hematites in various localities of Jackson and Macon counties, some of which are represented in the Museum by very fine specimens, and the deposits are reported to be extensive, but as no iron has been made in those counties, there has been no occasion for their development.

Iron Ores of Cherokee.—There is no other county in the State which contains so much iron ore as Cherokee. It is all, however, of one species—limonite. The marble beds of Valley River and Notteley River are everywhere accompanied by beds of this ore. The breadth of this iron and marble range is two to more than three miles.

About one mile north of Murphy the quartzite forms a high ridge, having two beds of limonite, one on either flank, that on the north-west very fine and twenty-five feet thick.

At one-half mile below Murphy there seem to be four limonite beds with a small outcrop of the quartzite, the marble occupying the middle term of the section.

These beds of ore are traceable northwards to within two miles of the Valley River beds, near Mrs. Hayes's. The quantity of ore in this county is therefore immense, and is very widely distributed, and the forests of the mountain slopes furnish unlimited supplies of fuel, while the marble is at hand everywhere for fluxing.

Spathic ore (siderite) is found in many of the mines of Cabarrus, Rowan and Davidson, and in some of them in large quantities. At the Cosby Mine, in Cabarrus, an immense heap of it has been thrown out in mining for copper, and it is contaminated by the presence of copper pyrites.

MINING OPERATIONS IN 1882.

BY G. B. HANNA, U. S. ASSAY OFFICE.

IRON.

[NOTE.—Only the localities in Lincoln and Gaston counties have come under my observation this season.]

LINCOLN COUNTY.

The following beds have been extensively worked in the past:—Big Ore Bank, Beard Ore Bank, Morrison Ore Bank, Robinson Ore Bank, Mountain Creek Ore Bank, Furnace Vein. These beds are

hardly more than local names for one and the same bed. They are situated about ten miles northeast of Iron Station.

No smelting was done in this county in 1881; the subjoined is the list of furnaces in this county:

Rehoboth Furnace,	cold blast charcoal,	capacity	2½ to 3½ tons per day.
Stonewall	“ “ “ “	“ “ “ “	“ “ “ “
Vesuvius	“ “ “ “	“ “ “ “	“ “ “ “
Durr's Forge	“ “ “ “	“ “ “ “	“ “ “ “

None of these mines or furnaces are in operation, though the pig iron last made at Rehoboth furnace, estimated at one thousand tons, lies at Iron Station waiting a favorable market.

GASTON COUNTY.

There is but one furnace in this county—the Long Creek, which is a warm blast charcoal furnace, capacity five tons per day; it is situated five miles south of the High Shoals; it has been out of blast twelve or fifteen years.

The Ormond Ore Bank was reopened in the summer of 1882 by the Carolina Mining Company, of Pittsburg, Pa. In December, 1882, a depth of one hundred and forty feet had been reached, and three other shafts, varying in depth from fifty to ninety feet were sunk.

A body of ore the average grade of which is sixty-five to sixty-eight per cent. in iron, and with only traces of sulphur and phosphorus, has been exploited; this body varies from six to twenty-one feet in thickness, and affords one hundred tons of shipping ore per day; it is confidently thought that the completion of the other shafts will double the producing capacity of the mine.

The ore locally called “Powder ore” is unique, being a very pulverulent mass carrying a notable per cent. of oxide of manganese. Sixty men are employed. The mine is situated one-half mile west of Wooten's Station, on the Air-Line Railroad; a track of three-fourths of a mile is being rapidly constructed from the station to the mine.

The Costner Ore Bank and the Ellerson Ore Bank have recently passed into the hands of the same company, and all are soon to be reopened. These ore banks formed a part of the High Shoals property.

The Yellow Ridge Ore Bank, under the west side of Crowder's Mountain, and three miles south of the Ormond, has also been purchased by the company. The iron produced from this ore was formerly noted throughout the section for its excellence.

[The following notices of the Chapel Hill and Cranberry mines were furnished by Mr. W. B. Phillips, Assistant Geologist.

The Chapel Hill Iron Mine is one mile northwest of Chapel Hill, Orange county. It has shipped a thousand tons of ore to Pennsylvania. The company is now making other arrangements with reference to its ores; the work, therefore, is temporarily suspended.

The Cranberry Iron Mine, in the northwest corner of Mitchell county, employs sixty hands and ships principally to Allentown, Pa., where the company's furnaces are. The product now is one hundred tons per day; preparations are making for shipping two hundred and fifty tons per day.]

G O L D .

The Gold of North Carolina belongs to four different geological positions: 1. The loose quartz grit beneath the surface soil; 2. In stratified layers, which are cotemporaneous with the rock; 3. In connection with seams and joints of the rocks, and probably also diffused in the mass; 4. In regular veins associated with quartz, and the sulphurets of iron and copper.

The principal counties in which it has been found in sufficient quantity for exploitation are: Franklin, Nash, Granville, Alamance, Chatham, Moore, Guilford, Davidson, Randolph, Montgomery, Stanly, Union, Cabarrus, Rowan, Mecklenburg, Lincoln, Gaston, Catawba, Caldwell, Burke, McDowell, Rutherford, Polk, Cleveland, Cherokee, Jackson, Transylvania and Watauga.

It is generally more or less alloyed with silver, varying from pure gold on the one side to pure silver on the other. Near the surface it is usually associated with limonite, and at a greater depth of the deposits with pyrite, chalcopyrite, galenite, zincblende, tetradymite, arsenopyrite, rarely with altaite and nagyagite.

G O L D M I N I N G I N 1 8 8 2 .

BY G. B. HANNA, U. S. ASSAY OFFICE.

The auriferous area of North Carolina in a general way embraces nearly one-half of the State; the productive area is much less, containing a little more than tveve thousand square miles.

Franklin and Nash counties on the northeast, Moore county on the southeast, and the Tennessee line, mark approximately the east and west boundaries of the Gold field; it extends on the north into Virginia, and on the south into South Carolina; it comprises the best known and most productive part of the Appalachian Gold belt. Nearly every mode of occurrence of Gold known to the geologist and mining engineer finds here an illustrative example.

G E O L O G I C A L D I S T R I B U T I O N O F T H E M I N E S .

The best known mines are upon the central belt of granite (for such

it may be termed in a general way) stretching across the State in a northeast or southwest direction with a width of ten to twenty-five miles; the towns of Greensboro and Charlotte being nearly on its axis; this area is commonly regarded by geologists as among the oldest on the American continent.

To the east is a large body of slates generally argillaceous, but frequently departing from that type, with a width varying from fifteen to fifty miles; this region also abounds in mines, but it has been less explored. To the west is a still larger area, made up for the most part of gneissoid and schistose formations, and extending nearly or quite to the Tennessee border; this area, too, has a large number of mines, but the most valuable deposits are placers and gravel washings.

FRANKLIN AND NASH COUNTIES.

The deposits of Franklin and Nash counties were formerly worked on a large scale, but the difficulty of securing an adequate water supply has led to a well-nigh total abandonment of operations; only a few persons now give even a part of their time to mining work here.

Portis Mine.—The Portis Mine, which is the best known, is situated in the northeast corner of Franklin county, near the lines of Warren and Nash counties. It comprises 938 acres; it is exploited only by hydraulic methods. The present water supply is from Shooco Creek, from which the water is lifted 108 feet. It is supplied with the usual hydraulic apparatus, which is here inadequate, supplemented by Alden an crusher, two 5-stamp batteries, concentrators, etc. No men are regular employed.

Arrington Mine.—The Arrington Mine, two miles southeast from the above, in Nash county, has 2,000 acres of land.

Mann Mine.—The Mann Mine, of 1,000 acres, is six miles southeast of the Portis.

Taylor Mine.—The Taylor Mine is five miles southwest of the Portis.

Thomas Mine.—The Thomas Mine, of 450 acres, is one and one-fourth miles northeast of the Portis.

Kearney Mine.—The Kearney Mine is two and one-half miles northwest of the Portis.

The description of the Portis applies to the others, with slight differences.

This area extends southwest a little beyond Peach Tree Creek, towards Tar River. Very little work is done at any point, and that of

a desultory character only. As little attention is given to any of these mines except by individual operators in the intervals of other work, it is not easy to make any accurate statement of the number engaged; I judge the total number of men, women and children to be from twenty five to fifty.

A more energetic use of the highly improved and efficient lifting and forcing pumps now so often met with in other sections, would quickly put a changed face on this important industry.

All of these mines are in a formation classed by Prof. Kerr, the State Geologist, as the Upper Laurentian; they form a group of isolated mines quite remote from the main productive area of the State.

MOORE COUNTY.

In Moore county greater activity is manifested.

Bell Mine.—The Bell Mine, ten miles northwest of Carthage, has recently passed into the hands of a Washington capitalist.

The depth of this mine in August was seventy-two feet; the levels driven aggregated seventy feet. The vein matter is quartz, varying from four to twenty inches in thickness and everywhere of good grade, and frequently of high value. Assays run from \$33 to \$1300 per ton; it is usually much richer than its external appearance would indicate. Five to ten men are employed.

Chick Mine.—The Chick Mine is seven miles north of the Belle, and one mile north of Deep River. It is not now worked. The ore body shows a tendency to copper, which occurs as a black sulphide, (chalcocite), with the usual alterations. Assays run from \$18.17 in gold and silver, and copper 17 $\frac{1}{10}$ per cent., down to \$2.65 for gold and silver, and copper trace.

Phillips Mine.—The Phillips Mine, Chatham county, two and one-half miles north of the latter is similar in character. The work thus far done is too small to permit a judgment of its probable value. It has been sunk upon about twenty feet.

In the northwest part of Moore county is an interesting group of mines in a formation best described as quartz ore, talcose schist, though there is a considerable variation from this type at the different localities. This group of nine mines is comprised in a space one mile wide from northwest to southeast, and six miles long from northeast to southwest.

Brown Mine.—In entering this area the Brown Mine is met on the

northwest edge on the road from Moffat's to Richardson's mills, and one and a half miles southwest of the latter. It is evident that a large amount of work has been done on this mine; for the numerous large pits stretching along the outcrop for a hundred yards or more, and the large quantity of debris point to extended underground work, and presumptively to a satisfactory return, but no data, so far as known, are now procurable.

Bat Roost Mine.—One mile northeast is the Bat Roost Mine.

Shields Mine.—Two miles south and adjacent to the east edge of the belt is the Shields' Mine. This mine has been operated by a Chilian mill. Little is known of its history.

Cagle Mine.—One mile south and on the east side of Cabin Creek is the Cagle Mine; it is quite near the east edge of the belt. The mining tract embraces about five hundred acres. The mine is entered by two underlay shafts in the vein, the deeper being one hundred and sixty feet on the incline (equivalent to about one hundred and twenty feet vertical depth). The ore body is made up of a quartzo-talcosc schist with a small amount of disseminated iron pyrite and a trace of copper pyrite; the vein is reported to be two to nine feet thick. The assays made at the assay office, Charlotte, have run \$5.33, \$6.20, \$27.19 and \$39.88 per ton.

The average ore is of a rather low grade, but very abundant. The plant comprises the usual appurtenances including four 5-stamp batteries. Only three men were employed in August.

Clegg Gold Mine.—The Clegg Gold Mine—a tract of thirty acres—one-fourth of a mile west, on the opposite side of Cabin Creek, is made up of the same kind of schist, but the ore body is larger and quite decomposed, so much so that the material is worked by open cut, and for the most part by simple picking and shoveling. The milling is performed in a 10 stamp mill. It is worked exclusively by "open cuts."

Morrell Mine.—The Morrell Mine is one-fourth of a mile southwest. A tunnel reported to be two hundred feet in length had been run through hard ground to strike a body of soft ore, but for some unexplained reason it was abandoned when within fifty feet of the bunch.

Burns & Alred Mine.—The Burns & Alred Mine, of seventy-five acres, one-fourth of a mile south of the above, is the best example of this class of deposits. It is worked by "open cut" almost entirely, and with unusual success. Here the old North Carolina method of forty years ago (viz: by Chilian and Drag mills) is employed.

The simplicity, cheapness and economy of the management is in the highest degree commendable. Late reports state a sale of the mine to New York parties. Ten to twelve men are constantly employed.

Several other less known and less prospected localities in this belt are spoken of by those familiar with the ground as deserving attention.

The formation of Moore county, in which these gold deposits occur, is classed by Prof. Kerr as Huronian (Taconic of Emmons), and is immediately northwest of the Triassic.

Hamilton Mine.—The Hamilton Mine two miles southeast of Wadesboro is not now worked. There are two veins of which the easterly has been worked to the depth of one hundred feet. The vein is reported to be two and one-half to four feet wide. The ore is largely quartzite (compacted into hard quartz at the depth of one hundred feet) highly stained with peroxide of iron. The tract comprises one hundred and fourteen acres, and the vein is three quarters of a mile long. Assays are, per ton, \$10.34, \$17.40, \$31.68 and \$46.57.

MONTGOMERY COUNTY.

In Montgomery county five localities have been more or less worked.

Beaver Dam Mine.—The Beaver Dam Mine is on Beaver Dam Creek, a little above its junction with the Yadkin. The property contains between eight and nine hundred acres, and has for a long time had a high reputation for surface and hydraulic work, to which the chief attention has been given during the last year. The veins upon the property have been prospected recently to test their value, and Chilian mills have been erected to reduce the ore, of which a large quantity is at command. About ten men are employed.

Morris Mountain Mine.—Three miles northeast of this is the Morris Mountain Mine, of three hundred and fifty acres. Prospecting work is all that has been attempted. The schistose ore body is of low grade, but large, being sometimes twenty-five feet thick; the depth of twenty feet has been reached in the mine. Ten men were employed in the summer. Assays range \$4.18, \$11.50, \$30.29, \$37.81, \$82.68; the average will lie nearer the first.

A vein carrying argentiferous copper sulphurets and galena has recently been discovered three-quarters of a mile east of the above. It has not thus far been prospected sufficiently to determine its real value.

Coggins Mine.—The Coggins Mine, between the last two localities, is quite similar to the Morris Mountain. Assays \$1.03, \$7.71 to \$104.45.

Sam Christian Mine.—The Sam Christian Mine is twelve miles nearly west from Troy, and near the Yadkin River. The property embraces twelve hundred and sixty-eight acres, with the mineral rights of some adjacent properties.

The gold is found in the bed rock gravel, in the gulches of which three have been worked; the work of the last season was in Moore's Dry Hollow. The mode of treatment is exclusively hydraulic. A double acting pump lifts seven hundred gallons of water per minute to a vertical height of one hundred and ninety feet, whence it is thrown into the Dry Hollow and Sam Christian Cut; the latter cut has been enormously prolific of nuggets—almost no grain or dust gold is found. The largest nugget thus far found weighed eight pounds; the record of 1880 showed a production of thirty-nine nuggets aggregation 1024 dwts. Twenty to twenty five men are employed.

McLean's Branch.—On McLean's Branch, which empties into Beaver Dam Creek, some attention has been given during the year to alluvial deposits by a party of country people. About fifty persons are employed in occasional work in this county.

Other mines in this county are the Peebles (formerly Russell) Mine, which is one mile northeast of Morris Mountain.

Here an enormous body of sulphuretted ore is available. Assays of this ore are \$2.07, \$3.10, \$4.24, \$5.56, \$15.87 and \$22.86. No work of importance was done there in 1882.

The Steele Mine is two miles southeast of Morris Mountain; it is not now at work; the ore, which runs in strings, was enormously rich.

The Saunders Mine adjoins the Steele.

Other mines enumerated to me as worked in the past, but of which little is known, are: The Deep Flat, Worth, near junction of the Yadkin and Uwharie, Dutchman's Creek, Pear Tree, Hill, Tom's Creek, Harbin's, Bundle Mountain, Crump, Burnett Mountain, Swift, and Island Creek.

GRANVILLE COUNTY.

The Gillis mine is in Granville county.

This mine has yielded some high grade copper ore, both argentiferous and auriferous; some little work was done there in 1882.

RANDOLPH COUNTY.

In Randolph county work has been confined almost entirely to the Herring (formerly the Lafflin), the Winslow, and the Hoover Hill mines.

Lafflin Mine.—The Lafflin mine is situated fourteen miles nearly southeast from Thomasville. The gold is widely diffused in the soil, which is the soft loose decomposed product of a somewhat quartzose, talcose, chloritic schist; the surface is nearly everywhere auriferous, but the material is generally of low grade, and can be treated only where an abundance of water is at command; the supply is very small even when supplemented by reservoirs, deep shafts, etc. Comparatively little work was done in 1882. The milling was performed by a Howland Pulverizer and Amalgamator.

The Keystone (Jones) Mine, twelve miles southeast of Thomasville, comprises four tracts of two hundred and ninety three and a half acres, and in character is quite similar to the last named mine to which it is adjacent.

A large part of this area is auriferous to the depth of twenty and forty feet. The surface is everywhere cut up by ravines, which allow fine opportunities for exploitation. The ore is so soft that it can be mined and put into the mill house by "gravity" cars at a cost not exceeding fifteen cents per ton. Assays run: \$2.07, \$3.11, \$3.61, \$4.65, \$6.20 to \$28.92 per ton; the last named is exceptional, the second being nearer the average.

The water supply is deficient, and the artificial aids have been but partly successful in remedying the deficiency. The Uwharrie river, a bold stream, is only two miles distant, but at a lower level; the obstacles to bringing a supply from that river present no difficulties to an hydraulic engineer, which cannot be readily surmounted.

The Delft is in the neighborhood of the last two mines, and is of a similar character.

The Winslow Mine is five miles southwest from Ashboro; a little work was done in 1882, but towards the end of the year was discontinued. Ten stamps are employed.

The Hoover Hill mine, comprising 250 acres, is 17 miles southeast of High Point. Three shafts have been sunk in this mine, of which the deepest is about 150 feet. An adit has been run to cut all the ore bodies at a lower depth. The "county" is apparently an eruptive rock with channels containing numerous seams of quartz, many of

which are rich in gold. Thus far the amount of ore found has been very small, and the company (of London) has become much disheartened. The mine is finely equipped with all requisite machinery, a 20-stamp mill. About 25 men are employed.

Other localities in this county are the Robbins and the Sawyer.

The following list is copied from the *Salisbury Watchman*, June 8th, 1882:

Scarlet Mine, John Scarlet, Ashboro.

Hamlin Mine, J. J. Hamlin, Ashboro.

Gray.

Poplar Branch, R. E. Meeker, Ashboro.

Newberry, N. Newberry, Ashboro.

Davis' Mountain, A. C. McAlister.

Davis' Mountain, north end, H. T. Moffit, Moffit's Mills.

Branson, Wm. Branson.

Spoon, Joseph Spoon, Ashboro.

Johnson, Thomas C. Porter, St. Louis, Mo.

Free, Samuel Free, Cedar Falls.

Elliott Branch, J. S. Crocker, Ashboro.

Mendenhall, W. O. Harris, Trinity College.

Copple, W. O. Harris, Trinity College.

Fince, W. O. Harris, Trinity College.

Stoker, Jesse Miller, Bush Hill.

Tomlinson, Dr. J. N. Tomlinson, Bush Hill.

Frazer, Dr. Frazer, Trinity College.

Leach, S. N. Leach, Trinity College.

York.

Honey.

Lowe.

English.

STANLY COUNTY.

In Stanly county the only mines in active work are the Crowell and the Hearne.

The Crowell mine is situated 7 miles from Gold Hill. The tract has 840 acres. The greatest depth of this mine is about 150 feet. Quite recently four veins have been uncovered on this property. The ore is treated by a five-stamp battery, Howland pulverizer, two Varney pans and settler. Ore assays \$8.00, \$23.76, and occasionally much higher.

The Parker mine, one mile from the Crowell east, is worked on a

small scale and at intervals; this mine is credited in the neighborhood with a production of \$100,000; nuggets are frequently found.

Other mines in this county are:

The Haithcock, near the Hearne.

Lowder, near the Hearne.

Barringer, ten miles northwest of Albemarle.

Biles, seven miles northeast of Albemarle.

Cucumber, fifteen miles southwest of Albemarle.

Craton, fifteen miles southwest of Albemarle.

Carlyle, seven miles northeast of Albemarle.

Eudy, ten miles west of Albemarle.

Furr, eight miles west of Albemarle.

Haines, ten miles west of Albemarle.

Howell, fifteen miles southwest of Albemarle.

Honeycutt, thirteen miles southwest of Albemarle.

Jennings Crowell, ten miles northeast of Albemarle.

Littleton, ten miles northeast of Albemarle.

Love, seventeen miles southwest of Albemarle.

Rock Hole, seventeen miles southwest of Albemarle.

Shankle, eight miles southeast of Albemarle.

Troutman, seven miles northeast of Albemarle.

Tucker, fifteen miles northwest of Albemarle.

The Hearne mine is two miles west of Albemarle, the county seat; a shaft has been sunk one hundred feet; the ore is reported to be free-milling and of good grade.

UNION COUNTY.

No mines in this county are worked on a notable scale.

Preparations looking to systematic operations are now under way at the "Howie," (or as it is sometimes called, the Stockton or Cureton.)

This mine has been more deeply worked, with two or three exceptions, than any other in the State, the depth reached being more than 300 feet. Those familiar with its history speak of a production of \$700,000. The ore body is more than one mile long on this tract. Soft ores assay \$2.05, \$3.49, \$9.02, \$11.19, \$15.32, \$17.68, \$21.32, \$23.30, \$43.06. Hard ores, \$2.62, \$34.17, \$97.16, \$310.51. Rubbish pile, \$3.26, and tailings \$3.53.

The Wyatt (or McCorkle) mine is one mile east, and is not worked.

The Washington Mine is one and one-fourth mile southeast, and has been worked a depth of about eighty feet; ores reputed good. No

No statistics of production are known. The three last mines embrace in all 1,941 acres.

Two and one-half miles northeast of the Howie is a remarkable series of mines, four of which lie in regular succession from southwest to northeast, viz: Davis, Phifer, Lewis and Hemby; for a distance of one and a half to two miles the course of this deposit is a series of shafts, for the most part shallow, but occasionally sunk as deep as 150 feet, viz, the Davis. The whole deposit has been enormously rich, and especially the Phifer, where, on Mint Hill, an open cut has been excavated 100 feet in diameter, and fifty feet deep. None of these are worked systematically, but the Hemby was operated with some steadiness during 1882; the production was not great; a Chilian mill is employed. The Lewis has two and possibly more veins; the Hemby has several—three different series are reported. Assays are \$8.30 and \$34.53.

Moore Hill is situated one mile southwest of the Davis, and

Folger Hill, half mile west; this last locality has been worked to a depth of 90 feet.

The Harkness is half mile east of the Lewis. Its greatest depth is 120 feet, but the present operations are very light and nearer the surface. This group of seven mines gives occupation, at intervals, to 25 to 50 persons. These deposits are in clay slate, with a chloritic or talcose tendency; the gold is in a free state, for the most part, with a small proportion of sulphurets, and occasionally galena. One half mile north-east is

The Smart Mine.—The Smart mine was reopened in 1881 to a depth of seventy feet, and a fine body of galena was reported to be uncovered. It is not now worked.

The Crump is in the immediate neighborhood, and is now in operation. It is noted for its remarkable pockets, of which two were discovered during 1882. The shaft has reached a depth of ninety five feet; 15 men are employed. One mile northeast of the Smart is the

Dulin.—Thence in the same direction, one mile, the

Lemmonds—and, three fourths of a mile further on, the

Stewart.—This mine is fifteen miles nearly southeast of Charlotte; it has been worked to the depth of 170 feet, and has given some extremely rich chimnies of ore; galena and blende are frequently found in this mine, both of which are rich in gold and silver. Assays: \$9.20, \$38.77, \$4.93, \$47.92, 45.36, \$224.78. Tailings, \$5.94. It is not worked now. One half mile beyond the Stewart is the

Moore Mine—which in the character of its ores resembles the Smart. One and a half miles north is

The Long,—and one-half mile further on is the

Bright Light (formerly *Crowell*).—All of these mines are situated in the northwest part of Union county. The Long is not worked, but the Bright Light was reopened in June by a Baltimore company. There are four veins on this property, of which only the western main vein and the eastern (the extension of the Long) are worked; the former has been sunk to the depth of eighty feet and has afforded enough ore to keep the 15-stamp mill at work from about the 1st September. The high grade ore is reserved for future treatment; the ore is cellular quartz or compact white iron pyrites, and on the Long vein occasionally compact galena. The veins are large and the ores abundant. Assays: \$6.89, \$6.27, \$11.74, \$11.98, \$13.36, \$32.32, \$45.47. This stretch of mines is continued into the southeast corner of Cabarrus county in the same formation.

Two miles from the Bright Light is the

Pharr,—and five miles thence is

The Long, which is sometimes called the George Phifer. Three miles east of Matthews' Station is the

Henry Phifer Mine.—The geographical formation in which these are found is designated as the Huronian (or Taconic.)

The "Granite Belt" stretches from the north of Greensboro in a southwest direction into South Carolina. The best known mines of the State are on or adjacent to it.

GUILFORD COUNTY.

No regular mining operations are conducted in this county.

The Fisher Hill Gold Mine is three miles nearly south of Greensboro. Much work has been performed, but there are no statistics of its extent or of yield, or of the value of the ores.

The Fentress (or *N. C. Copper*) *Mine* is eight miles south of Greensboro; the vein is about one mile long, and is entered by at least a half dozen shafts; the greatest depth reached was about 300 feet. The ore body was rich in copper, and occasionally rose to a width of ten or twelve feet.

