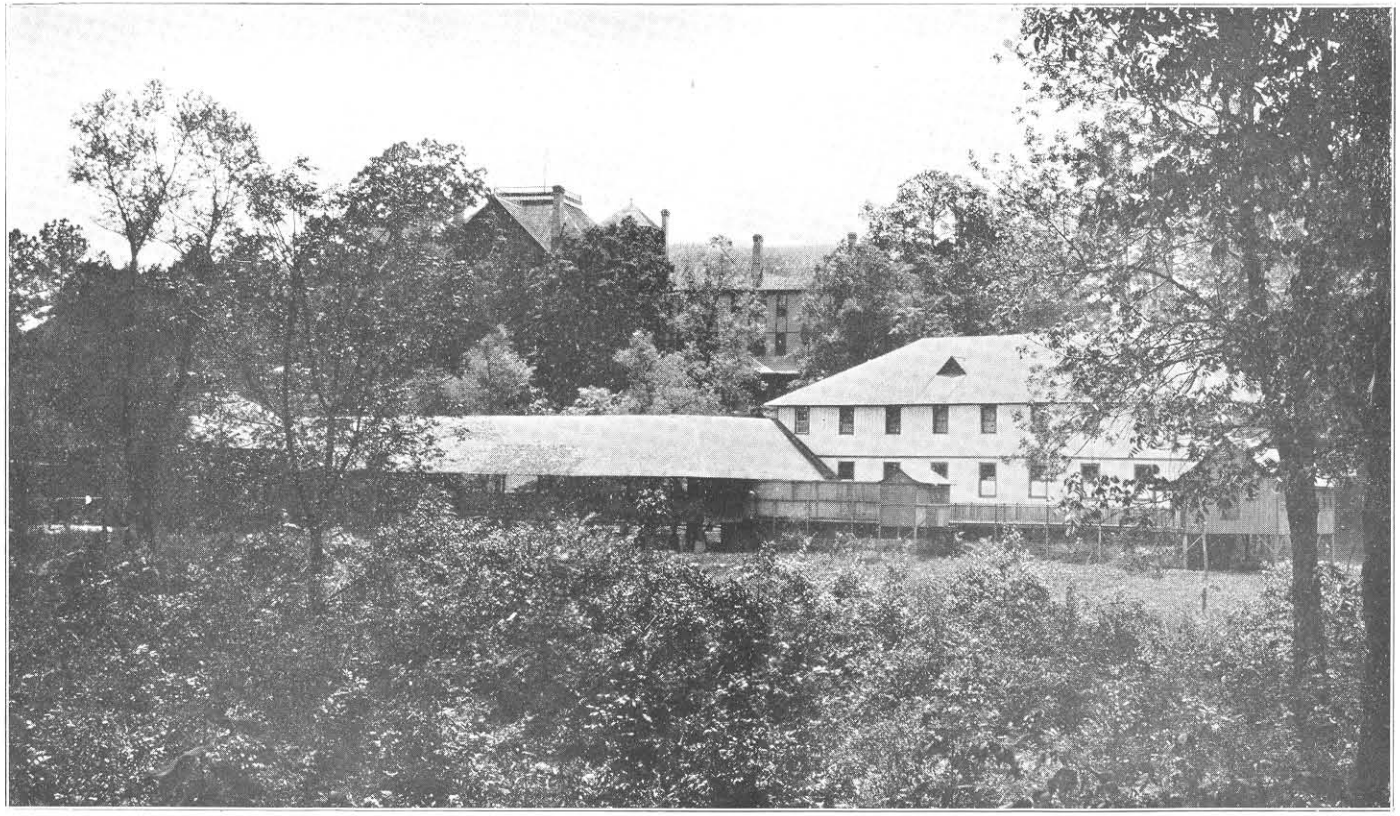

GENERAL VIEW OF INDIAN SPRINGS, BUTTS COUNTY, GEORGIA

GEOLOGICAL SURVEY OF GEORGIA

S. W. McCALLIE, State Geologist

BULLETIN No. 20

A PRELIMINARY REPORT

ON THE

MINERAL SPRINGS

OF

GEORGIA

BY

S. W. McCALLIE

State Geologist

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OF THE

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IN THE YEAR 1913

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LETTER OF TRANSMITTAL

GEOLOGICAL SURVEY OF GEORGIA

ATLANTA, JUNE 15, 1913.

To HIS EXCELLENCY, JOSEPH M. BROWN, Governor and President of the Advisory Board of the Geological Survey of Georgia.

SIR: I have the honor to submit herewith my report on the Mineral Springs of Georgia, to be published as Bulletin No. 20, of this Survey.

Very respectfully yours,

S. W. McCALLIE,

State Geologist.

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PREFATORY NOTE

In submitting this preliminary report on the mineral springs of Georgia, the writer wishes to state that in the great majority of instances the waters herein described were collected by him personally and that all analyses, with only one exception, were made by Dr. Edgar Everhart, chemist, of the State Geological Survey, by the same methods and under like conditions. In all cases, every precaution was taken with the waters to guard against unclean vessels and other conditions which might affect the result of the analyses.

All of these springs, with only a few exceptions, are or have been, regarded from time to time locally as possessing medicinal virtues. Even the springs in some instances whose waters are remarkably pure from a mineralogical standpoint and have for that reason been classified as neutral waters have a more or less extensive sale not only as a pure table water, but also as a medicinal water. It should here be added that this report contains not all of the springs of medicinal virtues in the State, but only those which have been investigated by the State Geological Survey.

The report, I am fully persuaded, will prove of much value to the practicing physician in selecting for his patients just such waters as are applicable to the treatment of certain diseases. To facilitate this use, a table has been added at the last of the report giving the classification and analysis of each water, together with the page number in the text where the description of the spring, the accommodations, etc., are found. By the use of this table the physician can readily select the water most suitable to his patient without having to peruse the entire report.

In conclusion, I wish to return thanks to the many mineral spring proprietors and mineral water dealers for their uniform courtesies and assistance rendered in furnishing data for this publication.

I wish also to express my appreciation to Dr. Edgar Everhart for his painstaking care in the analytical work as well as for assistance and advice in getting up the report.

MINERAL SPRINGS OF GEORGIA

HISTORY

The pages of mythology, as well as ancient history, bear records of mineral springs whose waters were supposed to possess supernatural properties. Bathing was made a religious duty by Moses, and the Israelites "dipped in the Jordan" to rid themselves of leprosy and other diseases. Josephus records that Herod "sent for physicians, and did not refuse what they prescribed for his assistance, and went beyond the river Jordan, and bathed himself in the warm baths at Callirrhoe." Bathing was a sacred rite with the ancient Egyptians, and mineral waters for medicinal purposes have been used by all nations since the remotest times. The ancients erected temples to the god of medicine near mineral springs, and resorts for the sick near by. It remained, however, for the Romans to establish baths at mineral springs that far excelled in number and beauty those of any other nation. It is said that during the days of imperial Rome 800 baths could be counted within the city. Pliny, Tacitus, Seneca, and other writers described these baths. The buildings were wonderfully beautiful, most artistic in design and ornamented with statuary and mosaics. Some of these buildings could accommodate 3,000 bathers at one time. At Baiae, ten miles from Naples, on the Gulf, were remarkable mineral springs, both hot and cold, which the wealthy Romans visited during the summer months. Seneca describes the baths at Baiae as scenes of voluptuous pleasure, luxury, and even of vice. Many ruins of Roman baths still exist, the most famous, however, being those of Caracalla, whose outside walls extend nearly one-fourth of a mile on each of its four sides. The baths of Europe at the present time bear traces of the Roman influence, as the Romans carried their love of bathing to the different parts of the world conquered by them.

Because of the unbounded license of the public baths, the early Christians proscribed their use to a great extent, the fathers permitting bathing for the sake of cleanliness and health, but not for pleasure. Few cities of Europe, however, were without baths, especially hot air and vapor baths, at the beginning of the 13th century. These baths were first adopted by the Mohammedans and were carried into Spain by the Arabs. The Crusaders helped to spread the use of these baths throughout Europe, and early European explorers in North America found the Indians using crude vapor baths.

In 1725, there was published in Boston as a reprint from a London edition a volume entitled "The Curiosities of Common Water, or the Advantages thereof in Curing Cholera, Intemperance, and Other Maladies," by John Smith, C. M. This book is the first work upon the qualities and uses of water published in this country. It calls attention to the excellence of water as a drink and says that "water is also of great use to strengthen weak children; it prevents swelling from bruises, sickness of the stomach, shortness of breath, and vomiting; it cures fluxes, consumption, flushes, colic, smallpox, etc."

The mineral springs of this country were highly esteemed by the Indians, and in many instances in the making of treaties with the whites the Indians reserved the springs with a certain amount of land for their own use. According to Walton, High Rock Spring, Saratoga, N. Y., was known to the Mohawk Indians as early as the 14th Centruy by the name of "The Medicine Spring of the Great Spirit." It was, however, many years after the first settlement of the country before it was known to the whites. A tavern for the accommodation of visitors was opened in 1774 on the summit of the hill in the rear of High Rock Spring. This, says Walton, was undoubtedly the first pleasure resort in the Northern States, that of Berkeley Springs, in West Virginia, being the first in the Southern. In colonial times the wealth and aristocracy of the South assembled at Berkeley Springs to enjoy the baths and country sports.

In 1777 the town of Bath was laid out at these springs, and General Washington purchased two adjoining lots, which are mentioned in his will.

Perhaps the most historic mineral springs of Georgia are Indian Springs, Warm Springs, Catoosa Springs, and Bowden Lithia Springs. The waters of all these springs are known to have been used by the Indians for medicinal purposes, and each one has been at one time or another the resort of the wealth and fashion of the State.

DEFINITION OF MINERAL WATER

The term mineral water is often used in two different senses. As used by the chemist or geologist the term signifies a water carrying an unusual amount of mineral matter, whereas, on the other hand, the physician or the commercial dealer uses the term to designate a water which is known or is supposed to possess certain medicinal virtues, often regardless of the amount of mineral matter present. In the one case the definition takes into consideration the quantity of mineral matter in solution, in the other the effect of the dissolved minerals on the human system is alone considered. According to the physician's definition the term mineral water may and is often applied to a water carrying only a few grains of mineral matter per gallon. As a matter of fact, it might be here stated that a considerable percentage of the mineral waters now put on the market carry only a small amount of mineral matter. Some of these waters, it might be further added, having a well established record for their healing virtues, in not a few instances carry less mineral matter than many of our common potable waters.

As the physician's definition of mineral water, as above given, is the one most commonly used in works on mineral springs, the term mineral water will be so used in this report.

ORIGIN OF MINERAL WATERS

Mineral waters, like all other underground waters in general, have their primary beginning, with but few exceptions, in the

rainfall. Rain as it falls from the clouds, which are only condensed aqueous vapor evaporated from the rivers, lakes, seas, and land, escapes from the surface of the earth either by runoff, by evaporation, or it may be taken up by the soils or porous rocks. That part of the rainfall last mentioned supplies all of our springs and wells.

Rain water, when it first falls on the surface of the earth, is quite pure, its chief impurities being carbon dioxide and ammonia, together with traces of a few other gases which it absorbs from the atmosphere in its descent. These impurities, especially the carbon dioxide, greatly add to the solvent power of the water and as it enters the earth its solvent power is further augmented by the addition of a number of organic acids. The water which, even in its pure state, is almost a universal solvent, now becomes more energetic, and as it passes deeper and deeper in the earth it takes up in a greater or less degree traces or appreciable parts of all the minerals with which it comes in contact. Other factors affecting the solvent power of water, are heat and pressure, agents which, no doubt, increase the solvent power of water to a considerable extent at great depths, but are less effective near the surface.

As underground waters are, to some extent, a universal solvent the percentage of mineral constituents of these waters usually bear a more or less definite relation to the minerals with which they come in contact. In other words, springs of limestone regions, as a general rule, carry a high percentage of calcium carbonate, while those flowing from rocks impregnated with pyrites are not infrequently chalybeate waters, or waters with high iron content. Again mineral springs appear to be more prevalent in mountainous regions than in level or plateau regions. An attempt has been made to explain the abundance of mineral springs in mountainous districts by supposing the waters of such springs to come either from a great depth or that the minerals in such regions are rendered

more soluble by reason of the dynamic action going on in these regions.

THERMAL SPRINGS

Thermal springs differ from common springs in having a temperature higher than that of the annual average temperature of the place in which they are located. This class of springs having a temperature between 70° and 98° F. are termed warm springs, while those with a temperature above 98° F. are designated hot springs. Thermal springs, in most cases, are probably deep seated and in many instances owe their high temperatures to the normal heat of the deep seated rocks. It is a well-known fact demonstrated by all deep mines and wells that the temperature of the rocks of the earth's surface increases as the depth increases. In some cases the rate of increase has been found as high as 1° F. for every 25 feet of descent, while in others it is only 1° F. for every 130 feet. The general average, however, is about 1° F. for every 50 or 60 feet descent. Following this rate of increased temperature as an illustration, the water from Warm Springs, Meriwether County, this State, which has a temperature of 85°[1] F., would have to come from a depth of only about 1,500 feet; and the waters from Thundering Spring and Lifsey Spring, the only two other thermal springs in the State with temperatures 76° and 77° respectively, would have to receive their waters from a depth of less than 700 feet to attain their present temperature. These depths seem to be very moderate when compared to the depth of the folding and faulting of the rocks, which in many cases enable the waters to penetrate to a depth of thousands of feet.

Thermal springs are most common in volcanic regions. In such localities they, together with geysers and fumaroles, appear to be last phases of volcanic activity.

Another cause of the heat of thermal springs is supposed to be due to chemical action or to rapid molecular changes taking place in the alteration and metamorphism of minerals.

[1] The temperature of Warm Springs, taken by Dr. S. L. Galpin, Asst. State Geologist, on June 6th, 1913, with a standardized thermometer showed 87° F.

Thermal waters, as a general rule, are more abundantly charged with mineral matter than normal waters, due, no doubt, in part, to the increased solubility of minerals in water at high temperatures. This fact is well illustrated in the case of Warm Spring and Cold Spring, Meriwether County, in this State. These springs are both very large, scarcely a mile apart, and similarly located at the base of Pine Mountain, but the former carries 123 parts per million of mineral matter, while the latter only 36 parts. In other words, the water of Warm Spring carries nearly four times as much mineral matter as Cold Spring.

MEDICINAL VALUE OF MINERAL WATERS

There seems to be at present quite a difference of opinion as to the true medicinal value of mineral waters. Some of our leading physicians are extremely skeptical about the use of mineral waters, while on the other hand physicians of equal learning have strong faith in their medicinal virtues. From our present knowledge of the effect of mineral waters on the human system it would seem that the true value of these waters is likely to be found occupying an intermediate ground between these two extremes. One of the chief causes, no doubt, of the general skepticism of the importance of mineral waters among physicians and the better informed laity has been due largely to the unwarranted claims of mineral spring proprietors and water dealers.

"When the intelligent practitioner," says Dr. Crook[1], "reads that a certain water is positively curative of an imposing list of diseases as set forth in divers pages of testimonials from renovated statesmen, restored clergymen, and rejuvinated old ladies, and then learns that from analysis that it contains two or three grains of lime-salts per gallon with the remaining ingredients requiring, perhaps, a third or fourth decimal figure to express, he can hardly be blamed for tossing the circular in the waste basket with an objuration upon quacks generally and mineral spring quacks in particular. Yet, the

[1] Mineral Waters of the United States and Their Therapeutic Uses, p. 35.

conservative physician will find a safe and dignified position between that of the pretentious advertiser, which claims everything, and that of the medical skeptic, which believes nothing."

In discussing this same subject, Peale[1] says:

"A number of the waters included, and of importance commercially, would be considered indifferent when viewed in the light of their chemical composition, but it must be remembered that some very pure waters have an undoubted therapeutical effect, and that chemical analysis, which is absolutely reliable only in its estimation of basic salts and acids, will not always explain the medicinal effect of a water, and that small quantities of some constituents are often more effective as remedial agents than others that are present in larger quantities. It is an undoubted fact that many springs which, upon chemical analysis of their waters, are found to be not so highly mineralized as the majority of potable waters, have acquired, and rightly, too, great reputations for their medicinal value. That their medicinal value is thus recognized and that they are sources of profit to their owners and also indirectly an addition to the wealth of their localities, seem sufficient reasons why they should be included under the head of mineral springs, from this commercial point of view."

It is a common saying that the change in environment, the increased amount of water taken into the system, fresh air, variation in altitude, congenial company, rest from the hum-drum of daily life, freedom from cares, etc., are the effective agents producing the improvement in health at resorts and not the medicinal effect of the waters. These factors in many cases, no doubt, add much toward the improvement of the health condition of the patient, nevertheless, at the same time we can not escape from the fact that mineral waters in many instances undoubtedly produce beneficial results.

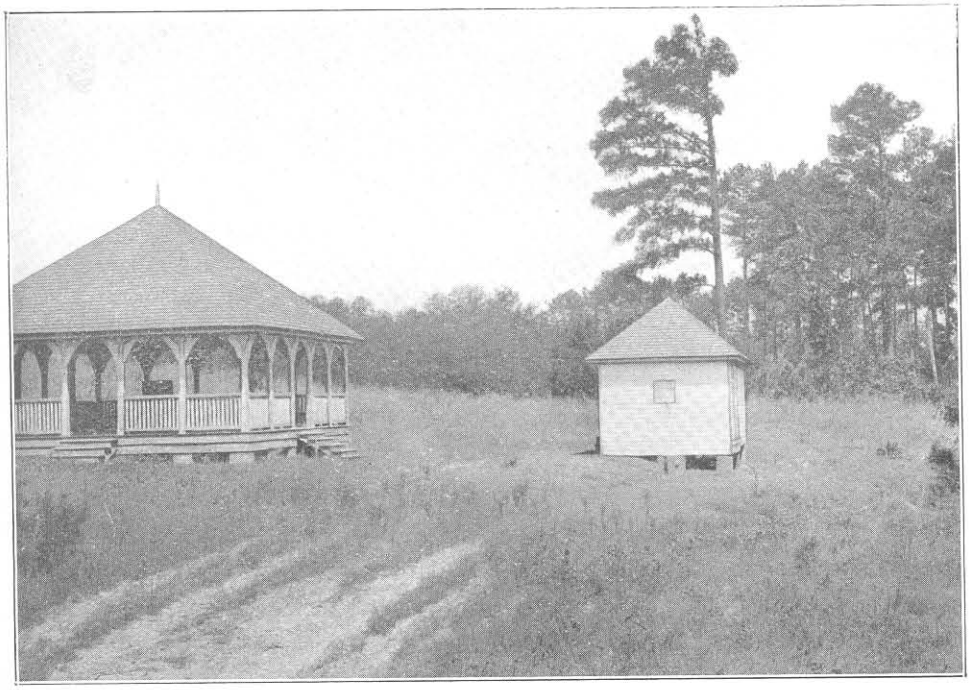
The action of mineral waters, according to Walton, is divided into *immediate* and *remote*. The immediate action is that which

[1] Fourteenth Annual Report U. S. Geological Survey, p. 57.

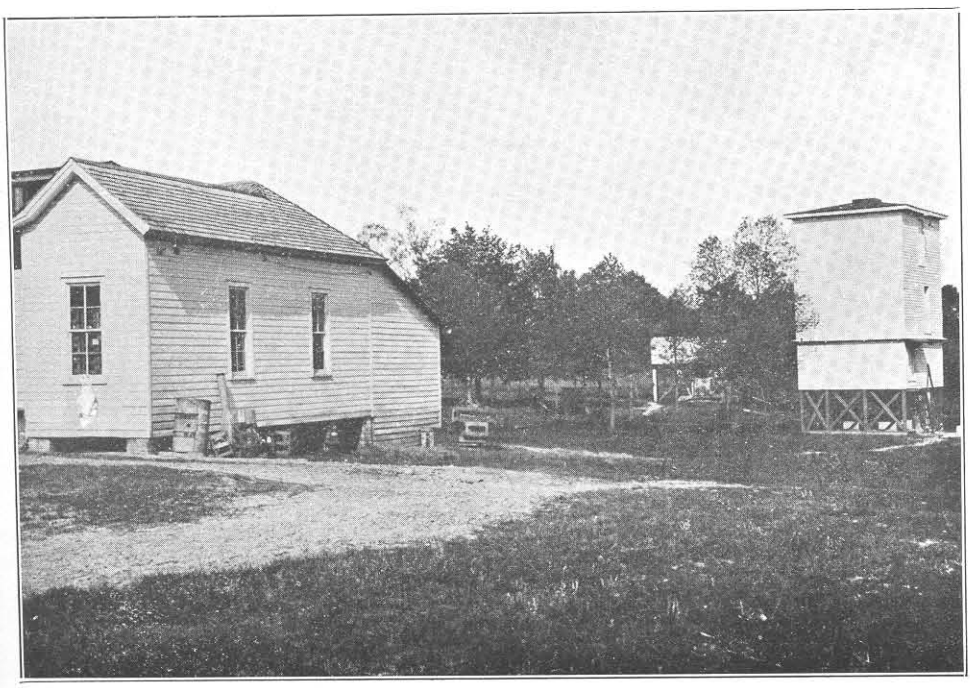
results within 24 hours after the water is taken into the system, whereas remote action is much longer delayed, often showing decisive results only after weeks, or possibly in some cases, months. Waters producing remote action are usually those carrying only a small percentage of the active mineral ingredients. Such waters have what may be termed an accumulative effect. As an illustration of this fact, it is well known that by continued use of waters carrying only a very small amount of sodium or magnesium sulphate, chronic inactivity of the bowels and other digestive troubles are alleviated. Arsenic of mineral waters also has an accumulative effect. It is said that by the continued use of waters containing this mineral in less than one hundredth of a grain per gallon the same physiological effect is produced as if taken in mineral doses. It might be further added that the same results can not be attained by adding these ingredients to pure water. This would seem to suggest that *synthetic* water or water manufactured in the laboratory, in which certain ingredients have been added in imitation of well known mineral water, will not produce results similar to the natural water.

CLASSIFICATION OF MINERAL WATERS

The classification of mineral waters has been much discussed by writers, not only of this country, but also by foreign writers. Schemes of classification have been proposed, based not only on the therapeutic effect of the waters and their chemical ingredients, but even upon their geographic or geological distribution. Probably one of the best classifications so far devised, and one which is applicable to all kinds of waters, is the one proposed by Dr. A. C. Peale of the U. S. Geological Survey and subsequently slightly modified by Dr. James K. Crook. According to this scheme of classification, all mineral waters are first divided into two major groups, namely, non-thermal and thermal waters. These divisions are further divided into minor subdivisions depending upon their



A. ARTESIAN-LITHIA (BENSCOT) WELL, COBB COUNTY, GEORGIA



B. MEDLOCK (BENSCOT) WELL AND BOTTLING PLANT OF BENSCOT MINERAL WATER COMPANY, COBB COUNTY, GEORGIA

mineral constituents. The classification here referred to, and the one followed in this report, is here given.

Scheme of Classification.

Group A. Non-thermal or cold springs.

Group B. Thermal Springs.

Class I.	Alkaline	Sulphated.
		Muriated.
Class II.	Alkaline-saline	Sulphated.
		Muriated.
Class III.	Saline	Sulphated.
		Muriated.
Class IV.	Chalybeate	Alkaline.
		Sulphated.
		Muriated.

Class V. Neutral or indifferent.

Dr. Crook[1], in his explanation of the different classes of waters here given makes, in part, the following statements:

"I. The alkaline springs include all those which are characterized by the presence of the alkaline carbonates, as the carbonates of the alkalies, the alkaline earths, and the alkaline metals. Generally, these waters are further distinguished by the presence of carbonic acid gas, and may thus be additionally designated as carbonated. Nearly half the alkaline springs of the United States are calcic-alkaline—i. e., they contain calcium carbonate or bicarbonate as a predominant ingredient.

"II. The alkaline-saline waters include all those in which there is a combination of alkaline carbonate with the sulphates or chlorides on anything like equal terms.

[1] Mineral Waters of the United States and Their Therapeutic Uses, pp. 31-32.

"III. The saline waters include those in which sulphates or chlorides predominate. They are about one-third more numerous in the United States than alkaline waters. A majority of the springs usually classed as purgative or aperient would fall under the head of sulphated salines. Under the head of muriated salines, all the brines would fall, as they are characterized by the presence of sodium chloride. Any of these springs may be sodic-sulphated or sodic-muriated, or calcic-sulphated or calcic-muriated. The sodic-muriated or chloride of sodium waters constitute 88 per cent. of the muriated saline springs of the United States.

"IV. The chalybeate springs form a large and important class of our mineral waters. In all of them the iron is combined with the sulphates, chlorides, or alkaline carbonates. A few of them also contain free acids. We may, therefore, speak of muriated chalybeates, sulphated chalybeates, alkaline chalybeates, acid chalybeates, etc.

"V. Neutral or indifferent waters. There are a number of springs in this country widely known as resorts, and others extensively used in commerce, which can not in a strict sense be included as mineral springs. Some of these contain not more than two or three grains of mineral ingredients to the gallon—less than most of our ordinary potable waters. These we would designate as neutral or indifferent waters. It may be well to add some of these waters are by no means neutral in a therapeutical sense. They are recommended by medical men who ought to be able to judge of their merits in a considerable range of disorders."

If a spring is densely charged with solid or gaseous contents it is spoken of as "strong" or "heavy," as a strong alkaline, a heavy saline, etc. If feebly mineralized, it is denominated "mild" or "light," as a mild chalybeate, a light carbonated water, etc.

As cold or non-thermal springs are in a great majority, all those not referred to as warm or hot are considered as belonging to this group."

SOLID AND GASEOUS CONSTITUENTS OF MINERAL WATERS AND THEIR MEDICINAL EFFECT

The chief solid constituents of Georgia mineral waters, as well as all other mineral waters, are silica, chlorine, sodium, potassium, calcium, magnesium, aluminum, sulphur, and iron. In addition to these common constituents there are a number of rarer constituents, such as lithium, bromine, iodine, manganese, arsenic, etc. The chief gaseous constituents are carbon dioxide, sulphuretted hydrogen, oxygen and nitrogen.

The solid constituents above enumerated do not occur separate and distinct in mineral waters, but they are always combined with one another forming well known groups. The most common of these groups are the carbonates, the chlorides, and the sulphates.