The Hodgkin Hill Mine, in the immediate vicinity, has been worked, and but little is known of its history; the vein is reported wide, and the ore of low grade. A noted group of mines in the southwest part of the county consists of the

North State,—(formerly known as "the McCulloch;")

Lindsay and Jack's Hill.—This group is in the immediate vicinity of

Jamestown. The depth of the McCulloch was given me as 200 feet; the vein is two to twenty feet wide, increasing in width as depth is attained. Like most mines of this section, it affords brown ore at the top, which gives place to heavy sulphurets in depth, that in this mine are often pure copper pyrite, and constitute a pure smelting ore. The Lindsay and Jack's Hill are the continuation of this. The Lindsay has never acquired the reputation of The McCulloch for high grade ores, but has yielded low grade ore in the greatest profusion, of which a large quantity is now on the dump. This vein on the different mines is thought to be not less than three quarter miles long.

The Gardner Hill Mine is a little to the east of Jamestown. No record is now known of its returns; its history has shown the usual vicissitudes of mining operations, and at times the work has been large and profitable. It is reported to have been worked 180 feet deep.

DAVIDSON COUNTY.

This county is the theatre of the greatest mining activity in the State. Two miles from Thomasville, south, is the

Lalor (formerly Allen) Mine.—The mine is entered by three shafts, the deepest of which has reached 165 feet on the underlay (equivalent to about 140 feet vertical.) The vein is reported of good width, and to carry a fair per centage of copper. The mine is provided with a 10-stamp battery, with all the usual appliances, including concentrating apparatus. A roasting furnace on a novel plan has been recently erected to desulphurize the ore preparatory to amalgamation. Seventy eight men are employed; the lowest grade brown ore was reported to assay \$20, and the highest grade sulphuret \$190.

The Eureka Mine, one-half mile west, is lying idle and filled with water. The depth reported is 125 feet; the vein is of good width; the ore is quite similar to that of the Lalor mine. Assays: \$25.19, \$41.47, \$46.51, \$73.55, up \$1,890.00.

The Black mine is immediately adjacent to the Eureka; the vein is small, but the ore has a high reputation.

The Conrad Hill Gold and Copper Mine is six miles east of Lexington. This property has seven veins, but only three are worked. This establishment has the finest equipment of any gold mine in the State, and is prepared for the thorough treatment of the free milling, and of the heavy copper sulphurets so abundantly supplied by the mine, which are suitable for a smelting treatment. Iron pyrite is rarely

Silver Valley Mine, four miles northeast of the above, carries ore of a similar character; the ore body was discovered in 1880; the mine is entered by an underlay shaft to the depth of 170 feet (equivalent to 110 feet vertical). At the present time the output is about ten tons per day. A new shaft is sinking to cut the vein at a greater depth, when the greater facilities will allow the raising of a larger amount of ore. The mill is provided with twenty stamps and other appliances, and nine buddles for concentrating the lower grade of ores. A contract has recently been closed with a Swansea (Wales) smelting company to take the entire output of the mine for several years. A thousand tons had been shipped from the mine the last of November, and the mine was in condition to send three to five tons per day of high grade ore and concentrates. Fifty men are employed. The appended assays will show the general character of the ores and concentrates:

	I.	II.	III.	IV.	V.
	Massive.	Galena.	.....	Poor Concentrates.	Rich do.
Gold	trace.	\$ 4.13	trace.	\$ 4.13	\$ 4.13
Silver.....	\$13.30	150.15	\$32.45	9.58	38.06
Total.....	\$13.30	\$ 154.28	\$32.45	\$13.71	\$42.19
	Per. cent.	Per cent.	Per cent.	Per cent.	Per cent.
Lead.....	15.89	55.25	38.80	11.18	47.62
Zinc	31.44	11.24	32.00	27.70	12.68

I am informed that the more recent work has resulted in making the higher grade concentrates richer in gold, silver and lead.

The Welborn Mine, two miles west of Silver Hill, has reached the depth of sixty feet. Twelve men are employed. Ore: sulphurets and galena; assays: \$10.88; \$7.60; \$13.90; \$19.26; \$39.20.

The Ward Mine, two miles east of Silver Valley, has been sunk upon to a depth of eighty feet; there are four nearly parallel veins. This property has also a large amount of surface suitable for hydraulic treatment. It received a very favorable notice from Prof. Emmons, the former Geologist of North Carolina. Twelve men are employed. These mines are in the clay slate belt to the east of the granite belt.

ROWAN COUNTY.

Mining is actively prosecuted in this county. At the

Dunn Mountain Mine, four miles southeast of Salisbury, both mining and milling has been carried on during a great part of the year. There

are several veins on the property; the main vein was allowed to fill up during the summer, the output of ore not being satisfactory, and thereafter attention was given to the "office vein," which is now at the vertical depth of 150 feet. A considerable amount of rich ore was obtained from the upper levels, which, with the reserve on hand at the beginning of 1882, allowed a good season of milling. The mill has ten stamps. Thirty men are employed.

The Reimer Mine, six miles east of Salisbury, has been the most extensively worked of any in this vicinity; a chimney of ore in the vein has allowed the output of a very large body of ore of fair grade. The greatest depth attained is 150 feet, but contracts have recently been put out for sinking 150 feet deeper. The vein is four to eight feet wide. Ore assays: \$11.32, \$36.00 and \$126.77. The mine is owned by the Davis Chlorination Company, whose works are one and one half miles south of Salisbury, working under Dr. Meares' patent. The ore is treated at the mine in a very complete concentration work, and then sent to the above chlorination work. These Chlorination works are amply provided with the necessary machinery for treating ten tons of ore or concentrates per day. Desulphurizing is conducted in reverberatory furnaces, chlorination in revolving barrels under pressure; thence after leaching, the solution containing the chloride of gold is filtered through charcoal, which completely deprives the solution of its gold contents; the charcoal is then burnt and the ashes sent to the melting pot. A high per centage of gold is extracted at, as stated to me, a very small cost. 130 men are employed at the mine and 25 men at the reduction works.

The New Discovery Mine is three miles from Salisbury, east; it is thus far merely prospected by J. D. Stewart and others; little depth had been attained; ten men were employed a part of the time.

The Hill Mine,—six miles south of Salisbury, has been prospected by a party of Salisbury gentlemen, and a large amount of fair grade ore exposed; the vein is large and prominent.

The Southern Belle is seven miles south of Salisbury. It had reached the depth of 160 feet, as reported last July. There is no machinery for the treatment of the ores at the mine. Assays: \$17.04 to \$49.61.

The Barringer Mine—seven miles east of Salisbury, has recently been bonded by a party from Thomasville and Salisbury, and will soon be thoroughly prospected; this mine has afforded some extraordinarily rich ore.

Dutch Creek Mines.—This group of mines is on the waters of Dutch Second Creek, ten miles east from Salisbury, on the Stokes Ferry road. The Superintendent reports twenty two veins on the property under his charge, two being copper bearing. The main development is on Hill, Tiptop and Katie veins; these veins afford an admirable brown ore down to the water level, and are in width from one foot upwards, and where the Hill and Tiptop cross eighteen feet wide. They are down seventy feet by shaft, and thirty feet deeper by winze. The adits and levels aggregate 1,000 feet. The average run of ore is from \$10 to \$30. The copper veins are down respectively fifty and forty feet, and are three and a half to four feet wide; the ore is of good grade, both as to copper and gold. Heretofore they have concentrated the ore, and treated the concentrates by a chlorinating method invented by one of the directors. The superintendent reports a high per cent. of gold saved and results good. The superintendent proposes to put up an amalgamating plant, and save as much gold as possible; then concentrate the tailings and treat the sulphurets by the above or any other method answering the purpose to extract the copper. At the

Gold Knob Mine, nine miles east of Salisbury, little work was done in 1882, and no force is kept at work constantly. Sixty feet is the greatest depth reached in any of the veins, of which there are eleven on the various tracts owned by the company. Only a little milling has been done on the 5 stamp mill. Ores abundant, and in the main quite sulphuretted. Assays, \$20.68, \$26.62, \$27.58, \$108 55.

Howard Mine, six miles east of Salisbury, is being opened, but little work has been done.

The Gold Hill Mine, sixteen miles southeast of Salisbury, was reopened in 1881 by an English company. This mineral property has a history of more than forty years, but of late years has been closed. There are two prominent veins, and two of less known character in the group. Till the middle of autumn last the eastern or Barnhardt vein, at the depth of 350 feet, had received exclusive attention, but at present an effort is making to "unwater" the western or Randolph vein, that has furnished the greater part of the product of the group, which is estimated at \$2,000,000 by those familiar with the work there. The greatest depth attained on the Randolph vein is 750 feet, (or 710 feet as held by some.) One hundred men are employed. The reducing machinery consists of twenty stamps, with four Freiberg barrels for amalgamating, with some other minor appliances for saving the gold. Assays: \$4.53, \$4.35, \$6.81, \$12.85, \$23.26, \$45.31, \$255.71. The ex-

tension of the Randolph vein is found in two other properties on which mining work has been done—the Stockton tract, and another on which is the “Big Cut,” as it is known locally. The *McMacken*, if not absolutely on the extension of the Randolph vein, is very near it. This mine, not now worked, was sunk to a depth of 110 feet. Ore: sulphurets, galena and blende, both auriferous and argentiferous.

The *Troutman Mine*, one mile southeast of Gold Hill village, is 125 feet deep; not much stoping was ever done there, and it is now abandoned. The ore is an argentiferous and auriferous galena and blende.

The *Rowan Mining and Milling Company* have the Atlas and Bame mines. This groupe is near the Stokes Ferry road and between it and Gold Hill, and twelve miles from Salisbury.

The following list is copied from the *Salisbury Watchman*:

Yadkin mine, two miles south of Salisbury.

Bringle mine, one mile south of Salisbury.

Roseman mine, eleven miles south of Salisbury.

Earnhardt mine, three miles southeast of Salisbury.

Kesler mine, eleven and a half miles southwest of Salisbury.

Trexler mine, six miles east of Salisbury.

Goodman mine, six miles southwest of Salisbury.

Brown mine, four and a half miles east of Salisbury.

Rendleman mine, six miles south of Salisbury.

Roseman mine, eight miles south of Salisbury.

Marsh mine, eight miles south of Salisbury.

Miller mine, nineteen miles southeast of Salisbury.

Hartman mine, three miles southeast of Salisbury.

Crawford mine, one mile southeast of Salisbury.

Morgan Peeler mine, twenty miles southeast of Salisbury.

Negus mine, two and a half miles southwest of Salisbury.

D. A. Goodman mine, seven miles southeast of Salisbury.

Boyden mine, one mile northeast of Salisbury.

Butler mine, one mile southeast of Salisbury.

Little Barefoot mine, eleven miles northwest of Salisbury.

Peeler mine, six and a half miles southeast of Salisbury.

Kern's mine, three miles east of Salisbury.

Pool mine, eight miles east of Salisbury.

Graham mine, nineteen miles south of Salisbury.

Peeler mine, eight miles east of Salisbury.

Newsom mine, seven miles east of Salisbury.

Baily mine, nine miles south of Salisbury.

Barringer mine, nine miles southeast of Salisbury.

Phillips mine, nine miles southeast of Salisbury.

Barringer mine, six miles east of Salisbury.

Huffman mine, eleven miles southeast of Salisbury.

Kluttz mine, seven and a half miles southeast of Salisbury.

Caster mine, ten miles southwest of Salisbury.

CABARRUS COUNTY.

Work is prosecuted at the Phoenix mine, ten miles southeast of Concord; at the North Barrier, one mile south of the above; at the Tucker (formerly California), one mile southwest of the Phoenix; at the Quaker city, one mile west of the Phoenix; and at the Rocky river mine, one mile from Bost's Mills. All these mines but the latter are in the granite and near the eastern edge.

The Phœnix Mine is worked by the same company that operates the Meares chlorination works; four deep underlay shafts have been sunk on the vein, one to the depth of 250 feet (equivalent to 225 feet vertical); a level to the north of this shaft has opened up a fine body of ore of fine grade, and two to four feet thick; this block of unstoped ore is estimated to have a two years supply for the works. The chlorination works can treat ten tons per day, and are soon to be enlarged; the plant is quite complete, consisting of a 10-stamp battery, Walker pulverizer, &c., three horizontal rotary roasting furnaces, four rotating barrel chlorinators, (for chlorinating under pressure,) leaching and precipitating tanks. Fifty men are employed. Ores assay \$10 to \$85.

The North Barrier Mine is down about fifty feet; no considerable body of ore has yet been uncovered. It is worked by the above company.

The Tucker Mine, seven miles southeast of Concord, was opened in 1881; milling was commenced in November of the same year, but was suspended early in 1882, to permit the erection of chlorination works; this plant was completed at the close of October, and the first run was made successfully in November. The method of chlorination employed is the old Plattner process, for which a small but sufficient plant has been established, consisting of a single hearth reverberatory roasting furnace, chlorinating tanks, leaching and precipitation vats. The capacity was given as five tons per day; it is altogether a model establishment of its kind. The depth reached in the vein is seventy eight feet. Twelve men are employed.

The Quaker City Mine has reached a depth of eighty feet; the ores proved so sulphuretted as to be refractory to work, and operations are temporarily suspended pending the introduction of some better method of extracting the gold. The mill is on Buffalo creek, three miles from the mine.

The Rocky River Mine, 350 acres, ten miles southeast of Concord, has just been reopened; the vein runs across two different properties. The shaft has been sunk about fifty feet, at which depth the vein had increased from four inches to a width of eighteen to twenty-four. The ore is unusually rich, but too little work had been done to determine its value. In November it was sold to a Pennsylvania company, that has already put in \$5,000 in machinery. Heretofore they have amalgamated in a Chilian mill capable of treating one ton of ore per day. The "clean up" late in November for four and a half tons of ore was twenty ounces of gold, valued at \$375.

The Reed Mine is ten miles southeast of Concord; it is not worked at present, and the last work was given to vein material. This mine was the first along the Appalachian range to give it celebrity for its gold production, though probably not the first to yield gold. The first gold was found here in 1799; the largest nugget 28 lbs. avoirdupois (408 ounces troy nearly) was found in 1803; regular operation commenced some years later. The largest nugget found on the eastern side of the United States has just been alluded to. There are four veins in the property of 780 acres, besides alluvial deposits.

The *Salisbury Watchman* furnishes the following list of mines in Cabarrus county:

- Bangle mine, ten miles northeast from Concord.
- Allison and Reed mine, ten miles southeast from Concord.
- Babcock mine, five miles northeast from Concord.
- William Bost mine, fifteen miles southeast from Concord.
- Eph. Bost mine, fifteen miles southeast from Concord.
- Martin Bost mine, eight miles southeast from Concord.
- Charles Bost mine, eight miles east from Concord.
- Allen Boger mine, eight miles southwest from Concord.
- Wiley Biggers mine, ten miles east from Concord.
- John Boger mine, eight miles northeast from Concord.
- Moses Barrier mine, ten miles east from Concord.
- George W. Bost mine, five miles south from Concord.
- Burton Blackwilder mine, three miles east from Concord.
- McDonald Biggers mine, ten miles south from Concord.

- Boger mine, ten miles south from Concord.
A. W. Bost mine, ten miles southeast from Concord.
Cabarrus mine, eleven miles east from Concord.
Cullen mine, eight miles southeast from Concord.
Gold Arbor mine, eight miles east from Concord.
Cruse mine, eight miles east from Concord.
Dey mine, eight miles east from Concord.
Duff mine ten miles east from Concord.
Reuben Blackwilder mine, three miles east from Concord.
C. H. Erwin mine, eleven miles south from Concord.
D. W. Flow mine, ten miles south from Concord.
Fagot mine, eight miles southeast from Concord.
Allen Furr mine, twelve miles east from Concord.
First National mine, ten miles east from Concord.
Furr Rachal mine, ten miles east from Concord.
Fisher mine, four miles east from Concord.
Fink mine, eight miles east from Concord.
Furner's mine, eight miles east from Concord.
Garmon mine, twelve miles southeast from Concord.
H. N. Goodman, four miles east from Concord.
Will. S. Harris mine, ten miles northwest from Concord.
James Hegler mine, eight miles southeast from Concord.
J. F. Litaker mine, four miles southeast from Concord.
Cyrus Litaker mine, four miles southeast from Concord.
Ludwick mine, eight miles east from Concord.
M. Melcher mine, eight miles east from Concord.
Michael mine, eight miles east from Concord.
Margaret Miller mine, eight miles east from Concord.
Newell mine, ten miles south from Concord.
Pioneer Mills mine, ten miles south from Concord.
Joe Reed mine, one mile east from Concord.
Paul Reinhart mine, ten miles east from Concord.
Jake Shins mine, ten miles southeast from Concord.
Tom Shins mine, ten miles southeast from Concord.
Christian Sossamon mine, twelve miles south from Concord.
Eph. Tucker mine, ten miles east from Concord.
Taylor mine, eight miles east from Concord.
Vanderburg mine, ten miles south from Concord.
Woods mine, four miles east from Concord.
M. C. Walter mine, four miles east from Concord.

J. C. Watts mine, ten miles east from Concord.

Natt White mine, five miles south from Concord.

A. M. Wilhelm mine, ten miles south from Concord.

MECKLENBURG COUNTY.

Nine mines are in operation in this county.

The Hopewell Mine, nine miles northwest from Charlotte, is down 100 feet; the ore which has a considerable per cent. of copper, assays only moderately well for gold.

The McGinn Mine, five miles northwest of Charlotte, has three veins, two carrying the gold ores usually found in this section, the third having rich copper as well as gold ores; the latter is the only one now prospected; the depth reached is 165 feet, from which a drift is run nearly to the vein. The more prominent of the two gold veins has been penetrated to a depth of 150 feet, and worked with some success as deep as the machinery could command the water. Twelve men are employed. Ore assays: \$4.37, \$5.18, \$12.50 and \$4.55 per cent. of copper; \$15.72, \$6.82 and \$7.50 per cent. copper, \$82.77, \$99.84, \$114.36, \$137.93, \$82.77.

The gold vein (Jayne vein) above alluded to runs on the south into the adjacent Capps Hill property, where it is joined by another prominent vein; the system has been worked to a depth of 200 feet, but work at present is at a depth of 150 feet. Several hundred tons of good ore are on the dump, and the work of development is continued; no method of treatment has yet been adopted. The record of yield of this mine is defective, but it is popularly credited with a product of \$2,000,000. Twenty five men are employed. Ores assay: \$7.10, \$56.35, \$96.37, \$133.00, \$133.76.

The Arlington Guarantee Mine, five miles west of Charlotte, has been worked to a depth of nearly fifty feet; a large amount of brown ore is at command. The milling machinery at present in use is a modified form of the old fashioned Carolina Gold Mill. Ten men are employed.

The Clark Mine, two and a half miles west of Charlotte, has been worked to a depth of seventy feet; twelve men are employed, when at full work. Ores assay: \$8.34, \$16.76, \$13.52, \$15.50, \$33.25, \$67.25, \$74.71, \$126.69, \$164.44.

The Rudisil Mine, one mile southwest of Charlotte, has reached the depth of 300 feet (equivalent to a vertical depth of about 275 feet), and has been very extensively worked, and with a yield, it is thought of

\$1,000,000. The ores are often very rich. The following assays are of representative samples: \$6.29, \$43.41, \$14.10, \$30.42, \$39.66, \$32.49, \$36.09, \$24.20, \$11.47, \$21.79, \$126.87, \$115.14, \$25.32, \$130.22, \$8.27, \$31.00, \$14.47, \$6.20, \$39.27, \$91.89, \$97.15, \$129.18, \$61.43, \$128.15. It is equipped with a 10-stamp battery. Ten to twelve men are employed.

The St. Catharine Mine (formerly known as the Old Charlotte) is the northern extension of the Rudisil, and is one half mile west of Charlotte. Two shafts have been sunk to a depth of seventy feet and 115 feet. A considerable dump of good milling ore has been accumulated; vein three to four feet wide. Ores assay: \$86.98, \$114.79, \$147.50.

The Smith and Palmer Mine is one and a half miles south of Charlotte, and in close proximity to the Rudisil; a shaft has been sunk to a depth of 100 feet; the force employed is small. Assays: \$4.66, \$5.17, \$15.51, \$72.34, \$149.59.

The Baltimore and North Carolina Gold Mining Company (formerly known as the Ray mine) has five veins on its property of 360 acres, of which three are worked. It is situated nine miles east of Charlotte, near the Carolina Central railroad.

The Ray vein is entered by five shafts, the deepest being 120 feet; ores are heavy sulphurets containing some copper, with some brown ores; vein one to four feet wide. The total length of veins on this property is about four miles. The south vein is down sixty feet, and the Phifer Grove vein shaft forty feet. Both give brown ores of good grade.

This mine is fully supplied with machinery and all milling appliances; the battery has ten stamps. Assays: \$20.95, \$31.82, and often a good per cent of copper.

The Ferris, six miles northeast of Charlotte, is a prominent mining property, with three veins; it is not now operated. Ores assay: \$20.14, \$10.34, \$111.61, \$28.94, \$44.32, \$128.66, \$220.54, \$512.94.

The Simpson Mine yields quartz ores with little sulpherets; the assays of representative lots are; \$3.79, \$4.75, \$3.60, \$5.17, \$7.37, \$29.97, \$32.10, and \$70.89.

The Stephen Wilson Mine has ten well defined veins; 310 acres of land; it is nine miles west of Charlotte; gives ores indicated as follows: \$4.52, \$11.37, \$13.56, \$44.03, \$36.56, \$38.26, \$26.04, \$51.50, \$25.70, \$97.53, \$8.53, \$355.96, \$261.76.

The Black Mine has a small but very rich vein of the finest kind of

brown ore, viz: \$50.16, \$56.86, \$62.00, \$488.12; large lots of the ore have milled more than \$50,00 per ton; a Chilian mill is used for reduction.

Other mines in this county are:

The Carson, Sam Taylor and Tayhorn, southwest of Charlotte.

The B. F. Wilson & R. McDonald, one and a half miles southeast.

The Davidson group, one mile west.

The Trotter, three miles southwest, and cut by the Air Line railroad.

The Dunn mine, nine miles west with three veins, one with copper.

The Frazer, Hipp & Todd are near by.

The Henderson and the Chapman are to the northwest.

On the farm of S. H. Hunter, of Huntersville, sixteen miles north of Charlotte, is a gold mine with a promising exposure; it has been explored to a depth of twenty three feet, and found to carry some good ore.

The Hunter, Crosby, Rogers and Pioneer Mills are twelve to 17 miles northeast of Charlotte; the last three carry copper pyrites in considerable quantity.

The Newell, the Pharr, and other mines are near by.

The Johnson, Stinson, Maxwell, and Rea are seven to nine miles east of Charlotte.

The Tredwick, seven miles east.

The Alexander is five and a half miles east.

The Caldwell is six miles northeast.

The Harris mine is ten miles nearly east. The stretch of mining property upon which this mine is situated is thought to have some rich gravel. Surface Hill, one of these localities, is famous for its rich nuggets; occasional pockets of ore are found, as during the last season, of extreme richness.

The farm of Elliott Bros., five miles south of Charlotte, has several veins.

The Nolan, Jordan, Meares, Bennett, Cathy, G. C. Cathy, Sloan, Gibson, the McCorkle, and several others are within easy reach of Charlotte.

GASTON COUNTY.

The only mine at work is the

Kings Mountain, and even here the main part of the mine is idle and filled with water; only small outlying bodies of ore were worked

in 1882, but the results have been comparatively good. This mine has reached a depth of 332 feet. The vein (or front and back vein as it is commonly spoken of) is of great thickness, sometimes reaching to forty feet; the front vein has generally been the richest; assays running \$3.55, \$4.41, \$11.84, \$16.79, \$45.94.

The vein is in limestone. The great thickness of the vein, the ease with which it is worked and milled, and the small amount of sulphurets combine to make even the low grade material profitable ore to treat. The mill is equipped with forty stamps. A yield of \$750,000 is attributed to this mine.

Several barytes mines are on the east flank of King's and Crowder's mountains, and from the latter locality about 700 tons were shipped in 1882, giving employment to about twenty five men, when fully at work, besides teamsters.

The Crowder's Mountain Mine (or Caledonia) is four miles to the northeast of King's Mountain Mine, and on the east side of the mountain of that name; it has very large ore bodies, generally of low grade. Too little work has been done to justify any confident assertion of their value.

The Duffie Mine, in Gaston county, is in the gneissoid belt bordering the granite on the west. It has been worked to a depth of about 150 feet. A large body of sulphurets is found in this mine, assaying \$5.79, \$12.95, \$8.31, \$13.98, \$47.37.

The Robinson Mine adjoins the Duffie, and is of a similar character

The Long Creek property has three veins, Long Creek, Dixon and Asbury. The ores of these mines are generally of low grade. Assays of Long Creek ores are: \$4.14, \$10.34, \$21.94, \$821.84.

Other mines in this county on the same formation are the Oliver, Rhodes, Rhyne and Burwell Wells.

LINCOLN.

The Burton Mine has been worked at intervals for several years.

The Hoke Mine, four miles from Lincolnton, has been opened to a depth of 110 feet, and drifted in for some length. The vein is reported of good width. Ores assay: \$17.09, \$1.87, \$95.32.

CATAWBA.

The Shuford Mine has been worked but little in 1882. The want of

water is a great drawback to the property of this mine. An area of several acres is covered with auriferous quartz, and the surface soil is also rich in gold that would pay handsomely in an hydraulic treatment.

DAVIE.

In the gneissoid formation, in Davie county, are several localities where gold has either been mined or found in some quantity. The only prominent mine is the "*Butler*" (or County Line Mine), eight miles southwest of Mocksville. No work is done there at present. The only assays of ore at command are: \$8.27 to \$8.75 per ton, but occasionally masses are met with much richer.