CARBONATES

The carbonates, which include calcium carbonate, sodium carbonate, potassium carbonate, magnesium carbonate, ferrous carbonate, and lithium carbonate, are the most common constituents of mineral waters. In general, it might be stated that all waters carrying these carbonates, or more properly speaking, bicarbonates, in considerable quantities, have an alkaline effect when taken into the system. They are said to stimulate the secretions of the digestive tract, relieve the super-acidity of the stomach, augment the flow or urine, dissolve uric acid deposits, and also correct the acid condition of the urine, and are considered of special value in fevers, rheumatism, gout, etc.

Calcium carbonate.—Calcium carbonate, or carbonate of lime, occurs in nature in many different forms, sometimes crystalline in the form of marble, and sometimes amorphous in the form of chalk. It is found most abundant in the form of limestone and constitutes the mineral matter of shells. Calcium carbonate is readily soluble in water containing carbonic acid, and is therefore found in greater or less quantities in all spring or well waters. In its therapeutic effect, calcium carbonate differs from the other car-

bonates in diminishing the secretions and producing constipation. The calcic waters are said to often cure obstinate cases of chronic diarrhoea and to disintegrate and eliminate gall and kidney stones.

Sodium carbonate, which is one of the most important of all manufactured chemical products, occurs, when pure, in the form of colorless, transparent crystals. It is manufactured at present from sodium chloride (common salt) and is used in large quantities in the manufacture of soap, glass, bread, etc. When taken into the system, sodium carbonate tends to correct all abnormal acid conditions of the fluids of the body. Mineral waters carrying sodium carbonate often give satisfactory results in certain kinds of dyspepsia, rheumatism, gout, and diabetes. They also, like the calcic waters, eliminate uric acid deposits. In addition to the medicinal effect, sodium carbonate forms one of the normal constituents of the body, being found in the blood, lymph, and the various secretions of the mucus membrane.

Potassium carbonate is one of the main constituents of wood-ashes, from which it may be extracted by leaching. The impure salt is usually called potash. It is a white granular material very deliquescent, that is, readily absorbs moisture from the atmosphere. Potassium carbonate, like the other carbonates, is anti-acid in effect, but it is thought to be more energetic in dissolving and removing uric acid from the body.

Magnesium carbonate.—This salt occurs in nature as the mineral magnesite. It is very similar to calcium carbonate, both in color and form of crystallization. Dolomite, one of the most common sedimentary rocks, is a combination of magnesium carbonate and calcium carbonate. Mineral waters containing magnesium carbonate are mild laxatives and the best of alkaline carbonate waters to relieve acid conditions of the stomach and sick headache when caused by constipation. Such waters are also said to be used successfully in checking the formation of acid gravel.

Ferrous carbonate.—Iron carbonate is the main active ingredient in chalybeate waters, giving to them their peculiar astringent

and ferruginous taste. They are valuable waters for increasing the appetite, for bringing back the normal color to the anaemic, for toning up and in putting new life into the body when run down by overwork. Crook, in discussing chalybeate water, says, that in slow convalescence from acute diseases, the anaemic state resulting from a severe operation or difficult confinement, in all forms of hemorrhage not due to fullness of the blood vessels or fragility of their coats, in amenorrhoea when due to chlorosis, in the debilitating catarrhs, etc., the chalybeate waters may be expected to render valuable aid.

Lithium carbonate.—Lithium in the form of a carbonate or chloride is occasionally met with in mineral waters, but usually in very small quantities. Lithium carbonate dissolves readily uric acid and is therefore recommended in the treatment of uric acid gravel, gout, and other diseases due to the abnormal accumulation of uric acid in the system.

CHLORIDES

Chlorides occur in greater or less abundance in all natural waters, the most common combinations being the chlorides of sodium, potassium, calcium, iron, lithium, and magnesium.

Sodium chloride.—Sodium chloride, or common table salt, is one of the essential constituents of the body. It is found in greater or less abundance in the blood, the bones, and the muscles, as well as in the various secretions of the body. Sodium chloride is a universal condiment and in order that the body may be kept in a healthy and normal condition it is essential that this salt should be supplied daily. The effect of waters carrying a high percentage of sodium chloride, when taken into the body, are aperient and diuretic. They increase the flow of the bile, pancreatic juice, intestinal fluids, and at the same time improve the appetite and promote digestion. They, furthermore, have an antiseptic effect on the intestines by retarding putrefactive changes. It is said that there

are but few ailments of the stomach, liver and intestines that are not benefited by the use of these saline waters.

Chloride of potassium is a white crystallized salt found only in small quantities in mineral waters. It most generally occurs in waters carrying sodium chloride, a mineral which it very closely resembles in its effect on the system.

Chloride of calcium is a crystallized substance formed by treating marble with hydrochloric acid. When exposed to ordinary temperature the mineral soon absorbs so much water from the atmosphere that it is completely dissolved. This salt is often found in saline waters. It is supposed to act as a tonic, besides increasing the secretion of urine and mucous. Mineral waters carrying calcium chloride are recommended in the treatment of scrofula, eczema, and other eruptional diseases.

Chloride of iron is only occasionally met with in mineral waters. In effect it is like carbonate of iron, being both an astringent and a tonic.

Chloride of lithium like the carbonate of lithium, is occasionally met with in mineral waters. In this form the lithium of the waters shown in the analyses of this report, has been calculated to conform with the water analyses published by the United States Department of Agriculture. The therepeutic effect of chloride of lithium is supposed to be practically the same as that of carbonate of lithium.

Chloride of magnesium is a bitter salt found in sea water and often met with in mineral springs. It is the substance which gives to the water of the Dead Sea its bitter taste and renders it unfit for drinking purposes. Chloride of magnesium acts on the liver, relieves constipation, and increases the appetite.

SULPHATES

The sulphates most frequently found in mineral waters having medicinal value are sulphates of potassium, sodium, calcium, magnesium, aluminum, and iron. When these salts occur in consider-

able quantity they give to the waters a bitter taste and at the same time have a purgative effect.

Sulphate of potassium is an anhydrous crystallized salt occurring in kainit, a mineral used as a source of potash in the manufacture of commercial fertilizers. The salt is only occasionally met with in mineral waters. Its action on the system is not unlike Epsom or Glauber salts, being purgative in its nature.

Sulphate of sodium.—This salt, familiarly known as Glauber salts, is one of the most common constituents of mineral waters. It occurs in the natural state as the mineral mirabilite, forming white or yellowish-white effervescent masses in caves, but the commercial supply is manufactured from common salt. The manufactured product is a white crystalline salt having a bitter, nauseous taste. Mineral waters carrying this salt in considerable quantity are active purgatives, but in less quantity they become laxative in effect. Such waters are also said to stimulate the action of the liver and to increase the flow of the urine.

Sulphate of magnesium, commonly known as Epsom salts, is very similar in effect to that of sulphate of soda. It has a characteristic bitter, nauseous taste and is a more violent purgative than Glauber salts. Mineral waters carrying this salt in greater or less quantity are quite common, and they are regarded of very great value in the treatment of numerous diseases due to the disorders of the liver, stomach, etc.

Sulphate of calcium occurs in nature as extensive beds known as sulphate of lime, or gypsum. Many spring waters carry this mineral in considerable quantities, but it is supposed to possess little or no therapeutic value.

Sulphate of aluminum is a crystalline salt soluble in water often met with in waters carrying sulphate of iron. It frequently occurs in Georgia spring waters flowing from the Devonian black shale which carries much iron pyrites. Waters with the mineral in solution have an astringent effect and are beneficial in the treatment of

chronic diarrhoea, and is also considered of value in chronic bronchitis, whooping cough, and lead poisoning.

Sulphate of iron.—This is a bluish-geen salt which, when hydrated, is called copperas or green vitriol. It often occurs associated with aluminum sulphate in waters flowing from pyritiferous shales. These waters are effective both as astringents and astonics.

GASES

The most important gases in mineral waters from a medicinal standpoint are carbon dioxide and sulphuretted hydrogen. The former gas occurs in a free state in limited quantities in all natural waters, but the latter is of less frequent occurrence.

Carbon dioxide.—This gas, which escapes when limestone and other carbonates are treated with an acid, is an extremely heavy gas, being one and one-half times as heavy as air. On account of its high specific gravity it often collects in the low places of caves and mines. It is a gas produced by the combustion of all organic substances, is also set free in the decay of organic matter, and is exhaled from the lungs of animals in the process of breathing. It is a non-combustible gas, and when taken into the lungs, even in small quantities, produces headache, drowsiness, and other ill effects. This same gas, which is used in the manufacture of soda-water and often occurs in large quantities in mineral waters, is not only agreeable to the taste, but is also healthful, when taken into the stomach in limited quantities. It has a pleasant, cooling effect, increases the flow of saliva, and aids digestion. The presence of this gas in waters used for bathing purposes is very desirable, as it stimulates the skin by producing pricking or stinging-like sensations, and thus accellerates the circulation.

Sulphuretted hydrogen.—This gas, also called hydrogen sulphide, is of common occurrence in mineral waters. It is often met with in waters in volcanic districts and is also often found in the waters of artesian wells along the Atlantic coast. It is a colorless

irrespirable gas having the odor of rotten eggs. When the gas comes in contact with the air its hydrogen readily oxidizes, leaving the sulphur as a white precipitate or milky colored sediment in the water. Dr. Crook,[1] in speaking of the medicinal effect of mineral waters charged with sulphuretted hydrogen, says: "It can not be disputed that these waters promote the activity of the bowels and kidneys. They are highly advocated by medicinal practitioners of experience in rheumatism, gout, chronic synovitis, white swelling, and skin diseases. Many of the sulphur springs are celebrated in the treatment of chronic malarial infections accompanied by an enlarged spleen and liver, and in hapatis congestion, abdominal plethora and hemorrhoids."

Besides internal use, sulphuretted water has an extended use for bathing purposes.

OTHER MINERALS

Silica.—This is a very common constituent of mineral waters and in a number of Georgia waters put on the market it is one of the most abundant minerals. The medicinal effect of this ingredient, as it occurs in mineral waters, has apparently been but little investigated. It has been suggested that it is possibly of some value in the treatment of cancer. It has also been claimed to reduce the albumen and sugar in urine.

Iodine and bromine are occasionally met with in saline waters. Such waters have a sedative effect and are recommended in the treatment of scrofula, syphilis, goiter, and diseases produced by the disorders of the lymphatics. They are also of value in eradicating poisons from the body.

Arsenic.—This mineral is of frequent occurrence in waters flowing from pyritiferous mines as well as in natural springs. The arsenic apparently originates from the decomposition of arsenic pyrites. The medicinal effect of such waters is to produce a gradual change

[1] Mineral Waters of the United States and Their Therapeutic Uses, pp. 47-48.

in the system, which increases the appetite and promotes digestion. They are, furthermore, of value in the treatment of cutaneous diseases.

For a more extensive discussion of the medicinal value of mineral waters, the reader is referred to the following publications:

Mineral Waters of the United States and their Therapeutic Uses, by James K. Cook; Mineral Springs of the United States and Canada, by Geo. E. Walton; Mineral Springs of North America, by J. J. Moorman; Mineral Springs of Georgia, by J. R. Duggan.

GEOGRAPHICAL DISTRIBUTION OF MINERAL SPRINGS

By an examination of the accompanying map it will be noticed that the mineral springs of Georgia are most abundant in the northern part of the State. This is largely due, no doubt, to differences in geological formations. The southern part of the State is made up entirely of unaltered Cretaceous and Tertiary sediments, while in the northern part occur the much faulted and wholly or partly altered Paleozoics and Crystallines. The latter rocks, in many cases, are of igneous origin, which have been more or less metamorphosed chiefly by the action of mineralized waters. Another explanation of the prevalence of mineral springs in the northern part of the State or rather their development is the climate condition which has much to do in the location of summer resorts, the usual outgrowth of the mineral springs. In South Georgia the more promising mineral waters are those derived from artesian wells, but at the same time both chalybeate and sulphur springs occur quite widely distributed, throughout that section of the State, but only in a few instances have efforts been made to develop them.

A. HOEN & CO. BALTIMORE

DESCRIPTIONS OF INDIVIDUAL SPRINGS

ADAMS MINERAL SPRING

HABERSHAM COUNTY

Adams Mineral Spring is located just below the dam forming Demorest Lake. It is a rather bold chalybeate spring forming a copious precipitate of brownish-red iron oxide about the spillway. It has been suggested that this spring is only a seepage from the lake above; however, it is claimed that the spring was in existence prior to the construction of the dam. The amount of iron carbonate in this water is unusually large for a Georgia spring, there being only a few springs so far known in the State which carry a higher percentage.

The water from this spring is largely used as a mineral water, it being especially popular with the summer boarders who visit Demorest.

ANALYSIS ADAMS MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	9.3	.540
Chlorine (Cl)	10.0	.583
Sulphur trioxide (SO_3)	12.3	.707
Carbon dioxide (CO_2)	66.0	3.849
Sodium oxide (Na_2O)	7.0	.408
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	17.0	.991
Magnesia (MgO)	5.0	.291
Alumina (Al_2O_3)	3.0	.175
Ferric oxide (Fe_2O_3)	45.0	2.624
Manganous oxide (MnO)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	13.2	1.773

Calcium carbonate	30.3	1.773
Magnesium carbonate	9.9	.577
Magnesium chloride	1.8	.105
Aluminum sulphate	15.3	.892
Ferrous carbonate	65.2	3.802
Manganese carbonate	2.2	.128
Silica	9.3	.542
Total solids	148.7	9.679
Free carbon dioxide	21.6	1.259

ALBANY ARTESIAN WELL

DOUGHERTY COUNTY

The artesian well here referred to, which furnishes a water that might be designated a mineral water, is located at the Albany water works pumping station. The water-bearing stratum from which this water is supplied was struck at 1,310 feet from the surface. The flow was 50 gallons per minute and the temperature 78° F. Originally this water was allowed to mix with the waters from the other water-bearing stratum above, but at present it is cased off and is delivered in a separate pipe to the surface.

ANALYSIS ALBANY ARTESIAN WELL

Alkaline-sodic. Carbonated

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.62	.794
Chlorine (Cl)	69.36	4.045
Sulphur trioxide (SO_3)	1.22	.070
Carbon dioxide (CO_2)	677.00	39.480
Sodium oxide (Na_2O)	623.76	36.376
Potassium oxide (K_2O)	34.72	2.024
Lime (CaO)	6.00	.350
Magnesia (MgO)	3.00	.175
Phosphorus pentoxide (P_2O_5)	trace	trace
Iron oxide and alumina (Fe_2O_3 & Al_2O_3)	1.75	.102
PROBABLE COMBINATIONS		
Potassium chloride	55.03	3.209
Sodium chloride	71.09	4.146
Sodium sulphate	2.16	.126
Sodium phosphate	trace	trace

Sodium carbonate	998.71	58.243
Manesium carbonate	6.30	.367
Calcium carbonate	10.71	.625
Alumina and iron oxide	1.75	.102
Silica	13.62	.794
Total solids	1,159.37	67.612
Free carbon dioxide	254.43	14.838

ARGON SPRING

TALIAFERRO COUNTY

This spring, known also as the "Anti-Nausea Spring," is located on the Washington branch of the Georgia Railroad in the eastern part of Taliaferro County, about one-fourth mile from Hillman station. It is only a few yards from the so-called "Hillman Electric Rock," which is claimed to have performed some remarkable cures by its shocks.

The spring is situated on low ground, at the base of a hill of quartzose schist. It is surrounded by a curb, and is also protected by a small house. The flow of the spring is somewhat variable, but Mr. Hillman estimated that the average is about 150 gallons per hour. Some years ago there was a large hotel near the spring for the entertainment of guests, but it was destroyed by fire and there now remain only a few small buildings.

ANALYSIS ARGON SPRING

Light alkaline-calcic-sodic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	39.42	2.299
Chlorine (Cl)	6.30	.367
Sulphur trioxide (SO_3)	1.20	.070
Carbon dioxide (CO_2)	74.32	4.334
Sodium oxide (Na_2O)	13.05	.761
Potassium oxide (K_2O)	2.45	.143
Lime (CaO)	10.31	.601
Magnesia (MgO)	4.05	.236
Alumina (Al_2O_3)	.45	.026
Ferric oxide (Fe_2O_3)	.80	.047

PROBABLE COMBINATIONS		
Potassium chloride	3.89	.227
Sodium chloride	7.32	.427
Sidium sulphate	.35	.020
Sodium carbonate	13.49	.787
Calcium carbonate	18.41	1.074
Magnesium carbonate	8.50	.496
Aluminum sulphate	1.49	.087
Ferrous carbonate	1.16	.068
Silica	39.42	2.299
Total solids	94.03	5.485
Free carbon dioxide	55.73	3.250

ARTESIAN-LITHIA WELL

COBB COUNTY

This is one of a group of mineral wells located near Sweetwater Creek, three-fourths mile northwest of Austell. The well has a diameter of 2 inches and is reported to have attained a depth of 900 feet. It is said to furnish by pumping several gallons per minute. The water is chiefly used as a mineral water and in the last few years has been extensively sold in Atlanta and elsewhere. Artesian-Lithia well, together with Sulpho-Magnesia Artesian Well near by, was put down about 20 years ago with the hope of locating anthracite coal. As no coal was found, the wells were later turned to commercial use by putting their waters on the market.

ANALYSIS ARTESIAN-LITHIA WELL

Muriated-saline. Lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	24.30	1.417
Chlorine (Cl)	1,032.00	60.184
Sulphur trioxide (SO_3)	148.40	8.654
Carbon dioxide (CO_2)	163.30	9.523
Sodium oxide (Na_2O)	876.80	51.133
Potassium oxide (K_2O)	6.40	.373
Alumina (Al_2O_3)	.90	.052
Ferric oxide (Fe_2O_3)	.30	.017
Arsenic (As)	trace	trace
Bromine (Br)	14.00	.816

Lime (CaO)	169.10	9.862
Magnesia (MgO)	21.40	1.258
Lithia (Li_2O)	17.00	.991
PROBABLE COMBINATIONS		
Lithium chloride	47.00	2.741
Potassium bromide	16.20	.945
Sodium chloride	1,634.30	95.309
Sodium bromide	4.00	.233
Sodium sulphate	21.10	1.231
Sodium phosphate	.80	.047
Calcium sulphate	153.20	8.934
Calcium carbonate	189.30	11.040
Magnesium sulphate	64.20	3.744
Aluminum sulphate	3.90	.228
Ferrous carbonate	.90	.052
Silica	24.30	1.417
Total solids	2,159.20	125.921
Free carbon dioxide	80.00	4.665

BAGWELL WELL

CATOOSA COUNTY

This well, which was bored in 1901, is located at R. B. Bagwell's residence near the southeast corner of Chickamauga Park and about 200 yards from Chickamauga Creek. The well has a depth of 232 feet, and is said to penetrate hard rock its entire depth, except the first 15 feet, which consist of clays. The greater part of this rock, judging from the location of the well, is Chickamauga limestone. The water, which is quite saline, is reported to come from within a few feet of the bottom of the well. It rises to within 70 or 80 feet of the surface. At the time of the writer's visit, the capacity of the well had not been tested, and nothing definite seemed to be known about the amount of water supply.

The mineral constituents of the water from the Bagwell Well are shown by the following analysis made by Dr. J. M. McCandless, former State Chemist:

ANALYSIS BAGWELL WELL

Muriated-saline-bromic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	45.0	2.624
Chlorine (Cl)	40,039.0	2,334.994
Sulphur trioxide (SO_3)	1,271.0	74.122
Carbon dioxide (CO_2)	84.5	4.928
Sodium oxide (Na_2O)	28,855.0	1,682.766
Potassium oxide (K_2O)	212.0	12.363
Lime (CaO)	3,337.5	194.636
Magnesia (MgO)	2,430.0	141.713
Bromine (Br)	379.0	22.102
Iodine (I)	19.5	1.137
Lithium oxide (Li_2O)	62.0	3.616
Iron oxide and Alumina (Fe_2O_3 & Al_2O_3)	53.0	3.091
PROBABLE COMBINATIONS		
Potassium chloride	335.0	19.536
Sodium chloride	54,791.0	3,195.301
Lithium sulphate	225.0	13.121
Magnesium chloride	5,265.0	307.044
Magnesium bromide	494.0	28.809
Calcium chloride	4,831.0	281.734
Calcium sulphate	1,883.0	109.812
Calcium carbonate	192.0	11.197
Sodium iodide	23.0	1.341
Ferric oxide and alumina	53.0	3.090
Silica	45.0	2.624
Total solids	68,137.0	3,973.609

BARTOW SPRING

Bartow County

Bartow Spring is on the right-of-way of the Western and Atlantic Railroad in the southeastern part of Bartow County about one mile east of Emerson. It is a chalybeate spring having quite a local reputation, but is entirely unimproved. The spring is within one-fourth mile of the old Bartow furnace. During the operation of this furnace it is said the water of Bartow Spring was more or less extensively used. The flow is two gallons per minute. Upon standing the water yields quite a precipitate of yellowish-brown iron sesqui-oxide.

ANALYSIS BARTOW SPRING
Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.8	.455
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	40.4	2.356
Sodium oxide (Na_2O)	4.8	.280
Potassium oxide (K_2O)	1.2	.070
Lime (CaO)	2.4	.140
Magnesia (MgO)	2.9	.169
Alumina (Al_2O_3)	1.2	.070
Ferric oxide (Fe_2O_3)	16.9	.985
PROBABLE COMBINATIONS		
Potassium chloride	1.9	.111
Sodium chloride	4.3	.251
Calcium carbonate	4.3	.251
Magnesium carbonate	6.1	.356
Aluminum oxide	1.2	.070
Ferrous carbonate	23.5	1.429
Silica	7.8	.455
Total solids	50.1	2.923
Free carbon dioxide	26.0	1.516

BEALL SPRING

WARREN COUNTY

Beall Spring is said to have been discovered in the early part of last century and some crude improvements made as early as 1825. The spring is located in the southwestern part of Warren County, 8 miles from Warrenton and about the same distance from Mitchell, a station on the Southern Railway. The improvements consist of a small hotel of about 20 rooms constructed many years ago. The spring has quite a reputation as a mineral spring and is visited during the summer by a large number of people. The flow is less than one gallon per minute. The water has no odor or any decided taste nor does it yield any precipitate about the drain way. The location is by nature an ideal watering place. The spring is surrounded by a beautiful grove which adds much to the attractiveness of the place.

ANALYSIS BEALL SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	64.0	3.732
Chlorine (Cl)	5.2	.303
Sulphur trioxide (SO_3)	10.5	.612
Carbon dioxide (CO_2)	153.5	8.952
Sodium oxide (Na_2O)	12.3	.717
Potassium oxide (K_2O)	1.9	.111
Lime (CaO)	51.3	2.991
Magnesia (MgO)	4.5	.262
Alumina (Al_2O_3)	1.6	.093
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	3.3	.192
Sodium chloride	6.2	.362
Sodium sulphate	18.6	1.085
Sodium carbonate	1.5	.087
Calcium carbonate	91.6	5.342
Magnesium carbonate	9.5	.554
Ferrous carbonate	1.4	.082
Aluminum oxide	1.6	.093
Silica	64.0	3.732
Total solids	197.7	11.529
Free carbon dioxide	107.1	6.246

BESSIE TIFT COLLEGE SPRING

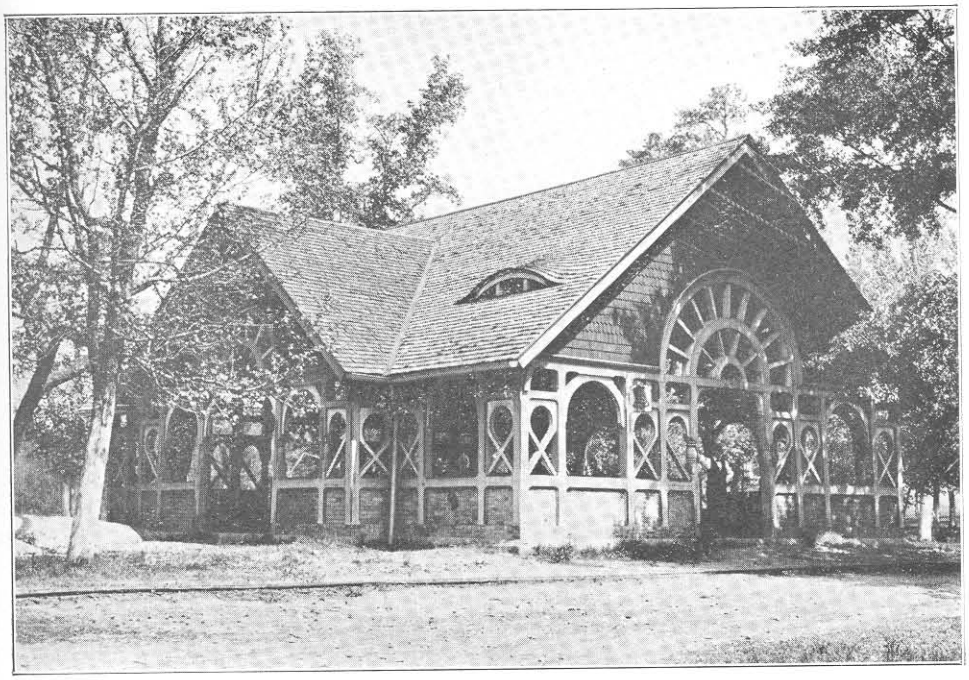
MONROE COUNTY

This is a small spring, furnishing about three gallons per minute. It is located near the Bessie Tift College and was formerly used to supply that institution with water.