Callahan Mountain was worked a generation ago, with what results it could not be learned.

The Isaac Allen Mine is one mile northwest of Mocksville.

There are deposits of gold in Clarksville township, seven and a half miles northwest of Mocksville; also seven miles northeast, in Fulton township.

ASHE.

The Copper Knob Mine, (formerly Gap Creek) is situated in the southeast part of Ashe county, and fourteen miles southeast of Jefferson; it has 210 acres; it has been penetrated to a depth of 135 feet; the vein is twenty to forty two inches wide. This mine has given the finest kind of peacock copper ore, rich also in gold and silver. It is one of a group of mines, but none of the others have ever been explored, with the exception of Rich Knob, two miles distant. Assays of the ore are as follows: \$60.27, \$10.88, \$166.37 and copper 37.44 per cent, \$61.45 and copper 23.82 per cent., a working sample at E. Ballock & Sons, Newark, gave gold and silver \$15.95 and copper 7½ per cent. The dressed ore ran gold and silver \$79.75, copper 37½ per cent.

BURKE, RUTHERFORD, McDOWELL AND CLEAVELAND.

The gravel area of the Upper Laurentian in Burke, Rutherford, McDowell and Cleaveland counties, where these counties come together, is fifteen to twenty miles long from northeast to southwest following the general direction of the mountain ranges, and from ten to fifteen miles wide from northwest to southeast.

The Polk county deposits some twenty-five miles southwest, may be an extension of this area. Almost everywhere in these limits gold is found, but not everywhere in paying quantities.

As the processes are made more economical or effective the paying areas will be more numerous.

Brackettown, Janestown, Brindletown, Dysartville, Whitesides and Golden Valley are the best known localities. The gold hitherto extracted has been almost exclusively from the gravel; the ultimate source of this gold is apparently the rich seams of quartz, which in great numbers everywhere traverse the schists of this section, sometimes conformably to the schists, sometimes dipping and coursing in contrary directions.

Eleven miles south of Marion, the Vein Mountain Company are at work; the water is brought from the upper branches of the second Broad River by a ditch aggregating with its branches about eleven miles in length.

The gulches about this mountain though worked for forty years still yield up their rich contents. So far only hydraulic work has been done, but not to the extent which this important locality would justify. The superintendent has spent most of the year in prospecting the veins, and reports twenty-two uncovered; some of these veins can furnish an abundance of good material for a mill. The quartz of these veins assays: \$2.18, \$4.13, \$6.20, \$10.33, \$13.43.

This property embraces upwards of 6,000 acres; the north or Huntsville end of the property has been less prospected, but is known to abound in rich gravel; a deficient water supply, and unfavorable conformation of the surface of the adjacent country for bringing water, forbid any extensive use of this part of the property for the present. Twenty-five to fifty men are employed.

The Hard Bargain Tract, one half mile west of the Vein Mountain has been operated with fair results; a small supply of water and unfavorable tailing ground prevents more than sluicing work. Five to ten men are employed.

The individual operations to the southeast in Brackettown are not so generally pursued as in former years; the storekeepers from Bright's to Dysartville (to whom the gold is sold) a distance of six miles, estimated about one hundred men, women and children at work on their own account with more or less constancy.

The Granville Mine, two miles east of Iron Mountain, did nothing in 1882.

Sixteen miles southwest of Morganton, J. C. Mills, of Brindletown, has enlarged his water supply, and increased his works to some extent; his ditches aggregate nearly fifteen miles, and his mineral tract embraces 2,500 acres. Ten to fifteen men are employed.

The Hancock Mine, operated by a Boston company, is fourteen miles southwest of Morganton. Five to twenty five men are employed. The tract consists of five hundred acres, of which two hundred and fifty are mineral. The supply of water is drawn from the place, and is sufficient with economy for moderate work. The return has been fair for a new enterprise.

One mile east of the above, and near the Glen Alpine Hotel, are the *Glen Alpine* and *Little Queen* Mines; at neither has more than preparatory work been done; the latter has one hundred and fifty acres.

The Carolina Queen Mine, two miles southeast of the Hancock, contains seven hundred and fifty acres, and is in full operation. On this property is a large amount of gravel which has thus far received the chief attention, but the veins, of which five are uncovered and partly developed are likely to add something to the returns. The water ditch is four miles long. This is also a Boston company. This mine has declared four dividends since June, 1882. About one hundred to one hundred and fifty individual operators are at work along this stretch at intervals.

In Golden Valley south of mills across the South Mountains, two mines are at work, viz.: the Connecticut Mining Association (a Hartford company), and the Greyson company, (a Meriden, Connecticut, company).

The Connecticut Mining Association has the Lawson Smart mining tract on a lease; sixteen veins are reported on the property; the miners of the neighborhood have a high opinion of the resources of the property. Five hundred acres is the tract, of which one half is mineral land.

The Greyson Mine, two miles south, farther down the valley, is worked for its ore supply and not for its gravel, though there is a supply of that class. The mill is operated by a 5-stamp battery and a Holliday pan.

Negotiations are pending looking to the opening of other mines in this valley. Much work has been done in this section for years, and careful examination would show many other localities to be still worthy of work; a half-dozen tracts are well known in the vicinity of the

Greyson mine. About fifty individual operators are at work in this valley.

There are fourteen well-known localities in

POLK COUNTY,

commencing with the *Double Branch Mine* and extending west to the vicinity of Columbus, the county seat; these are: the Double Branch, Patty Abrams, Wetherbee, Red Spring, Tom Arms, Splawn, Prince, Ponder, Riding, L. A. Mills, Carpenter, Hamilton, Neal, and Macintire. These all had a good reputation in the palmy days of gold mining, while the deposits contiguous to water lasted, but at present none can be worked on a large scale without a larger supply of water than can be afforded from the vicinity of the mines; a sufficient supply could be obtained only from the North Pacolet, in the southwest part of the county, by a ditch twenty miles long.

At present only the Double Branch, the Prince, Hamilton and Riding are doing any notable work.

The Double Branch Mine, in the southeast part of the county, is operated by a 5-stamp mill.

Attention has been given mostly to the quartz seams in the mica schist, which is so far decomposed as to allow of easy and cheap mining; the quartz is rich and will assay high: \$2.07, \$9.30, \$33.77 \$466.28.

The property embraces 600 acres of mineral land belonging to the "Speculation Co." Six to ten men are employed.

The Prince Mine, four miles south of the Double Branch Mine, is a purely surface vein, and the entire work is hydraulic; the property has three hundred and sixty acres; the water is taken from the property itself; a larger supply of water is a desideratum.

Twelve miles north of Morganton, in Caldwell county, and on the northeast side of John's river, is the Baker Mine.

Two well known veins are on this property—a gold vein and a galena vein. The gulches leading up to this mine were rich and extensively worked, and are still worked on a small scale. The galena vein is reported to carry a large amount of galena, rich in gold and silver.

Other mines in this neighborhood are the Michaux, Packs Hill and Corpenning. A mere handful of men are at work in this section.

To the west of the Blue Ridge gold is found in a few localities,

chiefly in the "Gravel"; little is known of the veins from which it is derived.

Prof. Kerr enumerates the following localities:

Howard Creek, Watauga county; Cane Creek, Buncombe county; Boylston Creek, Transylvania county; Georgetown Creek, Jackson county. In Cherokee county, Valley River, and from Valley to Vengeance Creek, for fifteen miles; at the Parker and Warren Mines and other localities on Nottely River. It is thought that not more than fifty persons give a part of their time to mining here.

The Reduction works of the State, either for an entire or partial reduction of the metallic gold, are the Smelting Works at Conrad Hill, the Davis Chlorinating Works at Salisbury, the Meares Chlorinating Works near Mt. Pleasant, Cabarrus county, and the chlorinating plant at the Tucker Mine near by. These have been sufficiently described in their respective places. The North Carolina and New York Reduction Works at Charlotte have entirely stopped for more than a year; the Adams Reduction works were brought to a stand-still in the fall of 1881.

A new establishment, four miles south of the city of Charlotte, is putting up a "Designable" Plant, and are ready for work, with a capacity of 11 to 15 tons of ore per day; the prospects of the works are good.

COPPER.

Dr. Genth, the eminent mineralogist, says in regard to copper ores :

“Copper ores have been found in many localities throughout the state, in the veins of the old gneissoid rocks, as well as in the more recent slates, and even in the triassic formation.

The principal ore is chalcopyrite or copper pyrites; and there is every reason to believe that many of the mines require only a fuller development to enable them to furnish large quantities of valuable ores.

Many of the gold veins are associated with pyritic ores, and in fact almost all the North Carolina copper mines in the central counties have first been worked for gold, and there are hardly any mines in Guilford, Cabarrus and Mecklenburg counties occurring in the gneissoid and syenitic rocks, which do not show strong indications of copper ores.

The general character of these mines is that about at water level, the so-called brown gold ores are replaced by quartz richly charged with iron pyrites more or less mixed with copper pyrites, the latter increasing as the mine deepens, and in many places becoming the only or the predominating ore, and forming a regular copper vein.

The ores either became poor in gold or the latter could not be extracted by the ordinary process, then chiefly in use in North Carolina—Chilian mills and arastra—therefore many valuable mines were abandoned, mostly before a larger and paying quantity of copper ores had been reached.

The principal mines which promised to change into copper mines are in Guilford county, the Fisher Hill, the North Carolina, the McCulloch, Lindsay, Gardner Hill, Twin Mines, etc.; in Cabarrus county the Ludowick, Boger, Hill, Phoenix, Orchard, Vanderburg, Pioneer Mills, etc., and in Mecklenburg the McGinn, Hopewell, Rudisill, Cathay Mines, etc.

The cupreous minerals observed in the mines are, near the surface, small quantities of native copper and cuprite, the latter sometimes in beautiful needles, the so-called chalcotrichite, malachite, rarely azurite, chrysocolla and pseudo-malachite, and in some of the mines chalcocite and barnhardtite; all resulting from the decomposition of chalcopyrite or copper pyrites, which forms the principal ore. Siderite or carbonate of iron often forms an important gangue rock.”

There are, says Emmons, several veins of copper ore in the northeast

part of Person county. At the Gillis mine the metal which the vein carries is known as the vitreous copper ore, which yields when properly dressed about sixty per cent. of copper. Two shafts have been sunk upon the vein; in the south shaft it is eighteen inches, in the north about five feet. The vein carries in addition to the vitreous copper, silicate of copper, green carbonate, red and black oxides of copper, the latter rare. Dr. Emmons expressed the opinion that this part of Person and the adjoining part of Granville would prove a mineral district of considerable importance.

COPPER MINES.

[By G. B. HANNA, U. S. Assay Office.]

The Ore Knob Copper Works are in Ashe county, twelve miles east of Jefferson.

The greatest depth reached in this mine is a little more than 400 feet; the vein is large and the ores abundant; the ore body consists of iron pyrite with a small proportion of copper pyrite; the per cent of copper is small, but by sorting it is brought to a grade of five per cent. and upwards. A complete and extensive plant is maintained for the production of ingot copper of high grade.

The production varies from year to year, but at present is at the rate of about 450 to 500 tons per year. Two hundred men are directly employed by the company, and a village of 600 inhabitants has sprung up about the works; the superintendent estimates that the teamsters, wood cutters and charcoal burners will swell the number of men at work for the company in whole or in part to 500 or 600.

The only other copper smelting works are at the Conrad Hill Mine, which has elsewhere been described.

The chlorination at Salisbury and at Mount Pleasant (see previous description) produce a small amount of copper incidentally, but it is too irregular to admit of statistical exhibit.

Gold and silver production of State approximately in 1882, \$175-000; Copper shipped from the State in 1882, 400 to 500 tons.

Miners operatives constantly employed 1,280 to 1,400; men (including women and children) incidentally and occasionally employed 800.

Lead ore shipped from State in 1882, 1,200 tons; Gold ores shipped from State in 1882, 200 tons; Barytes ores shipped from State in 1882, 700 tons; Iron ore (Gaston county) shipped from State in 1882, 2,000 tons.

COAL.

The coal fields of North Carolina are referred by Dr. Emmons and Prof. Kerr to the triassic system.

There are, says the latter, in this state two narrow fringes of an eroded and obliterated anticlinal, which belong to this system; the smaller, or Dan river belt, from two to four miles wide, following the trough-like valley of that stream, (about N. 65° E.), for more than thirty miles, to the Virginia line; the other, the Deep river belt, extending, in a similar trough, five to fifteen miles wide, (and depressed 100 to 200 feet below the general level of the country), from the southern boundary of the state, in Anson county, in a N. E. direction to the middle of Granville county, within fifteen miles of the Virginia line.

The most important and conspicuous member of the series, is a large body of black shales, which encloses seams of bituminous coal, two to six feet. This coal lies near the base of the system in both belts, and is underlaid on Dan river by shales, and on Deep river by sandstones and conglomerates; the latter constituting the lowest member of the series, and being in places very coarse.

The black shales near the base of the system contain beds of fire clay and black band iron ore, interstratified with the coal.

Emmons reports five seams of coal, separated by black slates, shales, black band iron ore and fire clay; and in general, he finds a remarkable similarity to the coal deposits of the carboniferous formation.

The coal with its shales outcrops along the northern margin of the belt at various points, for more than fifteen miles, and many shafts having been sunk to, and through the main seam, which is the upper one, it is ascertained to be very persistent in all its characteristics and associated beds.

The area of this coal field is given by Emmons as about 300 square miles. The quality of the coal is also discussed by him and by Admiral Wilkes, and various analyses are published; the three following by the latter, of samples from different parts of the field:

Carbon,	60.7	59.25	84.56
Volatile Matter,.....	32.7	30.50	7.42
Ash,.....	5.3	10.21	7.80
Sulphur,	1.3		
	100.0	99.99	99.87
Specific Gravity,.....	1.28	1.41	1.49

The first analysis (by Schæffer) represents the coal at the Egypt shaft, the second by Prof. Johnson, the outcrop at Farmersville, and the third by the same, the Wilcox seam. Wilkes says, in his report to the United States government: "The three upper seams of the bituminous coal are well adapted for fuel, cooking, gas and oil. It is a shining and clear coal, resembling the best specimens of Cumberland. It ignites easily and burns with a bright, clear combustion, and leaves a very little purplish grey ash. It swells and agglutinates, making a hollow fire." "It yields a shining and very porous coke, and is an excellent coal for making gas or for burning." "The dry or debitu-minized coal" exists in "but small quantities in the basin," and "contains less than one quarter of the volatile matter that the bituminous coal contains."

In regard to the value of the Chatham coal for gas making, the reports of the superintendents of the gas works of Norfolk and Portsmouth are highly favorable, "both as to the quality of the gas produced and the quantity which a given amount of the coal yielded."

It is worth while to mention here also the *bituminous shales*, which show themselves in so strong force above the coal in the Egypt section. Dr. Emmons estimated the thickness of the oil bearing strata at seventy feet, and pronounced them capable of yielding thirty per cent. of their weight in kerosene oil. So that here is an inexhaustible resource for fuel, over and above that furnished by the coal seams.

On Dan river the coal first shows itself on the surface about three miles east of Germanton, being imperfectly exposed in a ravine. The coal is about three feet thick. Some six to seven miles further east, at Stokesburg, there are outcrops of three seams in successions, the upper about three feet thick, with a heavy body of bituminous shales; the other two were not well enough exposed for measurement, but they were explored by a very intelligent gentleman who reports one of them as much thicker than the top seam. The black shales and

slates crop out at various points about the town of Madison ; and near Leaksville a slope was driven some sixty feet on the coal seam which is here three feet thick, and with a dip of 34° and considerable quantities were mined during the war. It is classed as a semi-bituminous or dry coal. The outcrops show that the coal is continuous through the whole length of the belt in this state, which is above thirty miles.

SILVER, LEAD, ZINC.

From Dr. Genth's Report.

"I shall consider these three metals under one head, as they are always associated.

Silver is a rare metal in North Carolina. With the exception of the silver alloyed with gold, varying from one or two to about twenty per cent., in the gold from veins and gravel deposits of the granitic and gneissoid rocks, very little silver has been found in the veins of these strata.

The only real silver mines of North Carolina are ore beds of zinc blende, mixed with galenite, in the argillaceous and talcose slates. The type of these is the old Washington mine, now Silver Hill, in Davidson county, which was discovered in 1838. Near the surface is formed a bed of carbonate of lead, having in many places films and plates of metallic silver disseminated throughout the mass of the ore. These ores were easily reduced, and produced handsome returns to the owners. This was, however, but of short duration. The undecomposed ores, which were a very fine grained mixture of brown zinc blende and argentiferous galenite, were soon reached, and presented great difficulties in the extraction of the precious metals.

Recently, says Prof. Kerr, they have been discovered in several of the western counties.

OTHER USEFUL MINERALS.

Mica.

A great many mines of this mineral have been opened in the last twelve years in some of the western counties of the State, in the archæan rocks. It is found in ledges (veins) of very coarse granite. Many of the plates of Mica are of remarkable size, reaching three and even four feet in diameter. It is used chiefly in the manufacture of stoves, and the mining of it is a very profitable and rapidly growing industry.

Mica mining has been carried on most extensively in Mitchell, Yancey, and Macon counties; in Jackson, Haywood and Buncombe &c., to a less extent. One mine in Mitchell yields a ton of marketable Mica a month; and this region furnishes the bulk of this mineral to the world's markets. The aggregate product of these mines has been over 250,000 pounds, worth about half a million dollars.

Corundum.

has been found in large quantities in several counties west of the Blue Ridge, and is now extensively mined. Several valuable rubies and sapphires have been obtained, among them a chrysal of 312 pounds, which is in the cabinet of Amherst College, Massachusetts.

The principal use of this mineral is in the manufacture of the finer kinds of emery, for which purpose it has no equal.

Chromic Iron.

Small quantities of chrome are found associated with some of the iron ores of the State, the lead which crosses Guilford county for example. But it is also found as chromic iron, in coarsely crystalline masses, often of considerable size and in the form of very irregular veins, or pockets in the chrysolyte beds of Jackson, Yancey, Mitchell and Watauga counties. The most considerable deposits are two, one near Webster, and the other five miles from Burnsville, on Jack's creek, at Hampton's.

Manganese.

From Dr. Genth's Report:

"Pyrolusite, psilomelane and wad are found in small quantities in many places in this State, but nowhere in abundance, so far as known, They are generally associated with iron, gold and silver ores. There is a very promising vein, or bed of psilomelane in Caldwell county, five miles west of Lenoir. It is found in irregular and rounded masses embedded in light colored gneissic slates, some of the masses being ten, fifteen and twenty inches thick, and occupying a breadth of three or four feet of the strata. There is also a small seam in the town of Danbury, Stokes county, and laminated masses of one half to one inch thick occur in the Buckhorn iron ore beds, and there are hand specimens in the Museum from Nash county and several other points.

Manganese is found associated with the iron ores in various parts of the State. At Buckhorn it is found as a silicate and probably in the form of Knebelite. Beds of Manganese garnet are of common occurrence and often of great thickness. There is a series of such beds associated with the King's Mountain slates of Gaston, Lincoln and Catawba, which are superficially changed to black oxide.

Several veins of the black oxide, of considerable extent, says Prof. Kerr, in a recent report, have been found.

Kaolin,

says Prof. Kerr, is found abundantly almost from one end of the State to other, from Edgecombe and Robeson to Macon; valuable for china and other wares, for paper making and for firebrick. A curious fact may be mentioned here which I came upon recently, that the first mineral export from North Carolina, if not from America, more than two hundred years ago, was kaolin, from the mica mines of Mitchell to Macon; for it happened that at that time all Europe was wild in the search for the earth out of which china ware was fabricated, the Asiatics and Asiatic traders having carefully concealed their art from the outside barbarians of Europe. This mineral, therefore, bore a high value; and there is none better found in Europe to-day than that which the Indians "packed" from the Smoky mountains to the coast, under the name Unakeh, their name for the Smokies, (meaning *white*,) still called in places Unaka in Mitchell, and Unakoi in Cherokee. These Indians were not miners, but this kaolin or white earth had

been exposed like snow banks in huge dumps and open cuts by an ancient mining people, the Mound Builders, a thousand or two years ago, who obtained here the mica which is found so abundantly among the remains of those people, all over the Northwest to the great lakes."

One of the largest beds of kaolin is found near Greensboro, a few miles south.

Fire Clay.

The vast tertiary and quaternary tracts of the eastern section, says Prof. Kerr, abound in beds of potter's clay, fire clay, &c.

Dr. Emmons, in his report, refers particularly to one locality. He says: Clay for fire brick is abundant in Gaston county. It is free, I believe, entirely from lime and the alkalies, potash and soda. It extends through the county. It is inexhaustible in the vicinity of King's Mountain, and appears at numerous places between the Iron-works and Dallas, as well as at numerous places in and about the latter place.

Agalmatolite.

is found in the south west corner of Chatham. This is a large deposit belonging to the Huronian series, which has a quite extensive range; occurring in Montgomery and parts of Chatham. It is popularly called soapstone, and has the soapy feel of that mineral, but contains only 3.02 per cent. of magnesia. This substance has been an article of trade to New York, on a large scale and for many years. It is used in the manufacture of paper,—wall paper especially, soaps, cosmetics, pencils, &c., and for various adulterations.

Whetstone.

Among the silicious argillytes so abundant in the Huronian strata, there are frequent beds of novaculite or whetstone. One of the best localities is a few miles west of Chapel Hill, from which these stones have been carried in all directions. Other quarries are found in Person county, near Roxboro, in Anson, not far from Wadesboro, in Montgomery and adjoining counties, on the great Huronian belt, and in fact almost every section of the State has its own quarries, which either do or might supply the local demand, at least in part, and as to articles of the commoner grades.

Millstone and Grindstone Grits, &c.

The sandstone of the State is, in many places, well adapted to the purposes of grindstones, and during the war, while the foreign supply was cut off, they were largely so used. The Anson county quarries furnish a very fine grindstone and whetstone grit.

The conglomerates of the Triassic series, which are associated with and replace the sandstones above mentioned, have been long and widely used for millstones. They have been principally obtained from Moore county, on McLennan's Creek, where they are obtained of excellent quality; and they have been distributed from this point over a large number of the intervening counties, to the Blue Ridge. Some of these stones have been in use for fifty years; and they are occasionally found to be nearly equal to the French buhr-stone.

The coarse porphyroidal granites and gneisses which are scattered over so large a part of the State, are however, the most common material for mill stones. And in the eastern section the shell rock is often partly or wholly silicified, forming a sort of buhr stone, as in Georgia, and is well adapted to the same uses. In Madison county, in the Huronian slates on Laurel river, there is an irregularly laminated whitish quartz, occurring in large veins, which is used for millstones, which are reported to be a good substitute for buhr-stone.

Graphite.

This mineral is quite widely distributed in North Carolina, both in the Huronian and Laurentian formations. There are very fine hand specimens in the Museum from a number of counties, Person, Yancey, Catawba, Cleaveland, Burke and others; and there are beds of a more or less impure, slaty and earthy variety, in several sections of the State, the principal of which are two: one in Gaston, Lincoln and Catawba, as a constant associate of the argillaceous and talcose slates and shales which belong to the King's Mountain slates; and the other in Wake county. The former may be seen at various points crossing the public roads and cropping out in the gullies. At Sigmond's not far from Catawba Station, in Catawba county, the bed was opened many years ago, and several barrels mined; and within the last year or two a considerable amount of trenching and exploration has been made, and several parallel beds are reported, three feet and more in thickness. In Cleaveland county there are several outcrops

also, of a thin seam of a few inches; one of them is near McBrier's Spring.

But the Wake county beds are the most extensive, as well as the best known graphite beds in the State. They extend in a northeast and southwest direction for a distance of sixteen or eighteen miles, passing two and a half miles west of Raleigh. There are two beds apparently, forming a sharp anticlinal. The thickness is two to three, and occasionally four feet. The eastern (and longitudinally the most extensive) bed is nearly vertical, dipping sometimes east, but mostly west, at an angle of 70° to 90° ; it was opened at a number of points many years ago, and is wrought to a considerable extent at present. It is a bed of quartzitic and talco-argillaceous slates, which are more or less graphitic—from about twenty or thirty to sixty per cent.

A large bed of a similar character is reported from Alleghany county, and a sample sent, which shows 12.38 per cent. of graphite.

Many of the Archæan gneisses of the middle and western regions of the State contain graphite, along with, or replacing the mica.

Limstone.

From Mitchell's Geology :

Limestone has been discovered at three points in the primitive rocks in Stokes county; at one on the bank of the Yadkin, three miles below Rockford, in Surry, and at several places in the southeastern part of Buncombe and Henderson. Small nodules and masses also have been found about Lincolnton, encouraging a further search, in the hope that larger bodies may be discovered. The Limestone of King's Mountain is in a small tract of later primitive, bearing an intimate resemblance to the country around Charlotte, and like that rich in veins of gold.

We have at some points a simple accumulation of shells, forming a good limestone sufficiently pure for all the common purposes of building, and of which it might be expected that it would supply a large extent of country with quicklime. Such is that nine miles below Waynesboro, in the northwest corner of Jones, in the northern part part of Onslow, at Wilmington, and on the northwest brach of the Cape Fear to the distance of forty miles above.

Small nodules of *compact* limestone, and masses of loose texture

are found in the upper part of Wake, in Anson, and elsewhere.

Says Prof. Kerr :

This mineral is not as abundant in North Carolina as in many States, constituting, as has been seen, but an insignificant proportion of the mass of its rocky strata. And yet its distribution is such, and such are its relations to existing and abundant means of transportation, that it is accessible to the greater portion of the State. That part of the eastern region south of the Neuse river is abundantly supplied with Eocene or shell limestone and to the northern half of that section both this source of supply is open, and the oyster shell heaps of the sounds and bays round to Norfolk.