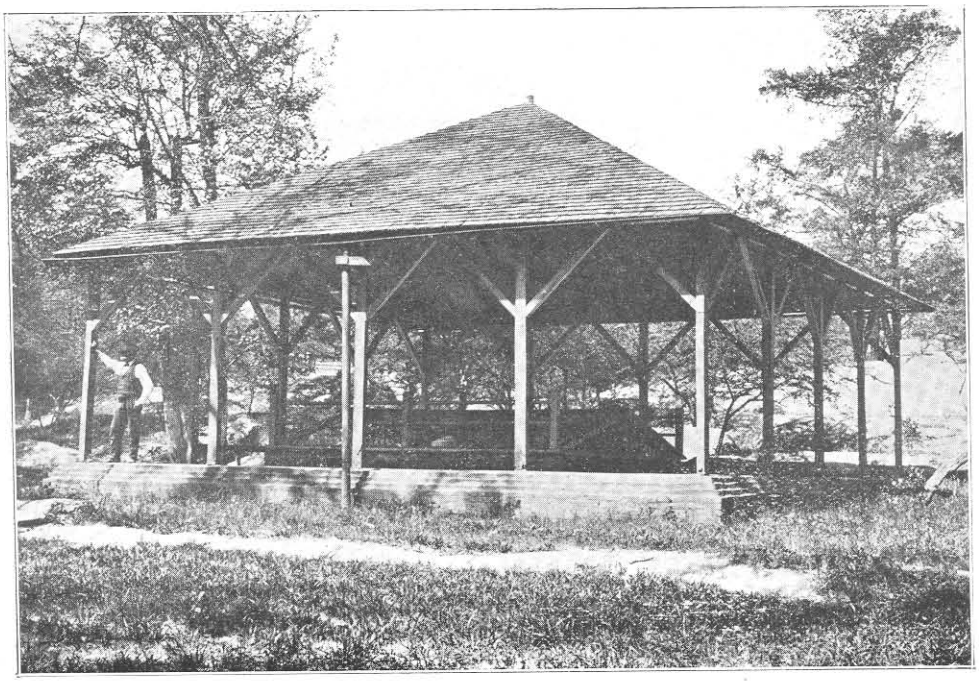
ANALYSIS BESSIE TIFT COLLEGE SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	16.0	.933
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	2.1	.133
Carbon dioxide (CO_2)	19.0	1.106
Sodium oxide (Na_2O)	5.2	.303
Potassium oxide (K_2O)	.3	.017



A. THE ORIGINAL BOWDEN LITHIA SPRING, DOUGLAS COUNTY, GEORGIA



B. BOWDEN LITHIA SPRING NOW IN USE, DOUGLAS COUNTY, GEORGIA

Lime (CaO)	1.8	.105
Magnesia (MgO)	.6	.035
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	1.8	.105
PROBABLE COMBINATIONS		
Potassium chloride	.6	.035
Sodium chloride	4.6	.268
Sodium sulphate	3.9	.227
Calcium carbonate	3.2	.187
Magnesium carbonate	1.3	.076
Aluminum oxide	.4	.023
Ferrous carbonate	2.5	.146
Silica	16.0	.933
Total	32.5	1.895
Free corbon dioxide	16.8	.980

BLUE SPRING

HARRIS COUNTY

Blue Spring is a very large spring located at the base of Pine Mountain in Harris County about 6 miles southwest of Hamilton. The water rises to the surface from a large circular, funnel-shaped cavity, varying from 2 to 8 feet in diameter, and having a depth of many feet. The form of this spring is not unlike those frequently met with in limestone regions, and usually designated as "well springs," on account of the shape of the cavity through which the water ascends to the surface. The capacity of the spring is about 1,000,000 gallons per day. The water is always clear and is said to be but little affected by the seasons. There was a plan on foot a few years ago to pipe the water of this spring to Columbus, 17 miles distant, to supply the city with water.

ANALYSIS BLUE SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	14.80	.861
Chlorine (Cl)	4.80	.280
Sulphur trioxide (SO_3)	4.09	.238
Carbon dioxide (CO_2)	72.60	4.234

Sodium oxide (Na_2O)	9.03	.527
Potassium oxide (K_2O)	2.78	.162
Lime (CaO)	8.63	.503
Magnesia (MgO)	1.06	.062
Alumina and Ferric oxide (Al_2O_3 & Fe_2O_3)	4.62	.269
Phosphorus pentoxide (P_2O_5)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	4.41	.257
Sodium chloride	4.45	.259
Sodium sulphate	7.26	.423
Sodium phosphate	trace	trace
Sodium carbonate	6.00	.350
Magnesium carbonate	2.22	.129
Iron oxide and alumina	4.62	.269
Calcium carbonate	15.41	.899
Silica	14.80	.861
Total solids	59.17	3.447
Free carbon dioxide	62.04	3.618

BLUE RIDGE MINERAL SPRING

FANNIN COUNTY

Blue Ridge Mineral Spring, also sometimes called Glover Mineral Spring, is located near and on the east side of the Ellijay-Morganton public road about one mile east of Blue Ridge. It is a small unimproved spring flowing only about one gallon per minute. The water has a faint odor of sulphuretted hydrogen. The spring is frequented by the summer visitors at Blue Ridge. It has quite a local reputation, but is apparently almost unknown except in Blue Ridge and in the immediate surrounding country.

ANALYSIS BLUE RIDGE MINERAL SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.0	.758
Chlorine (Cl)	3.0	.175
Sulphur trioxide (SO_3)	2.8	.166
Carbon dioxide (CO_2)	30.0	1.750
Sodium oxide (Na_2O)	5.0	.292
Potassium oxide (K_2O)	1.5	.087

Lime (CaO)	2.5	.146
Magnesia (MgO)	1.4	.082
Alumina and ferric oxide (Al_2O_3 & Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	2.4	.140
Sodium phosphate	trace	trace
Sodium sulphate	5.2	.301
Sodium chloride	3.2	.185
Sodium carbonate	2.0	.116
Calcium carbonate	4.5	.266
Magnesium carbonate	2.9	.172
Alumina and iron oxide	1.0	.058
Silica	13.0	.758
Total solids	34.2	1.996
Free carbon dioxide	25.7	1.488

BOOTH WELL

Clinch County

This is a driven well 15 feet deep and 2 inches in diameter, located on land lot 505, 7th district, Clinch County, 3 miles south of Argyle. The water is said to rise within one foot of the surface. It is reported to have a sulphurous odor and to yield, on standing, a brownish precipitate. The water is claimed by its owner to possess healing properties; however, its reputation seems to be only local. No effort, apparently, has been made to put the water on the market.

ANALYSIS BOOTH WELL

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.7	.449
Chlorine (Cl)	10.0	.583
Sulphur trioxide (SO_3)	1.2	.070
Carbon dioxide (CO_2)	104.0	6.065
Sodium oxide (Na_2O)	6.2	.362
Potassium oxide (K_2O)	.4	.023
Lime (CaO)	1.2	.070
Magnesia (MgO)	.9	.052
Alumina (Al_2O_3)	.5	.029
Ferric oxide (Fe_2O_3)	13.0	.758

PROBABLE COMBINATIONS		
Potassium chloride	.6	.035
Sodium chloride	11.7	.682
Magnesium chloride	1.5	.087
Calcium Chloride	2.3	.134
Aluminum sulphate	1.7	.099
Ferrous carbonate	18.9	1.102
Silica	7.7	.449
Total solids	44.4	2.588
Free carbon dioxide	96.8	5.645
Organic matter	25.0	1.458

BOOZ WELL

POLK COUNTY

This well, which is 40 feet deep, is located in the back yard of the Booz Hotel in Cedartown, the county site of Polk County. The water is said to come from a fissure in the limestone rock at the bottom of the well. In addition to supplying the hotel for domestic use the water is also used to a limited extent for medicinal purposes. The proprietor of the hotel takes great pride in calling the attention of his guests to the supposed medicinal properties of this water and by this means has given the water a rather wide advertisement. The high percentage of chlorine in this water would seem to indicate that it is possibly contaminated. However, as chlorine is often found in considerable abundance in waters from the Chickamauga limestone, the formation from which the Booz well receives its water supply, surface contamination may not exist.

ANALYSIS BOOZ WELL

Alkaline-saline-calcic-magnesic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.4	.781
Chlorine (Cl)	75.2	4.385
Sulphur trioxide (SO_3)	8.8	.513
Carbon dioxide (CO_2)	166.6	9.704
Sodium oxide (Na_2O)	74.8	4.362
Potassium oxide (K_2O)	1.7	.099

Lime (CaO)	35.3	2.058
Magnesia (MgO)	33.6	1.959
Alumina (Al_2O_3)	.8	.046
Ferric oxide (Fe_2O_3)	1.5	.087
PROBABLE COMBINATIONS		
Potassium chloride	2.7	.157
Sodium chloride	111.9	6.526
Sodium sulphate	15.6	.910
Sodium carbonate	28.7	1.674
Calcium carbonate	63.0	3.674
Magnesium carbonate	70.6	4.117
Aluminum oxide	.8	.046
Ferrous carbonate	2.2	.128
Silica	13.4	.781
Total solids	308.9	18.013
Free carbon dioxide	89.1	5.196

BOWDEN LITHIA SPRING

DOUGLAS COUNTY

Bowden Lithia Spring, formerly known as "Salt Spring," is located near Lithia Springs station on the Southern Railway, 21 miles northwest of Atlanta. Prior to the settlement of that part of the country by the whites the spring was known to the Cherokee Indians as a "deer lick," so-called from the frequent visits of deer to the spring to lick the rocks in order to obtain salt. Some years ago, shortly after the present company obtained possession of the property, an effort was made to increase the capacity of the spring by blasting. The result of this work was ruinous to the spring, owing to a stream of fresh water having been struck.[1] This mishap led to the opening of the spring now in use, which is situated only a few hundred feet from the original spring. This spring flows into a large basin, blasted out of the granitoid rock, forming a reservoir. The basin is surrounded by a substantial wall of masonry which is protected above by a glass covering. Connected with the basin is an overflow pipe and two other pipes, the latter being connected with pumps which draw the water from the basin as it

[1] Since this was written considerable money has been expended in improving this spring.

is used. The sanitary conditions of the spring seem to be well nigh perfect and every precaution is taken to keep the water during the rainy season from being diluted by seepage.

The capacity of the Bowden Spring at present is about 3 gallons per minute. The water flows into the artificial basin through small fissures in the granitoid rock. From a financial point of view, the Bowden Lithia spring is, so far, one of the most important mineral springs in the State. The water has an extensive sale throughout the South, and it is also kept on sale in many of the northern cities. Recently the Sweetwater Park Hotel, belonging to the Bowden Lithia Springs Water Company, and having a capacity of 300 guests, was burned, so at present accommodations can only be had at Austell, which is only a short walk from the spring.

ANALYSIS BOWDEN LITHIA SPRING

Muriated-saline. Lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	32.60	1.901
Chlorine (Cl)	1,101.60	64.243
Sulphur trioxide (SO_3)	151.20	8.818
Carbon dioxide (CO_2)	129.80	7.570
Sodium oxide (Na_2O)	946.00	55.169
Potassium oxide (K_2O)	24.50	1.429
Lime (CaO)	163.40	9.529
Magnesia (MgO)	15.30	.892
Alumina (Al_2O_3)	2.50	.146
Ferric oxide (Fe_2O_3)	1.50	.087
Phosphorus pentoxide (P_2O_5)	.20	.012
Arsenic (As)	.10	.006
Bromine (Br)	20.70	1.207
Manganous oxide (MnO)	.20	.012
Baryta (Ba_2O)	.20	.012
Lithia (Li_2O)	12.00	.700
PROBABLE COMBINATIONS		
Lithium chloride	34.00	1.983
Potassium chloride	.30	.018
Potassium bromide	30.80	1.796
Sodium chloride	1,785.00	104.098
Sodium sulphate	.30	.018
Sodium phosphate	.80	.047

Sodium arsenate	.40	.023
Magnesium sulphate	45.90	2.677
Calcium sulphate	183.90	10.725
Calcium carbonate	156.60	9.133
Barium sulphate	.30	.018
Manganese carbonate	.50	.029
Aluminum sulphate	10.90	.636
Ferrous carbonate	4.40	.257
Silica	32.60	1.901
Total solids	2,286.70	133.359
Free carbon dioxide	70.90	4.135

BOWDEN LITHIA SPRING NO. 2

DOUGLAS COUNTY

This spring, often called the "Old Spring," is located about 300 feet north of the main Bowden spring near a small branch. The spring was originally used, but was finally abandoned. Some 3 or 4 years ago when the water supply from the main Bowden Lithia Spring was not sufficient for the demand the "old spring" was again opened and put in use. The general character of this water is quite similar to the main spring, differing chiefly in the lower percentage of mineral contents.

ANALYSIS BOWDEN LITHIA SPRING No. 2

Muriated-saline. Lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	48.2	2.811
Chlorine (Cl)	558.0	32.541
Sulphur trioxide (SO_3)	86.0	5.015
Carbon dioxide (CO_2)	152.6	8.899
Sodium oxide (Na_2O)	505.0	29.451
Potassium oxide (K_2O)	8.2	.478
Lime (CaO)	123.6	7.208
Magnesia (MgO)	11.5	.670
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	.5	.029
Bromine (Br)	14.0	.816
Phosphorus pentoxide (P_2O_5)	.1	.006
Lithia (Li_2O)	8.0	.467

PROBABLE COMBINATIONS

Lithium chloride	25.2	1.470
Potassium bromide	20.8	1.213
Sodium chloride	922.3	53.786
Sodium sulphate	40.8	2.380
Magnesium sulphate	34.5	2.012
Calcium sulphate	68.0	3.966
Calcium carbonate	170.7	10.322
Ferrous carbonate	.7	.041
Aluminum sulphate	1.2	.070
Silica	48.2	2.811
Total solids	1,332.4	78.071
Free carbon dioxide	77.3	4.507

BOWMAN MINERAL SPRING

BIBB COUNTY

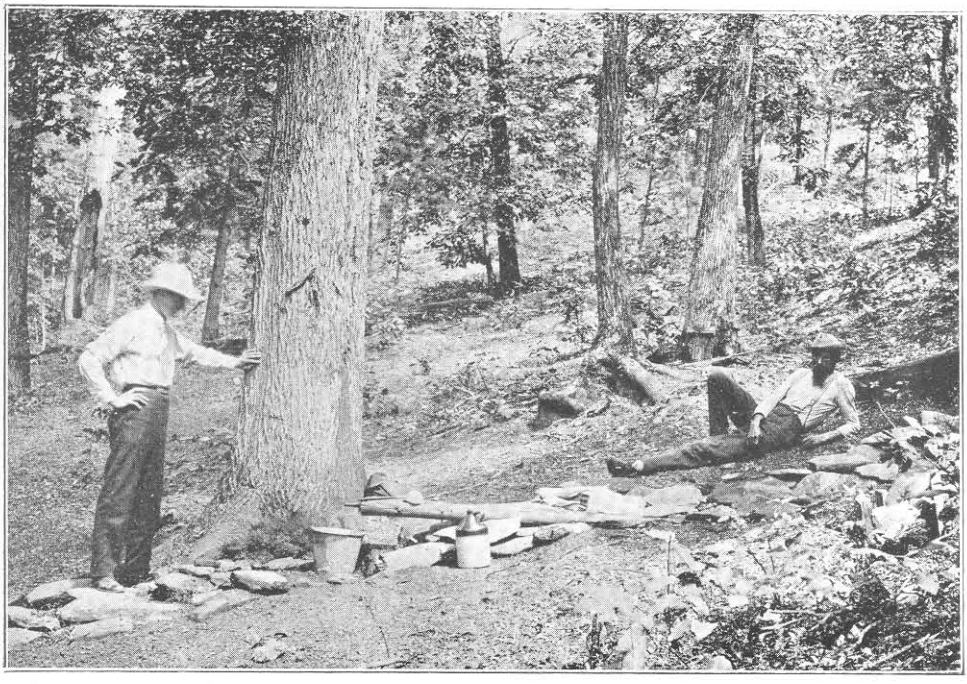
This spring, often referred to as Holton Mineral Spring, is situated within a few hundred yards of the Southern Railway 2 miles north of Holton. It is rather picturesquely located in a deep hollow. A shallow catchment basin hewn out of a solid rock is the only improvement. Near the spring are to be seen some huge rocks exposed on the hillside. Formerly this spring is said to have been much visited, but of recent years it seems to have fallen into disuse. It is a small chalybeate spring furnishing less than one gallon per minute. Upon standing, the water throws down quite a copious precipitate of reddish-brown iron sesqui-oxide.

ANALYSIS BOWMAN MINERAL SPRING

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	48.7	2.840
Chlorine (Cl)	5.6	.327
Sulphur trioxide (SO_3)	9.9	.577
Carbon dioxide (CO_2)	141.6	8.258
Sodium oxide (Na_2O)	16.4	.956
Potassium oxide (K_2O)	1.8	.105
Lime (CaO)	36.2	2.111
Magnesia (MgO)	9.8	.572
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	3.0	.175

A. BEALL SPRING, WARREN COUNTY, GEORGIA



R. CARTER'S MINERAL SPRING, GORDON COUNTY, GEORGIA

PROBABLE COMBINATIONS		
Potassium chloride	2.9	.169
Sodium chloride	7.1	.414
Sodium sulphate	17.6	1.026
Sodium carbonate	8.9	.519
Calcium carbonate	64.6	3.707
Magnesium carbonate	20.6	1.201
Aluminum oxide	.8	.047
Ferrous carbonate	4.4	.257
Silica	48.7	2.840
Total solids	175.6	10.180
Free carbon dioxide	97.1	5.663

BRENAU COLLEGE SPRING

HALL COUNTY

This spring, which is owned by Brenau College, is located in the city of Gainesville, about 4 blocks east of the post office. It is a small spring, furnishing less than one gallon per minute. The spring is protected by a stone wall and is mainly used to supply the college park in which it is located.

ANALYSIS BRENAU COLLEGE SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.7	.274
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	.7	.041
Carbon dioxide (CO_2)	12.5	.729
Sodium oxide (Na_2O)	2.7	.157
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	.8	.047
Magnesia (MgO)	1.0	.058
Alumina (Al_2O_3)	.5	.029
Ferric oxide (Fe_2O_3)	.3	.017
PROBABLE COMBINATIONS		
Potassium chloride	.8	.047
Sodium chloride	5.1	.297
Magnesium sulphate	1.0	.058
Magnesium carbonate	1.4	.081
Calcium carbonate	1.4	.081

Ferrous carbonate	.7	.041
Aluminum oxide	.5	.029
Silica	4.7	.274
Total solids	15.6	.908
Free carbon dioxide	11.0	.641

BROOKS MINERAL SPRINGS

WASHINGTON COUNTY

This group of springs, 3 in number, is located on the Sandersville-Milledgeville public road near Buffalo Creek, 8½ miles west of Sandersville. They are on the margin of the swamp and are overflowed by Buffalo Creek during very high floods. Mr. Brooks, the original owner of the springs, claims that 2 of these springs made their appearance about 15 years ago immediately following the subsidence of an overflow from Buffalo Creek. The improvement consists of 6 or 8 roughly constructed cottages which are chiefly occupied by people from Sandersville and the surrounding country for summer outings. The waters from these springs have quite a local reputation as medicinal waters, they are used to a limited extent in Sandersville and Tennille, but none are shipped.

The flows vary from 1 to 3 gallons per minute. The water from one of the springs, known as the Pine Tree Spring, has a faint odor of sulphuretted hydrogen.

ANALYSES BROOKS MINERAL SPRINGS

Light alkaline-saline-calcic

CONSTITUENTS DETERMINED	I		II	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	14.2	.828	12.9	.752
Chlorine (Cl)	7.0	.408	7.0	.408
Sulphur trioxide (SO_3)	9.4	.548	8.0	.467
Carbon dioxide (CO_2)	109.8	6.204	80.9	4.717
Sodium oxide (Na_2O)	3.5	.204	3.6	.210
Potassium oxide (K_2O)	1.2	.070	1.6	.093

CONSTITUENTS DETERMINED	I		II	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Lime (CaO)	14.2	.828	16.5	.962
Magnesia (MgO)	1.3	.076	1.2	.070
Alumina (Al_2O_3)	.4	.023	.8	.047
Ferric oxide (Fe_2O_3)	.6	.035	.6	.035
PROBABLE COMBINATIONS				
Potassium chloride	2.1	.122	2.5	.146
Sodium chloride	6.6	.385	6.8	.397
Calcium sulphate	16.0	.933	12.9	.752
Calcium carbonate	13.6	.793	20.0	1.166
Magnesium chloride	2.9	.169	2.3	.134
Magnesium sulphate	----	----	.6	.035
Aluminum oxide	.4	.023	.8	.047
Ferrous carbonate	.9	.052	.9	.052
Silica	14.2	.828	12.9	.752
Total solids	56.7	3.305	59.8	3.481
Free carbon dioxide	103.4	6.030	71.7	4.182

[1] No. 1 is what is known as the Pine Tree Spring, and No. 2 is a spring about 200 yards from the Pine Tree Spring.

BROYLES MINERAL WELL

CATOOSA COUNTY

This well is located within the corporate limits of Ringgold only a few hundred yards west of the depot. It is a bored well 5 inches in diameter and 31 feet deep. The well was put down in 1902 by C. E. Broyles to secure water for household purposes. The water has an irony taste and throws down a yellowish-brown precipitate on standing.

ANALYSIS BROYLES MINERAL WELL

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	15.2	.887
Chlorine (Cl)	15.0	.875
Sulphur trioxide (SO_3)	11.0	.641
Carbon dioxide (CO_2)	273.1	15.927
Sodium oxide (Na_2O)	12.3	.717

Potassium oxide (K_2O)	1.1	.064
Lime (CaO)	124.7	7.272
Magnesia (MgO)	22.2	1.295
Alumina (Al_2O_3)	6.3	.267
Ferric oxide (Fe_2O_3)	14.3	.833
PROBABLE COMBINATIONS		
Potassium chloride	1.7	.099
Sodium chloride	23.3	1.358
Magnesium sulphate	16.5	.962
Magnesium carbonate	35.1	2.047
Calcium carbonate	222.7	12.987
Aluminum oxide	6.3	.267
Ferrous carbonate	20.7	1.207
Silica	15.2	.887
Total solids	341.5	19.841
Free carbon dioxide	108.9	6.351

CALHOUN SPRING

Montgomery County

This is a small chalybeate spring located in the eastern part of Montgomery County near Higgston station. The flows is less than one gallon per minute. The water has an irony taste and throws down upon standing a brownish-yellow precipitate. The spring is unimproved and only known locally as a mineral spring.

ANALYSIS CALHOUN SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	10.0	.583
Chlorine (Cl)	2.8	.163
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	26.0	1.516
Sodium oxide (Na_2O)	2.6	.152
Potassium oxide (K_2O)	trace	trace
Lime (CaO)	1.0	.058
Magnesia (MgO)	.2	.012
Alumina (Al_2O_3)	trace	trace
Ferric oxide (Fe_2O_3)	43.7	2.549

PROBABLE COMBINATIONS

Potassium chloride	trace	trace
Sodium chloride	4.7	.274
Sodium carbonate	.2	.012
Calcium carbonate	1.8	.105
Magnesium carbonate	.4	.023
Ferrous carbonate	68.7	4.017
Aluminum oxide	trace	trace
Silica	10.0	.583
Total solids	85.8	5.014
Free carbon dioxide	1.0	.058

CARTER'S MINERAL SPRING

GORDON COUNTY

Carter's Mineral Spring is located on what is known as Carter's Quarter in the eastern part of Gordon County, near Oakman, a station on the Louisville and Nashville Railroad. The spring is a small chalybeate spring furnishing less than one gallon per minute. It is romantically located in a deep hollow near the foothills of Cohutta Mountain and about three-fourths mile from the old Carter Mansion. There are no improvements, whatever, about the spring. The water is used only locally. Much iron oxide is to be seen in the drain trough which carries the water from the spring.

ANALYSIS CARTER'S MINERAL SPRING

Light alkaline-saline—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	28.3	1.650
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	22.0	1.283
Carbon dioxide (CO_2)	53.3	3.108
Soda (Na_2O)	13.0	.758
Potash (K_2O)	2.2	.128
Lime (CaO)	19.2	1.120
Magnesia (MgO)	5.3	.309
Alumina (Al_2O_3)	3.1	.181
Ferric oxide (Fe_2O_3)	8.5	.496

PROBABLE COMBINATIONS		
Potassium chloride	3.5	.204
Sodium chloride	4.4	.257
Sodium sulphate	23.6	1.376
Magnesium sulphate	13.1	.764
Calcium carbonate	34.3	2.000
Magnesium carbonate	1.9	.111
Aluminum oxide	3.1	.181
Ferrous carbonate	12.3	.717
Silica	28.3	1.650
Total solids	124.5	7.260
Free carbon dioxide	32.5	1.883

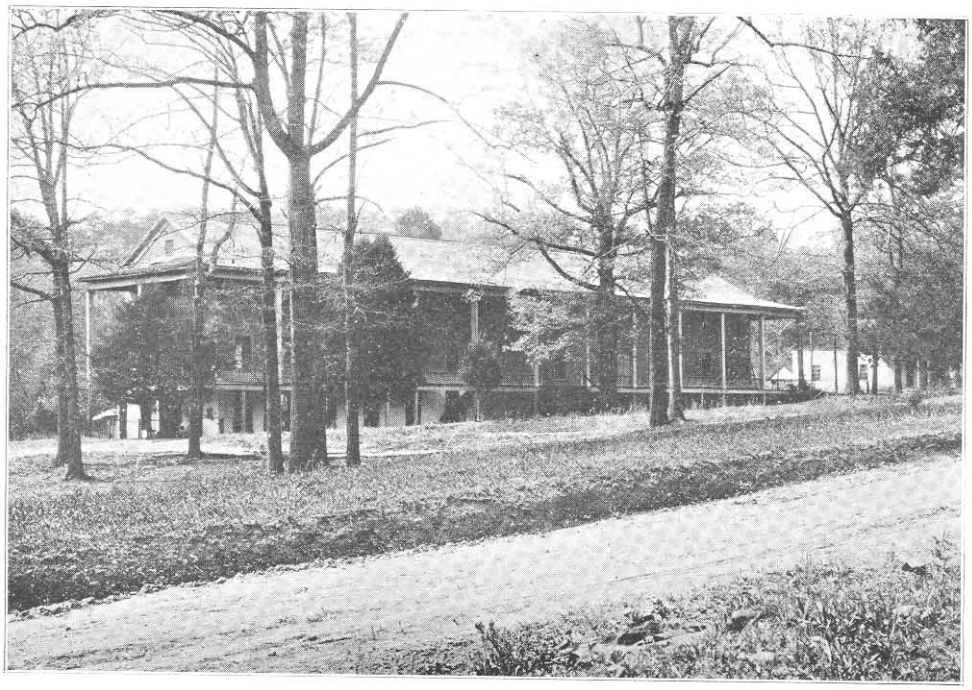
CASCADE SPRINGS

FULTON COUNTY

The Cascade Springs are on Cascade Avenue 6 miles southwest of Atlanta, being so called from a beautiful waterfall nearby. The location of the springs is quite picturesque, being situated in a deep rocky gulch surrounded by steep wooded hill slopes. On the hill-top nearby are a number of cottages and a small, neat, well arranged hotel for the accommodation of guests.