The middle region of the State lies under the disadvantage of being dependent on railroad transportation for this most important agricultural necessity, and its source of supply is chiefly the same as for the east, together with the two narrow limestone belts, the one extending from Gaston to Stokes, (the outcrops being intermitted between the Catawba and Yakin), and the other lying wholly in McDowell county, so far as it appears this side of the Blue Ridge, and along the upper valley of the French Broad, beyond that range.

Marble.

As elsewhere stated, there are several ranges of beds of crystalline limestone in the middle and western regions. The first belonging to the King's Mountain belt, contains so far as yet known, very little marble that may be considered available for the purposes of ornamental architecture, or regarded as better than other common building stones. In the extreme west, however, in Macon and Cherokee, the limestone range, both on Nantehaleh and Valley rivers, contains beds of very fine marble of various colors, white, pink (or flesh colored), black, gray, drab and mottled. It is capable of a very fine polish, and will one day, (when the difficulties of transportation shall be overcome, acquire a high value in architecture, as well as in other ornamental arts. In this last connection some of the *serpentine* beds may be mentioned as likely to come into use, and so to acquire a market value.

Talc.

From Dr. Genth's Report :

Foliated talc, of a white or greenish white color, is found in many of the chrysolite beds, west of the Blue Ridge, at Shooting Creek, Clay

county, Franklin, Macon county, Webster, Jackson county, Hampton' Mining Creek, Yancey county, Bakersville, Mitchell county, and other localities; in sheets of three-quarters to one inch in thickness and of a somewhat columnar structure, near Pilot Mountain, Surry county; fibrous talc, with silky lustre, and of a white or green color, also compact, crystalline white talc, with a splintery structure on Valley river, Cherokee county, and also in Macon county. Talc slate and coarse soapstone is found in many localities throughout the State.

Serpentine.

Dr. Olmsted, in his report, in speaking of the magnesian minerals of Wake county, says: "Serpentine, though not strictly marble, is sometimes sawn into slabs and polished and sold under the name of green marble. It is by no means an uncommon mineral, but is not often found so beautiful as at the foregoing locality." The locality referred to is a little north of the black lead formation, and within twelve miles of Raleigh.

Dr. Genth says that "the massive are found in many localities. The best appears to come from the neighborhood of Patterson, Caldwell county. It has a dark greenish black color and contains fine veins of the yellowish green fibrous and silky *chrysolite*, and admits of a fine polish; greenish grey massive serpentine, also with seams of greenish and greyish white chrysolite is found in the Baker mine, in Caldwell county, at which place is also found the variety picrolite. Dark green serpentine, has been observed in the neighborhood of Asheville, in Forsyth and Wake counties. A greyish or yellowish green serpentine occurs in the chrysolite beds of Macon, Jackson, Yancey, Mitchell and other counties. It results from the decomposition of the chrysolite.

Baryte.

In Prof. Olmsted's Report is found the following notice of the vein found in Orange county: "On the farm of Mr. Latta, three miles south of Hillsboro, is a fine vein of a mineral called sulphate of barytes. or Heavy Spar. This substance is not very uncommon, but it is rare to meet with it of such purity and elegance as at this place. It is beautifully white and shining. It enters, as an ingredient, into the finest kinds of porcelain ware; it is used in certain chemical preparations, and is employed by the painter in forming certain water colors."

The following general notice is from Dr. Genth's Report: "Barite is found in small white tabular crystals, with pyromorphite and manganese ores at the McMakin Mine, Cabarrus county. The laminated and coarsely granular white variety at the Cosby Mine, and orchard vein, in Cabarrus county; a vein of the coarsely laminated, greyish white barite, at the Latta Mine, near Hillsboro, Orange county. It occurs coarsely granular, and has the appearance of white marble, at Col. Walkup's, Union county. A vein of very white compact and granular barite of from seven to eight feet in width, has been found at Crowder's Mountain: west of the Blue Ridge, a vein eight feet in width, of the white granular variety, exists at Chandler's, nine miles below Marshall, in Madison county, where it is white and grayish white, and of a granular structure, with small patches of laminated barite, and again on Elkin Creek, Wilkes county.

Marls.

Marl is very abundant in twenty five counties in North Carolina, very widely distributed, and of several kinds, the principal of which are four, viz: Green-sand, Eocene, Miocene and Triassic. The former has generally but a small percentage of carbonate of lime, 5 to 30; the second, usually 40 to 95; the third, 20 to 60; and the fourth, generally less than 50. The last is of little consequence as a fertilizer, because of the very limited extent of its outcrops, and it is scarcely used where abundant. These marles are more extensively exposed than elsewhere in the northwestern part of Wake county and in the edge of Orange, between Morrisville and Durham. There are frequent outcrops of a bed of marl and impure limestone; two to four feet thick, over a territory of fifteen or twenty square miles, the nearly horizontal strata coming to the surface in ravines and gullies, and exposed in ditches, wells, &c. Near Brassfield turnout, on Mr. W. Rochell's place, is an exposure of nearly four feet of alternate thin beds of compact, light gray and red arenaceous limestone, with strata of uncompact brick red, marly clay between. The upper indurated strata contain more than 90 per cent. of carbonate of lime, and the lower about 60 per cent., and both require to be burned before they are available for agricultural uses.

Green Sand Marl—occurs throughout the southeastern region of the State between the Neuse River and the Cape Fear. It comes to the surface, as stated, along the banks of the Cape Fear and Livingston's

Creek, on Black River and South River, on the Neuse and its tributaries about and below Kinston, along the Contentnea, and Moccasin, and at a few points even as far north as the Tar River.

Eocene Marl.—The marls of the next formation, which are always found overlying the preceding, when the two occur together, are either a calcareous sand, passing in places into a friable sandstone, coarse or fine, or a fine calcareous clay, or a conglomerate shell limestone, more or less compacted and occasionally semicrystalline. They are composed of comminuted shells, corals and other marine exuviae. A number of samples of these marls, representative of the Cape Fear region, have been analyzed and found to possess a chemical constitution not different from ordinary limestones, the percentage of carbonate of lime ranging from about 90 to 95.

Miocene Marl.—These are commonly known as shell marls, or blue marls. They are found in limited patches or “beds,” and are sattered over a much wider territory than either of the preceding, and being nearer the surface, and so, more accessible, have been much more extensively used, and are consequently much better known. They are found throughout a large part of the eastern region, from South Carolina to Virginia; in fact, they occur in all the counties of eastern North Carolina, except those lying between, and north of the great sounds, and two or three small outcrops have been observed in Chowan, and in the northern part of Currituck. The western boundary of these beds is very nearly represented by a line parallel to and three or four miles west of the Wilmington and Weldon Railroad, from Halifax to Goldsboro. Southward, the inland boundary is found to be generally but little west of a line connecting the latter point and Lumberton, that is, a line parallel to the coast and about sixty five miles distant from it.

The area included within the above limits is about one fourth of the State,—a much larger territory than the whole State of Massachusetts, or New Jersey. These marls are valuable not only for the lime they contain, they have also various other valuable ingredients.

The question is often asked whether there are any minerals in the eastern section of the State; the answer is, the mineral wealth of that section, in the form of marl, is worth ten fold more than that of all the rest of the State beside, great and various as that is. If the money spent in gold getting alone, which is not less than twelve or fifteen millions since 1820, had been spent in marl getting the State would be worth more than double its present aggregate valuation. For at

the rate already given, that sum would have marled three millions of acres,—more than the total surface now in cultivation; that is it would have produced a result at least equal to the adequate marling, (at the rate of ten tons to the acre), of every acre now in cultivation, leaving out of the calculation the interest, that is, the results of the increased production during several decades of years.

Peat and Muck.

Peat and muck abound in the eastern portion of this State, and are so widely distributed that a large proportion of the farms, and almost every neighborhood have their own local supply within easy reach. But the inexhaustible source of this material for the region, is the great swamps which extend through the whole of the seaboard region, from the extreme southern border to the great Dismal, which extends across the Virginia border. A considerable part of these areas designated as "The Swamp Lands," is simply, covered by a peaty accumulation,—a series of true peat bogs, of which the peat is from two or three, up to ten, fifteen and even twenty feet thick. Of such peat beds there are hundreds of square miles, which must one day become an important resource for fuel as well as manure.

Asbestos.

This is, says Prof. Kerr, one of the commonest associates also of the chrysolite beds heretofore mentioned, and it occurs also quite widely in the Laurentian rocks of the middle and western parts of the State. One of the best known localities in the State is that near Bakersville, in Mitchell county; in fact it occurs in two or three places in that vicinity. It is long, fibrous, white and readily reduced to a pulp, or mass of fine lint. An equally fine article is brought from the southern part of Jackson county. It is also found near Tryon Mountain, in Polk county. Another well known locality is in Caldwell county, near the Baker Mine. This is associated, like many others, with a serpentine rock. Specimens have been exhibited also from Ashe and from Yancey. This mineral occurs in many places from Warren to Jackson county.

Soapstone.

This is a very common mineral in North Carolina, both in the form of the impure, greenish, massive, or slaty rock, (potstone), used for grave stones, and for chimney and furnace hearths and linings, and in the form of a pure massive white steatite. The most extensive beds of this mineral are found in Cherokee and Macon, in immediate association with the marble range and accompanying it throughout its whole extent, on Nantehaleh River, Valley River and Notteley. An analysis of this rock, as it occurs at Jarrett's, on Nantehaleh, gave 23.71 per cent. of magnesia, which is about the percentage for pyrallolite. The variety rensselearite is found in Forsyth county, and probably also in the South mountains in Burke county.

Pyrite.

Pyrite is one of the most common minerals of North Carolina. It is not only found in globular crystalline masses in many of the marlbeds of the eastern counties, but many of the gneissoid rocks and slates contain it in considerable quantities, and besides it is found in almost every mine of the state. In the gold mines the associated pyrite is generally auriferous. Cubical crystals occur at Hickory, Catawba county, Asbury Mine, Gaston county, Soapstone Quarry, twelve miles Northeast of Statesville, Silver Hill, Gold Hill and many other localities. Combinations of cubes and octahedra are found at Clegg's Mine, Chatham county, and in the Guilford county gold and copper mines; the pyritohedron, often in combination with cubical and octahedral planes, is found at the Stewart Mine, in Union county, Cambridge Mine, Guilford county, Long Creek Mine, Gaston county, Rudisil Mine, Mecklenburg county, &c. Large veins of compact pyrite occur in Gaston county.

BUILDING STONES.

There exists the greatest abundance of material for architectural and engineering uses, over a large part of the state. Granite and gneiss are among the commonest rocks throughout its whole length, except in the coastward region, where it is overlaid by the Tertiary and Cretaceous beds. And the sand stones of the Triassic, red and

gray, as well as those of the Huronian, are available over considerable areas; while the shell limestone of the Eocene furnish a very fair building material to the sandy and alluvial coast region; and the crystalline limestones and marbles of the west supply an ornamental building stone of great variety and beauty. A particular notice of the marbles of the State, which are of every variety of tint, will be found elsewhere.

Seventy nine specimens of building stones have been sent from the State to the New National Museum at Washington. These embrace granite of every variety, (the beautiful Scotch granite included), gneiss, soapstone, talc, limestone, marble, firestone, limerock, sandstone of various shades and texture, syenite and porphyry.

PRECIOUS STONES.

Diamond.

This rare gem has been repeatedly found in North Carolina, and the following occurrences have been well established. In every instance it was found associated with gold and zircons, sometimes with monazite and other rare minerals in gravelbeds, resulting from gneissoid rocks, but it has never been observed in the North Carolina *itacolumite*, or any debris resulting from its disintegration. The first diamond was found in 1843 by Dr. M. F. Stephenson, of Gainsville, Georgia, at the ford of Brindletown creek. It was an octahedron, valued at about one hundred dollars. Another from the same neighborhood came into possession of Prof. Featherstonehough, while acting as United States Geologist.

The third diamond, at Twitty's Mine, Rutherford county, was observed in 1846, by General Clingman in D. J. Twitty's collection, and has been described by Prof. Shepard. Its form is a distorted hexoctahedron, and its color yellowish.

The fourth came from near Cottage Home, in Lincoln county, where it was discovered in the spring of 1852, and was recognized by Dr. C. L. Hunter. It is greenish and in form similar to the last, but more elongated.

A very beautiful diamond was found in the in the summer of 1852 in Todd's branch, Mecklenburg county. It was nearly of the first water and a perfect crystal. It was in possession of the late Dr. An-

drews, of Charlotte. Dr. Andrews informed me, says Dr. Genth, that a very beautiful diamond of considerable size, like a small chincapin, and of black color, had been found at the same locality, by three persons, while washing for gold. In their ignorance, believing that it could not be broken, they smashed it to pieces. Dr. Andrews tested the hardness of a fragment, which scratched corundum with facility, proving it to be a diamond. A very beautiful octahedral diamond of first water was found many years ago at the Portis' Mine, Franklin county. There is a report that a second one has been found in the same locality.

Beryl.

occurs in six sided prisms, sometimes doubly terminated, from about half an inch in thickness, and from one to six inches in length. Their color is yellowish and bluish green, small pieces of the latter color are sometimes transparent, and might be cut for gems (aquamarine); associated with orthoclase muscovite, tourmaline, &c., at Ray's Mine, on Hurricane Mountain, Yancey county; one imperfect yellowish green crystal, of about one and a half inches in length, has been found at Buchanan's Mica Mine, three and a half miles east of Bakersville, in Mitchell county; one bluish green crystal, implanted in quartz, has been found at Captain Mills' gold mine, in Burke county.

Zircon.

abounds in the gold sands of Burke, McDowell, Rutherford, Caldwell, Mecklenburg, and other counties, in very minute yellowish brown and brownish white, sometimes amethystine, pink and blue crystals with many planes; large grayish brown crystals of zircons are found so abundant on the south side of the Blue Ridge, near Green river, that Gen. Clingman easily obtained, in a few weeks, 1869, one thousand pounds of crystals. It is rarely found associated with chrysoberyl, at Ray's Mine, Hurricane Mountain, Yancey county.

Garnet.

is widely distributed throughout the State and a constant constituent of many of the mica and hornblende slates in which it occurs in minute dodecahedral and trapezohedral crystals of a brownish or brownish red color; it also occurs in many of the talcose and chloritic

slates; larger trapezohedral crystals of a brownish red color are frequently met with in the mica mines of Mitchell and Yancey counties; imperfect dodecahedral crystals at Weaver's, Janestown, Rutherford county, and in talcose slate in Rockingham and Cherokee counties. The most beautiful and perfect crystals are large trapezohedra, of a brownish red color, from Burke, Caldwell and Catawba counties. Some of these are transparent, and, when cut show a peculiar play of colors. Large crystals and crystalline masses of a reddish brown garnet, are found near Franklin, Macon county, and on Toe river, Mitchell county. Pyrope, of good color, has been observed in the sands from gold washings in Burke and McDowell counties. The massive manganese garnet is abundant at Janestown, Rutherford county, at Buckhorn Chatham county, near Moore's Mills, Stokes county, near Gold Hill, in Cabarrus county, near Brevard's Forge, one and a half miles from the Vesuvius Furnace, and near Macpelah Church, Lincoln county, near High Shoals, Gaston county, and near Madison, Rockingham county.

Agate.

Rough specimens of this form of quartz are very common, for example, in Cabarrus, near Harrisburg and Concord, and in Mecklenburg; and occasionally a handsome gem has been found among them. But a year or two ago some very fine specimens of moss agate were discovered near Hillsboro. It is found in Granville county also, and elsewhere.

Opal.

A number of gems of this species have been found in the State. Within the last twelve months a large number have been picked up in Concord, Cabarrus county, some of them of much beauty and high market value.

Hiddenite.

From a late publication of Prof. Kerr:

Hiddenite is an *emerald-green* gem, quite as handsome and as highly valued as the emerald proper, or the diamond. It is found in no other spot on the earth's surface save one, in the eastern edge of Alexander county. The mineral species to which this variety belongs is *spondumene*, which, as ordinarily found, has as little claim to be considered a gem as a common crystal of feldspar.

A considerable amount of work has been done in mining for the

gem by Mr. Hidden. The crystals are found, not in veins, but in nests or pockets, of which perhaps a dozen have been found within a depth of thirty five feet. These pockets contain, besides hiddenite, emerald, quartz, rutile and other crystals. The value of some of these other minerals has exceeded that of hiddenite. Emeralds have been found worth \$1,000 each.

Mr. Hidden writes: "The mine has never supplied twenty five per cent. of the amount ordered by the trade; only lately I made a \$1,300 sale of three emeralds and hiddenites to a gem collector. We continue to find emeralds, beryls and hiddenite; also many interesting associated minerals. The hiddenite is the least common among them."

"This the only strictly *American* gem," and it may be added, it is strictly a *North Carolina* gem. He reports that it "*it is already recognized as a gem of the highest rank.*"

A company has just been organized with a capital of \$200,000, with a view to larger and more systematic operations, and thirty hands are employed. A shaft has been sunk thirty six feet, and a tunnel cut two hundred and sixty feet, mostly through rock. The largest emerald found is eight and a half inches long and weighs nine ounces.

This inaugurates in the State an industry entirely new to this country. There have been a few sporadic efforts heretofore, at several different places and times, at mining for sapphires and rubies, and a number of very respectable gems have been picked up; but nothing like a regular business of this sort has been yet established anywhere in this country. Hiddenite may be set down as the thirteenth species of gem found in North Carolina.

Emerald.

A beryl, is found mostly in the mica mines of Mitchell and Yancey; an 8-inch section of one two feet long and seven inches thick is in the Museum, from a mine near Bakersville, and a block one foot long from another, which must have weighed hundreds of pounds.

Aquamarine, beryl, also, of a different color.

Ruby.

Ruby—Corundum, found as a gem in Clay and Macon, may also be found in other corundum localities in Jackson, Mitchell, Iredell, Gaston, &c. The largest crystal of ruby corundum in the world,

(twenty inches by seven) from Macon, was burned up the other day at Amherst, in Shepard's magnificent collection, together with a larger number of rare and fine North Carolina minerals than existed elsewhere.

Ruby—Spinal, deep color, Jackson; found last year in some gravel sent by mail, rough, imperfect, but suggestive.

Sapphire.

Sapphire, corundum—Found as above; a number of very pretty gems have been picked up.

Sapphire, kyanite—Best are found at Swannanoa Gap and top of Black Mountain; the common sort in Mitchell, Gaston and other counties.

Rock Crystal, false diamond, California diamond—Abundant in this State.

In addition, it is worth while to mention that specimens of *opalescent quartz*, occur in Cabarrus and elsewhere; also malachite, carnelian, jasper, chalcedony, rutile, tourmaline, chrysolite, lazulite and smoky quartz; so that our list of native gems is certain to be extended, and very considerably, too, whenever extensive mining operations are resumed.

Of the entire list of *real gems*, nine have been found as such in this State; and of the minerals which constitute these gems, all but one occur here; so that it is not improbable that we may complete the list as soon as mining industries take root among us.

And of minerals which furnish the *semi-gems*; a majority also occur in this State. This fact is explained, just as the other broader fact, of the occurrence of so wide a range of mineral species. It is due to the prevalence of the older rocks, which make up almost the whole of North Carolina, geographically, outside of the overmantling sands and gravels of the east.

MINERAL WATERS.

From Prof. Kerr's Report :

Both Chalybeate and Sulphur waters are of common occurrence in the State and in all sections of it, the former eminently so. Alum waters are also of frequent occurrence. In the eastern section, the abundance of peat and muck insures the prevalence of carbonated waters, which are continually dissolving the iron oxides from the ferruginous Quaternary earths, and in their issue in springs at the foot of the slopes and in the ravines, they come charged with this element, which is deposited in a flocculent ochreous precipitate, along the course of the streams. In the granitic and slaty regions of the middle and west, the presence of iron and alum is due to the decomposition of the iron pyrites, so widely diffused in the gneisses, granites and slates.

"Simple Chalybeate springs, where iron is dissolved by the agency of fixed air," says Dr. Olmsted in his Report, "are common in almost every part of this region (the middle section). Such waters are well fitted to relieve the langor induced by a warm climate, and are, perhaps more salubrious for frequent and constant use, than the stronger stronger and more complicated mineral waters."

There are numbers of mineral springs in the middle and western parts of the State which are noted for the efficacy of their waters in various forms of disease; among these the Sulphur Springs of Catawba, Cleaveland and Haywood are of high repute.

"In the lower part of Buncombe," (now Madison) says Dr. Mitchell, "are the Warm Springs, with a temperature of 104°. They rise on the bank and in the bed of the French Broad, give out considerable quantities of nitrogen, but contain very little mineral matter of any kind.



GOVERNMENT AND TAXATION.

The government of North Carolina is a pure democracy. It is based upon the will of the people as expressed in the Constitution, an instrument framed by them in their sovereign capacity through delegates appointed for that purpose. The will of the people of this and of each State, when thus expressed, and in conformity to the Constitution of the United States—for the will of the people of each State is subordinate to the collective will of the people of all the States—is the supreme law. The State Constitution thus made is the measure and test of all laws passed by the Legislature, and these laws must stand or fall by their agreement or disagreement with it.

The Constitution is a short instrument but wide in its scope and bearing. It contains a brief statement of the fundamental principles of civil and individual liberty, creates the different departments of government—Executive, Legislative and Judicial, and prescribes the powers of each; establishes Educational, Charitable and Penal institutions; directs who shall be liable to duty in militia; and prescribes the rights of citizenship.

The Legislature enacts laws. The Judiciary passes upon them when a question arises as to their constitutionality, and expounds them when a question is presented as to their meaning. The execution of the law is entrusted to the Executive. The Executive in this State possesses no veto upon the acts of the Legislature. When the law is once made, his duty as that of every other citizen is obedience in his sphere.

The rights of citizenship is the only point for consideration here; and these depend upon age, residence and previous citizenship.

A citizen of a foreign country can make himself a citizen here by becoming a resident; declaring before the proper tribunal his purpose to become a citizen; and taking the prescribed oath of allegiance.

A citizen of any other of the United States becomes a citizen here by changing his residence from that State to this.

All persons who are born and continue to reside within this State are citizens thereof.

The chief privilege of citizenship is suffrage. The Constitution ordains that, "every male person born in the United States, and every male person who has been naturalized, twenty one years old, or upward, who shall have resided in this State twelve months next preceding the election, and ninety days in the county in which he offers to vote, shall be deemed an elector."

Suffrage here embraces the right to vote for every officer in the State from the Governor down to constable. One only exception to this principle exists in this State—that is in the case of Justices of the Peace. These are appointed by the Legislature. Logical consistency was sacrificed in this case to secure what, in the judgment of the Convention, was a point of far higher importance, namely, the sound administration of justice in the county, and the administration of county finances, both of which are under the control of the Justices. In many of the eastern counties the colored population largely predominates. Newly emerged from slavery, and consequently ignorant of the duties of citizenship; ignorant of the law and therefore incapable of administering it; themselves without property and therefore without the judgment necessary to administer the finances of a community; it was deemed best to repose the power of making magistrates in another body; thus guarding those communities against error, whether of ignorance or design, until experience and education should make those colored majorities safe repositories of such power. This provision of the Constitution was inspired by no feeling of enmity toward the colored man; it was a provision of safety as well for the colored as for the white man. The provision was made impartial in its operation; it applies to every county in the State, whether the majority be white or black, and the object was secured. No such provision was necessary in the cases of officers elected by general ticket, for there the experience of the white population accustomed to the exercise of citizenship and educated to its responsibilities would counterbalance the inexperience of the colored race.

Citizenship under the Constitution of North Carolina carries with it high and important rights apart from suffrage. It confers a right to an education by the State, such as will qualify the citizen for the duties to be performed. If he be without property, it gives him a right to support from the county if incapable of earning it by sickness or old age. If he have property and is overtaken by irremediable misfortune, it exempts from execution personal property to the value of five hundred dollars, and vests in the owner in fee simple the home-

stead and the dwellings and the buildings used therewith not exceeding in value one thousand dollars to be selected by him. The unfortunate have thus a secure refuge in case of disaster in business.

It regulates taxation by providing that the General Assembly levying a tax shall state the object to which it is to be applied, and enjoins that it be applied to no other purpose. It establishes an equation between the property and the capitation tax by directing that the capitation tax levied on each citizen shall be equal to the tax on property valued at three hundred dollars in cash. The capitation tax is levied on every male inhabitant in the State over twenty one and under fifty years of age, which shall never exceed two dollars on the head. The effect of this limitation upon the capitation tax restricts the tax on each hundred dollars worth of property to sixty six and two thirds cents. It further directs that the amount levied for county purposes shall not exceed the double of the State tax except for a special purpose and with the approval of the Legislature.

The rate of State tax levied for the present year is twenty eight cents on one hundred dollars besides twelve and a half cents, school tax.

EDUCATION.

The Constitution of North Carolina, adopted in 1776, ordained as a part of the fundamental law that "schools shall be established for the convenient instruction of youth, with such salaries to the masters, paid by the public, as may enable them to instruct at low prices." As soon as the resources of the State permitted, this provision of the Constitution was carried into effect. Long before the civil war the system of common schools in this State had attained a full development. A fund of two millions of dollars had been accumulated, the income from which was supplemented by annual appropriations. From 1852 to 1861 our educational progress attracted general attention and admiration. This fund was engulfed in the war, and the system had to be built up anew from the very foundation.