There are 2 of these springs, one of which is designated as No. 1, located the farthest up the branch and the other as No. 2. Spring No. 1 was originally much used and the water was sold more or less extensively in Atlanta as a pure drinking water. More recently this spring has been abandoned and spring No. 2 has been improved and is now in use. The latter spring is surrounded and protected by a nice stone spring house and retaining walls and is kept in excellent sanitary condition. It has a strong flow, furnishing about 5 gallons per minute. The Whitehall-West End car line extends to within 2½ miles of these springs.

A. CATOOSA MINERAL SPRINGS, CATOOSA COUNTY, GEORGIA



B. HOTEL, CATOOSA SPRINGS, CATOOSA COUNTY, GEORGIA

ANALYSES CASCADE SPRINGS
Neutral

CONSTITUENTS DETERMINED	No. 1		No. 2	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	25.5	1.487	20.0	1.166
Chlorine (Cl)	5.1	.297	4.2	.245
Sulphur trioxide (SO_3)	5.6	.327	3.7	.216
Carbon dioxide (CO_2)	58.8	3.429	44.0	2.566
Sodium oxide (Na_2O)	9.5	.554	4.2	.245
Potassium oxide (K_2O)	4.0	.233	3.6	.210
Lime (CaO)	4.9	.286	7.3	.426
Magnesia (MgO)	3.0	.175	4.2	.245
Alumina (Al_2O_3)	.8	.047	.7	.041
Ferric oxide (Fe_2O_3)	.7	.040	1.6	.093
PROBABLE COMBINATIONS				
Potassium chloride	6.30	.367	5.7	.332
Sodium chloride	3.50	.204	2.5	.146
Sodium sulphate	9.94	.580	6.5	.379
Sodium phosphate	.20	.012	----	----
Sodium carbonate	3.54	.206	----	----
Calcium carbonate	8.75	.510	13.0	.758
Magnesium carbonate	6.60	.385	10.0	.583
Aluminum oxide	.80	.047	.7	.041
Ferrous carbonate	----	----	2.3	.134
Ferric oxide	.70	.040	----	----
Silica	22.50	1.487	20.0	1.166
Total solids	65.83	3.838	70.7	2.539
Free carbon dioxide	49.90	2.910	36.0	2.099

CATOOSA SPRINGS

CATOOSA COUNTY

Catoosa Springs is one of the oldest watering places in the State. The Indians are said to have considered these waters of great medicinal value and when they were driven from the country it is reported that they endeavored to stop the flow of the springs by driving pegs in the fissure of the rock from which the water issued. This group of springs, 12 in number, is located in the eastern part

of Catoosa County, 4 miles east of Ringgold. The nearest railroad station, and the point at which the hacks meet the trains, is Catoosa Springs station, 2 miles east of the springs. The springs are all situated in a basin-like depression covering less than 2 acres. The surrounding country is broken and hilly. Some of the higher hills near the springs attain an altitude of 400 feet above the general level of the surrounding country. Originally there was a very large hotel at these springs which accommodated a large number of guests, but a few years ago the hotel was burned, so at present the improvements are limited to a number of cottages and a common dining hall. The springs are all small, none of them furnishing more than 3 or 4 gallons per minute.

A limited amount of water is shipped from these springs to Chattanooga and other points where it is sold chiefly as a mineral water.

ANALYSIS CATOOSA SPRINGS

Sulphated-magnesic-saline-calcic

CONSTITUENTS DETERMINED	1		2		3		4	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	18.15	1.058	31.00	1.808	70.00	4.082	16.75	.977
Sulphur trioxide (SO_3)	632.66	36.895	608.00	35.457	762.40	44.462	700.43	40.848
Carbon dioxide (CO_2)	122.70	7.156	138.28	8.064	181.40	10.579	125.87	7.340
Phosphorus pentoxide (P_2O_5)	trace	trace	trace	trace				
Chlorine (Cl)	7.00	.408	5.60	.327	4.90	.286	4.90	.286
Ferric oxide (Fe_2O_3)	2.91	.170	3.00	.175	3.40	.198	.60	.035
Alumina (Al_2O_3)	.22	.013	1.00	.058	1.00	.058	.60	.035
Lime (CaO)	412.00	24.027	424.80	24.773	482.40	28.133	408 25	23.809
Magnesia (MgO)	63.30	3.692	80.28	4.682	93.68	5.463	60.00	3.499
Potash (Na_2O)	5.90	.344	11.27	.657	7.57	.441	3.02	.177
Soda (K_2O)	4.02	.234	15.90	.927	16.96	.989	8.00	.467

PROBABLE COMBINATIONS	1		2		3		4	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Potassium chloride	9.33	.544	11.75	.685	10.14	.591	4.78	.279
Potassium sulphate	----	----	7.14	.416	2.00	117	----	----
Sodium chloride	3.52	.205	----	----	----	----	4.32	.252
Sodium sulphate	4.30	.251	36.41	2.123	42.07	2.453	13.08	.763
Sodium phosphate	trace	trace	trace	trace	----	----	----	----
Magnesium sulphate	189.90	11.075	240.84	14.045	281.04	16.390	180.00	10.497
Calcium sulphate	847.89	49.447	711.11	41.471	923.54	53.859	970.70	56.609
Calcium carbonate	112.26	6.547	212.98	12.421	182.36	10.635	15.27	890
Aluminum sulphate	3.79	.221	3.35	.195	3.35	.195	1.98	.115
Ferrous carbonate	4.22	.246	4.35	.254	6.46	.377	1.14	.067
Silica	18.15	1.058	31.00	1.808	70.00	4.082	16.75	.977
Total solids	1,193.36	69.594	1,258.93	73.418	1,520.96	88.699	1,203.02	70.449
Free carbon dioxide	73.31	4.275	44.58	2.600	101.16	5.899	58.69	3.42

1 Epsom Spring. 2 Coffee Spring 3 Buffalo Lithia Spring 4 Cosmetic Spring

2

CAVE SPRING

Floyd County

Cave Spring is a very large spring located in a beautiful grove within the corporate limits of Cave Springs. The flow has been estimated at 3,444,000 gallons per day. The water is used chiefly for domestic purposes. Within a few rods of the spring is a large cave which has given the spring its name.

ANALYSIS CAVE SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.3	.426
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	2.4	.140
Carbon dioxide (CO_2)	90.5	5.277

Sodium oxide (Na_2O)	2.6	.152
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	35.0	2.041
Magnesia (MgO)	18.7	1.089
Alumina (Al_2O_3)	1.5	.087
Ferric oxide (Fe_2O_3)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	1.3	.076
Sodium chloride	5.9	.344
Magnesium sulphate	3.6	.210
Magnesium carbonate	36.8	2.147
Calcium carbonate	62.5	3.645
Aluminum oxide	1.5	.087
Ferrous carbonate	trace	trace
Silica	7.3	.426
Total solids	118.9	6.935
Free carbon dioxide	43.8	2.555

CHALYBEATE SPRINGS

Meriwether County

These springs are located at the foot of Pine Mountain on the Atlanta, Birmingham and Atlantic Railroad within a few hundred yards of Chalybeate Springs station. They are situated on the edge of a beautiful meadow surrounded by a grove of large oaks. The springs, some years ago, were, the site of a noted summer resort, being much visited by people from Columbus, Macon and elsewhere. At present the springs seem to have somewhat lost their former popularity; nevertheless, they are still much visited and the water is also shipped to a limited extent. Accommodations may be had at private boarding houses and at hotels near the springs.

There are a number of springs at this resort, the analyses of only three of which are here given.

ANALYSES CHALYBEATE SPRINGS

Chalybeate

CONSTITUENTS DETERMINED	I		II		III	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	41.7	2.432	37.6	2.193	21.0	1.225
Chlorine (Cl)	5.2	.303	5.0	.292	3.0	.175
Sulphur trioxide (SO_3)	7.4	.432	7.0	.408	8.1	.469
Carbon dioxide (CO_2)	105.0	6.123	95.1	5.546	64.9	3.785
Sodium oxide (Na_2O)	12.4	.723	13.7	.799	4.2	.245
Potassium oxide (K_2O)	2.7	.157	2.6	.151	2.4	.140
Lime (CaO)	21.7	1.266	28.8	1.680	18.7	1.090
Magnesia (MgO)	10.0	.583	13.5	.787	10.6	.622
Alumina (Al_2O_3)	1.7	.099	.9	.052	.8	.046
Ferric oxide (Fe_2O_3)	4.0	.233	6.0	.350	4.8	.280
Manganous oxide (MnO)	----	----	----	----	.4	.023
PROBABLE COMBINATIONS						
Potassium chloride	2.4	.140	4.2	.245	3.8	.222
Sodium chloride	5.1	.297	4.9	.286	1.9	.104
Sodium sulphate	13.1	.764	13.2	.770	7.3	.423
Sodium carbonate	6.8	.397	8.0	.467	----	----
Calcium carbonate	38.7	2.257	51.4	2.997	30.8	1.195
Magnesium carbonate	21.0	1.225	28.4	1.656	18.2	1.060
Magnesium sulphate	----	----	----	----	6.0	.350
Aluminum oxide	1.7	.099	.9	.052	----	----
Aluminum sulphate	----	----	----	----	2.7	.157
Ferrous carbonate	5.8	.388	8.7	.507	6.9	.406
Manganese carbonate	----	----	----	----	.8	.046
Silica	41.7	2.432	37.6	2.193	21.0	1.225
Total	136.3	7.999	157.3	9.173	99.4	5.188
Free carbon dioxide	72.0	4.199	51.0	2.974	40.4	2.356

I Magnesia Spring II Sulphur Spring III Chalybeate Spring

CHAPPELL SPRING

MUSCOGEE COUNTY

Chappell Spring, which is locally considered to possess medicinal properties, is located on the side of the Southern Railroad about 2 miles northeast of Columbus. It is an unimproved spring furnishing several gallons per minute. The chief characteristic of the

water, from a mineralogical point of view, seems to be its low percentage of mineral matter present.

ANALYSIS CHAPPEL SPRING
Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.9	.286
Chlorine (Cl)	7.0	.408
Sulphur trioxide (SO_3)	1.2	.070
Carbon dioxide (CO_2)	31.0	1.808
Sodium oxide (Na_2O)	4.4	.257
Potassium oxide (K_2O)	1.1	.064
Lime (CaO)	1.5	.105
Magnesium oxide (MgO)	.3	.017
Alumina (Al_2O_3)	.9	.052
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	1.7	.099
Sodium chloride	8.3	.484
Calcium carbonate	2.7	.157
Magnesium chloride	1.6	.093
Magnesium sulphate	1.8	.105
Magnesium carbonate	1.3	.076
Aluminum oxide	.3	.017
Ferrous carbonate	1.4	.082
Silica	4.9	.286
Total solids	24.0	1.399
Free carbon dioxide	28.2	1.645

CHEROKEE SPRING

CATOOSA COUNTY

Cherokee Spring is a bold chalybeate spring located in a narrow valley at the western base of White Oak Mountain (Taylors Ridge), 2 miles east of Ringgold. The spring is said to have been much frequented by health seekers a few years ago, but of late years it is only occasionally visited. There are no improvements near the spring except a farm house. The water flows from a fissure in a dark shale and yields quite a copious precipitate of iron sesquioxide on standing.

ANALYSIS CHEROKEE SPRING

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	19.30	1.125
Chlorine (Cl)	4.90	.286
Sulphur trioxide (SO_3)	16.60	.937
Carbon dioxide (CO_2)	123.80	7.220
Sodium oxide (Na_2O)	5.60	.327
Potassium oxide (K_2O)	3.40	.198
Lime (CaO)	61.20	3.569
Magnesia (MgO)	3.60	.210
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	1.20	.070
Ferric oxide (Fe_2O_3)	15.20	.886
PROBABLE COMBINATIONS		
Potassium chloride	5.40	.315
Sodium chloride	3.84	.224
Sodium sulphate	8.18	.477
Magnesium sulphate	10.80	.630
Calcium sulphate	3.35	.195
Calcium carbonate	109.29	6.374
Aluminum sulphate	4.02	.234
Ferrous carbonate	22.04	1.285
Silica	19.30	1.125
Total solids	186.22	10.859
Free carbon dioxide	67.73	3.950

CLIFF ROCK SPRING

Fulton County

Cliff Rock Spring, which has recently been developed by T. H. McCrea at an outlay of above $5,000, is located within a few rods of the Roswell public road, 8 miles north of Atlanta. The spring is beautifully located in a deep picturesque gorge near the edge of a precipitous cliff which has given the spring its name. The improvements consist of a substantially and artistically constructed two-story spring house made of concrete; and also a packing or bottling house. Every precaution has been made to insure absolute sanitary conditions about both the spring and the packing house.

The spring furnishes approximately 1¼ gallons per minute. The water is used largely as a drinking water. About 200 gallons at present are sold daily to the various office buildings in Atlanta.

ANALYSIS CLIFF ROCK SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	20.0	1.166
Chlorine (Cl)	7.1	.414
Sulphur trioxide (SO_3)	1.0	.058
Carbon dioxide (CO_2)	15.0	.875
Sodium oxide (Na_2O)	4.0	.233
Potassium oxide (K_2O)	3.5	.204
Lime (CaO)	1.1	.064
Magnesia (MgO)	1.0	.058
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	6.7	.391
Sodium chloride	6.6	.385
Sodium sulphate	1.6	.093
Calcium carbonate	2.0	.116
Magnesium sulphate	1.4	.081
Aluminum oxide	.4	.023
Ferrous carbonate	1.4	.081
Silica	20.0	1.166
Total solids	40.1	2.336

COHUTTA SPRINGS

Murray County

Cohutta Springs, a summer resort of considerable importance, is located on the Louisville and Nashville Railroad in the northern part of Murray County. The main spring from which the resort takes its name, was known to the early settlers of Murray County, but it seemed not to have attracted much attention until about 50 years ago, at which time the first log cabin was built near the spring. Since that time the spring has been much visited in the summer by the people from Dalton and the surrounding country,

A. CASCADE SPRING, FULTON COUNTY, GEORGIA

B. CAVE SPRING, FLOYD COUNTY, GEORGIA

who in some cases have constructed small cottages near the spring for the accommodation of their families. These cottages, together with 2 or 3 small boarding houses, constituted practically all of the improvements in the immediate vicinity of the spring at the time of the writers visit.

From a scenic point of view, Cohutta Spring is most favorably located. It is within less than 3 miles of Grassy Mountain, which has an elevation of nearly 4,000 feet above sea level and is within a short walk of some very picturesque gorges and beautiful water falls.

The spring furnishes 3 gallons per minute and upon standing the water throws down quite a precipitate of brownish-colored iron oxide.

ANALYSIS COHUTTA SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Salica (SiO_2)	15.00	.875
Chlorine (Cl)	7.00	.408
Sulphur trioxide (SO_3)	6.53	.381
Carbon dioxide (CO_2)	28.00	1.633
Sodium oxide (Na_2O)	7.09	.413
Potassium oxide (K_2O)	2.05	.120
Lime (CaO)	5.81	.339
Magnesia (MgO)	3.20	.187
Ferric oxide (Fe_2O_3)	10.44	.609
Alumina (Al_2O_3)	1.25	.073
PROBABLE COMBINATIONS		
Potassium chloride	3.25	.190
Sodium chloride	8.98	.524
Sodium sulphate	5.34	.311
Magnesium sulphate	.87	.051
Magnesium carbonate	6.11	.356
Calcium carbonate	10.37	.605
Aluminum sulphate	4.19	.244
Ferrous carbonate	15.14	.883
Silica	15.00	.875
Total solids	69.25	4.039
Free carbon dioxide	14.51	.846

COLD SPRING

MERIWETHER COUNTY

This spring is located at the base of Pine Mountain only a short distance from Bullochville. The spring is one of the largest in the State, having a daily capacity of 2,916,000 gallons. At present the spring is the site of a United States Fish Hatchery. The water escapes to the surface in a number of "boils" which continuously agitate the white sand that covers the bottom of the large artificial basin. This basin is surrounded by a substantial wall of masonry. Escaping with the water from the various "boils" there is to be seen from time to time bubbles of air rising from the water.

Cold spring is probably so-called on account of the contrast in temperature of its water with the tempreature of the water of Warm Spring. The two springs are less than a mile apart, yet there is a difference of approximately 25° in the temperatures of their waters.

ANALYSIS COLD SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	10.10	.589
Chlorine (Cl)	4.76	.278
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	57.60	3.359
Sodium oxide (Na_2O)	9.54	.556
Potassium oxide (K_2O)	1.64	.096
Lime (CaO)	1.00	.058
Magnesia (MgO)	1.30	.076
Phosphorus pentoxide (P_2O_5)	none	none
Alumina (Al_2O_3)	.10	.006
Ferric oxide (Fe_2O_3)	1.40	.082
PROBABLE COMBINATIONS		
Potassium chloride	2.59	.151
Sodium chloride	5.80	.338
Sodium sulphate	trace	trace
Sodium carbonate	11.06	.645
Magnesium carbonate	2.73	.159
Calcium carbonate	1.80	.105
Aluminum oxide	.10	.006

Ferrous carbonate	2.03	.118
Silica	10.10	.589
Total solids	36.21	2.111
Free carbon dioxide	50.00	2.916

COX MINERAL SPRING

BURKE COUNTY

The Cox Mineral Spring is in the eastern part of Burke County 9 miles northeast of Waynesboro and 1½ miles north of Shell Bluff post office. It is situated in a grove near a small branch. The only improvement near the spring, when the writer visited it, was a small dancing pavilion. The spring was well protected by a substantial brick curbing. Water from this spring, in the last few years, has been shipped to Augusta, Savannah, and other points. The flow is 6 gallons per minute. The water is said to be used both for table and medicinal purposes.

ANALYSIS COX MINERAL SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.4	.432
Chlarine (Cl)	5.2	.303
Sulphur trioxide (SO_3)	.4	.023
Carbon dioxide (CO_2)	115.9	6.759
Sodium oxide (Na_2O)	2.2	.128
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	70.6	4.117
Magnesia (MgO)	2.2	.128
Alumina (Al_2O_3)	.3	.017
Ferric oxide (Fe_2O_3)	.4	.023
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	4.1	.239
Magnesium chloride	2.7	.157
Magnesium sulphate	.6	.035
Magnesium carbonate	3.4	.198
Calcium carbonate	126.1	7.354
Aluminum oxide	.3	.017

Ferrous carbonate	.6	.035
Silica	7.4	.432
Total solids	146.7	8.554
Free carbon dioxide	58.6	3.417

DANIEL MINERAL SPRING

GREENE COUNTY

Daniel Mineral Spring is regarded by many persons as one of the most important mineral springs in the State. It is located in the eastern part of Greene County, 7 miles northeast of Union Point. The spring has long been known, but it is only in recent years that the water has been put on the market. The chief points of shipment, up to the present, have been Atlanta and Augusta. With the exception of one or two small cottages, there are no accommodations for guests. The spring is beautifully located in a lovely grove near the bank of a small stream.

ANALYSIS DANIEL MINERAL SPRING

Sulphated-saline-magnesic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Salica (SiO_2)	43.20	2.519
Chlorine (Cl)	7.50	.437
Sulphur trioxide (SO_3)	933.60	54.446
Carbon dioxide (CO_2)	95.40	5.564
Sodium oxide (Na_2O)	44.40	2.589
Potassium oxide (K_2O)	5.00	.292
Lime (CaO)	636.90	36.781
Magnesia (MgO)	56.30	3.283
Alumina (Al_2O_3)	.50	.029
Ferric oxide (Fe_2O_3)	1.00	.058
Phosphorus pentoxide (P_2O_5)	.20	.012
Lithia (Li_2O)	trace	trace
PROBABLE COMBINATIONS		
Lithium chloride	trace	trace
Potassium chloride	7.92	.462
Sodium chloride	6.14	.360
Sodium sulphate	94.25	5.497
Sodium phosphate	.40	.023
Magnesium sulphate	168.60	9.832
Calcium sulphate	1,305.10	76.111
Calcium carbonate	177.70	10.363
Aluminum sulphate	2.18	.127

Ferrous carbonate	2.90	.169
Silica	43.20	2.519
Total solids	1,808.39	105.463
Free carbon dioxide	26.00	1.516

DEFORE SPRING

Twiggs County

This is a small, apparently unimportant spring, located on lot 74, 28th district, Twiggs County, near Dry Branch. The flow is small, but non-failing. There are no improvements. The water is used chiefly for domestic purposes.

ANALYSIS DEFORE SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	10.0	.583
Chlorine (Cl)	16.0	.933
Sulphur trioxide (SO_3)	3.2	.187
Carbon dioxide (CO_2)	52.0	3.033
Sodium oxide (Na_2O)	14.0	.816
Potassium oxide (K_2O)	3.7	.216
Lime (CaO)	5.7	.332
Magnesia (MgO)	2.5	.146
Alumina (Al_2O_3)	2.4	.140
Ferric oxide (Fe_2O_3)	3.0	.175
PROBABLE COMBINATIONS		
Potassium chloride	5.9	.344
Sodium chloride	21.8	1.272
Sodium sulphate	5.8	.338
Magnesium carbonate	5.2	.303
Calcium carbonate	10.2	.595
Ferrous carbonate	4.3	.251
Aluminum oxide	2.4	.140
Silica	10.0	.583
Total solids	65.6	6.826
Free carbon dioxide	43.2	2.524

DEMOREST SPRINGS

Habersham County

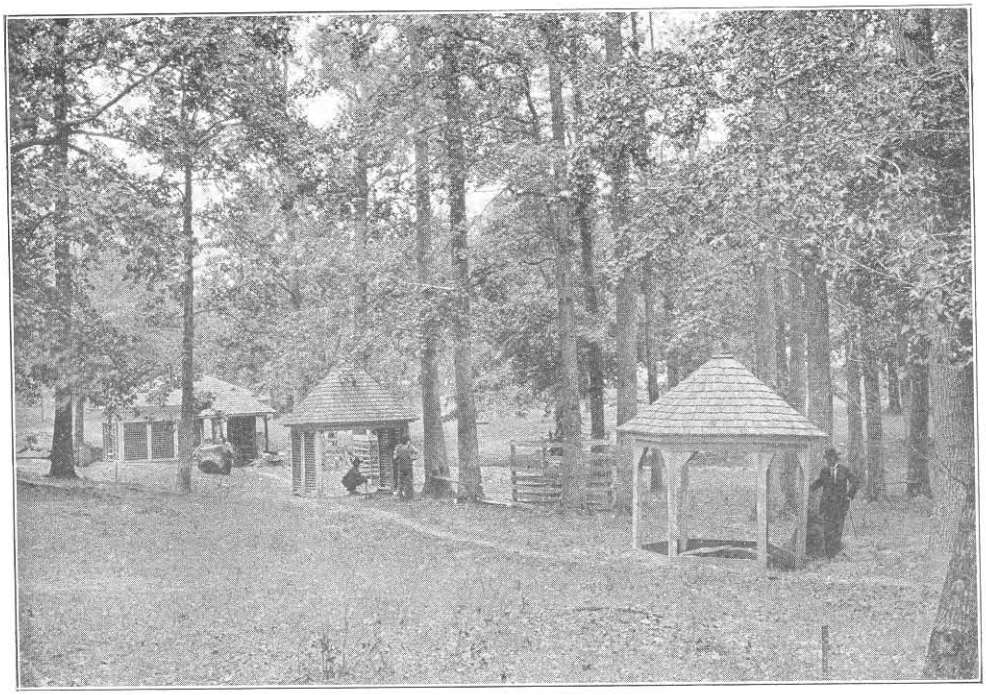
This group of springs, 6 in number, is located in a beautiful park near the center of the town of Demorest. They are all within

a few feet of each other and are all protected by a common wall of concrete. Immediately above each spring in the concrete wall is a metallic plate bearing the name of the spring, which is given from the supposed leading mineral property of the water. All of the springs furnish a strong flow. The waters from these springs are used for general domestic supply for the town and also by summer visitors, some of whom claim to be benefited by the use of the waters.

The analyses of 2 of the waters of these springs, namely, "Freestone Magnesia" and "Freestone Lithia" are here given.

ANALYSES DEMOREST SPRINGS
Neutral

CONSTITUENTS DETERMINED	FREESTONE MAGNESIA		FREESTONE LITHIA	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	9.6	.560	10.0	.583
Chlorine (Cl)	4.6	.268	4.6	.268
Sulphur trioxide (SO_3)	2.3	.134	7.0	.408
Carbon dioxide (CO_2)	17.0	.991	20.0	1.116
Sodium oxide (Na_2O)	3.2	.187	4.7	.274
Potassium oxide (K_2O)	1.1	.064	2.4	.140
Lime (CaO)	2.8	.163	3.4	.198
Magnesia (MgO)	1.3	.076	2.0	.117
Alumina (Al_2O_3)	2.8	.163	2.0	.117
Ferric oxide (Fe_2O_3)	2.8	.163	2.3	.134
Lithia (Li_2O)	none	none	none	none
PROBABLE COMBINATIONS				
Potassium chloride	2.0	.117	4.2	.245
Sodium chloride	6.0	.350	3.9	.227
Sodium sulphate	----	----	6.2	.362
Calcium carbonate	5.0	.291	6.0	.350
Magnesium carbonate	.5	.029	.8	.047
Magnesium sulphate	2.9	.169	5.2	.303
Aluminum oxide	2.8	.163	2.0	.117
Ferrous carbonate	4.1	.239	3.3	.192
Silica	9.6	.560	10.0	.583
Total solids	32.9	1.918	41.6	2.426
Free carbon dioxide	11.6	.676	14.0	.816



A. CHALYBEATE SPRINGS, MERIWETHER COUNTY, GEORGIA

B. CLIFF ROCK SPRING, FULTON COUNTY, GEORGIA

DIXON SULPHUR SPRING

WILKINSON COUNTY

This spring, formerly known as Myrtle Spring and more recently as Cannon Spring, is located within a few rods of the Central of Georgia Railway about 1 mile from Toomsboro. The spring has long been known as a mineral spring and at one time had quite a reputation, but for want of improvements it has apparently lost its former reputation and is but little used. The water is said to have a distinct odor of sulphuretted hydrogen. The flow is 3 gallons per minute. There is no improvement at present for the accommodation of guests.

ANALYSIS DIXON SULPHUR SPRING

Alkaline-saline-calcic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	21.0	1.224
Chlorine (Cl)	10.0	.583
Sulphur trioxide (SO_3)	12.0	.700
Carbon dioxide (CO_2)	44.3	2.583
Sodium oxide (Na_2O)	5.4	.315
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	21.3	1.242
Magnesia (MgO)	3.3	.192
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	1.0	.058
Sodium chloride	10.4	.606
Calcium sulphate	11.9	.693
Calcium carbonate	29.2	1.703
Magnesium sulphate	4.5	.262
Magnesium chloride	4.4	.257
Aluminum oxide	.8	.047
Ferrous carbonate	1.5	.087
Silica	21.0	1.224
Total solids	87.4	4.937
Free carbon dioxide	26.0	1.516

DUCKETT SPRING

Whitfield County

Duckett Spring is located on Lot 210, 12th district, Whitfield County about 5 miles due east of Dalton, the nearest railroad station. The spring is said to be of medium size and to furnish water having a faint odor of sulphuretted hydrogen. There are no improvements. The water is used chiefly for domestic purposes, but it is supposed by its owner to have medicinal properties.

ANALYSIS DUCKETT SPRING

Alkaline-calcic. Carbonated

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	9.0	.525
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	1.2	.070
Carbon dioxide (CO_2)	200.0	11.664
Sodium oxide (Na_2O)	3.8	.222
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	64.0	3.732
Magnesia (MgO)	35.0	2.041
Alumina (Al_2O_3)	2.1	.122
Ferric oxide (Fe_2O_3)	1.2	.070
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	5.4	.315
Sodium sulphate	2.0	.116
Calcium carbonate	114.0	6.648
Magnesium carbonate	88.5	5.161
Ferrous carbonate	1.7	.099
Aluminum oxide	2.1	.122
Silica	9.0	.525
Total solids	224.2	13.073
Free carbon dioxide	110.0	64.415

DUKE SPRING

Polk County

Duke Spring is located on lot 146, 1st district, Polk County, about 3 miles north of Dugdown, the nearest railroad station. There are said to be 14 different springs at this place within an

area covering less than a half acre. The spring from which water was taken for analysis is reported to furnish 5 gallons per minute. The improvements consist of a small hotel of 12 rooms and a bath house. A limited amount of the water is sold, but it is used chiefly at the hotel for drinking and general domestic purposes.

ANALYSIS DUKE SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.3	.775
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	13.6	.793
Carbon dioxide (CO_2)	103.2	6.019
Sodium oxide (Na_2O)	7.1	.414
Potassium oxide (K_2O)	1.3	.076
Lime (CaO)	49.1	2.864
Magnesia (MgO)	15.0	.875
Phosphorus pentoxide (P_2O_5)	.1	.006
Alumina (Al_2O_3)	4.0	.233
Ferric oxide (Fe_2O_3)	1.6	.093
PROBABLE COMBINATIONS		
Potassium chloride	2.1	.122
Sodium chloride	4.1	.239
Sodium phosphate	.2	.012
Sodium sulphate	11.4	.664
Calcium carbonate	87.7	5.114
Magnesium carbonate	27.5	1.604
Magnesium sulphate	10.8	.630
Ferrous carbonate	2.3	.134
Aluminum oxide	4.0	.233
Silica	13.3	.775
Organic and volatile matter	68.0	3.966
Total solids	231.4	13.493
Free carbon dioxide	53.2	3.103

EADY MINERAL SPRING

Heard County

This spring is on Mill Creek in the northeastern part of Heard County only a short distance from the Chattahoochee River. The location of the spring is quite picturesque, being situated in a

mountainous-like section and near the beautiful falls on Mill Creek. Some years ago the spring is said to have had quite a local reputation as a health resort, but at present it is only occassionally visited. No improvements are near the spring except a small cabin and a mill-house. The flow is only about 1 gallon per minute. The water has a faint odor of sulphuretted hydrogen and yields upon standing a light brownish precipitate.

ANALYSIS OF EADY MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	10.50	.612
Chlorine (Cl)	6.65	.388
Sulphur trioxide (SO_3)	1.45	.085
Carbon dioxide (CO_2)	45.57	2.658
Sodium oxide (Na_2O)	9.40	.548
Potassium oxide (K_2O)	3.47	.202
Lime (CaO)	3.65	.213
Magnesia (MgO)	trace	trace
Ferric oxide (Fe_2O_3)	8.50	.496
Alumina (Al_2O_3)	.25	.015
Manganous oxide (MnO)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	5.50	.321
Sodium chloride	6.64	.387
Sodium sulphate	2.57	.150
Sodium carbonate	8.14	.475
Calcium carbonate	6.52	.380
Magnesium carbonate	trace	trace
Aluminum sulphate	.78	.045
Ferrous carbonate	12.32	.719
Manganese carbonate	trace	trace
Silica	10.50	.612
Total	52.97	3.089
Free carbon dioxide	34.65	2.020

ELECTRIC LITHIA WELL

TALLIAFERRO COUNTY

This well is located at Hillman, only a short distance from Argon Spring previously described. The well is said to furnish

about 30 gallons per hour. The water is mainly used by the guests who visit the so-called electric rock near by. A small amount is also shipped.

ANALYSIS ELECTRIC LITHIA WELL

Light alkaline-saline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.6	.443
Chlorine (Cl)	3.0	.175
Sulphur trioxide (SO_3)	16.6	.968
Carbon dioxide (CO_2)	47.0	2.741
Sodium oxide (Na_2O)	8.1	.472
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	13.4	.781
Magnesia (MgO)	8.3	.484
Alumina (Al_2O_3)	2.4	.140
Ferric oxide (Fe_2O_3)	2.9	.169
Nitric acid radical (NO_3)	.2	.011
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	3.9	.227
Sodium sulphate	14.0	.816
Sodium nitrate	.3	.017
Calcium carbonate	24.0	1.400
Magnesium sulphate	14.4	.840
Magnesium carbonate	7.3	.425
Aluminum oxide	2.4	.140
Ferrous carbonate	4.2	.245
Silica	7.6	.443
Total solids	79.3	4.640
Free carbon dioxide	25.0	1.458

EVERETT SPRING

Floyd County

Everett Spring is in the extreme northern part of Floyd County, about 6 miles west of Reeves, a station on the Southern Railway. It is located in a narrow, picturesque valley between Horn and John mountains, near the highway leading from Armuchee Valley to Rome. The spring is of local reputation only, and has no improvements near, except a farm house and a small country store.

The water emerges as a stream from the Carboniferous shale. The flow, which is said to be but little effected by the seasons, is less than one gallon per minute.

ANALYSIS EVERETT SPRING

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	20.50	1.196
Chlorine (Cl)	10.20	.595
Sulphur trioxide (SO_3)	8.86	.517
Carbon dioxide (CO_2)	131.00	7.640
Sodium oxide (Na_2O)	11.82	.689
Potassium oxide (K_2O)	2.83	.165
Lime (CaO)	90.40	9.272
Magnesia (MgO)	12.20	.711
Phosphorus pentoxide (P_2O_5)	trace	trace
Arsenic (As)	trace	trace
Manganese (MnO)	trace	trace
Alumina (Al_2O_3)	3.40	.198
Ferric oxide (Fe_2O_3)	7.20	.420
PROBABLE COMBINATIONS		
Potassium chloride	4.48	.261
Sodium chloride	13.28	.780
Sodium phosphate	trace	trace
Sodium arsenate	trace	trace
Sodium sulphate	1.52	.089
Sodium carbonate	7.04	.411
Magnesium carbonate	25.62	1.494
Calcium carbonate	161.03	9.311
Aluminum sulphate	11.40	.665
Ferrous carbonate	10.44	.609
Manganese carbornate	trace	trace
Silica	20.50	1.196
Total solids	255.31	14.816
Free carbon dioxide	39.67	2.314

FLEMING SPRING

FRANKLIN COUNTY

Fleming Spring, which is located about 600 yards south of the depot at Cannon, is a small spring furnishing 1¼ gallons per minute. The water has an iron taste and yields, upon standing, a

yellowish precipitate. The spring is unimproved, but locally it has a reputation as a mineral spring.

ANALYSIS FLEMING SPRING
Light alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	31.0	1.808
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	6.7	.391
Carbon dioxide (CO_2)	42.6	2.484
Sodium oxide (Na_2O)	10.3	.600
Potassium oxide (K_2O)	3.3	.192
Lime (CaO)	12.2	.712
Magnesia (Mgo)	7.2	.420
Alumina (Al_2O_3)	2.2	.128
Ferric oxide (Fe_2O_3)	4.4	.257
PROBABLE COMBINATIONS		
Potassium chloride	5.2	.303
Sodium chloride	1.6	.093
Sodium sulphate	11.9	.694
Sodium carbonate	7.3	.426
Calcium carbonate	21.8	1.272
Magnesium carbonate	15.1	.880
Ferrous carbonate	6.4	.373
Aluminum oxide	2.2	.128
Silica	31.0	1.808
Total solids	102.5	5.977
Free Carbon dioxide	19.7	1.490

FLOYD SPRINGS

Floyd County

Floyd Springs are situated near the southern terminus of John Mountain in the northern part of Floyd County. The nearest railroad station is Plainville on the Southern Railway about 7 miles distant. These springs have been long known and originally they were much frequented. There is now no improvement and no accommodations for guests at the springs.

The main spring, from which water was taken for analysis, is a small spring furnishing only a few gallons per minute. This

spring, at the time the sample of water was collected, was the only spring in general use.

ANALYSIS OF FLOYD SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	27.8	1.621
Chlorine (Cl)	10.5	.611
Sulphur trioxide (SO_3)	24.1	1.406
Carbon dioxide (CO_2)	185.2	10.800
Sodium oxide (Na_2O)	26.5	1.545
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	96.0	5.599
Magnesia (MgO)	11.2	.652
Alumina (Al_2O_3)	6.7	.391
Ferric oxide (Fe_2O_3)	2.4	.140
PROBABLE COMBINATIONS		
Potassium chloride	1.2	.070
Sodium chloride	16.3	.951
Sodium sulphate	40.5	2.362
Mangesium sulphate	1.9	.111
Magnesium carbonate	23.5	1.370
Calcium carbonate	171.4	9.995
Aluminum oxide	6.7	.391
Ferrous carbonate	3.5	.204
Silica	27.8	1.621
Total solids	292.8	17.075
Free carbon dioxide	88.4	5.155

FOWLER SPRING

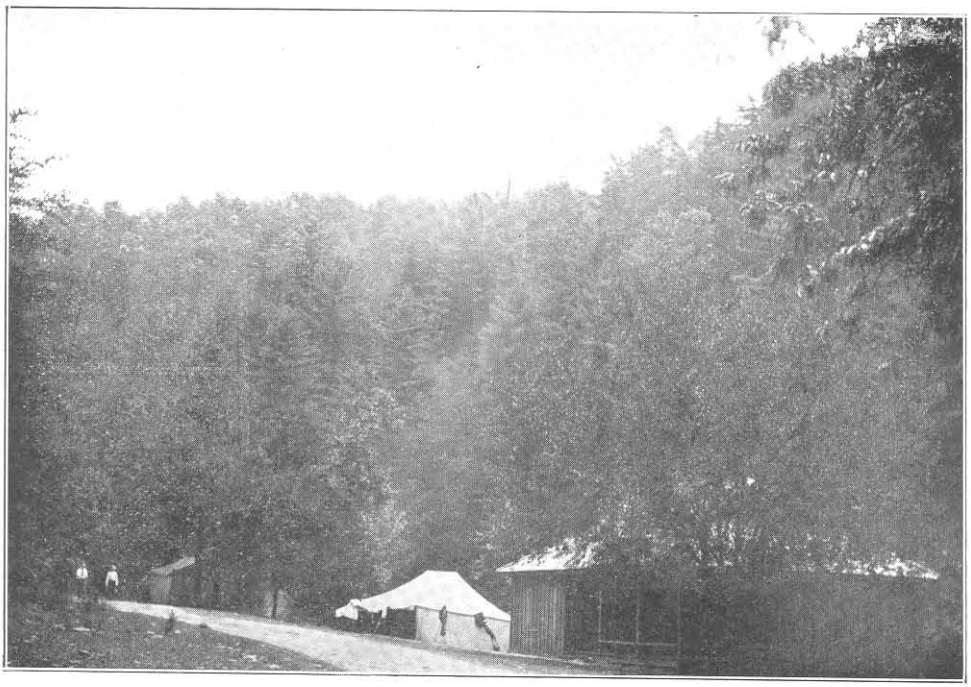
Meriwether County

Fowler Spring, which has a local reputation as possessing medicinal properties, is located near the Southern Railway in the southeastern part of Meriwether County, about 2½ miles north of Bullochville. It is a small unimproved spring, furnishing only about 1 gallon per minute.

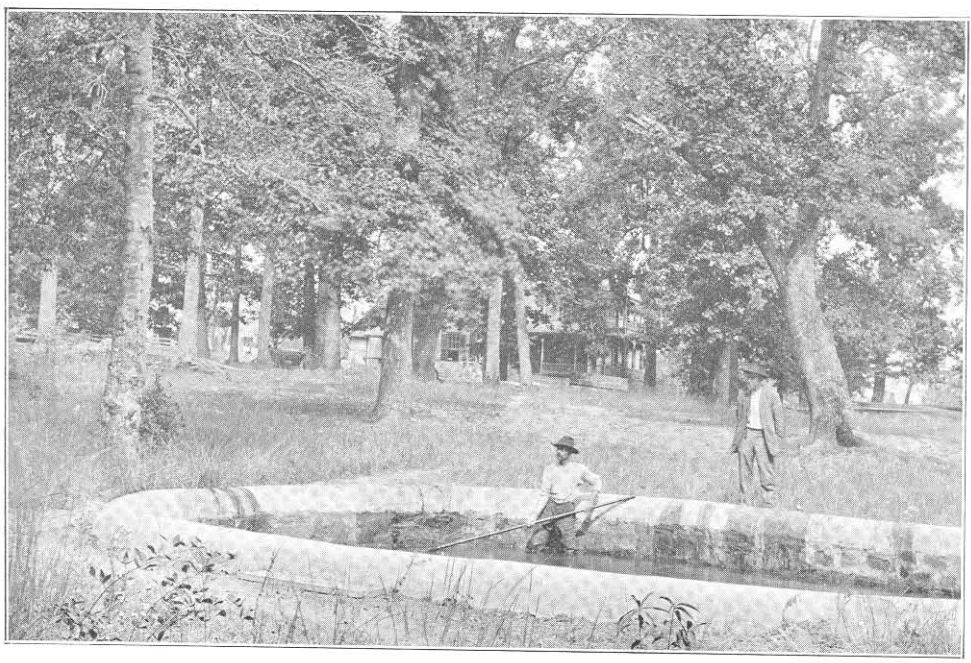
ANALYSIS FOWLER SPRING

Light alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	41.2	2.403
Chlorine (Cl)	7.0	.408



A. COHUTTA SPRINGS, MURRAY COUNTY, GEORGIA



B. COLD SPRING, MERIWETHER COUNTY, GEORGIA

Sulphur trioxide (SO_3)	3.7	.216
Carbon dioxide (CO_2)	83.3	4.857
Sodium oxide (Na_2O)	15.2	.887
Potassium oxide (K_2O)	3.2	.187
Lime (CaO)	18.6	1.085
Magnesia (MgO)	6.4	.373
Alumina (Al_2O_3)	.7	.041
Ferric oxide (Fe_2O_3)	2.0	.116
PROBABLE COMBINATIONS		
Potassium chloride	5.2	.303
Sodium chloride	7.5	.437
Sodium sulphate	6.6	.385
Sodium carbonate	14.3	.833
Calcium carbonate	33.2	1.936
Magnesium carbonate	13.4	.781
Aluminum oxide	.7	.041
Ferrous carbonate	2.9	.169
Silica	41.2	2.403
Total solids	125.0	7.288
Free Carbon dioxide	54.6	3.184

FRANKLIN SPRING

FRANKLIN COUNTY

Franklin Spring is in the extreme southeastern part of Franklin County, about 9 miles southeast of Carnesville, the county site. The nearest railway station is Royston, on the Elberton Air Line, a branch of the Southern Railway, 2 miles distant. The spring is a rather bold chalybeate spring, located in a deep hollow near the public road leading from Royston to Danielsville. It is said that this spring has had quite a reputation as a resort as far back as the oldest citizens can remember. The improvements consist of a few cottages and a small hotel. The water, as it flows from the spring, forms quite a precipitate of reddish-brown iron sesqui-oxide. It appears to come to the surface through fissures in the mica schist, the prevailing rock of the region. The flow is about 3 gallons per minute.

ANALYSIS FRANKLIN SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	34.40	2.006
Chlorine (Cl)	6.12	.357

Sulphur trioxide (SO_3)	8.24	.481
Carbon dioxide (CO_2)	77.80	4.957
Sodium oxide (Na_2O)	14.84	.865
Potassium oxide (K_2O)	3.52	.205
Lime (CaO)	4.30	.257
Magnesia (MgO)	3.75	.219
Phosphorus pentoxide (P_2O_5)	trace	trace
Manganous oxide (MnO)	.30	.017
Alumina (Al_2O_3)	.40	.023
Ferric oxide (Fe_2O_3)	12.00	.700
PROBABLE COMBINATIONS		
Potassium chloride	5.58	.325
Sodium chloride	5.70	.332
Sodium sulphate	12.96	.756
Sodium carbonate	10.53	.614
Magnesium carbonate	7.87	.459
Calcium carbonate	7.68	.448
Manganese carbonate	.48	.028
Aluminum sulphate	1.34	.078
Ferrous carbonate	17.40	1.015
Silica	34.40	2.006
Total solids	103.94	6.061
Free Carbon dioxide	65.75	3.834

FREEMAN SPRING

Gordon County

Freeman spring is in the eastern part of Gordon County, about 2 miles from Granger Station on the Louisville and Nashville Railroad. It is located in the quartzite hills on what is known as the Freeman plantation, about one-half mile east of the Tennessee public road. The spring is an unimproved chalybeate spring flowing about 1 gallon per minute. It has quite a local reputation as a medicinal spring. The water after standing throws down a considerable precipitate of iron oxide.

ANALYSIS FREEMAN SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	20.6	1.201
Chlorine (Cl)	7.0	.408

Sulphur trioxide (SO_3)	20.9	1.218
Carbon dioxide (CO_2)	101.0	5.890
Soda (Na_2O)	8.3	.484
Potash (K_2O)	.4	.023
Lime (CaO)	43.8	2.555
Magnesia (MgO)	15.2	.886
Alumina (Al_2O_3)	1.0	.059
Ferric oxide (Fe_2O_3)	3.8	.222
PROBABLE COMBINATIONS		
Potassium chloride	.6	.037
Sodium chloride	11.1	.646
Sodium sulphate	5.3	.309
Magnesium sulphate	26.9	1.568
Magnesium carbonate	13.2	.770
Calcium carbonate	78.2	4.560
Aluminum oxide	1.0	.059
Ferrous carbonate	5.5	.320
Silica	20.6	1.201
Total solids	162.4	9.470
Free carbon dioxide	57.5	3.353

FULLER SULPHUR SPRING

Gordon County

This spring is located in the extreme southeastern corner of Gordon County 3 miles east of Fairmount, a station on the Louisville and Nashville Railroad. It is a small sulphur spring furnishing 3 gallons per minute. The water has a distinct odor of sulphuretted hydrogen and a "gun powder" taste. The only improvements near the spring is a farm house where occasionally a few summer boarders are taken. The spring is beautifully located in a grove of oaks and other hard wood trees. It has only a local reputation.

ANALYSIS FULLER SULPHUR MINERAL SPRING

Alkaline-calcic—Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	17.8	1.038
Chlorine (Cl)	8.5	.496
Sulphur trioxide (SO_3)	8.1	.472
Carbon dioxide (CO_2)	132.0	7.698
Sodium oxide (Na_2O)	16.6	.968

Potassium oxide (K_2O)	4.5	.262
Lime (CaO)	58.8	3.429
Magnesia (MgO)	9.3	.542
Alumina (Al_2O_3)	1.4	.082
Ferric oxide (Fe_2O_3)	1.6	.093
PROBABLE COMBINATIONS		
Potassium chloride	7.2	.420
Sodium chloride	8.4	.490
Sodium sulphate	14.4	.836
Sodium carbonate	10.1	.587
Calcium carbonate	105.0	6.124
Magnesium carbonate	19.5	1.137
Aluminum oxide	1.4	.082
Ferrous carbonate	2.3	.134
Silica	17.8	1.038
Total solids	186.1	10.848
Free carbon dioxide	70.5	4.292

GARNET SPRING

STEPHENS COUNTY

Garnet Spring is in the western part of Stephens County about 1½ miles west of Toccoa, the county site, and within three-fourths mile of Toccoa Falls, one of Georgia's most noted waterfalls. The spring has been known for nearly 40 years and its water used locally for its supposed medicinal properties. The water from this spring is also used to a limited extent by the guests at Haddocks Inn,[1] a well-known summer hotel situated within a few hundred yards of Toccoa Falls. With the exception of a stone curbing the spring is unimproved. The flow is about 2 gallons per minute. The water has a faint odor of sulphuretted hydrogen and leaves a slight whitish precipitate where it flows from the stone curbing.

ANALYSIS GARNET SPRING

Alkaline-calcic—Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	27.10	1.580
Chlorine (Cl)	5.25	.306

[1] Since the above was written the Inn has been burned.

Sulphur trioxide (SO_3)	10.00	.583
Carbon dioxide (CO_2)	72.60	4.234
Soda (Na_2O)	8.48	.495
Potash (K_2O)	2.60	.152
Lime (CaO)	24.30	1.417
Magnesia (MgO)	9.04	.527
Alumina (Al_2O_3)	.40	.023
Ferric oxide (Fe_2O_3)	2.20	.128
Phosphorus pentoxide (P_2O_5)	trace	trace
Manganous oxide (MnO)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	4.11	.240
Sodium chloride	5.37	.313
Sodium sulphate	12.89	.752
Sodium phosphate	trace	trace
Magnesium sulphate	4.11	.240
Magnesium carbonate	16.11	.939
Calcium carbonate	43.40	2.531
Manganese carbonate	trace	trace
Aluminum sulphate	1.35	.079
Ferrous carbonate	3.19	.186
Silica	27.10	1.580
Total solids	117.63	6.860
Free carbon dioxide	43.85	2.557

GASKIN SPRING

COFFEE COUNTY

This spring is 1½ miles north of Douglas, the county site of Coffee County. The improvements consist of a pavilion and a bath house. It is much frequented by parties from Douglas. The flow is about 10 gallons per minute. It is claimed by some that the water possesses medicinal virtues, but the analysis shows that it is unusually free from mineral matter. The large amount of organic matter present would seem to indicate that the spring is not properly protected.

ANALYSIS GASKIN SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	5.6	.326
Chlorine (Cl)	6.3	.367

Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	12.0	.700
Sodium oxide (Na_2O)	2.7	.157
Potassium oxide (K_2O)	.3	.017
Lime (CaO)	.6	.034
Magnesia (MgO)	1.3	.076
Alumina (Al_2O_3)	trace	trace
Ferric oxide (Fe_2O_3)	.0	.000
PROBABLE COMBINATIONS		
Potassium chloride	.4	.023
Sodium chloride	5.1	.297
Calcium chloride	2.3	.134
Magnesium chloride	3.2	.186
Aluminum oxide	trace	trace
Silica	5.6	.326
Total solids	16.6	.966
Free carbon dioxide	12.0	.700
Organic matter	17.0	.991

GEORGIA MINERAL SPRING

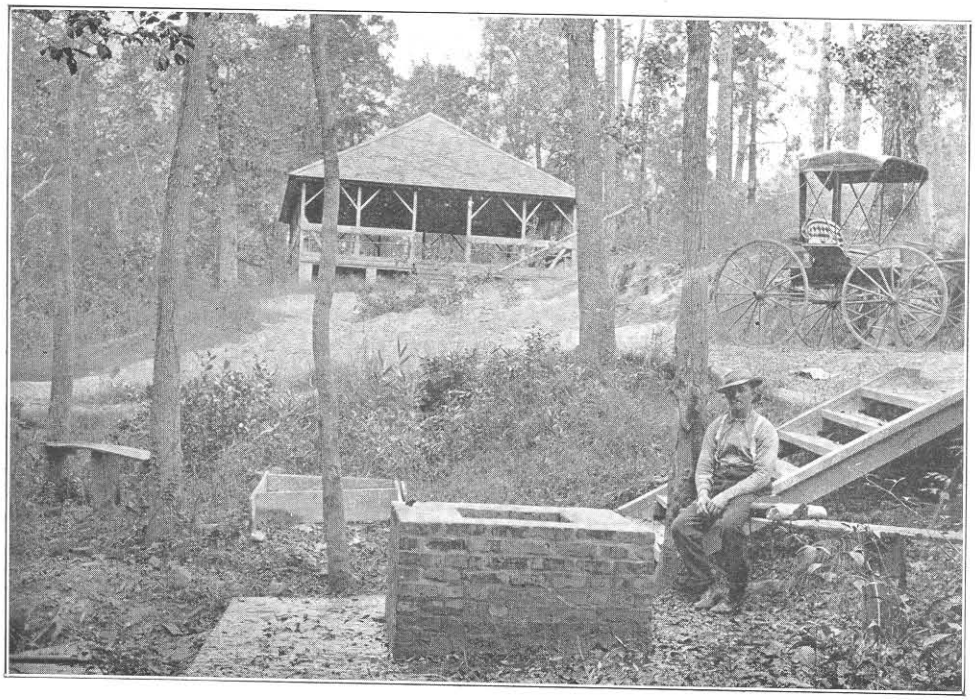
Catoosa County

This is a rather large spring located on the public highway between Ringgold and Chickamauga Park. It was improved a few years ago with a view of making it a pleasure resort. It is reported that a limited amount of the water from this spring has been put on the market in Chattanooga as a mineral water.

ANALYSIS GEORGIA MINERAL SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	10.2	.595
Chlorine (Cl)	2.8	.163
Sulphur trioxide (SO_3)	.8	.047
Carbon dioxide (CO_2)	123.2	7.185
Sodium oxide (Na_2O)	4.2	.245
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	57.0	3.324
Magnesia (MgO)	11.0	.641
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	.3	.017



A. COX MINERAL SPRING, BURKE COUNTY, GEORGIA

B. DANIEL MINERAL SPRING, GREENE COUNTY, GEORGIA

PROBABLE COMBINATIONS

Potassium chloride	1.2	.070
Sodium chloride	3.7	.216
Sodium sulphate	1.4	.082
Sodium carbonate	2.4	.140
Calcium carbonate	101.8	5.937
Magnesium carbonate	23.1	1.347
Aluminum oxide	.8	.047
Ferrous carbonate	.5	.029
Silica	10.2	.595
Total solids	145.1	8.463
Free carbon dioxide	64.8	3.779

GIBSON DEEP WELL

GLASCOCK COUNTY

This is a deep well furnishing the public water supply of Gibson. The well is located in the public square near the center of the town. It has a depth of 170 feet. The water which comes from a crevice in the granite rock, rises to within 20 feet of the surface. It is said that the water stains both wooden and metal vessels a yellowish color and that after standing for a short time an oil-like scum, probably iron oxide, forms on the surface of the water.