The provision for State education under the new Constitution of North Carolina, if not equal to that of some other States, is yet liberal. The Constitution sets apart a large extent of land, and appropriates all moneys arising from certain specified sources, for establishing and maintaining free public schools in the several counties of the State. Further, it directs the appropriation of 75 per cent., at least, of the State and county capitation tax to the same purpose. The moneys from these sources form a permanent fund for education which cannot be diverted. The legislation of the last few years shows a growing sense of this great interest. That of the session of 1881 was a marked advance on any that had gone before. In addition to the provisions specified above, a tax of twelve and a half cents was levied on every hundred dollars worth of property and credits, and the tax on the poll was correspondingly increased thirty seven and a half cents in aid of the education fund. The revenue from these sources was reckoned to be fully adequate to keep open the public schools for four months in the year. If the tax thus levied should prove insufficient to maintain one or more schools in each district for the period named, the county commissioners are required to levy annually a special tax to supply the deficiency. The ages for admission to the public school range from six to twenty one years.

The organization provided for administering the common school system is sound and judicious. The Constitution provides a State Board

of Education which has full power to legislate in relation to free public schools, and the educational fund of the State. Its legislation is subject, however, to be altered or amended by the General Assembly. A Superintendent of Public Instruction presides over and directs the operations of the whole system.

Corresponding to a State Board and State Superintendent, there is a county Board and county Superintendent. The county Board is charged with the general management of the public schools in their respective [counties. The county Superintendent examines applicants for positions as teachers, visits and inspects the public schools, advises with teachers as to methods of instruction and government, and he may, under regulations prescribed, suspend teachers if incompetent or negligent; his action in the latter case being subject to review by the county Board.

The county Board of Education of each county have authority to establish a teacher's institute in their county, or the boards of any number of counties may join in establishing one for the several counties so co-operating.

Each county is laid off into school districts, the convenience of each neighborhood being consulted. In each district there is a school committee consisting of three persons. It is the duty of the committee to provide school houses, employ teachers, and give orders for the payment of the sums due for their services, and take at a stated period a census of the children within the school age.

The compensation provided for teachers of the first grade is left to the discretion of the committee; that of teachers of the second grade is twenty five dollars a month; that for those of the third grade is fifteen dollars.

The schools for the two races are separate; the districts the same in territorial limits, or not, according to the convenience of the parties concerned.

The financial arrangements with respect to the school fund give the most absolute security for its safe custody and proper application. It is collected by the sheriff and by him paid to the county treasurer. It is drawn by a written order of the district committee, which order is countersigned by the county Superintendent. The school fund, it will be seen, is handled by none but bonded officers, and paid out under the most effective checks for its proper disbursement.

For the purpose of training teachers, and thus giving unity to methods of instruction, and the greatest efficiency to its practical

working, ten Normal Schools are established—five for the white and five for the colored race; and an equal fund is appropriated to the Normal schools for each race. Within the last few years graded schools have been established in all the principal towns of the State, and the number is yearly in creasing.

The provision for higher education is ample. Private schools for both sexes are numerous. The principal institutions for the education of boys and girls are of the highest order.

At the head of the institutions of learning is the University of the State, an institution established in pursuance of the constitution, and maintained in part by annual appropriations. Science and learning in their widest range are there taught by professors eminent in their several branches. Second only to the University are the denominational colleges of the State, each having a corps of learned professors and tutors.

RELIGION.

The people of North Carolina are almost entirely Protestant, of various denominations; but all sects are equally free before the law.

THE PEOPLE OF THE STATE.

Their Character.

In all those things which stamp a high moral impress, no people can look back upon the past with more pride than those of North Carolina. From the foundation of the colony, they have always been noted for those traits of character which give the greatest security to the State, to society, and the family. They have always upheld the exercise of constitutional authority; the social duties they have always appreciated and observed; and by none have the domestic ties been more prized and cherished. Industry, frugality, and social order have marked every stage of their existence. Yet more, reverence for truth—especially revealed truth—and a sacred regard for business engagements have been ingrained in them.

An observer would be at once struck by the homogeneity of the people, and with the agreeable spectacle of two races living in harmony on the same soil and under the same laws. The first is rare in this age of migration, and particularly in this country, but is easily explained by the natural barriers to commerce which excluded variety of pursuits and made the State essentially an agricultural community. The conservative disposition and tastes which these modes of life nurtured repressed any effort to make known the resources of the State, and to attract settlers. But under the stimulus of our system of railroad transportation which has, in a measure, redressed our natural disadvantages; the new order of things, brought about by the war, and through the necessity of cultivating smaller farms and the consequent surplus of lands in market, a new spirit has characterized the people and turned a general desire toward immigration.

In regard to the harmony existing between the two races, Gov. Jarvis, in his annual message to the Legislature, in 1881, said:

“The two races are working together in peace and harmony, with increasing respect for each other. The colored population, I am glad to say, are becoming more industrious and thrifty. Many of them are property owners and tax payers. They seem to be learning the important lesson that they have nothing to rely upon but their own

labor. I have tried, on every opportune occasion, to impress this lesson upon them, and to assure them of the sympathy and hearty co-operation of the white race in their efforts to make themselves good and useful citizens. They have held during the past two years, in the city of Raleigh, two industrial exhibitions that were exceedingly creditable to them. I attended both of these exhibitions, and made short addresses, and was glad to see that the efforts of the colored race in this direction found so much favor and encouragement among the whites. I regard it as an imperative duty from which the whites can not escape, if they would, to see that in all things full and exact justice is done the blacks, and that they are not left alone to work out their own destiny. They are entitled, by many binding considerations, to receive aid and encouragement from the whites, in their efforts to be better men and women, and I have no doubt will receive it."

The events of the past two years have confirmed the justness of this official statement.

The natural increase in our population has been greater than that from natural and foreign sources in most other States, and now ranks it as the fifteenth in the number of its inhabitants in the Union. It increased from 1,071,361 in 1870 to 1,399,750 in 1880, and can now be safely estimated at 1,500,000. Classified by the census according to sex there were in 1880, 687,908 males, and 711,842 females: by race, 867,242 whites, 531,267 colored people, 1,230 Indians and 1 Japanese. The aggregate population consisted of 270,994 families, living in 264,305 dwellings. The number of persons to a square miles was 28.81, the number of families 5.58, dwellings 5.44. The number of acres of land to a person 22.21, to a family 114.73. The number of persons to a dwelling 5.30; to a family 5.17.

The per centage of increase from 1870 to 1880 was 30.06; of density of population 8 per cent.

Distributed according to topography 421,157 of the population live on the South Atlantic coast, 743,739 on the Interior Plateaus and Table Lands; and 233,654 in the Mountain districts. According to the same distribution 203,771 colored people live on the South Atlantic coast; 300,236 on the Interior Table Lands; and 27,270 in the Mountain districts.

The aggregate population and land area by counties are as follows

COUNTIES.	TOTAL POPULATION.	SQUARE MILES.	COUNTIES.	TOTAL POPULATION.	SQUARE MILES.
The State,.....	1,399,750	48,580	Johnston,.....	23,461	670
Alamance,.....	14,613	430	Jones,.....	7,481	450
Alexander,.....	8,355	300	Lenoir,.....	15,344	420
Alleghany,.....	5,486	300	Lincoln,.....	11,061	270
Anson,.....	17,994	500	McDowell,..	9,836	440
Ashe,.....	14,437	450	Macon,.....	8,064	650
Beaufort,.....	17,474	720	Madison,.....	12,810	450
Bertie,.....	16,399	720	Martin,.....	13,140	500
Bladen,.....	16,158	900	Mecklenburg,.....	34,175	680
Brunswick,.....	9,389	950	Mitchell,.....	9,435	240
Buncombe,.....	21,909	620	Montgomery,.....	9,374	570
Burke,.....	12,809	400	Moore,.....	16,821	800
Cabarrus,.....	14,964	400	Nash,.....	17,731	520
Caldwell,.....	10,291	450	New Hanover,.....	21,376	80
Camden,.....	6,274	280	Northampton,.....	20,032	510
Carteret,.....	9,784	520	Onslow,.....	9,829	640
Caswell,.....	17,825	400	Orange,.....	23,698	670
Catawba,.....	14,946	370	Pamlico,.....	6,323	860
Chatham,.....	23,453	800	Pasquotank,.....	10,369	240
Cherokee,.....	8,182	500	Pender,.....	12,468	800
Chowan,.....	7,900	240	Perquimans,.....	9,466	220
Clay,.....	3,316	160	Person,.....	13,719	400
Cleaveland,.....	16,571	420	Pitt,.....	21,794	820
Columbus,.....	14,439	750	Polk,.....	5,062	300
Craven,.....	19,729	900	Randolph,.....	20,836	720
Cumberland,.....	23,836	900	Richmond,.....	18,245	860
Currituck,.....	6,476	200	Robeson,.....	23,880	950
Dare,.....	3,243	270	Rockingham,.....	21,744	550
Davidson,.....	20,333	600	Rowan,.....	19,965	450
Davie,.....	11,096	300	Rutherford,.....	15,198	470
Duplin,.....	18,773	670	Sampson,.....	22,894	840
Edgecombe,.....	26,181	500	Stanly,.....	10,505	380
Forsyth,.....	18,070	340	Stokes,.....	15,353	500
Franklin,.....	20,829	420	Surry,.....	15,302	500
Gaston,.....	14,254	340	Swain,.....	3,781	420
Gates,.....	8,897	360	Transylvania,.....	5,340	330
Graham,.....	2,335	250	Tyrrell,.....	4,545	320
Granville,.....	31,286	750	Union,.....	18,056	640
Greene,.....	10,037	300	Wake,.....	47,939	950
Guilford,.....	23,585	680	Warren,.....	22,619	450
Halifax,.....	30,300	680	Washington,.....	8,928	350
Harnett,.....	10,862	540	Watauga,.....	8,160	460
Haywood,.....	10,271	740	Wayne,.....	24,951	500
Henderson,.....	10,281	360	Wilkes,.....	19,181	700
Hertford,.....	11,843	340	Wilson,.....	16,064	350
Hyde,.....	7,765	430	Yadkin,.....	12,420	320
Iredell,.....	22,675	600	Yancey,.....	7,694	400
Jackson,.....	7,343	920			

AGRICULTURAL POPULATION.

The table showing the enumeration of the population of the State according to occupation, has not yet been published; but the census of 1870 shows that three fourths of the population of the State were engaged in agriculture; one seventh in professional and personal service; one eighteenth in manufacturing, mining and mechanical operations; and one thirty fifth in trade and transportation.

Gross Number of Farms.

The total number of farms in North Carolina, is according to the census of 1880, 157,609.

Classification According to Acreage.

The number of farms under 3 acres is	277
“ “ “ “ 3 and under 10 acres,.....	13,314
“ “ “ “ 10 and under 20 “	34,148
“ “ “ “ 50 and under 100 “	34,007
“ “ “ “ 100 and under 500 “	61,806
“ “ “ “ 500 and under 1000 “	5,063
“ “ “ “ 1000 and over,.....	1,721

Classification of Gross Number of Farms According to Tenure:

The number of farms occupied by owners is.....	104,887
The number of farms rented for fixed money rental is.....	8,644
The number rented for shares of produce is	44,078

Classification According to Acreage of Farms Occupied by Owners:

The number of farms so occupied under 3 acres is	128
“ “ “ “ “ “ 3 and under 10 acres,.....	2,141
“ “ “ “ “ “ 10 and under 20 acres,.....	3,851
“ “ “ “ “ “ 20 and under 50 acres,.....	13,973
“ “ “ “ “ “ 50 and under 100 acres,.....	25,929
“ “ “ “ “ “ 100 and under 500 acres,....	52,810
“ “ “ “ “ “ 500 and under 1000 acres,...	4,447
“ “ “ “ “ “ 1000 and over.....	1,608

Classification According to Acreage of Farms occupied by persons paying a fixed money rental:

Under 3 acres,	23
3 acres and under 10,.....	921
10 acres and under 20,.....	1,553
20 acres and under 50,	3,023
50 acres and under 100,..	1,305
100 acres and under 500	1,639
500 acres and under 1000,.....	145
1000 acres and over,	35

Classification According to Acreage of Farms Occupied by Persons Paying Rent in shares of the products.

Under 3 acres,	126
3 acres and under 10,.....	4,211
10 acres and under 20,	7,910
20 acres and under 50,	17,152
50 acres and under 100,.....	6,773
100 acres and under 500,	7,357
500 acres and under 1000,	471
Over 1000 acres,.....	78

AGRICULTURAL PRODUCTS.

A statement of the agricultural products of the State will be found in a table at the end of this volume. The table, however, embraces only the principal products. An examination of the former census tables will show the notable fact that almost every crop produced in the United States is found in one region or another of this State, so that the widest diversification of industries is practicable.

PUBLIC INSTITUTIONS.

The three Asylums for the Insane, the two Institutions for the Deaf and Dumb and the Blind, the Orphan Asylum and the county Poor Houses constitute the public charities of the State. The Penitentiary, county Jails, and city Police Prisons are its penal institutions. All are supervised by the board of public charities. Two of the Asylums for the insane, one at Raleigh and the other at Morganton, are set apart for white patients, and have a capacity of six hundred and seventy-nine inmates. At Goldsboro is situated the Asylum for the colored insane. It has a present capacity of one hundred patients which will be doubled in the next few months. The total number of insane in the State is reported to be 1,050. In this number are many idiots from nativity and imbeciles. No State will have more decent accommodations for this unfortunate class than North Carolina.

There is an institution for the white and one for the colored deaf and dumb and the blind children in the State, both situated at the Capital, and under the same management. The pupils must be between the ages of eight and twenty years to gain admission, and are educated and maintained while at the institution. There are now sixty one blind pupils, and sixty four mutes in the institution for whites; twenty blind and thirty five mutes in the institution for the colored. This makes a total of 180 pupils of the 630 blind and 745 deaf and dumb people in the State.

The Orphan Asylum, at Oxford, is maintained by the charity of the Masons and other benevolent persons; it receives an annual appropriation of five thousand dollars per annum from the State. The inmates are clothed, fed and taught the rudiments of English and some trade or business. Last year there were 187 orphans cared for. Two were adopted and forty discharged. The present number is 150.

The Board of County Commissioners are charged with the duty of maintaining by taxation and of providing for the comfort and well ordering of the poor. A competent person, called the Overseer, has the immediate management of the Poor House in each county and generally it is well provided and appointed.

The Penitentiary is located at the Capital and is one of the most sub-

stantial buildings of its kind. There are at present in its walls and farmed out on railroads and other works of internal improvements 996 convicts. This is a small number of criminals to a population of 1,500,000 people, when it is remembered that a large fraction of that population was once in slavery and had to be educated to the laws. Of this total 137 are whites, and 859 colored. Of this number 10 per cent. were convicted for crimes against persons. In this class all grades of crime from murder to aggravated assaults are included. The rest are committed for crimes against property. A large majority of this class of convicts are imprisoned for the crime of larceny.

PUBLIC BUILDINGS.

The State Capitol, the Agricultural Department Building and all the buildings of the Public Institutions are of a substantial and commodious character that reflects the general character of the people. The capitol is built of massive granite, and the other buildings of brick or a combination of brick and granite.

MANUFACTURING FACILITIES.

Extracts from paper read before the General Assembly by W. C. Kerr, State Geologist, in January, 1881:

“The circumstances which commonly determine the character and location of factories are a demand for their products, abundant and cheap raw materials, the necessary power (or the means for its generation), and available capital. It is unnecessary to add to this category skilled labor, because the fore-mentioned conditions usually suffice to attract or create the necessary skill; and this is true also in general, of the capital required, unless there be abnormal, hindering conditions.

“Now, it can be shown that all the necessary conditions exist in North Carolina for successful and profitable enterprise in many, and in some most important branches of manufacture.

“Consider, first, the most important of the above named manufacturing facilities, viz: abundant and cheap power.

Water Power.

“The aggregate water power of the State is about 3,500,000 horse powers, and this force is distributed over the entire area of the State, (with the exception of a few seaboard counties,) and is thus brought into juxtaposition with whatever raw materials or other advantageous conditions may be found in any part of its territory. This is equal to the total power, water and steam, employed by all the manufacturing industries of Great Britain, the foremost manufacturing nation, and considerably exceeds that of the United States. Estimated in another way, it is equal to the power which would be produced by the combustion of nearly 4,000,000 tons of coal per annum.

“This power is due to an average annual rainfall of upwards of fifty inches, and an average elevation of 640 feet. Allowing 75 per cent. for evaporation, we have a residuum of about 46,000,000 tons to be discharged by the rivers. And a consideration of the greatest importance in estimating the availability of this power, is, that the rainfall is nearly equally distributed through the months of the year,

being as follows: For January, 4.5 inches; February, 5.3; March, 4.0; April, 3.9; May, 4.9; June, 4.3; July, 4.9; August, 6.1; September, 4.5; October, 3.3; November, 3.4; December, 3.7.

“If the whole of this force were employed in cotton manufacturing, it would be adequate to turn 140,000,000 spindles. All the cotton mills in the United States contain not quite 11,000,000. The water power of North Carolina would manufacture three times the entire crop of the country, whereas all the mills in operation on the continent only spin one quarter of it. Putting the crop of this State at 400,000 bales, she has power enough to manufacture fifty times that quantity.

“The manufacture of cotton has been taken for illustration, because all the conditions of it are so well known, the raw materials are at hand in unlimited amount, and on terms which give a great advantage to the domestic manufacture, and the market is everywhere, and especially because the staple is produced in five eighths of the territory of the State, and the water power of eight ninths of it (all east of the Blue Ridge) is within seventy five miles of the cotton fields: and these advantages are enhanced by a most favorable climate, a varied and elastic agriculture, capable of furnishing food supplies to any extent to meet the local demand, and by the presence of not only ample power for such other affiliated and ancillary industries as might be developed along with this, but also of abundant raw materials for these other industries, as will appear presently.

“And as to the wide distribution of this power, just now, as well as previously referred to as an enhancement of its value, a few data from different sections will suffice to illustrate it. Not to dwell on details, such as for example, the fall of the streams, as far east as Carteret county, below Newbern, to an extent of forty feet, and the like descent of the waters of Brunswick, Beaufort and other seaboard counties, we will confine ourselves to certain aggregates, distributed through the territory of the State above and west of the limit where the streams emerge from the hill country into the great coast champaign, at an elevation of about one hundred feet above the sea. Beginning with the Roanoke river, the discharge of which at Haskins' Ferry, some fifty miles above Weldon, is 170,000 cubic feet per minute, we have a force of 335 horse powers for each foot of fall, or an aggregate, for the part of the river lying in this State of 70,000 horse powers.

Tar river has not been measured, but its force above the Wilmington and Weldon Railroad is not less than eight to ten thousand horse

powers. The Neuse near Raleigh gives a force of twenty two horse powers per foot, which will make for the whole river and its tributaries above Goldsboro, about the same aggregate as the Tar. The power employed in all the mills at Lowell, Mass., and at Lawrence is nine thousand, and the population of these towns is fifty and forty thousand respectively; this is an indication of the possible value of these rivers to the future development of the State, and these streams draining only the lower section of the hill country, are less favorably situated for manufacturing purposes, and so have received almost no attention.

Haw river, the next in order as we go west, is the only stream in this quarter of the State which has received anything like adequate appreciation: it turns more spindles than any other river in the State. The force of this stream is not less than forty thousand horse powers; and that of Deep river about its confluence with the Haw, is nearly as much, and the total of these and of the Cape Fear, with its other principal affluents, will not be less than one hundred and thirty to one hundred and forty thousand horse powers, as previously stated. Smiley's Falls alone gives a force of 15,000.

Leaving out smaller intermediate rivers, the Yadkin measured near Salisbury, at the Railroad bridge, discharges 155,000 cubic feet per minute, which gives two hundred and ninety four horse powers per foot, or for the whole stream to the southern border of the State, with its fall of 1,000 feet from Patterson, two hundred and fifty five thousand horse powers, a force capable of turning all the 10,000,000 spindles in the United States. Its tributaries would add at least 20 per cent to this estimate—giving a grand total of more than 300,000. The Catawba, above the State line, with its chief tributaries, will give more than two hundred and fifty thousand horse powers; the fall at Mountain Island alone reaching not less than 12,000.

Broad river, with its tributaries out of Cleaveland, Rutherford and Polk counties, and a fall for most of them of five hundred feet and upwards will give an aggregate of sixty to seventy five thousand horse powers.

Passing beyond the Blue Ridge, the French Broad at Asheville measures one hundred and twenty five, and at Warm Springs one hundred and seventy horse powers, which gives for this part of the river, from Asheville to the State line, 100,000. At Brevard in Transylvania, it measures forty eight, which adds 10,000; and the tributaries, like the

Swannanoa, Ivey, Laurel, &c., add 5,000 each ; so that the French Broad may be set down at 175,000 horse powers.

The Nolechucky, in Mitchell county, measures near the State line, 190 horse powers ; so that we shall have for this hydrographic basin, between the Black, and the Roan the Grandfather, not less than 150,000 horse powers. New river and its affluents in Watauga, Ashe, and Alleghany will give about 120,000. The Tennessee at Franklin gave forty horse powers per foot ; and this with the Tuckasege, Oconaluftee and Nantehaleh, which will average 25,000 each, and the Tennessee with a fall of an additional 500 feet below the confluence of its main tributaries, will make a total for this basin of not less than 150,000 horse powers. Pigeon river was not measured, but it differs little in power from the Tennessee above its confluence with the Tuckasege, and will give, with its much greater fall, to the State line, a probable aggregate of sixty to seventy five thousand. And for the Hiwassee, the same estimate will hold.

If these approximate *low water* estimates of only a score of the larger rivers, be summed, they amount to one and one half million horse-powers, leaving out of the count a thousand smaller streams of 500 to 1,000 horse powers each.

The distribution of the water power may be illustrated in another way, by estimating its amount for a given territory in different parts of the State. Take, for example, Chatham county in the east and Wilkes in the west : the amount of force available in the former may be approximated by taking that of its principal streams thus : Haw river will give 25,000 horse powers ; Deep river, below Carbonton, 10,000 ; Cape Fear, 6,000 ; Rocky river, 3,000 ; New Hope, 1,000 ; total 45,000. For Wilkes the sum of the forces of all its dozen considerable rivers and as many more large creeks, added to that of the Yadkin, will give a total of not less than 70,000 horse powers.

Steam Power.

The abundance of wood furnished by our forests and wooded portions of almost every farm will make it, on account of its cheapness, the fuel for steam power and for ordinary heating purposes for many years to come. Saw mills get their motive power from waste lumber and from tops of trees, after the log is removed. Cotton gins, grist mills, and what may be generally termed plantation mills, are all run by steam produced from wood cut near them. In the interior,

where there is no railway or water transportation, all the small factories, such as wagon factories, foundries, plow factories, &c., have their machinery moved by steam made from wood. Wood can be bought at prices ranging from seventy five cents to three dollars per cord, delivered, and until the supply is perceptibly diminished, or freight rates on coal are reduced very considerably it will be relied on to create the power needed.

The estimate of wood for domestic purposes made by the census office is 7,434,690 cords, valued at \$9,019,569.

The completion of the Western North Carolina Railroad across the Blue Ridge to the Tennessee line at Paint Rock has opened the East Tennessee coal fields to people living along the line of this road and its immediate connections. Good bituminous coal is delivered at stations along these lines at about five dollars and fifty cents per ton.

The coal from the Chatham mines, on Deep river, when worked, is sold at a price even less than this, but the supply is not regular.

In no part of the State, where there is an eligible location for purposes of manufacturing, and where the raw material is cheap, abundant and accessible, is there any want of the means necessary for generating the needed power, whether this power is natural or created.

MANUFACTURES.

Cotton Factories.

Cotton manufacturing has long been an established industry in North Carolina. Though generally prosperous it advanced cautiously until within the last six or eight years, within which time it has been doubled.

In 1870 the census reported thirty three establishments, with a capital of \$1,030,900, operating 618 looms and 39,897 spindles.

The census bulletin on Specific Cotton Manufactures states the number of establishments to be forty nine, an increase of sixteen over that of 1870, with a capital of \$2,855,800, an increase of \$1,824,900; 1,790 looms, an increase of 1,172; and 92,385 spindles, an increase of 52,488.

The actual number of completed mills in the State, ascertained by reports from mill owners made to the Department of Agriculture, a list of which is subjoined, is sixty four. These mills operate 2,858 looms and 156,030 spindles. It will be seen that within the past twelve years the number of establishments has almost doubled, and if two mills now under construction and with machinery on the floors are counted in, there are exactly as many mills again as in 1870. The number of looms has increased four hundred and fifty per cent., and the number of spindles three hundred per cent. There are no accessible statistics by which a comparison of products can be made, but the large increase in looms will add greatly to the money value of the total product. Number 14 is the average yarn spun. The cloths, bags and bagging woven are of excellent quality and rank as leading standard goods in the markets. All these mills except about 12 are operated by water power. While good water powers will always be favorite investments, the low rates at which coal is and will continue to be delivered at stations along the lines of railway that run through the cotton belt, and where raw material for manufacture can be bought at factory doors, will modify the almost exclusive use of water as a motive power and will aid in building mills in localities that are supplied with the other governing facilities for manufacturing.

The amount of capital invested in cotton factories in the State by other than native citizens is inconsiderable.

Five mills have been completed during the year ending September 1st, 1882, and 31,000 spindles were added. Three mills to run about 10,000 spindles, are now building, and several more are projected. The opinion of the best informed and most experienced manufacturers is to the effect that the proven, undeniable advantages of making at least the coarser fabrics,—where the material for them is grown, and where a favorable climate, light taxes and cheap labor are auxiliary conditions,—will maintain the rate of increase of the past five years.

THE COTTON FACTORIES OF THE STATE.