The water from this well, as above stated, is used chiefly for general domestic supply; however, many of those using it are of the opinion that it possesses special medicinal properties.

ANALYSIS GIBSON DEEP WELL

Light alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	40.9	2.385
Chlorine (Cl)	3.0	.175
Sulphur trioxide (SO_3)	6.7	.391
Carbon dioxide (CO_2)	9.1	.531
Sodium oxide (Na_2O)	11.0	.641
Potassium oxide (K_2O)	3.2	.187
Lime (CaO)	9.0	.525
Magnesia (MgO)	3.4	.198
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	5.0	.292
Ferric oxide (Fe_2O_3)	6.8	.397

PROBABLE COMBINATIONS		
Potassium chloride	5.0	.292
Sodium chloride	1.0	.058
Sodium sulphate	11.9	.694
Sodium carbonate	8.9	.519
Magnesium carbonate	7.1	.414
Calcium carbonate	.4	.023
Calcium silicate	18.2	1.062
Aluminum oxide	5.0	.292
Ferric oxide	6.8	.397
Silica	31.5	1.837
Total solids	95.8	5.588

GLENN ELLA SPRING

Habersham County

This spring is in the northern part of Habersham County about 4 miles west of Tullulah Falls. The mineral nature of this water is said to have been discovered a few years ago while being used in a steam boiler. From a description given by the owner it seems to be a fair size spring favorably located for a resort. The only improvement mentioned is a large boarding house. One characteristic given of the water is that a yellowish color is left by it upon vessels.

ANALYSIS GLENN ELLA SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.0	.401
Chlorine (Cl)	5.3	3.09
Sulphur trioxide (SO_3)	1.7	.099
Carbon dioxide (CO_2)	32.0	1.866
Sodium oxide (Na_2O)	4.0	.233
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	4.1	.239
Magnesia (MgO)	2.0	.116
Alumina (Al_2O_3)	1.8	.105
Ferric oxide (Fe_2O_3)	11.0	.641
PROBABLE COMBINATIONS		
Potassium chloride	1.1	.064
Sodium chloride	7.7	.449

Calcium carbonate	8.3	.484
Magnesium sulphate	2.5	.146
Magnesium carbonate	2.5	.146
Aluminum oxide	1.8	.105
Ferrous carbonate	16.0	.933
Silica	7.0	.401
Total solids	46.9	2.728
Free carbon dioxide	18.0	1.050

GORDON SPRING

WHITFIELD COUNTY

Prior to the Civil War, Gordon Spring was a very popular summer resort, but since then it has been allowed to decline. The buildings, with the exception of one or two of the smaller ones, have all been burned or otherwise destroyed, so that there are at present practically no facilities whatever for the accommodation of guests. The spring is located at the eastern base of Taylor's Ridge in the western part of Whitfield County about 12 miles west of Dalton. It is a small chalybeate spring, furnishing about 3 gallons per minute. The water on standing throws down a precipitate of iron sesqui-oxide. In addition to the main spring, from which the sample of water was secured for analysis, there are several smaller springs near by, which are also said to possess medicinal properties. These springs are all located in a small depression or basin at the foot of Taylor's Ridge near the line of contact of the Carboniferous shales and the Silurian sandstone. Gordon Spring is well located for a summer resort. It is 7 miles from the present terminous of the Rome and Northern Railroad.

ANALYSIS GORDON SPRING

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	15.50	.904
Chlorine (Cl)	5.60	.327
Sulphur trioxide (SO_3)	14.78	.862
Carbon dioxide (CO_2)	182.40	10.637
Sodium oxide (Na_2O)	10.60	.618

Potassium oxide (K_2O)	2.80	.163
Lime (CaO)	82.00	4.782
Magnesia (MgO)	12.76	.744
Phosphorus pentoxide (P_2O_5)	trace	trace
Manganese (MnO)	trace	trace
Alumina (Al_2O_3)	.40	.023
Ferric oxide (Fe_2O_3)	5.40	.315
PROBABLE COMBINATIONS		
Potassium chloride	4.44	.259
Sodium chloride	5.75	.335
Sodium sulphate	17.31	1.033
Sodium phosphate	trace	trace
Magnesium sulphate	7.55	.440
Magnesium carbonate	21.50	1.254
Calcium carbonate	146.43	8.540
Aluminum sulphate	1.35	.079
Ferrous carbonate	7.83	.457
Manganese carbonate	trace	trace
Silica	15.50	.904
Total solids	227.66	13.301
Free carbon dioxide	103.75	6.050

GOWER SPRING

Hall County

Gower Spring is located on the Gainesville-Dahlonega public road only a few hundred yards from the corporate limits of Gainesville, the county seat of Hall County. A few years ago this spring was a very popular resort, but since the destruction of the hotel, near by, the spring has been neglected and it is now but little used. The flow is about a gallon per minute. Upon standing the water throws down a rather copious prescipitate of reddish-brown iron sesqui-oxide.

ANALYSIS GOWER SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	9.00	.525
Chlorine (Cl)	4.70	.274
Sulphur trioxide (SO_3)	.40	.023
Carbon dioxide (CO_2)	52.00	3.032
Ferric oxide (Fe_2O_3)	5.20	.303

Alumina (Al_2O_3)	10	.006
Lime (CaO)	.70	.041
Magnesia (MgO)	1.10	.064
Potash (K_2O)	1.26	.073
Soda (Na_2O)	4.24	.247
PROBABLE COMBINATIONS		
Potassium chloride	2.00	.117
Sodium chloride	6.28	.356
Sodium sulphate	.28	.016
Sodium carbonate	1.35	.079
Magnesium carbonate	2.31	.135
Calcium carbonate	1.25	.073
Aluminum sulphate	.26	.015
Ferrous carbonate	7.54	.440
Silica	9.00	.525
Total solids	30.27	1.756
Free carbon dioxide	47.37	2.763

JOHN M. GREEN MINERAL SPRING

FANNIN COUNTY

This spring is located on the beautiful grounds of the Georgia Baptist Association near the corporate limits of Blue Ridge. The water from this spring supplies the Georgia Baptist Association while in session and is also more or less used by the people of Blue Ridge, many of whom regard the water as possessing medicinal properties. The flow is said to be several gallons per minute. The spring is well protected and flows into a nice marble catchment basin.

ANALYSIS JOHN M. GREEN MINERAL SPRING

Light alkaline-saline—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	28.4	1.656
Chlorine (Cl)	3.0	.175
Sulphur trioxide (SO_3)	10.3	.600
Carbon dioxide (CO_2)	30.5	1.779
Sodium oxide (Na_2O)	7.5	.437
Potassium oxide (K_2O)	1.2	.070
Lime (SaO)	7.5	.437
Magnesia (MgO)	2.3	.134

Alumina (Al_2O_3)	3.4	.198
Ferric oxide (Fe_2O_3)	6.8	.397
PROBABLE COMBINATIONS		
Potassium chloride	1.8	.105
Sodium chloride	3.6	.310
Sodium sulphate	12.3	.717
Magnesium sulphate	5.7	.332
Calcium carbonate	13.4	.781
Magnesium carbonate	.8	.047
Aluminum oxide	3.4	.198
Ferrous carbonate	9.8	.572
Silica	28.4	1.656
Total solids	79.2	4.718
Free carbon dioxide	20.7	1.207

HAMPTON SPRING

MURRAY COUNTY

This spring is located on the side of a narrow hollow or gorge about 1 mile east of Cohutta Springs. It is a small chalybeate spring furnishing less than 2 gallons per minute. The only improvement about the spring at the time it was visited was a few ill-constructed cottages owned by individuals who move their families to the spring for a short time during the hot summer months. There is quite a precipitate of iron oxide in the form of a brownish sediment to be seen about the drainway leading from the spring. The location is all that can be desired from a scenic point of view.

ANALYSIS HAMPTON SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	12.75	.744
Chlorine (Cl)	6.30	.367
Sulphur trioxide (SO_3)	6.12	.357
Carbon dioxide (CO_2)	24.40	1.423
Sodium oxide (Na_2O)	5.08	.296
Potassium oxide (K_2O)	1.55	.090
Lime (CaO)	4.50	.262
Magnesia (MgO)	2.61	.152

Alumina (Al_2O_3)	1.45	.085
Ferric oxide (Fe_2O_3)	9.66	.563
PROBABLE COMBINATIONS		
Potassium chloride	2.44	.142
Sodium chloride	8.45	.493
Sodium sulphate	1.39	.081
Calcium carbonate	8.03	.468
Magnesium sulphate	3.15	.184
Magnesium carbonate	3.27	.191
Aluminum sulphate	4.86	.283
Ferrous carbonate	14.00	.816
Silica	12.75	.744
Total solids	58.34	3.402
Free carbon dioxide	13.85	.808

HARBEN SPRING

DAWSON COUNTY

This spring is on Lot 1,144, 5th district, Dawson County, about 7 miles northwest of Dawsonville. It is a small spring furnishing less than 1 gallon per minute. The spring is said to have a local reputation as a mineral spring. A yellowish precipitate is reported to form in the spring. There are no improvements. The nearest railroad station is Tate, on the Louisville and Nashville Railroad, 16 miles to the southwest.

ANALYSIS HARBEN SPRING

Light alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	18.6	1.085
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	8.2	.478
Carbon dioxide (CO_2)	34.6	2.018
Sodium oxide (Na_2O)	10.1	.588
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	13.0	.758
Magnesia (MgO)	2.6	.152
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	2.0	.117

PROBABLE COMBINATIONS		
Potassium chloride	1.3	.076
Sodium chloride	4.8	.280
Sodium sulphate	14.6	.851
Sodium carbonate	1.9	.111
Magnesium carbonate	5.4	.315
Calcium carbonate	23.2	1.353
Aluminum oxide	.8	.047
Ferrous carbonate	2.9	.169
Silica	18.6	1.085
Total solids	73.5	4.287
Free carbon dioxide	19.8	1.155

HARBOUR SPRING

Floyd County

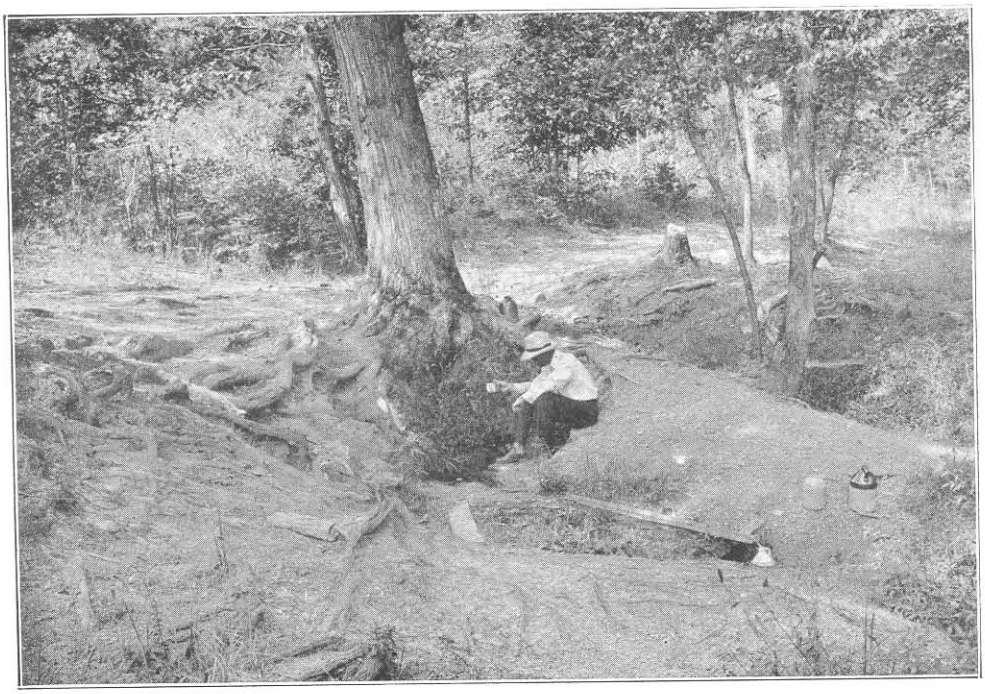
Harbour Spring is on the right bank of Oostanaula River about 5½ miles north of Rome. During high water it is entirely submerged. No improvement whatever is to be seen about the spring. The water has had a limited sale in Rome for the last 20 years. The flow is about 3 gallons per minute.

ANALYSIS HARBOUR SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	11.5	.670
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	1.4	.082
Carbon dioxide (CO_2)	33.5	1.953
Sodium oxide (Na_2O)	4.2	.245
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	6.0	.350
Magnesia (MgO)	2.0	.117
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	1.4	.082
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	4.6	.268
Sodium sulphate	2.5	.146
Sodium carbonate	1.2	.070
Calcium carbonate	10.7	.624
Magnesium carbonate	4.2	.245

A. DEMOREST SPRINGS, HABERSHAM COUNTY, GEORGIA



B. FREEMAN SPRING, GORDON COUNTY GEORGIA

Aluminum oxide	.4	.023
Ferrous carbonate	2.0	.117
Silica	11.5	.670
Total solids	38.6	2.250
Free carbon dioxide	25.4	1.481

HARDY WELL

HARRIS COUNTY

The Hardy well is a dug well about 25 feet deep. For the greater part of its depth it penetrates gneissoid rock. The well, which was put down for household supply, is located in A. L. Hardy's yard only a few hundred feet north of the depot at Hamilton. The water is said to have an alum-like taste and upon standing furnishes a slight precipitate.

ANALYSIS HARDY WELL

Sulphated-magnesic-saline. Aluminous. Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	28.0	1.633
Chlorine (Cl)	7.1	.414
Sulphur trioxide (SO_3)	160.0	9.330
Carbon dioxide (CO_2)	0.0	.000
Sodium oxide (Na_2O)	24.0	1.400
Potassium oxide (K_2O)	2.8	.163
Lime (CaO)	27.0	1.574
Magnesia (MgO)	7.3	.426
Manganous oxide (MnO)	trace	trace
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	37.0	2.158
Ferric oxide (Fe_2O_3)	4.3	.251
Nitric acid (HNO_3)	25.0	1.458
PROBABLE COMBINATIONS		
Potassium chloride	4.4	.257
Sodium chloride	8.2	.478
Sodium bisulphate	27.0	1.574
Sodium nitrate	34.2	1.994
Calcium sulphate	67.0	3.907
Magnesium sulphate	22.8	1.330
Aluminum sulphate	124.0	7.231
Ferric sulphate	10.8	.630
Silica	28.0	1.633
Total solids	326.4	19.034

HAWKINS MINERAL SPRING

CHEROKEE COUNTY

This spring is located in the northeast part of Cherokee County 1½ miles west of Ball Ground. It is said to possess medicinal properties. The flow is several gallons per minute. The water is reported to possess an iron taste and to precipitate iron oxide in the branch which runs from it. The spring is unimproved and apparently but little known.

ANALYSIS HAWKINS MINERAL SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	26.4	1.539
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	7.0	.408
Carbon dioxide (CO_2)	80.4	4.688
Sodium oxide (Na_2O)	7.4	.432
Potassium oxide (K_2O)	4.4	.257
Lime (CaO)	40.3	2.350
Magnesia (MgO)	10.4	.606
Alumina (Al_2O_3)	.3	.017
Ferric oxide (Fe_2O_3)	1.2	.070
PROBABLE COMBINATIONS		
Potassium chloride	7.0	.408
Sodium chloride	1.2	.070
Sodium sulphate	12.4	.722
Sodium carbonate	.6	.035
Calcium carbonate	72.0	4.200
Magnesium carbonate	21.8	1.271
Ferrous carbonate	1.9	.111
Aluminum oxide	.3	.017
Silica	26.4	1.539
Total solids	143.6	8.373
Free carbon dioxide	36.2	2.111

HELICON SPRING

CLARKE COUNTY

Helicon Spring is 4¼ miles northeast of Athens and within a few hundred yards of the Athens-Danville public road. The spring

is said to have been discovered about 60 years ago, and at one time is reported to have had a hotel for the accommodation of guests. At present there is no improvement about the spring with the exception of a brick curbing, the hotel and other improvements having been long since destroyed by fire. The excellent road from Athens makes this spring quite accessible and is much frequented by automobile parties from Athens during the summer months.

The flow of the spring is less than 1 gallon per minute. The copious precipitate of yellowish iron oxide and the irony taste are the most striking characteristics of the water.

ANALYSIS HELICON SPRING
Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	29.0	1.691
Chlorine (Cl)	7.1	.414
Sulphur trioxide (SO_3)	6.7	.391
Carbon dioxide (CO_2)	50.0	2.916
Sodium oxide (Na_2O)	6.7	.391
Potassium oxide (K_2O)	1.1	.064
Lime (CaO)	10.6	.618
Magnesia (MgO)	4.6	.268
Alumina (Al_2O_3)	2.0	.117
Ferric oxide (Fe_2O_3)	12.0	.700
PROBABLE COMBINATIONS		
Potassium chloride	2.1	.122
Sodium chloride	9.9	.577
Sodium sulphate	3.4	.198
Calcium carbonate	19.0	1.111
Magnesium sulphate	8.6	.502
Magnesium carbonate	3.0	.175
Aluminum oxide	2.0	.117
Ferrous carbonate	19.0	1.111
Silica	29.0	1.691
Total solids	96.0	5.604
Free carbon dioxide	25.6	1.493

HENDERSON MINERAL SPRING

WASHINGTON COUNTY

This spring, which is locally known as the "Mineral Spring," is in the eastern part of Washington County. It is 9 miles from

Sandersville, and 4 miles from Davisboro, and within one-half mile of the Central of Georgia Railway. The location is said to be ideal for a resort. The water is reported to emerge from 3 or 4 separate openings, all within a radius of less than 3 feet. It is claimed that the water possesses medicinal properties of value. There is no improvement about the spring.

ANALYSIS HENDERSON MINERAL SPRING

Alkaline- calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	17.0	.991
Chlorine (Cl)	3.0	.175
Sulphur trioxide (SO_3)	1.2	.070
Carbon dioxide (CO_2)	130.0	7.581
Sodium oxide (Na_2O)	2.1	.122
Potassium oxide (K_2O)	.7	.041
Lime (CaO)	78.2	4.561
Magnesia (MgO)	1.5	.087
Alumina and ferric oxide (Al_2O_3 & Fe_2O_3)	.6	.035
PROBABLE COMBINATIONS		
Potassium chloride	1.2	.070
Sodium chloride	4.0	.233
Magnesium sulphate	1.8	.105
Magnesium carbonate	1.9	.111
Calcium carbonate	139.6	8.141
Alumina and ferric oxide	.6	.035
Silica	17.0	.991
Total solids	166.1	9.686
Free carbon dioxide	67.6	3.942

HIGH ROCK SPRING

FULTON COUNTY

This spring is on Ormwood Road near the city limits of Atlanta and may be reached by the Soldiers' Home electric car line which passes within two blocks of the spring. The improvements consist of a spring house and a small bottling house, together with stone curbing and protecting walls. No provisions are made for guests.

The water from this spring has been sold in Atlanta for some years chiefly as a table water. It has also been used by the State Legislature for the last 3 sessions as a drinking water both in the House and the Senate Chamber. The flow is approximately 6 gallons per minute.

ANALYSIS HIGH ROCK SPRING
Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	8.5	.496
Chlorine (Cl)	5.2	.303
Sulphur trioxide (SO_3)	.6	.035
Carbon dioxide (CO_2)	46.7	2.724
Sodium oxide (Na_2O)	3.9	.227
Potassium oxide (K_2O)	.8	.046
Lime (CaO)	2.8	.163
Magnesia (MgO)	3.0	.175
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	.3	.017
PROBABLE COMBINATIONS		
Potassium chloride	1.4	.082
Sodium chloride	7.6	.443
Calcium carbonate	5.0	.292
Magnesium carbonate	5.7	.332
Magnesium sulphate	.9	.052
Ferrous carbonate	.4	.023
Aluminum oxide	.4	.023
Silica	8.5	.496
Total solids	29.9	1.743
Free carbon dioxide	41.2	2.403

HITCHCOCK SPRING

Polk County

Hitchcock Spring is on lot 192, 18th district, in the extreme northeast corner of Polk County, about 3 miles southeast of Taylorsville. The spring is unimproved, and but little used. It furnishes 2 gallons of water per minute, which is said to form a yellowish precipitate about the drainway.

ANALYSIS HITCHCOCK SPRING

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	27.3	1.592
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	10.0	.583
Carbon dioxide (CO_2)	54.0	3.419
Sodium oxide (Na_2O)	9.9	.577
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	23.7	1.382
Magnesia (MgO)	7.5	.437
Alumina (Al_2O_3)	.5	.029
Ferric oxide (Fe_2O_3)	4.5	.262
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	4.6	.268
Sodium sulphate	17.1	.997
Magnesium sulphate	.6	.035
Magnesium carbonate	15.3	.892
Calcium carbonate	45.2	2.635
Ferrous carbonate	6.5	.379
Aluminum oxide	.5	.029
Silica	27.3	1.592
Total solids	118.6	6.914
Free carbon dioxide	23.0	1.341

HOOTEN SPRING

HARRIS COUNTY

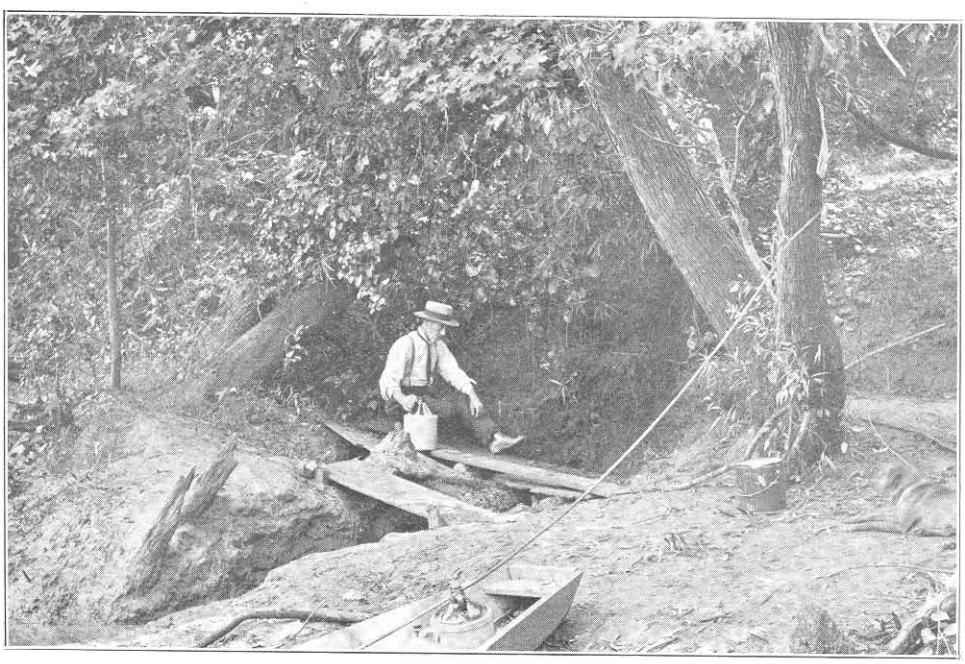
Hooten Spring is located 1 mile south of Hamilton, the county site of Harris County. It is a small, unimproved, chalybeate spring, having a local reputation only. The water has an irony taste, and yields, upon standing, a yellowish-brown precipitate.

ANALYSIS HOOTEN SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.00	.758
Chlorine (Cl)	6.00	.350
Sulphur trioxide (SO_3)	4.20	.245
Carbon dioxide (CO_2)	71.20	4.152
Sodium oxide (Na_2O)	5.60	.327

A. GORDON SPRING, WHITFIELD COUNTY, GEORGIA



B. HARBOUR SPRING, FLOYD COUNTY, GEORGIA

Potassium oxide (K_2O)	1.10	.064
Lime (CaO)	3.60	.210
Magnesia (MgO)	1.50	.087
Phosphorus pentoxide (P_2O_5)	trace	trace
Manganous oxide (MnO)	trace	trace
Alumina (Al_2O_3)	.70	.041
Ferric oxide (Fe_2O_3)	7.30	.425
Hydrogen sulphate (H_2S)	.36	.021
PROBABLE COMBINATIONS		
Potassium chloride	1.7	.099
Sodium chloride	3.6	.502
Sodium sulphate	2.5	.146
Sodium phosphate	trace	trace
Magnesium sulphate	4.2	.245
Magnesium carbonate	.2	.012
Calcium carbonate	6.4	.373
Aluminum oxide	.7	.041
Ferrous carbonate	10.4	.606
Silica	13.0	.758
Total solids	42.7	2.782
Free carbon dioxide	64.1	3.738
Free hydrogen sulphide	.36	.021

HORSESHOE SPRING

FLOYD COUNTY

This spring is located within 100 feet of the grounds of the State Deaf and Dumb School at Cave Spring, in the southern part of Floyd County. The water has a limited use only, being used chiefly by the students of the school and the people of the town. It has a very faint odor of sulphuretted hydrogen and a slight irony taste. The spring takes its name from the shape of the cement curbing which is in the form of a horseshoe. The flow is about one gallon per minute.

ANALYSIS HORSESHOE SPRING

Alkaline-calcic-magnesic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	14.0	.816
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	2.3	.134

Carbon dioxide (CO_2)	165.3	9.640
Sodium oxide (Na_2O)	3.5	.204
Potassium oxide (K_2O)	.9	.052
Lime (CaO)	52.1	3.038
Magnesia (MgO)	33.3	1.942
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	2.0	.117
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	5.8	.338
Sodium sulphate	.9	.052
Calcium carbonate	93.0	5.424
Magnesium carbonate	69.9	4.076
Magnesium sulphate	2.7	.157
Aluminum oxide	.8	.047
Ferrous carbonate	2.9	.169
Silica	14.0	.816
Total solids	191.5	11.166
Free carbon dioxide	85.7	4.997

HUGHES MINERAL WELL

FLOYD COUNTY

Hughes' Mineral Well is on the Alabama public road 2½ miles west of Rome. It is a dug well 4 feet in diameter and 25 feet deep. The only improvement is a farm house near by. The water from this well has attracted attention for a number of years and has been more or less extensively sold in Rome and elsewhere as a mineral water.

ANALYSIS HUGHES MINERAL WELL

Alkaline-saline-sulpho-magnesic-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	15.87	.925
Chlorine (Cl)	38.50	2.245
Sulphur trioxide (SO_3)	227.90	13.290
Carbon dioxide (CO_2)	327.00	19.069
Sodium oxide (Na_2O)	47.20	2.752
Potassium oxide (K_2O)	1.54	.089
Lime (CaO)	258.25	15.066
Magnesia (MgO)	77.90	4.542
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina and ferric oxide (Al_2O_3 & Fe_2O_3)	1.44	.084

PROBABLE COMBINATIONS		
Potassium chloride	2.44	.142
Sodium Chloride	61.53	3.588
Sodium sulphate	33.41	1.948
Calcium sulphate	80.59	4.699
Calcium carbonate	394.55	23.008
Magnesium sulphate	233.70	13.628
Alumina and ferric oxide	1.44	.084
Silica	15.87	.925
Total solids	823.53	48.022
Free carbon dioxide	153.40	8.946

ILLGES SPRING

MUSCOGEE COUNTY

Illges Spring, a spring of supposed medicinal virtues, is located on land lot No. 99, about 2½ miles east of Columbus. The flow is about 5 gallons per minute. The water has a salty taste and is reported to cure stomach troubles, constipation, etc. It is at present mainly used for domestic purposes. There are no improvements about the spring and no effort has been made to put the water on the market.

ANALYSIS ILLGES SPRING

Muriated-saline

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.5	.787
Chlorine (Cl)	246.3	14.364
Sulphur trioxide (SO_3)	4.4	.257
Carbon dioxide (CO_2)	3.6	.209
Sodium oxide (Na_2O)	179.5	10.468
Potassium oxide (K_2O)	16.0	.933
Lime (CaO)	24.0	1.400
Magnesia (MgO)	6.6	.385
Alumina and ferric oxide (Al_2O_3 and Fe_2O_3)	1.5	.087
Nitric anhydride	20.0	1.166
PROBABLE COMBINATIONS		
Potassium chloride	25.4	1.481
Sodium nitrate	27.4	1.597
Sodium chloride	319.7	18.645

Magnesium chloride	26.1	1.522
Calcium sulphate	7.4	.432
Calcium chloride	38.8	2.262
Calcium carbonate	2.5	.146
Alumina and Ferric oxide	1.5	.087
Silica	13.5	.787
Total solids	462.3	26.959
Free carbon dioxide	2.5	.146

INDIAN SPRINGS

BUTTS COUNTY

Indian Springs resort, one of the most noted watering places in Georgia, is located 3 miles west of Flovilla, a station on the Southern Railway, and 37 miles northwest of Macon. A branch road, known as the Flovilla and Indian Springs Railroad, connects the springs with the main line of the Southern Railway at Flovilla.

Prior to the settlement of this part of the State by the white people, Indian Spring is said to have had quite a reputation among the Indians, on account of the healing qualities of its waters. This statement is substantiated by the fact that during the treaty of 1821 with the whites, the Creek Indians, then inhabiting that region, reserved the right to the spring, together with 1,000 acres in the immediate vicinity. After the removal of the Indians from Georgia the spring, together with the 1,000 acres of land, became the property of the State. Subsequently, all the land was disposed of to individuals, except 8 or 10 acres immediately surrounding the spring, which is still the property of the State. The State at present leases the property to parties who, within the last few years, have constructed within a few hundred feet of the spring, an excellent hotel known as the Wigwam, having accommodations for 300 guests.

In addition to the hotel here referred to there are several other hotels near the spring some of which are said to be able to accommodate as many as 200 guest. The Wigwam hotel has a large swim-

ming pool, sulphur baths, tennis courts, etc., for the accommodation of its guests.

The spring flows from a small fissure in the gneissoid rock at the base of a low elevation on which the hotel is situated. The capacity of the spring is less than a gallon per minute. The water has a distinct odor of sulphuretted hydrogen, and it forms, in the bottom of the shallow basin into which it flows, a slight precipitate of a grayish or whitish color.

ANALYSIS INDIAN SPRING
Alkaline-saline. Sodic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	23.50	1.370
Chlorine (Cl)	14.70	.857
Sulphur trioxide (SO_3)	21.16	1.234
Carbon dioxide (CO_2)	62.86	3.666
Sodium oxide (Na_2O)	40.69	2.373
Potassium oxide (K_2O)	2.74	.160
Lime (CaO)	17.12	.998
Magnesia (MgO)	3.30	.192
Phosphorus pentoxide (P_2O_5)	.40	.025
Arsenic (As)	trace	trace
Ferris oxide and Alumina (Fe_2O_3 & Al_2O_3)	1.00	.058
Lithia (Li_2O)	.045	.002
PROBABLE COMBINATIONS		
Lithium chloride	.13	.007
Potassium chloride	4.25	.248
Sodium chloride	20.71	1.208
Sodium sulphate	37.56	2.190
Sodium phosphate	.92	.054
Sodium carbonate	22.75	1.327
Magnesium carbonate	6.93	.404
Calcium carbonate	30.57	1.783
Alumina and ferric oxide	1.00	.058
Silica	23.50	1.370
Total solids	148.32	8.649
Free carbon dioxide	36.34	2.119

INMAN PARK MINERAL SPRING

FULTON COUNTY

Inman Park Mineral Spring, also known as "The Spa Spring," is located in Inman Park, a beautiful residence park in the eastern

part of Atlanta. The spring is small, furnishing less than 1 gallon a minute. It is surrounded by a heavy wall of masonry, and is apparently well protected from local surface drainage. The water, upon standing, forms a heavy reddish-brown precipitate of iron sesqui-oxide. It has a slightly astringent taste, but it is otherwise a pleasant drinking water.

ANALYSIS INMAN PARK MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.20	.420
Chlorine (Cl)	5.50	.321
Sulphur trioxide (SO_3)	.60	.035
Carbon dioxide (CO_2)	33.40	1.948
Sodium oxide (Na_2O)	5.40	.315
Potassium oxide (K_2O)	.20	.012
Lime (CaO)	1.20	.070
Magnesia (MgO)	1.22	.071
Manganous oxide (MnO)	trace	trace
Alumina (Al_2O_3)	.20	.012
Ferric oxide (Fe_2O_3)	6.60	.385
PROBABLE COMBINATIONS		
Potassium chloride	.30	.017
Sodium chloride	8.82	.514
Sodium sulphate	.23	.013
Sodium carbonate	1.04	.061
Manganese carbonate	trace	trace
Calcium carbonate	2.14	.125
Magnesium carbonate	2.56	.149
Ferrous carbonate	9.57	.558
Aluminum oxide	.20	.012
Silica	7.20	.420
Total solids	32.06	1.869
Free carbon dioxide	27.08	1.579

JAMES MINERAL SPRING

MADISON COUNTY

James Mineral Spring is about 8 miles southwest of Royston near Broad River. It is a small chalybeate spring furnishing only one-half gallon per minute. The water has an iron taste and yields

a yellowish precipitate on standing. The spring has been opened to the public for only about 4 years. The improvements consist of a number of cottages for the accommodation of guests. The spring may be reached by the Southern Railway from Royston or Commerce, 8 and 14 miles respectively, or by the Seaboard Air Line Railway from Comer, 12 miles distant.

ANALYSES OF JAMES MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	32.0	1.866
Chlorine (Cl)	3.2	.187
Sulphur trioxide (SO_3)	8.0	.467
Carbon dioxide (CO_2)	36.6	2.134
Sodium oxide (Na_2O)	9.4	.548
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	6.0	.350
Magnesia (MgO)	2.2	.128
Alumina (Al_2O_3)	1.6	.093
Ferric oxide (Fe_2O_3)	14.0	.816
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	4.1	.239
Sodium sulphate	14.2	.833
Sodium carbonate	1.4	.082
Calcium carbonate	10.7	.624
Magnesium carbonate	4.6	.268
Ferrous carbonate	20.3	1.183
Aluminum oxide	1.6	.093
Silica	32.0	1.866
Total	90.4	5.275
Free carbon dioxide	21.8	1.271

JAY BIRD SPRING

Dodge County

Jay Bird Spring is in the extreme northern part of Dodge County about 7 miles north of Helena. It is located in a swamp, the spring being reached by a long, plank walkway. It was originally a natural spring, but at present the water flows from a two-inch pipe

which has been driven to a depth of about 15 feet. The flow is 5 gallons per minute. On the elevated ground near the edge of the swamp is a small hotel with nine rooms for the accommodation of guests. In the last few years a considerable amount of this water has been put on the market, chiefly as a medicinal water. There is a small bath house near the spring.

ANALYSIS JAY BIRD SPRING

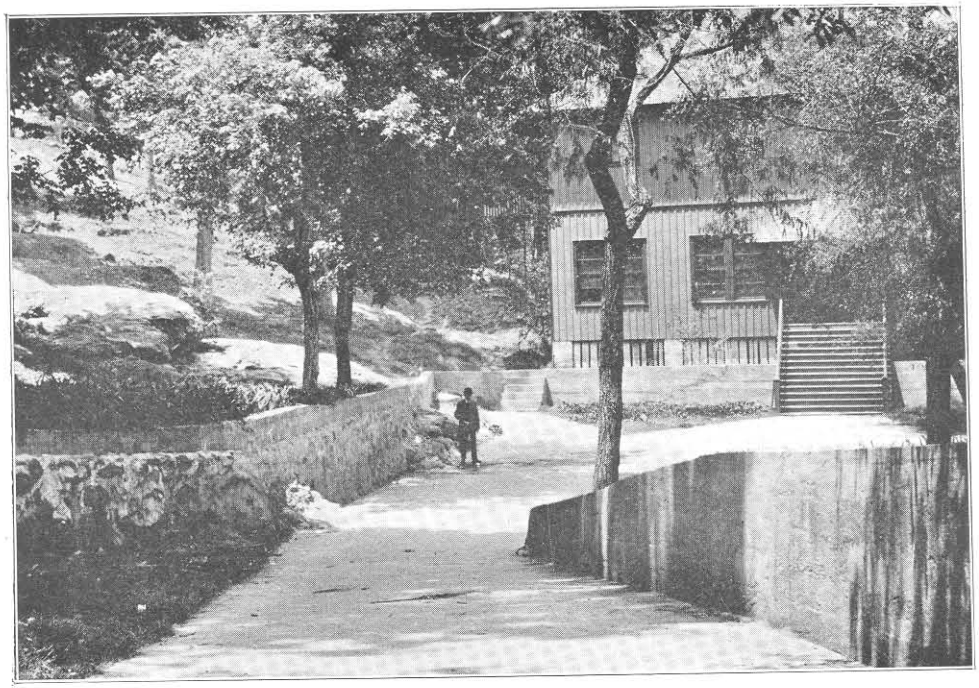
Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	18.6	1.085
Chlorine (Cl)	4.9	.286
Sulphur trioxide (SO_3)	2.8	.163
Carbon dioxide (CO_2)	185.6	10.824
Sodium oxide (Na_2O)	6.5	.379
Potassium oxide (K_2O)	1.3	.076
Lime (CaO)	71.8	4.188
Magnesia (MgO)	11.0	.641
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	1.1	.064
PROBABLE COMBINATIONS		
Potassium chloride	1.9	.111
Sodium chloride	6.8	.397
Sodium sulphate	5.0	.292
Sodium carbonate	1.2	.070
Calcium carbonate	128.2	7.476
Magnesium carbonate	23.1	1.347
Aluminum oxide	.8	.047
Ferrous carbonate	1.6	.093
Silica	18.6	1.085
Total solids	187.2	10.918
Free carbon dioxide	116.0	6.765

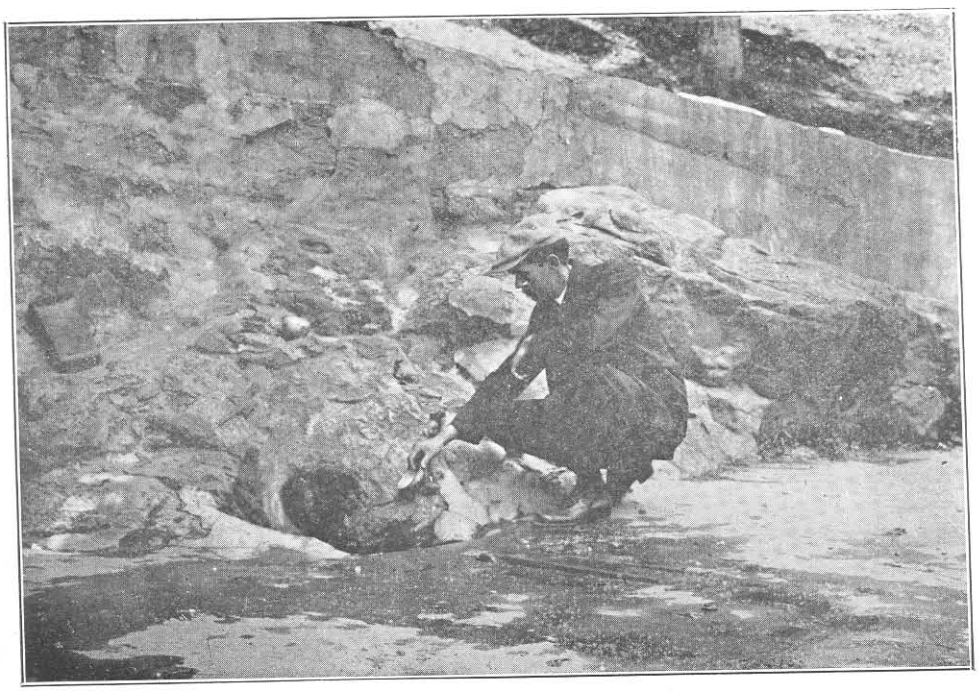
JOHNSON MINERAL SPRING

GORDON COUNTY

This is a small unimproved chalybeate spring which has quite a local reputation as a health restorer. It is located in the sandstone hills on the Johnson estate in the southeastern part of Gordon County about 2 miles east of Boliver Station on the Louis-



A. GENERAL VIEW OF INDIAN SPRING, BUTTS COUNTY, GEORGIA



B. NEAR VIEW OF INDIAN SPRING, BUTTS COUNTY, GEORGIA

ville and Nashville Railroad. The flow is approximately 2 gallons per minute. There is quite a precipitate of iron oxide to be seen in the spring and also along the small stream which flows from it.

ANALYSIS JOHNSON MINERAL SPRING

Alkaline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	23.4	1.364
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	15.0	.875
Carbon dioxide (CO_2)	93.0	5.424
Soda (Na_2O)	9.6	.560
Potash (K_2O)	1.3	.076
Lime (CaO)	53.6	3.126
Magnesia (MgO)	7.4	.432
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	5.0	.292
PROBABLE COMBINATIONS		
Potassium chloride	2.1	.122
Sodium chloride	5.3	.309
Sodium sulphate	15.3	.892
Magnesium sulphate	9.6	.560
Magnesium carbonate	8.8	.513
Calcium carbonate	95.7	5.581
Aluminum oxide	1.0	.058
Ferrous carbonate	7.2	.420
Silica	23.4	1.364
Total solids	168.4	9.819
Free carbon dioxide	43.6	2.543

KAVANAUGH SPRING

MUSCOGEE COUNTY

This spring is 3 miles northeast of Columbus near Lindsey Creek, about 150 yards below the crossing of this stream by the Southern Railway. The spring is unimproved, with the exception of a terra cotta curbing enclosed within a substantial granite wall. The flow is quite small, being only about 1 gallon in 5 minutes. On the opposite side of the creek and scarcely 50 yards distant is another spring known as the Sulphur Spring. As this spring had long been abandoned and was well filled with accumulated vege-

table matter at the time of the writer's visit no sample of the water was collected from it for analysis. The following analysis was made from sample of water from the spring surrounded by the granite wall on the right side of the creek.

ANALYSIS KAVANAUGH SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	35.0	2.041
Chlorine (Cl)	7.0	.408
Sulphur trioxide (SO_3)	50.9	2.968
Carbon dioxide (CO_2)	133.6	7.791
Sodium oxide (Na_2O)	17.0	.991
Potassium oxide (K_2O)	2.5	.146
Lime (CaO)	82.8	4.821
Magnesia (MgO)	7.1	.414
Alumina (Al_2O_3)	.9	.052
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	4.0	.233
Sodium chloride	8.4	.490
Sodium sulphate	28.8	1.680
Calcium sulphate	34.9	2.035
Calcium carbonate	123.1	7.179
Magnesium sulphate	21.3	1.242
Aluminum oxide	.9	.052
Ferrous carbonate	1.4	.082
Silica	35.0	2.041
Total solids	257.8	15.034
Free carbon dioxide	78.4	4.572

KELLEY SPRING

FORSYTH COUNTY

Kelley Spring is located on land lot 88, 2nd district, Forsyth County, about 2 miles southwest of Cumming. The flow is 2 gallons per minute. The water is locally used for its supposed medicinal properties. There is no improvement and no provision for the accommodation of guests, at present; however, the owner advises that a hotel will likely soon be constructed.

ANALYSIS KELLEY SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	8.0	.466
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	15.0	.875
Sodium oxide (Na_2O)	2.5	.146
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	2.2	.128
Magnesia (MgO)	3.3	.192
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	1.1	.064
Sodium chloride	5.1	.297
Calcium carbonate	2.8	.163
Magnesium carbonate	7.0	.408
Aluminum oxide	1.0	.058
Ferrous carbonate	1.5	.087
Silica	8.0	.466
Total solids	26.5	1.543
Free carbon dioxide	9.9	.577

KEYSTONE SPRING

LAURENS COUNTY

This spring, also known as the Reinhart Mineral Spring, is located near the Dublin-Macon public road 8 miles west of Dublin. The flow is only one-third of a gallon per minute. There is no improvement about the spring except a cement catchment basin, holding 100 gallons or more. Within the last few years a considerable amount of this water has been shipped to Macon and other points where it has been sold as a medicinal water. The spring flows from a fossil-bearing siliceous rock near the base of a low hill wooded with an original forest of oaks, etc.

ANALYSIS KEYSTONE SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	1.9	.111
Chlorine (Cl)	4.0	.233

Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	28.3	1.650
Sodium oxide (Na_2O)	2.8	.163
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	2.8	.163
Magnesia (MgO)	.7	.041
Alumina (Al_2O_3)	.1	.006
Ferric oxide (Fe_2O_3)	.3	.017
PROBABLE COMBINATIONS		
Potassium chloride	1.6	.093
Sodium chloride	5.4	.315
Sodium sulphate	trace	trace
Calcium carbonate	5.0	.292
Magnesium carbonate	1.5	.087
Ferrous carbonate	.4	.023
Aluminum oxide	.1	.006
Silica	1.9	.111
Total solids	15.9	.927
Free carbon dioxide	26.2	1.528

LIFSEY SPRING

Pike County

This spring, is located about 6 miles southwest of Zebulon on land lot 59, 9th district of Pike County. It is a large thermal spring furnishing 100 gallons or more per minute, having a temperature of 79° F. The spring is beautifully located in a broken country near the foot of Pine Mountain, and is quite similar to Thundering Spring, which has a like location a few miles farther to the southwest. A few years ago considerable improvements, consisting of a 40-room hotel and two very large cement bathing pools were constructed at this spring with a view of making it a permanent health resort, but at the time of the writer's visit, 5 years ago, the hotel had been burned and nothing remained but the bathing pools and 4 or 5 cottages. A peculiarity of this spring, in addition to the abnormal temperature of its water, is that the water comes up in numerous "boils" through white sand carrying with it a large amount of air in the form of bubbles.

ANALYSIS LIFSEY SPRING

Thermal. Alkaline-calcic-magnesic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	15.5	.904
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	3.8	.222
Carbon dioxide (CO_2)	110.0	6.415
Sodium oxide (Na_2O)	11.0	.642
Potassium oxide (K_2O)	2.9	.169
Lime (CaO)	33.1	1.930
Magnesia (MgO)	17.5	1.020
Alumina (Al_2O_3)	.7	.041
Ferric oxide (Fe_2O_3)	.5	.029
PROBABLE COMBINATIONS		
Potassium chloride	5.1	.297
Sodium chloride	3.3	.192
Sodium sulphate	6.8	.397
Sodium carbonate	10.8	.630
Calcium carbonate	59.1	3.447
Magnesium carbonate	36.8	2.146
Ferrous carbonate	.7	.041
Aluminum oxide	.7	.041
Silica	15.5	.904
Total solids	138.8	8.095
Free carbon dioxide	60.0	3.499

LOUCH WELL

COBB COUNTY

The Louch well was put down in October, 1903. It is 6 inches in diameter, 80 feet deep, and furnishes about 1,500 gallons in 24 hours. The water rises to within 5 feet of the surface. This well is located within about 75 yards of the Medlock well and nearer Sweetwater Creek. The water was formerly extensively sold in Atlanta and elsewhere under the name of Benscot Lithia water but it is not now put on the market.

ANALYSIS LOUCH WELL

Muriated-saline-lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	11.60	.677
Chlorine (Cl)	3,134.16	182.777

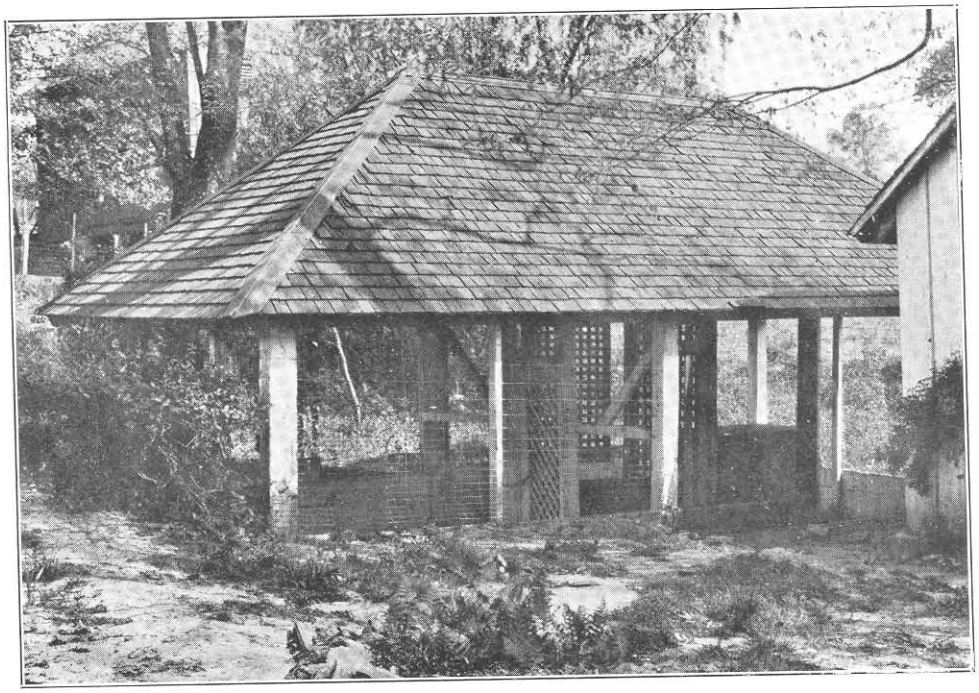
Sulphur trioxide (SO_3)	485.15	28.293
Carbon dioxide (CO_2)	95.79	5.581
Sodium oxide (Na_2O)	2,687.58	156.734
Potassium oxide (K_2O)	76.94	4.487
Lime (CaO)	276.21	16.107
Magnesia (MgO)	44.43	2.591
Phosphorus pentoxide (P_2O_5)	trace	trace
Bromine (Br)	2.82	.121
Alumina (Al_2O_3)	.40	.023
Ferric oxide (Fe_2O_3)	.64	.037
Manganese (MnO)	trace	trace
Barium oxide (Ba_2O)	.25	.015
Lithia (Li_2O)	8.76	.511
PROBABLE COMBINATIONS		
Lithium chloride	24.67	1.430
Potassium chloride	119.50	6.969
Potassium bromide	4.20	.245
Sodium chloride	5,070.90	295.725
Sodium phosphate	trace	trace
Magnesium sulphate	133.30	7.774
Calcium sulphate	670.80	39.120
Barium sulphate	.38	.022
Aluminum sulphate	1.36	.079
Ferrous carbonate	1.22	.071
Silica	11.60	.677
Total solids	6,037.93	352.112
Free carbon dioxide	70.10	4.088

The waters from the Medlock and Louch wells, and also the water from the "Artesian Lithia" well, are rather remarkable waters on account of the high percentage of sodium chloride. This is especially true when it is taken into consideration that the water in each case is obtained from granite-geniss and that all the rocks for miles around are all highly crystalline.

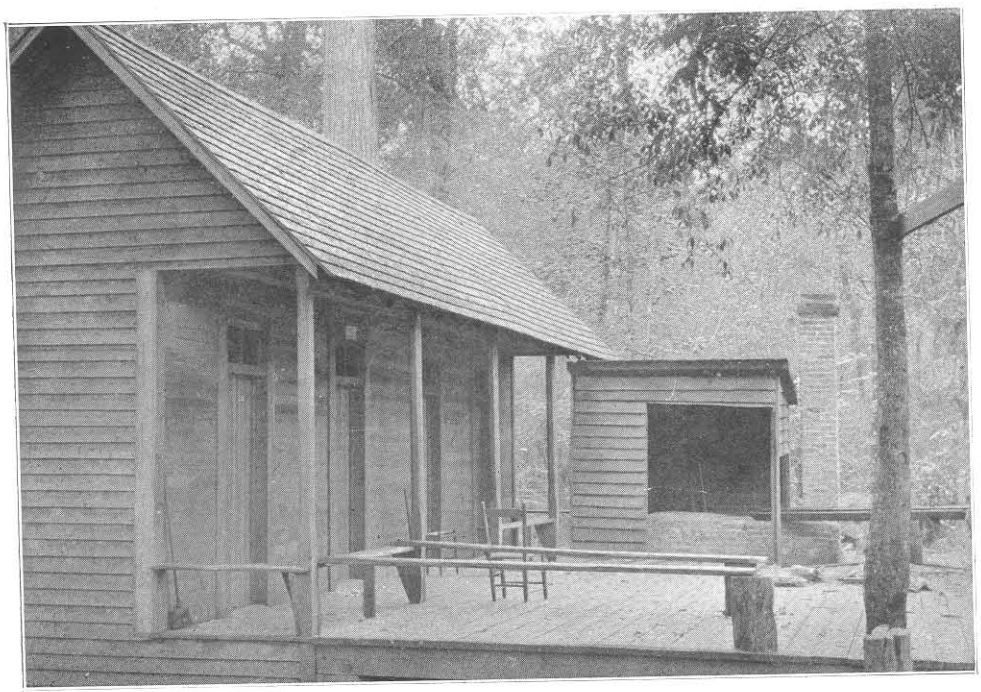
McCRANIE WELL

BERRIEN COUNTY

This is a private well located within the corporate limits of Sparks. The well is 21 feet deep and the water rises to within 7 feet of the surface. It is claimed by the owner of this well that the water when first drawn has a decided odor of sulphureted hydrogen,



A. HIGH ROCK SPRING, FULTON COUNTY, GEORGIA



B. JAY BIRD SPRING, DODGE COUNTY, GEORGIA

and that it possesses certain medicinal properties. The chief characteristic of the water seems to be its remarkable freedom from mineral matter.