COUNTY.	FACTORY.	POSTOFFICE.	Looms.	Spindles.	PROPRIETORS.
Alamance, ----	Clover Orchard Fact'ry	Clover Orchard,	40	1200	W. C. Holman.
"	Rock Creek Man'f Co.	Graham, -----	30		C. C. Curtis & Co.
"	Saxapahaw Factory, --	"		4740	Holt, White & Wil- son.
"	Carolina Cotton Mills.	"	52	3000	J. H. & W. E. Holt & Co.
"	Alamance " "	"	92	1000	E. M. Holt's Sons.
"	Bellmont " "	"	110	2600	L. B. & L. S. Holt.
"	Glencoe " "	Company Shops	125	3120	W. E. & J. H. Holt.
"	Granite " "	Graham, -----	220	8424	T. M. Holt.
"	Altamahaw " "	Company Shops		1008	Davidson & Gant.
"	Falls of Neuse Manu- facturing Co., -----	Haw River, ---		2240	George W. Swepson.
"	Lafayette Mills, -----	Company Shops		1248	Lafayette Holt, Supt.
Alexander, ----	Sulphur Springs Manu- facturing Co., -----	Stony Point, ---		600	J. L. Davis & Co.
"		Taylorville, ---	12	528	Alspaugh Bros.
Bertie, -----	Harden Man'f Co., ---	Windsor, -----		612	C. T. Harden, Prest.
Cabarrus, -----		Concord, -----		400	W. J. Black.
"	Odell Man'f Co., -----	"	126	4500	J. M. Odell, Prest.
Caldwell, -----		Patterson, -----	19	1808	Gwyn Chatham & Co.
Catawba, ----	Beaumont Falls Cotton Mills, -----	Monbo, -----	50	1500	Turner Bros.
"	Newton Cotton Mills,	Newton, -----		2040	W. H. Williams, Prest. S. M. Finger, Sec'y.
"	Long Island Man'f Co.	Catawba Station	40	1000	Powell & Shuford.
Chatham, ----	Bynum Man'f Co., ---	Pittsboro, -----		2200	L. B. Bynum, Agent.
Cleaveland, ---	Cleaveland Mills. ---	Shelby, -----	20	848	Schenck, Ramsour & Co
"	Morgan Falls Manu- facturing Co., -----	Double Shoals,		1224	E. A. Morgan & Co.
Craven, -----	New Berne Man'f Co.,	New Berne, ---		2100	T. A. Green.
Cumberland, ---	Manchester Mills, ---	Manchester, ---	46	1800	A. K. McDairmid, Prest
"	Linwood Cotton Mills.	Manchester, not running.		700	W. J. McDiarmid, Tr.
"	Beaver Creek " " "	Fayetteville, ---	69	3360	E. J. Lilly, Prest.
"	Bluff " " "	"	62	3028	E. J. Lilly, Prest.
"	Rock Fish Man'f Co.,	"		4500	T. C. Oakman, Prest.
Durham, -----	Orange Factory, -----	Orange Factory,	45	1300	S. W. Holman.
Forsyth, -----	Fries' Factory, -----	Salem, -----	76	3372	F. & H. Fries.
Franklin, ----	Laurel Cotton Factory	Laurel, -----		650	J. F. Jones.
Gaston, -----	Stowesville Cot. Mill,	Garibaldi -----		1400	Thos. H. Gaither.
"		Gastonia -----		2500	J. H. Wilson, Jr.
"	Woodlawn Man'f Co.,	Lowell, -----	50	2500	C. J. Lineberger, Prest.
"	Lawrence Man'f Co.,	"		5000	C. J. Lineberger, Prest.
"		Mount Holly, ---		2800	A. P. Rhyne & Co.
"	Mountain Island Mill,	Mountain Island	150	6000	F. A. & G. K. Tate.
Guilford, -----	Mount Pleasant Manu- facturing Co., -----	Brick Church --	30	864	W. M. Kline, Sec'y.
"	Oakdale Man'f Co., ---	Jamestown, ---	125	3120	C. P. Mendenhall.
"	High Point Man'f Co.,	High Point, ---		3000	O. S. Causey, Treas.
Iredell, -----	Nicholson's Mills, ---	Nicholson's Mill		528	T. A. Nicholson & Son
"		Eagle Mills, ---		600	Morrison, Gaither & Co

THE COTTON FACTORIES OF THE STATE.—*Continued.*

COUNTY.	FACTORY.	POSTOFFICE.	Looms.	Spindles.	PROPRIETORS.
Johnston, -----	Lowell Cotton Factory,	Pine Level, ----		1320	Wm. Edgerton.
Lincoln, -----	Ivy Shoals, -----	Lincolnton, ---	75	2016	Phifer Allison.
Mecklenburg --	Charlotte Cotton Mills,	Charlotte, -----		6056	Oates Bros.
Montgomery, --	Yadkin Falls, -----	Milledgeville, -	12	600	McAlister & Co.
Nash, -----	Rocky Mount Mills, --	Rocky Mount, --	80	3616	Battle & Son.
New Hanover, --	Wilmington Cot. Mills	Wilmington, --	156	5304	W. G. MacRae, Sec'y.
Pasquotank, ---	Clement Attachment, --	Elizabeth City,		708	S. S. Fowler.
Randolph, ----	Central Falls Manu- facturing Co., -----	Ashboro, -----		5000	J. H. Ferree, Prest.
"	Cedar Falls, -----	Cedar Falls, ---	60	2144	O. R. Cox, Agent.
"	Columbia Man'f Co.,	Columbia Fact'y		2880	W. H. Watkins, Agent
"	Franklinville Manufac- turing Co., -----	Franklinville, --	20	960	Benj. Moffitt, Treas.
"	Randolph Man'f Co., --	"	50	2000	Hugh Parks, Treas.
"	Naomi Man'f Co., ----	Randleman, ---	118	4608	J. H. Ferree, Prest.
"	Randleman Man'f Co.,	"	290	3500	J. H. Ferree, Prest.
"	J. M. Worth Manufac- turing Co., -----	Foust's Mills, --	26	1100	
			50	2500	J. M. Worth.
Richmond, ----		Laurel Hill, ----		2408	Mark Morgan.
"	Great Falls Man'f Co.,	Rockingham, --	130	4280	R. L. Steele, Prest.
"	Pee Dee, -----	"	100	4032	R. L. Steele, Prest.
Rockingham, --	Leaksville Cotton Mills	Leaksville, ----	62	5000	J. Turner Morehead,
Surry, -----	Hamburg Mills, -----	Mt. Airy, -----		576	A. Hines.
"	Elkin Man'f Co., -----	Elkin, -----	15	1500	R. R. Gwyn, Agent.
"		Mt. Airy, -----	25	1000	J. F. & W. A. Moore.
Wilson, -----	New Mill, -----				
			2858	156030	

Woollen Mills.

There were according to the census of 1870 fifty two establishments for the manufacture of wool, operating ninety seven looms and 2,806 spindles. This enumeration embraced not only mills of considerable size, but also the small carding establishments. Since then the number of these has probably diminished, as the census of 1880 will report only forty nine as the total number of such establishments. There has been a substantial improvement in the mills themselves, both in their capacity for doing more work and better work, and also in number. The subjoined list of woollen mills will show eleven mills now running, with 110 looms and 3,586 spindles. The increase in the number of looms is very small, but that in spindles is about 30 per cent. The supply of domestic wool is ample and convenient, and there is a ready sale at home and abroad for all the products of the factories. Blankets of excellent quality and fine cassimeres are made by the Forsyth and Surry county mills. All the mills are run by water power except the Fries, Lash and Shortridge mills, in which steam is used. Until sheep raising becomes more of a specialty, and ceases to be a mere branch of general agriculture, there is no reason for believing that the increase of woollen manufactures will more than keep pace with that of population.

LIST OF WOOLLEN MILLS.

COUNTIES.	NAME OF MILL.	POST OFFICE.	Looms.	Spindles.	PROPRIETORS.
Buncombe, --	Reems Creek Woollen, --	Weaversville, --	5	210	John Cairns.
Caldwell, ---	Gwynn, Harper & Co.'s, ---	Patterson, ---	8	240	Gwyn, Harper & Co.
Catawba, ---	Pleasant Valley Mills, ---	Jacob's Fork, ---	168	168	Mosteller & Warlick.
Forsyth, ----	Lash's Mill, ----	Bethania, ---	14	560	T. B. Lash.
"	Fries' Mill, ----	Salem, ----	40	678	F. & H. Fries.
Guilford, ----	Freeman's Mills, ----	Freem'ns M'ls	6	240	Bodie & Freeman.
Richmond, ---	Shortridge's Mill, ---	Hamlet, ---	6	200	John Shortridge.
Rockingham, ---	Leaksville Woolen Mills, ---	Leaksville, --	6	240	J. T. Morehead, A. P. Foard.
Surry, ----	Elkin Valley Mills, ----	Elkin, ----	10	480	Gwyn & Chatham.
"	Moore's Mill, ----	Mount Airy, ---	10	450	J. F. & W. A. Moore.
"	Allred's Mill, ----	"	4	120	Albert Allred.

Manufactures of Wood.

By the census enumeration of 1880 there were 776 establishments, with a capital of \$1,743,217, employing 5,334 men, receiving \$447,431 wages. The products in part were 241,822,000 feet of lumber, 13,340,000 laths, 8,707,000 shingles, 1,253,000 spool and bobbin stock. The value of logs \$1,490,616, mill supplies \$86,523, and the total value of all products was \$2,672,796. Most of these establishments are saw mills. Almost in every village there are carpenter shops, furniture and wagon factories, with capacities suited to the wants of the communities supplied.

Raleigh, Wilmington, Newbern, Salisbury, Company Shops and Laurinburg have car shops, where railway cars for passengers and freight are made on the most approved models, and of most substantial and beautiful material drawn from the woods of the State. In all the cities and larger towns are builders and contractors who own and operate extensive factories. The hard woods have laid the foundation for extensive manufactures. There are spoke and handle factories at several points in the middle section of the State, where these woods are the predominant and almost unimpaired growth, which ship their products to all parts of this country and Europe. At Hickory and Salem there are extensive wagon factories that ship their work to all parts of the Union. Wilson, Goldsboro, Carthage, Fayetteville and Raleigh, have important buggy and carriage factories; and at Winston, Oxford, Statesville and High Point, there are factories for the manufacture of shuttles and bobbins of dog wood and persimmon.

There is at Newbern a factory for manufacturing plates and dishes of gum wood. It is the only factory of this kind. Its capacity is 80,000 plates per day. Four hundred and fifty sweet-gum logs forty eight inches long are used per week, and four large flats are kept running to float in the logs. Engines with 200-horse power drive the machinery, and the factory is run on full time to keep up with its contracts. The capital invested is \$20,000, and the amount paid in wages is about \$21,000.

The most valuable cabinet woods, such as walnut, cherry, maple and birch have been felled in large quantities far in the interior and shipped abroad. Buyers from the North and West have made large purchases of these trees during the past year in the mountain coun-

ties. Since the display of unknown and almost incredible wealth of the State in its various woods, at the Atlanta Exposition, there has been a very active and growing demand for them. The supply is ample for shipment beyond the borders of the State for years to come, and it offers certain profits to enterprising and skilful workmen who will build their workshops near it.

Iron Manufactures.

The Bulletin of the census of 1880 on the iron and steel production of the United States puts down twenty manufactures of these materials in North Carolina, with a capital of \$759,400. As long as it took five or six tons of coal to convert two tons of ore into iron, the transportation of fuel was so heavy and expensive that it put manufacturers in the State at a disadvantage, and made it profitable to miners to ship their ores where they had facilities to the great iron making centres. But now, when under the present improved system of manufacture, one ton of coal makes a ton of iron, the advantages are reversed, and the fuel will be brought to the ore beds. The introduction of cheap coal, and the completion of the Western North Carolina railroad and the Pardee road to the Cranberry mines, will build up furnaces and manufactures, and make them among of most important industries.

There are large machine shops, railroad shops, foundries, agricultural implement works in all the cities and large towns, and in every village and at most of the country stores blacksmiths ply their trade.

Paper Factories.

There are four paper mills in the State. Buffalo, in Cleaveland county, Lincolnton, Longshoals, in Lincoln, and Falls of Neuse, in Wake county.

The daily capacity of the first three is about three tons each and the products are French folios, bristol boards, writing paper, blotting, book and newspaper, manilla, wrapping and colored cover papers.

The capacity of the Falls of Neuse mills is one ton heavy paper per twelve hours, and 1,500 pounds light paper. Its products are book, Nos. 1 and 2; news, Nos. 1 and 2; manilla and wrapping, No. 1. The water power is excellent.

The supply of poplar and soft old field pine has already attracted the attention of manufacturers of paper pulp, and as the material

has been tested and found satisfactory, and is to be had at almost nominal cost, there is little doubt that its manufacture will be one of the new industries. A company for this purpose has been organized at Asheville.

Flouring and Grist Mills.

Mills of these sorts are, as a rule, of limited capacity, and are run to grind the wheat and corn grown in the neighborhood, and brought to their doors. But little of the grain converted into meal or flour is sent away to market, and when they have supplied the communities for whose apparent convenience they were built, the mill wheels stop. A few large mills, some run by steam and others by water power, make excellent meal and flour for the large provision markets, and their brands have wide reputations.

At the last Mechanics' Institute Fair, held in Boston, wheat, corn, flour and meal grown and ground in North Carolina attracted especial attention, and were pronounced the best on exhibition. The wheat was plump and full, and weighed from four to five pounds above the commercial standard, and the flour produced from it was white and smooth and rich.

The corn of the State is a hard flint corn, heavier than the Western corn, and better. It makes a white, sweet meal, and is largely bought by millers to mix with Western corn in grinding, to give the meal color and body. Formerly these mills were run almost entirely by water power, and there is still a strong feeling among dealers and consumers in favor of water ground meal. This, however, will not continue long. Improved machinery, driven by steam, produces a meal that defies detection; and cheap portable engines, and mills that can be placed wherever it is wished, will make convenience overcome prejudice.

Rice Mills.

The increased and growing production of both golden seed or lowland and white or upland rice has furnished in abundance raw material for rice mills, and they have increased in number and capacity during the past year. There are now in operation four mills.

The Carolina Rice mill, daily capacity, 1,000 bushels, Wilmington.

Newbern	"	"	"	"	500	"	Newbern.
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Washington	"	"	"	"	500	"	Newbern.
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Goldsboro	"	"	"	"	468	"	Goldsboro.
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The products of these mills are clean rice and what are termed by-products, rice flour and rice polish. Rice flour is the skin covering the grain, between it and the chaff. It is a slightly brownish meal, about the appearance of "wheat middlings," and is a rich, strong food for horses, cattle and hogs, producing fat rapidly. It contains about thirteen and a half per cent. of fat. Rice polish shows about half this amount of fat. This is made by subjecting rice cleaned of hulls and skins to very rapid friction. The fine particles turned off are the polish. It is a whiter and finer meal than the flour.

Fertilizer Factory.

The Navassa Guano Company's works, near Wilmington, on the west bank of the Cape Fear river, in Brunswick county, are very extensive, and their mills, offices and storage houses, make up a village in themselves.

The tracks of the Wilmington and Weldon, Wilmington, Columbia and Augusta, and Carolina Central railroads pass their grounds, and with their wharf conveniences supply necessary transportation. The company was organized in 1869, with a paid up capital of \$200,000. The works have been improved, and their capacity increased from time to time, until their annual capacity has reached 15,000 tons. There are large double chambers for making sulphuric acid, and a single for muriatic acid. The basis of their products is the Navassa and South Carolina Phosphate Rocks. From the beginning the enterprise has been highly successful.

Pine Leaf Manufactory.

The manufacture of the pine leaf into a material to be used in the arts is, so far as known, pursued only in this State. The works are built at Riverdale, on the Neuse river, nine miles below Newbern, a station on the Atlantic and North Carolina railroad. The capital invested is about thirty thousand dollars, and twenty five hands are employed.

The full capacity, with necessary facilities for artificial drying, is nine tons of raw material per day. The product is one and a half tons pine leaf hair, and a like amount of curled pine straw. The former is sold to furniture and carriage manufacturers for stuffing cushions, chairs, sofas, &c., while the latter is used exclusively for mattresses, and is so

prepared as to preserve the balsamic odor, for which medicinal virtues are claimed.

In the process of manufacture an oil is distilled, called Pineoleum, that is considered valuable for its curative properties.

The mattresses are sold largely for hospital purposes, and a large trade for all the products of the factory has been established in the Northern States and in Canada.

Shoe Factories.

Tanneries of the State supply very good leather for ordinary purposes, and shoe shops employing small numbers of workmen are to be found in every community. Thomasville, in Davidson county, has a large number of factories, generally of small capacity, but in the aggregate forming a very respectable industry. The town has been built up by this branch of manufacture, and is a growing and thriving business place.

Mill Stones.

There are in Moore county, near the Raleigh and Augusta Air-Line railroad, two mill and mill stone factories in operation. The material used has been pronounced by competent authority as unsurpassed for stones for grinding corn, and is abundant. It has been used in flouring mills, and occasionally found to be nearly equal to the French buhr-stone.

The North Carolina Mill Stone Company at Parkewood, employs forty men and turns out fifteen portable mills and ten mill stones per month. The value of the annual product is \$60,000. Mills have been shipped into more than half the States, and into Canada.

The Little River Millstone Quarry is situated on Little river, six miles from Manly, on the Raleigh and Augusta Air-line railroad. Five experienced workmen are employed, and a mill is turned out every three weeks. Mills complete or millstones are manufactured of 30, 33 and 36 inches, and have been widely sold in the State.

Cotton Seed Oil Mills.

There are four Cotton Seed Oil Mills in the State:
The Fayetteville Oil Mill, capacity,..... 20 tons per day.

Goldsboro Oil Company, capacity,.....	20 tons per day.
New Bern Oil Mills, capacity,.....	30 " " "
Elizabeth City Oil Mills, capacity,.....	12 " " "

The cultivation of cotton has grown to such an extent as to make the seed sufficient in quantity to attract the attention of cotton seed oil manufacturers. If the statistics are correct 180,000 tons of seed were used by the mills in the United States in 1881. The cotton crop of the State is estimated at 421,000 bales for 1882, and allowing 800 pounds seed per bale, the cotton seed of this State would furnish all the mills in operation in the United States. The regular growth of the industry would seem to indicate that it is profitable. Of the mills in this State, one was built in 1880, and the other three in 1882. It is generally agreed that if the raw material, the seed, can be bought at reasonable prices, there is no more certain manufacturing enterprise. The supply of seed is large enough, but whether the farmers will sell them at prices which the manufacturer can afford to pay for them is the problem that is to be worked out. The mills are owned by prudent and successful men, and unless the difficulties referred to are insurmountable they will become an established branch of our manufactures.

Fish Oil Mills.

At Beaufort on Beaufort harbor are three Fish Oil Mills for expressing the oil and making fish scrap for fertilizers of the menhaden and refuse and unmarketable fish. The offal of fish has been utilized as a fertilizer for years past on the plantations contiguous to the large fisheries on the sounds and rivers. This waste, at the Albemarle fisheries alone, thus used, is estimated at 3,000 tons per annum. When to these figures is added the refuse from the Pamlico and the smaller sounds and the rivers that empty into them, the aggregate of fertilizing material is seen to be very large. The analysis of this refuse shows a high result. The immense schools of menhaden on the coast and in the sounds attracted attention a number of years ago and desultory attempts to take them were made, but on account of extravagant equipment, want of business management and proper acquaintance with the modes of fishing in these waters they were, as a rule, unsuccessful.

An old fisherman gives the following account of the visits of the menhaden to the eastern waters: They first make their appearance in June and remain until December; they generally come into the

shore on the northern coast of the cape, running south along the beach and entering the inlets and rivers. In the first of the season they may be seen, in moderate weather, five or six miles at sea, in large schools half a mile in length, apparently floating upon the surface of the water. They always make their appearance from the north and leave the coast by the same route. Some are seen in the sounds and rivers all the year. When the second large run occurs in the fall they appear in immense numbers. This is sometimes in November and in other seasons in December. Many schools may be seen at one time. They seldom come near the coast in high winds and rough seas, or if they do they swim so low that they are not seen from land. Their appearance is certain, and they are about the same in abundance every year at the spring run, but the fall and winter runs vary somewhat, the number in some seasons being very much smaller.

The sources of material for the manufacture of commercial fertilizers are sought for to keep pace with their use, and as these fish are especially valuable for producing ammonia the demand for them will increase from year to year. The points to which preference will be given for the establishment of factories are those where they will be found in greatest abundance. On the eastern waters of the State are many such points, notably Roanoke Island. It is almost equally accessible to Albemarle and Pamlico sounds, the great head quarters of the menhaden and near the great fisheries where a large supply of offal can annually be had. It has unlimited facilities for the transportation of its products by sea and by land from Edenton, Elizabeth City, New-Washington and Morehead City.

Indications are that fishing for material for fish oil mills will become one of the steady and profitable pursuits of the eastern section.

In 1880 there was a fish oil factory at Manteo, on Roanoke Island. During the summer of 1882 the three now in operation in Carteret county, near Beaufort, were established. In one of these engines with 48-horse power are used in running machinery and pumps. There are seventeen cooking tanks, holding twenty barrels of fish each, two presses, four curbs, two pumps and a hoisting engine for unloading boats. Two acres of ground are covered with boards for drying scrap. The scrap house is 40x60 feet. The factory is 50x60 feet, with sheds and engines and boiler houses attached. There is a good dock 40x60 feet, with twelve feet of water. A steamer and sail vessels and boats are used for catching fish, which are taken in purse

nets. The number of hands employed is thirty three, and the capacity of the works is six hundred barrels of fish per day.

Of another establishment the daily capacity is five hundred barrels of fish. The fish are mostly caught with purse seines, but large quantities are bought from fishermen, who use the ordinary hauling seines and set nets. During the fishing season there are employed at the works, on the seines and on the freight boats from thirty five to fifty men, at wages ranging from \$17.00 to \$40.00 per month. In addition to the regular employees, there are seventy five or one hundred men engaged in catching fish in their own nets, which they sell to this establishment.

There is another steam factory, with hydraulic presses in operation, but its capacity has not been ascertained.

There are also four small works, with caldrons for cooking the fish, and handpresses for pressing the oil from them.

This industry will give employment from the first of April to the last of November to four hundred men, at good wages, and will yield \$150,000 per annum when there is a good catch of fish.

FISHERIES AND ARTIFICIAL PROPAGATION OF FISH.

The North Carolina Fisheries are the most important on the South Atlantic coast. They yielded in 1880 four times as much food fish and employed three times as many persons as they did in 1870, and yet south of Albemarle Sound they are practically undeveloped on account of lack of shipping and refrigerating conveniencies. The means of shipment are increasing every year, however, and with this advantage the enterprise of the people along the coast will build up, at various points, a large trade in fish, such as Wilmington, Beaufort, New Bern and Washington now have.

The principal commercial fisheries are the herring, shad, blue fish, mullet, Spanish mackerel, sturgeon, menhaden, bass, trout and oysters.

The large rivers and brackish sounds of North Carolina are visited annually by immense numbers of shad and herring, and in spring and early summer the fishing is extensive in many portions of the State. The principal fisheries, however, are near the junction of the Roanoke and Chowan rivers, at the head of Albemarle sound, and in the Neuse and the Tar rivers. In the herring fisheries the State ranks first on the list, with 15,520,000 pounds, netting the fishermen \$142,847. The quantity of shad taken in 1880 was 3,221,263 pounds, being a little below the Maryland catch, but the price realized is so much greater that the value of the catch is more than double that of the Maryland fishery, because the shad are marketed before fishing begins there. Its sea fisheries, when compared with those of the more northern States, are of little importance, though in the Bays and Sounds between Beaufort and Wilmington many follow fishing for a livelihood, and secure annually large quantities of the various species. The mullet fisheries of North Carolina are second only to those of Florida, the catch in 1880 amounting to 3,368,000, pounds, valued at \$80,500.

The catch of blue fish, striped bass and trout, will average about a million pounds each per annum, and the run of these fish increases rather than diminishes.

Spanish mackerel are becoming more common along our shores. The Census Bulletin of last June estimates the number caught at ten thousand pounds, but this must be far under the real catch. Half that weight was caught during the past summer, by gentlemen fishing for sport at Beaufort and Morehead City, and these points represent a small area of the fishing grounds. The largest sturgeon and the best are caught and shipped from North Carolina waters, aggregating a million pounds in weight.

The oyster beds of the State have grown in favor during the last few years, and consequently their product has greatly increased to supply the demand. The New river oyster has a great local reputation, and is preferred by connoisseurs to the oysters of Virginia and Maryland. It sells for a uniform price. The total yield is 200,000 bushels.

The Menhaden Fisheries have variable success, according to the run of the fish. In some years the waters are alive with them, and the fishermen cannot handle them for number, in other years the run is small, and the seasons work unfavorable to the fishermen. In 1868 the catch was 50,000 pounds, at Manteo, Dare county. It fell off during the next two years, but has increased annually since, and there are now three fish oil mills at Beaufort that are supplied from these fisheries. Formerly a few were used for food, and the rest were thrown away.

There are the usual varieties of game fish and other fish that do not come under the head of commercial fish, found in the streams and ponds of all sections of the State.

The following summary represents the statistical review of the North Carolina Fisheries:

Persons employed.....	5,274
Fishing vessels.....	95
Fishing boats.....	2,714
Capital dependent on the fishery industries,.....	\$506,561
Pounds of sea products taken (including oysters).....	11,357,300
Value of same.....	\$280,745
Pounds of river products taken,.....	20,892,188
Value of same.....	546,950
Total value of products to the fishermen.....	\$827,695.

Propagation and Culture of Fish.

Since 1877 the State has by statute provided for the protection, propagation and culture of fish in its inland waters. The work has been done under the auspices of the Board of Agriculture, by Mr. S. G. Worth, Superintendent of Fish and Fisheries.

At Avoca, on Albemarle sound, is built the hatchery for shad. It is furnished with the most approved apparatus, and the results of its operations have given it a reputation with fish culturists throughout the country. The shad fry are distributed from this point to the inland waters of the State. Twenty millions have been released.

The following table shows the progress made, the number of fry planted, and the streams and their tributaries supplied :

TABLE NO. 1.

PLANTINGS OF SHAD FRY, 1877 TO 1882, INCLUSIVE.

STREAMS.	Tributary to	PLANTINGS OF THE SIX YEARS.						Total No. in each.
		1877.	1878.	1879.	1880.	1881.	1882.	
Neuse,.....	Pamlico Sound. 3,846,000.	134,000	150,000	225,000	700,000	700,000	350,000	2,259,000
Trent,.....		.....	.....	125,000	200,000	.....	.....	325,000
Tar,.....		50,000	250,000	200,000	790,000	270,000	150,000	1,710,000
Contentnea Creek,	Cape Fear River. 1,940,000.	52,000	.....	.....	.....	.....	.....	52,000
Haw River,.....		70,000	.....	.....	.....	470,000	.....	540,000
Deep River,.....		.....	.....	.....	600,000	.....	.....	600,000
Six Runs,.....	Albemarle Sound. 10,963,000.	.....	100,000	200,000	150,000	.....	485,000	935,000
N. East Cape Fear,		.....	.....	.....	150,000	.....	.....	150,000
Goshen Creek,.....		.....	100,000	100,000	.....	.....	.....	200,000
Roanoke River,.....	S. C. Rivers. 680,000.	.....	389,000	350,000	150,000	.....	.....	889,000
Meherrin,.....		.....	150,000	230,000	.....	.....	.....	380,000
Nottoway,.....		.....	111,000	275,000	.....	.....	1,135,000	386,000
Chowan,.....	S. C. Rivers. 680,000.	.....	200,000	.....	.....	.....	.....	200,000
Salmon Creeek,.....		.....	1,508,000	210,000	1,075,000	1,860,000	.....	5,788,000
Blackwater,.....		.....	.....	220,000	550,000	675,000	.....	1,445,000
Albemarle Sound,...	S. C. Rivers. 680,000.	.....	185,000	110,000	875,000	1,570,000	.....	2,740,000
Yadkin,.....		.....	73,000	50,000	240,005	100,000	.....	463,000
Catawba,.....		67,000	50,000	.....	100,000	.....	.....	217,000
Newport,.....	.....	.....	.....	.....	.....	140,000	.....	140,000
Total plant each y'r		446,000	3,243,000	2,485,000	5,440,000	5,545,000	.....	19,419,000

A Hatchery for California Salmon, Mountain Trout, &c., was built at Morganton on the Western North Carolina Railroad. It was discontinued last year when the distribution of carp was begun. The following table illustrates the plantings of four years:

TABLE No. 2.

PLANTING OF CALIFORNIA SALMON. 1877 TO 1880 INCLUSIVE.

STREAMS.	Tributary to	PLANTING OF THE FOUR YEARS.				Total No. in Each
		1877.	1878.	1879.	1880.	
Yadkin,	S. C. Streams 140,000.	60,000	60,000	20,000	.....	140,000
Pigeon,		10,000	.....	.....	.....	10,000
Swannanoa,		Tennessee 37,000.	27,000
Deep,	Cape Fear, 85,000.	20,000	65,000	.....	.....	85,000
Linville,		12,000	30,000	5,000	.....	47,000
John's,	Catawba 446,000.	30,000	30,000	10,000	.....	70,000
Catawba,		50,000	.....	5,000	160,000	215,000
Green,		.....	30,000	.....	.....	30,000
South Fork Catawba,	} Albemarle Sound	.....	.....	12,000	.....	12,000
Clark's Creek,		.....	.....	2,000	.....	2,000
Broad,		25,000	50,000	.....	.....	75,000
Dan River,	} 40000.	.....	20,000	.....	.....	20,000
Town Creek,		.....	20,000	.....	.....	20,000
Total planting of each year,		231,000	300,000	51,000	160,000	748,000

REMARKS.—In total for 1879 400 fish are added, 200 of which went to tributaries of the Neuse and 200 to tributaries of Catawba. They were put into private ponds.

A greater number would have been put in the Yadkin, but the headwaters were 30 miles away at the nearest Railroad points, and the distribution occurred in December and January when the wagon roads were in worst condition. Two shipments made to Dan river could not be got through and went into Deep river.

German Carp.

The introduction of the German Carp into the State as a food fish began in the fall of 1879, when there were not more than thirty ponds devoted to the systematic raising of food fish. The gratuitous distribution of young carp by the Department of Agriculture and their rapid growth and easy culture, popularized them, and by April, 1882, 289 ponds had been supplied. Since that time 800 additional ponds making a total of 1089 built within three years, have received their quota of fish. About 22,000 carp have been furnished by the United States Fish Commission. They give general satisfaction as a table fish. Their growth in average ponds is two pounds a year and under favorable circumstances it has exceeded four pounds.

The demand is daily increasing and to supply it breeding ponds have been built and stocked at Raleigh.

TOBACCO FACTORIES.

The enterprise of the people of North Carolina since the civil war has been trammelled by a want of capital. This has debarred them from entering upon undertakings of great magnitude, or if attempted, they have been prosecuted at great disadvantage. Our cotton factories, in their increase, show what may be done by energy, skill and industry, under the most straitened circumstances. Without external aid all have gone on increasing, and many have become imposing establishments. The manufacture of tobacco was attended to a less extent with this advantage. This business did not require the same amount as cotton manufacturing. It could, indeed, be entered upon and prosecuted with a very moderate capital. In this field of manufacture the enterprise of the people of the State has been most strikingly exhibited. The increase in tobacco factories during the decade included between the census of 1870 and 1880 is not far from double. The number in 1870 was 110; the number in 1880 was 206. The increase in the value of the property embarked in the pursuit is still greater. A recent sale of an interest in one of these factories will show this increase—an extreme case it may be, but nevertheless, an actual one. An interest in a factory in Durham recently sold for a sum but a fraction less than the whole capital invested in the business in 1870. These factories are widely distributed through the State; and property of every kind has been enhanced in value, the sum of comfort been enhanced through the employment of women and children, and the general prosperity promoted wherever they have been established. The following table will show their number and location :

COUNTIES.	Tobacco Factories.	Cigar Factories.	COUNTIES.	Tobacco Factories.	Cigar Factories.
Alamance.....	5		Lenoir.....	1	
Buncombe.....	8		Mecklenburg.....	1	2
Caldwell.....	1		McDowell.....	1	1
Caswell.....	4		New Hanover.....	1	1
Catawba.....	7	1	Nash.....	1	
Cleveland.....	3		Orange.....	5	
Craven.....	1	2	Person.....	2	
Cumberland.....	2		Rockingham.....	18	2
Davie.....	15		Rutherford.....	1	
Davidson.....	4		Rowan.....	2	1
Durham.....	8	3	Stokes.....	7	
Forsyth.....	29		Surry.....	13	
Franklin.....	1		Vance.....	5	
Granville.....	6		Wake.....	1	1
Greene.....	1		Wilkes.....	3	
Guilford.....	7	2	Wayne.....		1
Hertford.....	1		Wilson.....		1
Iredell.....	8	3	Yadkin.....	10	

JUTE.

It is an established fact now that this valuable plant can be grown successfully in Eastern North Carolina. It appears that it will grow and attain perfection wherever cotton will mature, although it prefers a warm, humid climate and a moist, sandy loam. It grows with equal luxuriance upon uplands or alluvial bottoms, if equally rich, but where the uplands are devoted to cotton, it finds its place appropriately in the moist low lands. It is very probable that just that description of moist rich bottom land which produces a large cotton stalk, but upon which no cotton matures, would be found to be the very best land for jute.

Its cultivation is simple and about the same as that of cotton. The methods in use to strip the fibre from the stalk are slow, tedious and not liked by laborers. Besides, the low wages paid laborers in India gave that country a great advantage in the production and marketing of this plant. Recent inventions have about solved the difficulties of stripping the fibre from the plant by machinery without the slow processes of water-rotting, and will place the lands of the eastern part of the State on an equal footing with those of Hindostan for its production. The advantages of more intelligent labor, manufactures near the supply of the raw material and the best market in the world for the sale of articles manufactured from it, will combine to make it a prominent staple.

Jute fibre is used to make bagging, bailing cloth, mattings, and in various mixed fibres. All of the fertilizer bags, all of the cotton bagging and a great many of the wheat sacks of the country are made from it. The jute cloth used in this country has heretofore all been made from jute from India, and the most of it manufactured at Dundee, in Scotland.

SILK CULTURE,

The following notice of Silk Culture is from the hand of Mr. Edward Fasnach, of Raleigh, North Carolina, who speaks from a practical knowledge of the business:

Among the undeveloped resources of North Carolina there are probably none deserving of more thoughtful consideration than silk culture.

The mulberry, which supplies the food for the silk worm, is indigenous, and grows in great abundance in almost every section of the State, and it attains its fullest development with scarcely any cultivation. Nor is the silk giving quality of its leaves less noticeable, for wherever North Carolina grown silk has been put to a test it has been found of most excellent quality, and equal to the best French and Italian.

There is no branch of agriculture that offers so generous a reward for so little capital invested as silk culture. The making of a crop, from the hatching to the gathering of the silk, be the crop small or large, will consume but six weeks' time. Moreover, the otherwise unemployed members of the family, as the women, the children, the aged, and even infirm, can here find profitable occupation. Nor is silk culture limited to the farm or country, but where there is a room and food for the silk worm available, whether it be in town or city, silk can be raised. It is computed that there are 270,994 families in North Carolina now, if only 10,000 would make a small crop each year of two hundred to three hundred pounds of silk, the aggregate income would amount to between one and two million of dollars. Three fourths of the silk in France is the production of small crops, from two hundred to four hundred pounds. It is a source of great wealth to that nation, and contributes more than any other branch of industry to the general prosperity of the people. The French call silk culture *une de nos gloires industrielles*, (one of our industrial glories.)

Our endless tracts of cheap and uncultivated lands, so well adapted to the growth of the mulberry, and our mild and equable climate, present strong inducements to French and Italian colonies of silk growers, with whom the culture of silk has become an hereditary occupation.

The rapid progress and fast increasing production of the American silk manufactories can not but have an encouraging influence upon silk culture in this country. The raw silk imported, duty free, last year, amounted to about twelve millions of dollars.

The prices for cocoons and raw silk have of late years very much fluctuated. While the cocoons sold in 1876 at \$3.00 per pound they are selling to day at \$1.25. These are the extreme figures, the average price may be fairly stated at \$1.50 per pound.

Two hundred mulberry trees will grow very well on two acres of land. A good medium size tree will yield one hundred and fifty pounds of leaves, which will give 30,000 pounds of leaves on two acres. As it takes seventeen pounds of leaves to make one pound of fresh cocoons, 30,000 pounds will give 1,765 pounds of fresh cocoons.

The 1,765 pounds of fresh cocoons will make 588 pounds of dried cocoons.

A ready market for these cocoons can be found in Philadelphia through the medium of the Department of Agriculture.

The expenses of cultivating two acres in trees feeding the worms, &c., may be stated as follows:

1 grown person first 10 days.....	\$10.00
2 boys or girls, " "	6.00
3 grown persons second 10 days.....	20.00
5 boys or girls " "	15.00
3 grown persons third 10 days.....	30.00
16 boys or girls.....	38.00
	\$129.00

If a few dollars for food is added, a few days work for pruning and cultivating the trees, and a few sundries, it will cover all the expenses which would not exceed \$160.

TAR, PITCH AND TURPENTINE.

For a long period this State was the principal source of supply for these products. The census of 1870 shows that this industry was much more largely developed in this than in any other State. The returns of the census of 1880 bearing upon this product have not yet been published. During the intervening period the pine forests of Georgia have been extensively worked, but exactly to what extent has not been ascertained from any authoritative statistics. The precise status of North Carolina with reference to this peculiar industry cannot therefore be stated. It is presumed, however, that the disproportion no longer exists that formerly obtained between this and one or two other States.

There were, according to the census of 1870 456,141 barrels of rosin ; 300 barrels of tar ; 3,799,499 gallons of spirits of turpentine.

The Census Bulletin on the subject for 1880 has not been completed, but will show when published 663,907 barrels of rosin, and 6,179,200 gallons of spirits of turpentine.

From the line of the Raleigh and Augusta Airline Railroad in 1882 there were shipped 79,603 barrels of rosin, and 17,451 barrels of spirits. From Wilmington, 454,917 barrels of rosin, 85,997 barrels of spirits, 68,653 tar, and 87,486 crude.

From Fayetteville, 10,725 barrels spirits turpentine, and 54,650 rosin. From Newbern, 10,000 barrels spirits, and 3,000 barrels tar.

COMMERCIAL FACILITIES.

RAILROADS IN NORTH CAROLINA IN 1882.

[From "Hale's Woods and Timbers."]

NAMES.

BETWEEN.

Asheville and Spartanburg,.....	Hendersonville, N. C., and Spartanburg, S. C.
Atlanta and Charlotte Air-Line,.....	Charlotte, N. C., and Atlanta, Ga.
Atlantic and North Carolina,.....	Goldsboro and Morehead City.
Atlantic, Tennessee and Ohio,.....	Charlotte and Statesville.
Cape Fear and Yadkin Valley,.....	Fayetteville and Gulf.
Carolina Central,.....	Wilmington and Shelby.
Cheraw and Wadesboro,.....	Cheraw, S. C., and Wadesboro, N. C.
Charlotte, Columbia and Augusta,.....	Charlotte, N. C., and Augusta, Ga.
Chester and Lenoir,.....	Lenoir, N. C., and Chester, S. C.
Danville, Mocksville and Southwestern,.....	Danville, Va., and Leaksville, N. C.
East Tennessee and Western N. C.,.....	Johnson City, Tenn., and Cranberry, N. C.
Elizabeth City and Norfolk,.....	Edenton, N. C., and Norfolk, Va.
Halifax and Scotland Neck,.....	Halifax and Hill's Ferry.
Jamesville and Washington,.....	Jamesville and Washington.
Milton and Sutherlin,.....	Milton, N. C., and Sutherlin, Va.
North Carolina,.....	Goldsboro and Charlotte.
Northwestern North Carolina,.....	Greensboro and Salem.
North Carolina Midland,.....	Goldsboro and Smithfield.
Oxford and Henderson,.....	Oxford and Henderson.
Petersburg,.....	Petersburg, Va., and Weldon, N. C.
Piedmont,.....	Greensboro, N. C., and Danville, Va.
Raleigh and Augusta Air-Line,.....	Raleigh and Hamlet.
Raleigh and Gaston,.....	Raleigh and Weldon.
Seaboard and Raleigh,.....	Williamston and Tarboro.
Seaboard and Roanoke,.....	Portsmouth, Va., and Weldon, N. C.
Tarboro Branch,.....	Rocky Mount and Tarboro.
University,.....	University Station and Chapel Hill.
Wilmington and Weldon,.....	Wilmington and Weldon.
Wilmington, Columbia and Augusta,.....	Wilmington, N. C., and Columbia, S. C.
Western North Carolina,.....	Salisbury and Paint Rock.

The Asheville and Spartanburg

Railroad has its present terminus at Hendersonville, North Carolina. Twenty miles of track are yet to be laid to complete it to Asheville,

where it will make connection with all the North Carolina roads, and with roads to the North and West; at Spartanburg, South Carolina, it already connects with the through lines of travel. Its present completed length is 49 miles, passing from Spartanburg, South Carolina, into Polk and Henderson counties, North Carolina. The Richmond and Danville Company controls it, and the Asheville connection will soon be made.

The Atlanta and Charlotte Air-Line

Railroad, 269 miles in length, reaches Charlotte, North Carolina, from Atlanta, Georgia, through Cleveland, Gaston, and Mecklenburg counties, North Carolina. At Charlotte, a thriving railroad centre, the traveller finds railroad connections north, south, east and west. The road is the property, by lease, of the Richmond and Danville Company.

The Atlantic and North Carolina

Railroad, 95 miles in length, passes from Morehead City (Beaufort Harbor) on the Atlantic coast, through the counties of Carteret, Craven, Jones and Lenoir to the thriving town of Goldsboro, in Wayne county, where it connects with the great lines of railway north south and west.

The Atlantic, Tennessee and Ohio

Railroad, 47 miles long, connects Charlotte with the Western North Carolina Road at Statesville, passing through the northern half of Mecklenburg and the southern half of Iredell county. It is leased to the Richmond and Danville.

The Cape Fear and Yadkin Valley

Railroad is in operation from Fayetteville, the prospering head of steam navigation on the Cape Fear river, to Gulf, Chatham county—a distance of 47 miles—passing through Cumberland, Harnett and Moore into Chatham. Its further route is graded and bridged from Gulf through Chatham and Randolph, to Greensboro, in Guilford county, 52 miles; and is graded from Greensboro to Walnut Cove, Stokes county, 30 miles beyond. The Cape Fear and

Yadkin Valley Road also owns the graded route of the Fayetteville and Florence Road from Fayetteville to the South Carolina line, 48 miles. The whole route will be rapidly completed after a slight change in the charter, to be made by the Legislature in January, 1883, and when finished will pass from a point on the Carolina Central Railroad through the counties of Robeson, Cumberland, Harnett, Moore, Chatham, Randolph, Guilford, Forsyth, Stokes, Surry, Yadkin, Wilkes, Caldwell and Mitchell.

The Carolina Central

Railway passes from Wilmington, the largest city of the State, and a seaport of great and growing foreign and domestic trade, 242 miles to Shelby. It traverses the counties of New Hanover, Brunswick, Columbus, Bladen, Robeson, Richmond, Anson, Union, Mecklenburg, Gaston, Lincoln and Cleveland. At Wilmington it connects with roads leading North and South and with the Cape Fear river and ocean steamers; at Hamlet with the Raleigh and Augusta Air-Line, which is under the same management; at Wadesboro with the South Carolina roads; and at Charlotte with roads in every direction.

The Cheraw and Wadesboro

Road connects Anson with the South Carolina roads, and the Carolina Central at Wadesboro gives it an outlet to all parts of North Carolina. Its present length in North Carolina is eleven miles. Its projected northern terminus is at Salisbury, Rowan county.

The Charlotte, Columbia and Augusta

Railroad is another of Charlotte's connections with the outside world. Its length is 191 miles, fourteen of which are in Mecklenburg county. It is a part of the Richmond and Danville system.

The Chester and Lenoir

is a narrow gauge railroad, at present 63 miles long, passing from Chester, South Carolina, on the Charlotte, Columbia and Augusta Road, through Gaston and Lincoln counties, North Carolina, to Lincolnton. Twenty seven miles remain to be built to its terminus at Lenoir, Caldwell county.

The Danville, Mocksville and Southwestern

Railroad is completed from Danville, Virginia, to Leaksville, Rockingham county, North Carolina. It is part of the North Carolina Extension of the Virginia Midland, is controlled by the Richmond and Danville, and will be completed across the State to its southern border at Charlotte.

The East Tennessee and Western North Carolina

Railroad, 34 miles long, connects the celebrated Cranberry mines, in Mitchell county, North Carolina, with the East Tennessee, Virginia and Georgia Road, at Johnson City, Tennessee.

The Elizabeth City and Norfolk

Railroad is in operation for 75 miles, passing from Norfolk, Virginia, through Currituck, Camden, Pasquotank, Perquimans and Chowan counties, North Carolina, to Edenton, on the Albemarle Sound. The road will probably be continued across the State through the eastern counties. At present, Edenton's other connections are by inland steam navigation on the rivers and sounds.

The Halifax and Scotland Neck

is a branch road from the Wilmington and Weldon at Halifax to Scotland Neck, Halifax county. Its length is 20 miles, and it connects with Roanoke river steamers for Norfolk, Baltimore, etc.

The Jamesville and Washington

Road, 29 miles long, connects Jamesville, in Martin county, with inland and ocean navigation at Washington Beaufort county.

The Midland North Carolina

Railroad, a road projected from Goldsboro to Salisbury, is in operation from Goldsboro, in Wayne county, to Smithfield, Johnston county, 22 miles.

The Milton and Sutherlin Narrow Gauge

Railroad, 9 miles long, connects Milton, Caswell county, with the Richmond and Danville Road at Sutherlin, Virginia.

The North Carolina

Railroad, 223 miles in length, passes from Goldsboro, through Wayne, Johnston, Wake, Durham, Orange, Alamance, Guilford, Davidson, Rowan, Cabarrus, Mecklenburg, to Charlotte. At Goldsboro it connects with the great lines of travel North and South by the Wilmington and Weldon Railroad; at Raleigh by the Raleigh and Gaston (North) and the Raleigh and Augusta Air Line (South); at Greensboro with the Richmond and Danville System by its junction with the Piedmont Road; at Charlotte with the Carolina Central, East and West, and with the Richmond and Danville Roads, heretofore noted, going South and West. It also forms part of a line of completed road, 526 miles in length, reaching from the Atlantic coast at Morehead to Paint Rock on the Western State line, and to Pigeon river, in Haywood county, and traversing the twenty counties of Carteret, Craven, Jones, Lenoir, Wayne, Johnston, Wake, Durham, Orange, Alamance, Guilford, Davidson, Rowan, Iredell, Catawba, Burke, McDowell, Buncombe, Haywood, Madison. The road is leased to the Richmond and Danville, which also owns the road from Salisbury to Paint Rock and Pigeon river.

The Northwestern North Carolina

Road is a branch of the North Carolina Road, owned by the Richmond and Danville Road, and passing from the important and prosperous town of Greensboro, through Guilford and Forsyth, to the thriving manufacturing centre at Salem-Winston. Its length is 25 miles.

The Oxford and Henderson

Railroad is 13 miles long. It runs from Henderson, the rapidly growing county seat of Vance, on the Raleigh and Gaston Road, to Oxford, the prosperous county town of Granville.

The Piedmont

Railroad, 49 miles, passes from Danville, Virginia, through Caswell, Rockingham and Guilford counties to Greensboro, where it makes connection with the whole system of North Carolina roads. It is owned by the Richmond and Danville, and is part of one of the great through routes from north to south.

The Petersburg

Railroad, 63 miles long, passes from Virginia through Northampton county, North Carolina, to the noted railroad centre, Weldon, in Halifax county, where it connects with the Raleigh and Gaston and Wilmington and Weldon through routes.

The Raleigh and Augusta Air-Line

Railroad, 99 miles in length, passes from Raleigh, the State capital, through Wake, Chatham Moore and Richmond counties to Hamlet, where its connection with the Carolina Central, (under the same management) makes a through route east and south by Wilmington and west and south by Charlotte. At Sanford, Moore county, it crosses the Cape Fear and Yadkin Valley Road, thus connecting with Fayetteville and the river steamers on the Cape Fear.

The Raleigh and Gaston

Railroad is 98 miles long. It runs from Weldon through Halifax, Warren, Vance, Franklin and Wake counties to Raleigh, where it connects with the Raleigh and Augusta (under the same management) and with the North Carolina Road east and west. At Weldon it connects with the Wilmington and Weldon, going south, and with the Petersburg Road and the Seaboard and Roanoke Road going north. The last named is under the same management, which owns a line of travel from Baltimore to Wilmington and Charlotte.

The Seaboard and Roanoke

Railroad is 80 miles long. Coming from Norfolk, Virginia, it passes through Northampton county, North Carolina, to Weldon, where it makes connection with the Wilmington and Weldon and Raleigh and Gaston Roads.

The Seaboard and Raleigh

Railroad is in operation for 45 miles, from Tarboro, through Edgecombe, Pitt and Martin counties, to Williamston, on the Roanoke. At Williamston it finds deep water and steam navigation; at Tarboro, railroad connection with

The Tarboro Branch,

which passes through Edgecombe, 17 miles, to Rocky Mount, on the Wilmington and Weldon through line.

The University

Railroad, 11 miles long, is owned by the Richmond and Danville, and runs from University Station, on the North Carolina Railroad, to the immensely valuable iron mines, near the State University, at Chapel Hill, Orange county.

The Western North Carolina

Railroad, now the property of the Richmond and Danville, is in operation from Salisbury through Rowan, Iredell, Catawba, Burke, Buncombe and Madison counties to Paint Rock—a distance of 189 miles. At Salisbury, the eastern terminus, it connects with the North Carolina Road; at Paint Rock with the East Tennessee, Virginia and Georgia Road. The Ducktown Branch is completed from Asheville to Pigeon river, Haywood county, and rapid progress is made in grading the remainder of the route through Jackson, Swain, Macon and Cherokee counties.

The Wilmington and Weldon

Railroad traverses the State from north to south. It passes, 163 miles, from Weldon through Halifax, Nash, Edgecombe, Wilson, Wayne, Duplin, Pender and New Hanover counties, to Wilmington. It owns and operates a branch road from Halifax to Scotland Neck, 20 miles; another from Rocky Mount to Tarboro, 17 miles; and is now locating a road from Wilson to Florence, South Carolina, which will pass through the North Carolina counties of Wilson, Johnston, Harnett, Cumberland and Robeson, and connect with river and rail at Fayetteville. This road connects at Weldon with the Raleigh and Gaston, the Petersburg, and the Seaboard and Roanoke Roads; at Goldsboro, with the North Carolina and the Atlantic and North Carolina; at Wilmington with the Cape Fear river and ocean steamers, the Carolina Central Railway, and

The Wilmington, Columbia and Augusta

Railroad, which is 189 miles in length, and part of the great Seaboard through route. It passes from Wilmington into South Carolina through Brunswick and Columbus counties, North Carolina.

INLAND STEAMBOAT NAVIGATION.

There are nine hundred miles of inland steamboat navigation in North Carolina.

Ocean steamers of large burden come into Wilmington and Beaufort, and the Old Dominion and Clyde lines of coastwise steamers come to Newbern, Elizabeth City and Washington *via* the Albemarle and Chesapeake Canal. The sounds are navigated by a large fleet of light-draft and fast steamboats that furnish abundant means of transportation for passengers and freight between the numerous points where they touch.

Steamboats run up the Chowan and Blackwater to Franklin, Va., and up the Meherrin to Murfreesboro; up the Roanoke to Halifax; up the Neuse to Kinston; up the Trent to Trenton; up the Cape Fear to Fayetteville; up the Tar to Tarboro; up the Scuppernong to Creswell; up the Alligator to Fairfield; up the Cashie to Windsor; up the Perquimans River to Belvidere; up the Little River to Woodville; up the Pasquotank many miles above Elizabeth City; up North River to Indian township; and up Contentnea and Swift Creeks to the head of navigation.

THE FARMS IN NORTH CAROLINA.

ACRES OF LAND IN FARMS IN EACH COUNTY OF NORTH CAROLINA, ACCORDING TO THE CENSUS OF 1880.

County.	Improved.	Unimprov'd	County.	Improved.	Unimprov'd
The State.....	6,481,191	15,882,367			
Alamance.....	77,799	129,269	Johnston.....	107,585	315,235
Alexander.....	48,985	97,680	Jones.....	53,605	139,324
Alleghany.....	74,747	75,278	Lenoir.....	85,809	128,034
Anson.....	90,061	192,787	Lincoln.....	57,523	112,832
Ashe.....	117,174	169,988	McDowell.....	38,795	126,993
Beaufort.....	44,887	228,538	Macon.....	39,370	178,679
Bertie.....	85,504	202,533	Madison.....	69,087	164,488
Bladen.....	40,563	310,501	Martin.....	57,030	184,883
Brunswick.....	19,399	307,680	Mecklenburg.....	146,243	147,164
Buncombe.....	99,602	241,940	Mitchell.....	42,572	108,687
Burke.....	44,496	140,623	Montgomery.....	48,117	192,952
Cabarrus.....	99,514	110,129	Moore.....	70,922	294,240
Caldwell.....	47,405	160,174	Nash.....	85,685	214,716
Camden.....	36,757	66,901	New Hanover.....	7,715	43,057
Carteret.....	22,472	69,660	Northampton.....	99,885	172,763
Caswell.....	89,885	147,249	Onslow.....	56,768	215,932
Catawba.....	78,080	141,593	Orange.....	86,401	190,192
Chatham.....	126,940	302,306	Pamlico.....	17,525	90,397
Cherokee.....	30,668	152,041	Pasquotank.....	51,770	46,464
Chowan.....	36,052	49,180	Pender.....	38,699	290,654
Clay.....	17,691	71,954	Perquimans.....	54,433	63,994
Cleveland.....	87,691	176,248	Person.....	76,797	141,884
Columbus.....	39,031	363,443	Pitt.....	107,255	227,150
Craven.....	52,392	199,199	Polk.....	21,762	77,052
Cumberland.....	59,639	314,948	Randolph.....	100,888	292,996
Currituck.....	41,170	56,846	Richmond.....	76,067	235,990
Dare.....	2,553	23,436	Robeson.....	120,480	403,842
Davidson.....	129,664	209,331	Rockingham.....	84,188	211,458
Davie.....	66,810	85,607	Rowan.....	110,178	174,553
Duplin.....	73,061	307,473	Rutherford.....	66,698	205,612
Edgecombe.....	136,015	135,422	Sampson.....	121,469	396,479
Forsyth.....	79,350	135,773	Stanly.....	61,279	155,775
Franklin.....	90,118	175,132	Stokes.....	57,393	168,780
Gaston.....	70,672	130,673	Surry.....	81,690	201,616
Gates.....	49,984	107,702	Swain.....	14,275	108,466
Graham.....	8,551	53,892	Transylvania.....	20,636	80,219
Granville.....	150,127	240,186	Tyrrell.....	19,801	60,293
Greene.....	75,942	86,828	Union.....	86,428	216,532
Guilford.....	148,392	208,261	Wake.....	161,272	316,814
Halifax.....	137,245	217,754	Warren.....	87,183	168,553
Harnett.....	42,927	186,107	Washington.....	31,695	77,360
Haywood.....	52,132	118,170	Watauga.....	69,999	139,993
Henderson.....	45,445	114,818	Wayne.....	123,629	195,664
Hertford.....	55,857	130,261	Wilkes.....	100,151	292,205
Hyde.....	33,153	42,772	Wilson.....	66,027	118,885
Iredell.....	112,365	211,716	Yadkin.....	60,070	138,011
Jackson.....	32,853	140,413	Yancey.....	45,689	113,790

STOCK RAISING.

The adaptability of the western part of the State to stock raising demands a special notice.

The entire transmontane country is well fitted for this business. The cultivated grasses flourish everywhere with even ordinary care. But it is in the northwestern counties—particularly the counties of Ashe, Alleghany, Watauga, Mitchell, Yancey, that all the conditions are found necessary for its perfect success. The soil throughout these counties is a deep rich loam, up to the summits of the mountains. The whole country is covered with a dense vegetation, amongst which will be found some of the largest timber in the United States, and as yet the forests are comparatively unbroken, because they have been inaccessible to market. The clearing of the timber is a work of some difficulty; but when that is done the labor of the farmer is rewarded with the richest crops. After two or three crops are taken off, the land, if suffered to lie at rest, springs up spontaneously in timothy herds grass, and other rich pasture grasses; and once established, the grass perpetuates itself upon the land. Nor is an entire clearing necessary to establish the land in grass. If the undergrowth is removed, the trees thinned out, and the surface stirred and sown in orchard grass (Cocks foot), it flourishes luxuriantly, even while the forest trees are left standing.

Its capacity as a grazing country has long been known. But formerly the cattle were left to the resources of nature, which, indeed, in such a country, were abundant and rich. Of late, attention has been turned to the breeding of fine stock, and some herds of cattle and flocks of sheep are found there which will compare with the best in Kentucky. This country is already penetrated by one railroad, and others are in course of construction. When fairly laid open to railroad communication, it will offer—besides its rich mining interests and timbers—one of the finest fields for cattle and sheep breeding and for dairy products that the Union presents.

WOODS AND TIMBERS.

The area of land covered with woods and timbers now standing in each of the counties of the State, as reported in "Hale's Woods and Timbers of North Carolina," will be found in the table hereto annexed:

COUNTIES.	WOODED AREA.	COUNTIES.	WOODED AREA.
Alexander,	One half.	Madison,	Three fourths.
Anson,	One third.	Mitchell,	Three fourths.
Ashe,	Seven tenths.	Montgomery,	Three fourths.
Bladen,	Nine tenths.	Moore,	One half.
Brunswick,	Two thirds.	Northampton,	One half.
Camden,	One half.	Onslow,	Six tenths.
Caswell,	One half.	Orange,	One third.
Chatham,	One third.	Pamlico,	Nine tenths.
Cherokee,	Four fifths.	Pender,	Two thirds.
Clay,	Five sixths.	Perquimans,	One fourth.
Cleveland,	Six tenths.	Person,	One eighth.
Columbus,	Two thirds.	Pitt,	Three fourths.
Currituck,	Three fifths.	Polk,	Three fourths.
Davidson,	Two thirds.	Randolph,	Five Sixths.
Davie,	One third.	Richmond,	Two thirds.
Edgecombe,	One half.	Robeson,	Two thirds.
Forsyth,	One third.	Roekingham,	One third.
Gaston,	Three fifths.	Rowan,	One third.
Gates,	Three fourths.	Rutherford,	Three fourths.
Graham,	Seven eighths.	Sampson,	Six tenths.
Granville,	Six tenths.	Surry,	Three fourths.
Greene,	One half.	Swain,	Five sixths.
Halifax,	Six tenths.	Tyrrell,	Seven tenths.
Haywood,	Four fifths.	Union,	One third.
Iredell,	One half.	Vance,	One tenth.
Jackson,	Five sixths.	Warren,	One half.
Johnston,	Two thirds.	Wayne,	Four tenths.
Lincoln,	Two thirds.	Wilson,	Six tenths.
Macon,	Five sixths.	Yadkin,	One half.

Forestry Bulletin No. 8, from the United States Census Office gives the amount of merchantable pine—long leaved pine (*Pinus Australis*) standing in fifteen counties as follows:

COUNTIES.	NO. FEET.	COUNTIES.	NO. FEET.
Bladen	288,000,000	New Hanover.....	96,000,000
Brunswick	141,000,000	Onslow.....	34,000,000
Chatham	448,000,000	Robeson.....	864,000,000
Columbus.....	288,000,000	Sampson.....	602,000,000
Cumberland.....	806,000,000	Wake.....	48,000,000
Duplin	21,000,000	Wayne.....	40,000,000
Harnett.....	486,000,000		
Johnston	563,000,000	Total.....	5,229,000,000
Moore.....	504,000,060		

NEWSPAPERS IN THE STATE.

NAME.	PUBLICATION OFFICE.	NAME.	PUBLICATION OFFICE
Gleaner.....	Graham	Times.....	Louisburg
Times.....	Wadesboro	Gazette.....	Gastonia
Intelligencer.....	"	Torch Light.....	Oxford
Press.....	Washington	Orphan's Friend.....	"
Citizen.....	Asheville	News.....	Kernersville
News.....	"	Banner.....	Raleigh
Blade.....	Morganton	Times.....	"
Sun.....	Concord	State Journal.....	"
Register.....	"	Dispatch.....	Lexington
Star of Zion.....	"	Falcon.....	Elizabeth City
Topic.....	Lenoir	North Carolinian.....	"
Telephone.....	Beaufort	News.....	Roxboro
Chronicle.....	Milton	Reflector.....	Greenville
Press.....	Hickory	Courier.....	Ashboro
Carolinian.....	"	Mercury.....	High Point
Enterprise.....	Newton	Observer.....	Hillsboro
Record.....	Pittsboro	Tobacco Plant.....	Durham
Argus.....	"	Recorder.....	"
Enquirer.....	Edenton	Church Messenger.....	"
Reporter.....	Rocky Mount	Economist.....	Elizabeth City
Free Press.....	Kinston	Vistor.....	Raleigh
Aurora.....	"	Biblical Recorder.....	"
Journal.....	Newbern	Christian Advocate.....	"
Newbernian.....	"	Christian Sun.....	"
Advocate.....	Snow Hill	News & Observer.....	"
Gold Leaf.....	Henderson	Farmer & Mechanic.....	"
Patriot.....	Greensboro	North Carolina Farmer.....	"
Protestant.....	"	Spirit of the Age.....	"
North State.....	"	Educational Journal.....	Chapel Hill
News.....	Weldon	Enterprise.....	Laurinburg
Herald.....	Hendersonville	Bee.....	Rockingham
Landmark.....	Statesville	Spirit of the South.....	"
American.....	"	Robesonian.....	Lumberton
Gazette.....	Mooreville	Gazette.....	Leaksville
Reporter.....	Franklin	Times.....	Reidsville
Lamp Post.....	Marion	Webster's Weekly.....	"
Baptist Review.....	LaGrange	Watchman.....	Salisbury
Observer.....	Charlotte	Examiner.....	"
Journal.....	"	Reporter.....	Danbury
Home.....	"	News.....	Mt. Airy
Star.....	Wilmington	Enquirer and Express.....	Monroe
Post.....	"	Home Journal.....	Warrenton
Review.....	"	Gazette.....	"
Presbyterian.....	"	Messenger.....	Goldsboro
Reporter.....	Jackson	Advance.....	"
Nut Shell.....	Newbern	Enterprise.....	"
Fayetteville Observer.....	Fayetteville	Free Will Baptist.....	"
Southerner.....	Tarboro	Index.....	Morganton
Guide.....	Tarboro	Home.....	Toisnot
Press.....	Salem	Advance.....	Wilson
Leader.....	Winston	Zion's Landmark.....	"
Republican.....	"	Mountain Voice.....	Bakersville
Sentinel.....	"	Banner.....	Shelby

STATE DEBT,

The following tables contains a statement of the debt of the State of North Carolina, taken from the report of the Treasurer, made by the General Assembly, at its session in 1883:

Actual debt bearing four per cent. interest.....	\$2,600,641.25	
Prospective debt bearing four per cent. interest.....	988,870.00	
	_____	[3,589,511.25.

The item designated as "prospective debt" represents bonds not yet exchanged under the "act to compromise the State debt."

Actual debt bearing six per cent interest... ..	\$1,720,000.00	
Prospective debt, bearing six per cent. interest, (old bonds now being renewed,).....	1,075,000.00	
	_____	\$2,795,000.00

This latter debt, \$2,795,000, was incurred for the construction of the North Carolina Railroad, which is in great part owned by the State. The income from the dividends realized by the road are not only sufficient to pay the interest, but leaves a surplus which is regularly funded from year to year, the aggregate of which will extinguish the debt at the maturity of the bonds. This debt does not now impose, nor will it in future impose, one cent of taxation upon the people of the State. The first amount, \$3,589,511.25, therefore represents the entire debt for which the property of the State is subject to be taxed.

The total valuation of real and personal property in North Carolina is, according to the Auditor's Report for 1882, \$167,738,639. But the valuation of property in this State is known to be from one third to one half below its real value. For the purpose of ascertaining the true value of the property of the State, an addition in that proportion must be made to the valuation above given. Taking, however, the valuation as given in the Auditor's Report, it will be seen that a tax of nine cents upon the hundred dollars worth of property will pay the interest upon the whole State debt.

But there exists in fact no necessity for such a tax, light as it would be. The act under which the debt was compromised, appropriates

certain taxes therein enumerated, known as privilege taxes, to the payment of the interest; and by the terms of the act this appropriation is made a part of the contract between the State and the bondholders, and is therefore inviolable. From this source the amount realized is so large, that the remainder of the interest is provided by a tax of only four cents on the hundred dollars worth of the property of the State.

PRINCIPAL AGRICULTURAL PRODUCTS OF NORTH CAROLINA.

COUNTIES.	COTTON.		INDIAN CORN.		OATS.		RICE.		RYE.		TOBACCO.		WHEAT.	
	Acres.	Bales.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.
The State.....	898,163	389,598	2,305,119	28,019,839	500,415	3,888,068	10,846	5,609,191	61,953	285,160	57,208	26,986,213	646,829	3,591,393
Alamance.....	211	91	24,628	305,874	9,618	48,869			149	619	1,688	695,013	18,661	82,163
Alexander.....	617	182	16,789	212,382	7,503	51,752			760	2,445	28	11,799	6,376	35,338
Alleghany.....			7,210	122,587	1,333	19,365			3,121	17,658	8	2,049	1,760	20,291
Anson.....	28,296	11,857	29,121	365,139	8,999	72,134			179	574	11	4,880	5,969	25,846
Ashe.....			15,616	277,927	3,257	37,955			4,685	33,809	60	11,964	5,473	39,407
Beaufort.....	11,785	6,021	20,225	286,211	1,396	18,436	979	502,676	16	94	17	5,263	374	2,736
Bertie.....	19,455	7,290	37,735	345,991	2,403	20,517			33	191	4	554	309	2,189
Bladen.....	1,618	683	21,556	188,208	392	3,795	473	10,310	261	756	6	1,040	109	521
Brunswick.....	385	244	4,915	46,329	240	2,262	1,189	1,163,852	127	616	7	2,502	8	70
Buncombe.....			29,108	490,514	6,997	62,679			2,966	12,707	947	475,428	17,501	81,974
Burke.....	732	361	22,613	325,656	3,455	21,762	8	4,308	1,054	4,009	58	20,079	10,016	49,338
Cabarrus.....	19,224	7,467	26,831	381,321	7,592	51,519			75	355	14	3,239	17,550	83,656
Caldwell.....	30	12	17,315	274,495	3,886	30,592	2	1,649	681	2,855	75	25,384	8,211	42,513
Camden.....	2,670	823	23,663	294,447	1,088	8,851	86	16,861	5	30			461	4,428
Carteret.....	2,936	1,014	5,456	41,458	107	1,122	111	206,965	85	264	1	303	418	2,090
Caswell.....	6	1	25,633	361,611	14,411	101,338			53	346	16,174	4,336,664	10,841	58,137
Catawba.....	5,175	2,012	21,218	358,210	7,366	61,256			181	783	49	26,388	15,054	101,770
Chatham.....	13,478	5,858	43,087	538,281	19,861	120,341			63	328	141	49,837	28,900	122,760
Cherokee.....			11,507	227,650	1,331	11,657			1,126	4,781	42	8,411	4,317	47,898
Chowan.....	6,047	2,223	13,877	113,136	791	6,888					1	398	622	4,357
Clay.....			113,462		1,230	7,607			854	3,592	25	5,771	3,382	13,093
Cleveland.....	19,288	6,126	31,339	390,281	10,999	62,211			210	875	23	5,122	41,116	53,983
Columbus.....	2,113	930	15,723	136,546	207	2,517	1,291	642,042	128	301	15	3,866	38	223
Craven.....	12,838	5,782	19,001	218,256	333	4,426	438	251,108	79	817	6	2,732	235	1,533
Cumberland.....	9,210	3,905	32,677	282,423	1,569	13,791	42	19,963	1,513	4,343			1,141	7,494
Currituck.....	316	139	23,310	321,819	267	2,731	58	7,727	15	75			101	892
Dare.....	16	8	36,956	11,205	17	230	7	2,789					25	167
Davidson.....	3,779	1,553	36,931	549,906	16,921	122,063			277	1,414	484	260,538	32,195	174,671
Davie.....	790	302	24,425	438,595	13,366	139,126			444	1,986	1,205	633,339	13,244	71,127
Duplin.....	9,654	4,499	36,813	330,437	433	6,132	629	300,203	422	1,931	16	4,555	1,031	6,292
Edgecombe.....	51,880	26,250	46,235	433,214	9,589	94,021	17	2,901	139	711	3	550	2,422	16,712

AGRICULTURAL PRODUCTS.

Forsyth	16	10	20,920	335,164	11,780	95,301	492	1,665	822,588	15,500	77,082
Franklin	30,274	12,938	32,612	338,239	5,560	45,812	239	118	58,932	8,362	45,504
Gaston	10,949	4,588	2,678	373,172	6,699	50,241	61	7	2,180	11,566	62,860
Gates	5,707	1,863	21,946	170,642	1,240	10,616	.....	3	620	718	1,187
Graham	.....	.....	4,222	66,982	628	3,911	.....	4	1,095	718	2,919
Granville	6,559	2,535	42,608	515,159	14,311	110,690	.....	8,941	4,606,358	14,428	90,761
Greene	16,988	8,020	35,141	173,121	1,738	16,772	35	8	1,955	3,638	19,392
Guilford	283	111	39,790	519,185	20,774	129,723	.....	910	422,716	27,443	127,211
Halifax	432,206	16,661	41,790	437,321	4,497	41,771	.....	21	8,487	1,500	9,235
Harnett	9,281	3,627	21,244	189,458	1,202	7,640	1	32	9,510	2,393	10,957
Haywood	.....	.....	17,254	311,416	4,099	35,834	.....	100	39,516	10,651	56,587
Henderson	10	4	16,407	227,411	2,908	23,087	.....	29	4,087	2,598	12,295
Hertford	14,605	6,360	25,521	236,088	1,800	14,512	.....	7	2,160	817	6,891
Hyde	2,513	718	21,632	243,623	3,371	18,400	1,016	4	517	1,079	8,919
Iredell	11,603	4,657	39,264	588,220	17,488	129,429	.....	465	2,12,714	17,476	88,056
Jackson	16	6	12,793	188,524	1,521	9,440	.....	21	4,801	4,217	21,801
Johnston	82,193	15,151	45,045	428,996	3,176	29,958	36	36	12,881	3,711	23,111
Jones	8,463	4,078	19,425	186,951	4,755	5,426	321	1	2,50	429	2,588
Lenoir	19,150	8,295	29,838	274,010	1,060	12,217	2,08	45	13,500	5,067	32,806
Lincoln	7,442	2,945	19,338	313,907	6,313	44,939	1	15	6,985	10,159	65,949
McDowell	23	8	17,675	265,934	1,690	13,111	545	100	30,541	6,397	32,903
Macon	.....	.....	14,423	222,855	1,621	12,209	.....	46	9,154	5,365	27,958
Madison	.....	.....	17,816	318,858	4,238	38,846	.....	1,626	807,911	7,702	40,492
Marth	13,441	6,383	24,209	227,445	1,447	11,229	11	1	211	940	6,251
Mecklenburg	41,345	19,129	41,285	539,385	12,949	94,356	.....	10	2,291	12,295	63,767
Mitchell	15	6	11,891	209,131	3,990	40,845	.....	77	29,617	3,374	19,725
Montgomery	6,519	2,980	18,090	210,521	7,852	50,248	.....	51	14,370	9,197	39,702
Moore	8,882	3,988	27,931	302,196	7,924	48,744	.....	70	15,724	11,242	45,413
Nash	23,768	12,567	32,490	295,619	3,875	30,135	.....	27	7,562	3,787	27,560
New Hanover	142	66	2,008	15,937	86	606	315	.....	20,484	1,725	14,193
Northampton	36,219	13,616	45,224	431,581	4,865	45,769	55	36	730	.....	.....
Onslow	6,678	2,841	23,259	185,019	96	1,280	159	.....	2,323	18,358	96,006
Orange	5,290	1,919	28,542	306,640	12,243	86,268	.....	2	1,178,732	.....	.....
Pamlico	4,585	2,226	6,381	107,950	378	4,845	394	12	1,520	285	2,401
Pasquotank	4,004	1,181	58,525	348,119	1,930	17,438	2	.....	.....	3,300	22,453
Pender	1,463	835	16,550	159,064	183	2,249	392	.....	690	7	28
Perquimans	7,025	2,778	21,916	292,850	1,222	13,924	3	.....	400	2,957	25,314
Pitt	.....	.....	19,372	241,523	9,821	56,926	.....	5,808	3,012,387	8,974	51,935
Polk	31,147	14,879	46,482	458,166	3,301	29,406	161	3	598	3,787	22,664
Polk	1,616	362	10,632	139,315	877	5,786	.....	.....	.....	1,896	9,516
Randolph	595	295	35,238	477,468	13,524	88,380	.....	4	931	29,413	137,404
Richmond	35,198	12,751	59,592	277,974	3,571	32,270	38	6	1,595	3,751	19,994
Robeson	21,607	8,846	49,991	360,128	2,814	22,847	303	2	577	875	6,153
Rockingham	.....	.....	25,171	392,577	15,299	129,266	.....	9,322	4,311,250	112,598	71,187

PRINCIPAL AGRICULTURAL PRODUCTS OF NORTH CAROLINA.—Continued.

COUNTIES.	COTTON.		INDIAN CORN.		OATS.		RICE.		RYE.		TOBACCO.		WHEAT.	
	Acres.	Bales.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.
Rowan.....	10,645	4,381	38,963	597,519	17,751	142,121	.....	.....	253	1,131	216	115,251	24,195	138,278
Rutherford.....	9,679	2,079	32,783	391,062	6,166	31,971	1	609	689	2,438	38	12,908	8,683	39,085
Sampson.....	15,346	6,291	33,951	436,768	654	6,297	411	240,086	409	2,086	28	14,352	1,249	7,370
Stanly.....	5,878	2,475	22,426	271,877	10,975	72,235	.....	.....	89	497	8	1,735	16,465	70,070
Stokes.....	13	7	19,969	338,781	8,408	72,391	.....	.....	1,195	5,023	4,690	2,131,161	9,374	55,284
Surry.....	3	1	25,334	397,143	9,199	70,737	.....	.....	3,027	10,482	2,136	905,250	9,823	42,046
Swain.....	.....	.....	6,809	100,543	757	4,301	.....	.....	515	2,259	14	1,166	1,473	6,578
Transylvania.....	.....	.....	9,762	154,769	257	2,870	.....	.....	3,289	16,043	10	3,853	869	3,700
Tyrrell.....	3,481	1,123	8,300	108,839	784	7,022	503	237,515	.....	.....	.....	.....	261	2,067
Union.....	19,090	8,336	28,877	338,520	14,337	101,719	.....	.....	12	67	9	3,467	12,164	49,783
Wake.....	59,916	30,115	53,172	612,869	13,948	98,962	.....	.....	241	1,109	230	91,354	14,783	72,341
Warren.....	21,693	7,778	28,457	293,773	5,559	46,090	.....	.....	39	189	1,759	992,256	5,098	37,889
Washington.....	8,17	3,524	15,824	217,631	1,065	13,427	87	60,873	68	380	4	685	617	5,594
Watauga.....	10	5	8,227	148,204	1,228	23,265	.....	.....	2,387	18,830	23	7,210	2,957	22,247
Wayne.....	32,103	14,558	44,469	466,432	1,779	18,600	567	294,201	819	2,922	198	102,979	7,041	37,195
Wilkes.....	107	29	34,865	480,089	8,240	55,369	.....	.....	3,236	17,579	110	33,211	9,515	37,696
Wilson.....	23,796	13,049	27,288	299,957	1,590	13,682	6	1,800	73	522	17	8,745	2,804	21,115
Yadkin.....	87	26	21,735	343,070	14,289	79,443	821	3,723	425	177,595	10,190	48,762
Yancey.....	11,200	205,659	3,657	43,631	1,290	7,647	84	35,898	3,940	21,452

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