ANALYSIS McCRANIE WELL

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	6.0	.350
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	42.0	2.449
Sodium oxide (Na_2O)	3.0	.175
Potassium oxide (K_2O)	trace	trace
Lime (CaO)	.2	.012
Magnesia (MgO)	.2	.012
Alumina (Al_2O_3)	.5	.029
Ferric oxide (Fe_2O_3)	1.0	.058
Hydrogen sulphide (H_2S)	.5	.029
PROBABLE COMBINATIONS		
Potassium chloride	trace	trace
Sodium chloride	5.6	.327
Magnesium chloride	.6	.035
Calcium carbonate	.3	.017
Ferrous carbonate	1.4	.081
Aluminum oxide	.5	.029
Silica	6.0	.350
Total solids	14.4	.839
Free carbon dioxide	41.0	2.391

MADISON SPRING

MADISON COUNTY

This spring is in the northern part of Madison County about 7 miles north of Danielsville, the county site. Royston, on the Elberton Air Line Railroad, is the nearest railroad station. Previous to the Civil War this spring was a very popular resort, but of late years it is seldom visited, except by the people in the immediate vicinity. The improvements, which are said to have once been quite extensive, have now all disappeared, with the exception of a few cottages much out of repair. The spring is small, furnishing less than 2 gallons per minute.

ANALYSIS MADISON SPRING

Light alkaline-saline

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	38.60	2.251
Chlorine (Cl)	5.25	.306
Sulphur trioxide (SO_3)	9.28	.541
Carbon dioxide (CO_2)	38.80	2.263
Sodium oxide (Na_2O)	12.30	.717
Potassium oxide (K_2O)	3.04	.177
Lime (CaO)	9.10	.531
Magnesia (MgO)	3.86	.225
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	.10	.006
Ferric oxide (Fe_2O_3)	1.00	.058
PROBABLE COMBINATIONS		
Potassium chloride	5.40	.315
Sodium chloride	4.42	.258
Sodium sulphate	16.46	.960
Sodium phosphate	trace	trace
Sodium carbonate	4.72	.275
Magnesium carbonate	8.10	.472
Calcium carbonate	16.25	.948
Aluminum sulphate	.34	.020
Ferrous carbonate	1.55	.090
Silica	38.60	2.251
Total solids	95.84	5.589
Free carbon dioxide	24.90	1.452

MAGNOLIA SPRING

SUMTER COUNTY

Magnolia Spring, a resort of local importance, has been known for many years. It is located about 7½ miles northwest of Americus, near the public road leading to Friendship. The flow is about 20 gallons per minute. The improvements consist of a dancing pavilion, a bath house and a number of small cottages. The spring furnishes an ideal place for picnics and public gatherings. It is no uncommon thing to see collected here during the summer or the early spring a thousand or more people on a picnic or pleasure outing.

ANALYSIS MAGNOLIA SPRING
Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	11.0	.641
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	10.0	.583
Carbon dioxide (CO_2)	98.0	5.715
Sodium oxide (Na_2O)	5.4	.315
Potassium oxide (K_2O)	.9	.052
Lime (CaO)	39.8	2.321
Magnesia (MgO)	5.3	.309
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	5.7	.332
PROBABLE COMBINATIONS		
Potassium chloride	1.9	.111
Sodium chloride	5.0	.291
Sodium sulphate	6.2	.361
Calcium carbonate	71.0	4.140
Magnesium sulphate	9.8	.571
Magnesium carbonate	4.2	.245
Aluminum oxide	.4	.023
Ferrous carbonate	9.2	.536
Silica	11.0	.641
Total solids	118.7	6.919
Free carbon dioxide	46.2	2.694

MAJORS MINERAL SPRING

CHATTOOGA COUNTY

This spring, also known as Menlo Mineral Spring, is in the western part of Chattooga County, only a few hundred yards from the corporate limits of Menlo. The main spring, from which the sample of water was taken for analysis, furnishes only about 1 gallon per minute. The water deposits quite a precipitate of iron oxide and has a distinct astringent taste. It issues as a small stream from a fissure in the Devonian black shale. The only improvement at the time of the writer's visit was a small, poorly constructed boarding house located on the hill just above the spring. Locally, Majors Mineral Spring has quite a reputation, being much visited by people from Chattooga and the surrounding counties.

ANALYSIS MAJORS MINERAL SPRING

Sulphated aluminous-saline-chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	65.30	3.808
Chlorine (Cl)	5.60	.327
Sulphur trioxide (SO_3)	137.00	7.990
Carbon dioxide (CO_2)	77.90	4.543
Sodium oxide (Na_2O)	11.60	.676
Potassium oxide (K_2O)	.92	.053
Lime (CaO)	13.30	.776
Magnesia (MgO)	6.00	.350
Phosphorus pentoxide (P_2O_5)	trace	trace
Manganous oxide (MnO)	1.40	.082
Alumina (Al_2O_3)	40.50	2.362
Ferric oxide (Fe_2O_3)	49.50	2.304
PROBABLE COMBINATIONS		
Potassium chloride	1.46	.085
Sodium chloride	7.35	.429
Sodium sulphate	17.63	1.028
Sodium phosphate	trace	trace
Magnesium sulphate	18.00	1.050
Calcium sulphate	32.30	1.884
Manganese carbonate	3.00	.175
Aluminum sulphate	135.80	7.920
Ferrous sulphate	1.40	.082
Ferrous carbonate	66.28	3.282
Silica	65.30	3.808
Total solids	348.52	19.743
Free carbon dioxide	51.36	2.995

MARTIN MINERAL SPRING

WHITFIELD COUNTY

This spring is located among the foot-hills of Chattoogata Mountain about 2 miles southwest of Dalton. It is a small chalybeate spring furnishing only about one-half gallon per minute. The water, which has a distinct irony taste, issues from the Devonian black shale. There is no improvement about the spring, except a curbing and a small shed-like spring house.

The spring is much visited during the summer months by the people of Dalton, many of whom speak in the highest terms of the curative properties of the water.

ANALYSIS MARTIN MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	28.50	1.662
Chlorine (Cl)	5.10	.297
Sulphur trioxide (SO_3)	17.92	1.045
Carbon dioxide (CO_2)	63.20	3.686
Sodium oxide (Na_2O)	8.66	.505
Potassium oxide (K_2O)	4.00	.233
Lime (CaO)	21.40	1.248
Magnesia (MgO)	12.61	.735
Phosphorus pentoxide (P_2O_5)	trace	trace
Manganous oxide (MnO)	trace	trace
Alumina (Al_2O_3)	1.00	.058
Ferric oxide (Fe_2O_3)	10.30	.601
PROBABLE COMBINATIONS		
Potassium chloride	6.23	.363
Sodium chloride	3.46	.202
Sodium sulphate	15.64	.912
Sodium phosphate	trace	trace
Magnesium sulphate	10.11	.584
Magnesium carbonate	19.40	1.131
Calcium carbonate	38.21	2.228
Manganese carbonate	trace	trace
Aluminum sulphate	3.35	.195
Ferrous carbonate	14.94	.871
Silica	28.50	1.662
Total solids	139.84	8.148
Free carbon dioxide	31.00	1.808

MEDLOCK WELL[1]

COBB COUNTY

This well, now known as "Old Salt," is near the left bank of Sweetwater Creek, five-eights of a mile northwest of Austell and only a few hundred yards southwest of the Sulpho-Magnesia Artesian well. It is located within a few rods of the old Medlock Spring now no longer in use, but which formerly had a considerable reputation as a mineral spring. The well was completed in 1903.

[1] The water from this well mixed in the proportion of 1 to 2, with the water from the Artesian Lithia Well forms the Benscot Lithia Water as now put on the market.

It is 6 inches in diameter and 65 feet deep. The water which is said to flow several gallons per minute, rises to within 5 feet of the surface. It has been used chiefly for medicinal purposes.

ANALYSIS MEDLOCK WELL

Muriated-saline-calcic-lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	26.20	1.528
Chlorine (Cl)	4,769.26	278.144
Sulphur trioxide (SO_3)	641.60	37.417
Carbon dioxide (CO_2)	93.38	5.446
Sodium oxide (Na_2O)	3,759.19	219.228
Potassium oxide (K_2O)	77.47	4.518
Lime (CaO)	667.05	38.901
Magnesia (MgO)	89.20	5.202
Alumina & ferric oxide (Al_2O_3 & Fe_2O_3)	18.40	1.073
Phosphorus pentoxide (P_2O_5)	.11	.006
Manganese (MnO)	trace	trace
Lithia (Li_2O)	14.45	.834
PROBABLE COMBINATIONS		
Lithium chloride	41.86	2.441
Potassium chloride	122.80	7.161
Sodium chloride	7,093.80	413.696
Sodium phosphate	.20	.012
Magnesium carbonate	267.60	15.607
Calcium sulphate	787.40	45.920
Calcium carbonate	40.70	2.782
Calcium chloride	634.40	36.997
Manganese carbonate	trace	trace
Alumina and ferric oxide	18.40	1.073
Silica	26.20	1.528
Total solids	9,033.36	527.217
Free carbon dioxide	93.38	5.446

MERIWETHER WHITE SULPHUR SPRINGS

MERIWETHER COUNTY

Within the last few years these springs have been greatly improved and as a result the accommodations compare favorably with the best summer resorts of the state. In addition to a well-arranged modern hotel, there are also a large number of attractive cottages

for the accommodation of guests. The grove of large oaks and the pavilion-like spring house make the grounds very attractive. The springs are located near the foot of Pine Mountain within a short distance from Meriwether Springs Station on the Central of Georgia Railway, and also near Durand Station on the Atlanta, Birmingham and Atlantic Railway. There is a group of some 4 or 5 springs, forming the so-called Meriwether White Sulphur Springs, but the analyses of only 3 of these springs, namely the White Sulphur, the Red Sulphur, and the Iron Spring, are given below. The White Sulphur Spring has a distinct odor of hydrogen sulphide and forms, at the point where it overflows its basin, a grayish-white precipitate; the Red Sulphur spring deposits a reddish-brown precipitate.

ANALYSES MERIWETHER WHITE SULPHUR SPRINGS

CONSTITUENTS DETERMINED	I		II		III	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	47.1	2.747	32.8	1.913	42.1	2.449
Chlorine (Cl)	7.0	.408	3.5	.204	3.4	.198
Sulphur trioxide (SO_3)	6.6	.385	5.2	.303	10.2	.595
Carbon dioxide (CO_2)	100.0	5.832	82.6	4.817	68.5	3.995
Sodium oxide (Na_2O)	14.3	.832	18.7	1.091	14.7	.857
Potassium oxide (K_2O)	3.4	.198	1.9	.111	3.4	.198
Lime (CaO)	24.5	1.429	29.0	1.691	29.5	1.720
Magnesia (MgO)	6.0	.350	4.6	.268	4.5	.262
Alumina (Al_2O_3)	.4	.023	.6	.035	.7	.041
Ferric oxide (Fe_2O_3)	3.6	.210	1.1	.064	3.0	.175
Phosphorus pentoxide (P_2O_5)	trace	trace	----	----	----	----
Manganous oxide (MnO)	trace	trace	----	----	----	----
PROBABLE COMBINATIONS						
Potassium chloride	5.4	.314	3.0	.175	5.4	.315
Sodium chloride	7.3	.426	3.4	.198	1.3	.076
Sodium sulphate	10.0	.585	9.2	.537	18.6	1.085
Sodium phosphate	trace	trace	----	----	----	----
Sodium carbonate	16.6	.970	22.0	1.283	10.2	.595
Calcium carbonate	43.7	2.551	51.8	3.021	52.7	3.074

PROBABLE COMBINATIONS	I		II		III	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Magnesium carbonate	12.6	.735	9.6	.560	9.5	.554
Manganese carbonate	trace	trace	----	----	----	----
Aluminum sulphate	1.4	.079	----	----	----	----
Aluminum oxide	----	----	.6	.035	.7	.041
Ferrous carbonate	5.2	.304	1.6	.093	4.4	.257
Silica	47.1	2.747	32.8	1.913	42.0	2.449
Total solids	149.4	8.711	134.0	7.815	144.8	8.446
Free carbon dioxide	70.48	4.110	45.1	2.630	34.4	2.006

I White Sulphur Spring II Red Sulphur Spring III Iron Spring

MILLER'S MINERAL SPRING

Baldwin County

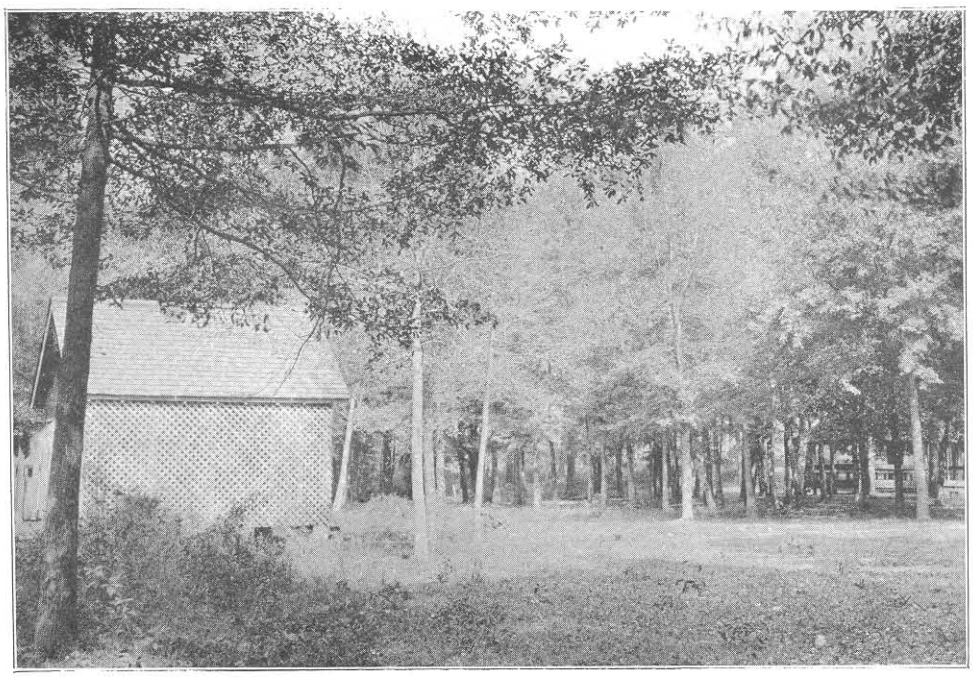
This spring is within the corporate limits of Milledgeville, about one-fourth mile north of the court house. It is a never failing spring, furnishing 1½ gallons per minute. Within the last few years a considerable amount of this water has been put on the market, both as a drinking and as a meidcinal water. The spring is unimproved, being situated within a short distance of the residence, of the owner, W. W. Miller.

ANALYSIS MILLER MINERAL SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	45.6	2.659
Chlorine (Cl)	64.0	3.732
Sulphur trioxide (SO_3)	7.0	.408
Carbon dioxide (CO_2)	99.0	5.773
Sodium oxide (Na_2O)	29.7	1.732
Potassium oxide (K_2O)	2.5	.146
Lime (CaO)	50.7	2.957
Magnesia (MgO)	25.7	1.499
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	.3	.018
Nitrogen pentoxide (N_2O_5)	1.9	.111

A. KAVANAUGH SPRING, MUSCOGEE COUNTY, GEORGIA



B. LIFSEY SPRING, PIKE COUNTY, GEORGIA

PROBABLE COMBINATIONS		
Potassium chloride	4.0	.233
Sodium nitrate	3.0	.175
Sodium chloride	52.6	3.068
Magnesium chloride	39.5	2.303
Magnesium sulphate	10.5	.612
Magnesium carbonate	11.5	.670
Calcium carbonate	90.5	5.278
Aluminum oxide	.4	.023
Ferric oxide	.3	.018
Silica	45.6	2.659
Total solids	257.9	15.039
Free carbon dioxide	53.2	3.102

MINERAL SPRINGS SUMMER RESORT

WALKER COUNTY

The Mineral Springs Summer Resort is located in the gap of Pigeon Mountain 4 miles north of LaFayette and about 24 miles south of Chattanooga. This resort, which has only been recently opened, can be reached either by the Central of Georgia Railway or the Tennessee, Alabama and Georgia Railroad, both roads having stations within two miles of the resort. It can also be reached by the Government Highway which runs to within a short distance of the resort. The location is all that could be desired for a summer resort. It is near the northern terminus of Pigeon Mountain in what is known as Catlett Gap, a natural wind gap connecting Chattooga Valley with the valley of West Chickamauga Creek. The improvements at present consist of a club house, a score or more of open air sleeping rooms, large dining hall and kitchen, pool room, and baths, together with tennis court, bowling alley, artificial lake, etc. Near the club house, and connected with it by a nice paved, graded way, is a group of springs said to be 21 in number, which furnish the water supply for drinking and other purposes. The character of these waters are shown by the following analyses of samples taken from springs Nos. 1, 2, 10, and 21.

ANALYSES MINERAL SPRINGS SUMMER RESORT

CONSTITUENTS DETERMINED	1		2		10		21	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	23.4	1.341	19.0	1.108	12.0	.700	18.0	1.050
Chlorine (Cl)	4.2	.245	7.0	.408	4.2	.245	3.5	.204
Sulphur trioxide (SO_3)	10.6	.618	14.0	.816	1.6	.093	18.3	1.067
Carbon dioxide (CO_2)	117.0	6.822	137.0	7.989	148.0	8.632	20.0	1.167
Sodium oxide (Na_2O)	7.5	.437	16.0	.933	4.7	.274	2.2	.128
Potassium oxide (K_2O)	2.0	.116	1.8	.105	.7	.041	.7	.041
Lime (CaO)	47.0	2.740	51.0	2.974	48.7	2.840	4.2	.245
Magnesia (MgO)	14.0	.816	13.3	.775	11.7	.682	3.7	.216
Alumina (Al_2O_3)	1.4	.082	.8	.047	.8	.047	.2	.011
Ferric oxide (Fe_2O_3)	8.0	.466	4.0	.233	1.7	.099	8.0	.466
PROBABLE COMBINATIONS								
Potassium chloride	3.6	.210	2.9	.169	1.1	.064	1.5	.087
Sodium chloride	5.1	.297	9.2	.536	6.1	.356	4.6	.268
Sodium sulphate	13.6	.793	24.9	1.452	3.1	.181	.6	.035
Calcium carbonate	84.0	4.900	91.0	5.307	87.0	5.074	----	----
Calcium sulphate	----	----	----	----	----	----	10.2	.595
Magnesium carbonate	25.2	1.469	28.0	1.633	24.5	1.446	----	----
Magnesium sulphate	6.1	.356	----	----	----	----	11.0	.641
Aluminum oxide	1.4	.082	.8	.047	.8	.047	----	----
Aluminum sulphate	----	----	----	----	----	----	.6	.035
Ferrous carbonate	11.6	.645	6.6	.385	2.5	.146	5.5	.321
Ferrous sulphate	----	----	----	----	----	----	9.2	.537
Silica	23.0	1.341	19.0	1.108	12.0	.700	18.0	1.050
Total solids	173.6	10.093	182.4	10.637	137.1	8.014	61.2	3.569
Free carbon dioxide	64.7	3.773	80.0	4.665	96.0	5.599	18.0	1.050

MIONA MINERAL SPRINGS

Macon County

This group of springs is located near the right bank of Flint River about 12 miles north of Oglethorpe. They are 7 in number all occurring within a space of a few acres near the margin of the river swamp. The nearest railroad station is Ideal on the Atlanta, Birmingham and Atlantic Railway. At the time of the writer's visit 5 years ago the improvements consisted of a 22-room hotel

and a number of cottages. The springs flow from 5 to 20 gallons each per minute. One of the main springs, known as No. 7, yields a faint odor of sulphuretted hydrogen and throws down a light yellowish-brown precipitate on standing. Another spring, which is designated in the analyses given below No. 3, is quite similar to spring No. 7, but shows less evidence of sulphur and iron.

The waters from the Miona Springs, in addition to being used at the spring by guests, have been put on the market both as a table and mineral water.

ANALYSES MIONA MINERAL SPRINGS

CONSTITUENTS DETERMINED	No. 7		No. 3	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	10.5	.612	8.8	.513
Chlorine (Cl)	15.6	.910	4.0	.233
Sulphur trioxide (SO_3)	4.0	.233	4.6	.268
Carbon dioxide (CO_2)	58.0	3.382	22.6	1.318
Sodium oxide (Na_2O)	9.2	.537	2.8	.163
Potassium oxide (K_2O)	8.0	.467	.6	.035
Lime (CaO)	4.2	.245	1.7	.099
Magnesia (MgO)	3.8	.222	.8	.047
Alumina (Al_2O_3)	7.0	.408	.8	.047
Ferric oxide (Fe_2O_3)	6.5	.379	1.6	.094
PROBABLE COMBINATIONS				
Potassium chloride	12.8	.747	1.0	.058
Sodium chloride	15.6	.910	5.8	.338
Sodium sulphate	2.1	.122	----	----
Magnesium sulphate	4.2	.245	2.4	.140
Magnesium carbonate	5.0	.292	----	----
Calcium carbonate	7.5	.437	----	----
Calcium sulphate	----	----	4.1	.239
Aluminum sulphate	----	----	.9	.052
Aluminum oxide	7.0	.408	.1	.006
Ferrous carbonate	9.4	.548	2.3	.134
Silica	10.5	.612	8.8	.513
Total solids	74.1	4.321	25.4	1.480
Free carbon dioxide	48.6	2.834	21.7	1.266

MONTPELIER SPRING

MONROE COUNTY

This spring is located in the extreme southern part of Monroe County about 17 miles west of Macon. Prior to the Civil War the spring was quite a resort and also the seat of a very flourishing Episcopal school.

ANALYSIS MONTPELIER SPRING

Alkaline-saline

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	50.0	2.916
Chlorine (Cl)	5.3	.309
Sulphur trioxide (SO_3)	14.7	.857
Carbon dioxide (CO_2)	124.0	7.231
Sodium oxide (Na_2O)	16.1	.938
Potassium oxide (K_2O)	2.4	.140
Lime (CaO)	16.8	.979
Magnesia (MgO)	6.0	.350
Alumina (Al_2O_3)	2.2	.128
Ferric oxide (Fe_2O_3)	3.0	.175
PROBABLE COMBINATIONS		
Potassium chloride	4.6	.268
Sodium chloride	5.1	.297
Sodium sulphate	26.0	1.516
Sodium carbonate	3.2	.187
Calcium carbonate	30.0	1.750
Magnesium carbonate	12.6	.735
Aluminum oxide	2.2	.128
Ferrous carbonate	4.4	.256
Silica	50.0	2.916
Total solids	138.1	8.053
Free carbon dioxide	101.3	5.907

MORGAN MINERAL WELL

DADE COUNTY

The Morgan well is in the Lookout Valley, Dade County, one-fourth mile north of Morganville, a station on the Alabama Great Southern Railroad. The well, which was put down about 2 years ago, has a depth of 112 feet, the last 88 feet being in limestone. The

water has a distinct odor of sulphuretted hydrogen and a salty taste. The amount of supply has not yet been definitely determined; however, the test made seems to indicate that the supply is large. So far, the water has been used only for stock and domestic purposes, but the owner advises the writer that he will probably place it on the market in a short time.

ANALYSIS MORGAN WELL

Muriated-saline. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	19.0	1.108
Chlorine (Cl)	565.0	32.950
Sulphur trioxide (SO_4)	136.7	7.972
Carbon dioxide (CO_2)	388.0	22.627
Sodium oxide (Na_2O)	630.8	36.786
Potassium oxide (K_2O)	25.4	1.481
Lime (CaO)	96.9	5.650
Magnesia (MgO)	46.7	2.723
Alumina (Al_2O_3)	8.0	.467
Ferric oxide (Fe_2O_3)	1.0	.058
Sulphur (S)	44.0	2.566
Bromine (Br)	3.0	.175
Nitric acid (HNO_3)	trace	trace
Phosphoric acid (P_2O_5)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	33.2	1.935
Potassium bromide	4.6	.268
Sodium chloride	910.0	53.069
Sodium sulphate	242.6	14.147
Sodium carbonate	72.8	4.247
Calcium carbonate	173.0	10.089
Magnesium carbonate	98.0	5.715
Aluminum oxide	8.0	.467
Ferrous carbonate	1.3	.076
Silica	19.0	1.108
Total solids	1,562.5	91.121
Free carbon dioxide	220.0	12.829
Hydrogen sulphide	47.0	2.741

MOZLEY SPRING

COBB COUNTY

This spring is located in a beautiful grove near the right bank of Sweetwater Creek one-half mile northwest of the depot at Austell. The spring was improved a year or so ago by J. H. Louch by the addition of a cement curbing, etc., with a view of putting the water upon the market, but as the analysis did not show any lithium present the undertaking was abandoned. The flow is about 1 gallon per minute. The limited amount of mineral matter present in this water would suggest that it would make a desirable table water.

ANALYSIS MOZLEY SPRING

Light alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	38.3	2.233
Chlorine (Cl)	4.2	.244
Sulphur trioxide (SO_3)	2.1	.122
Carbon dioxide (CO_2)	57.4	3.347
Sodium oxide (Na_2O)	5.2	.303
Potassium oxide (K_2O)	2.1	.122
Lime (CaO)	9.2	.536
Magnesia (MgO)	5.0	.292
Alumina (Al_2O_3)	.2	.012
Ferric oxide (Fe_2O_3)	.6	.035
PROBABLE COMBINATIONS		
Potassium chloride	3.2	.187
Sodium chloride	4.4	.257
Sodium sulphate	3.7	.216
Sodium carbonate	2.2	.128
Calcium carbonate	16.4	.956
Magnesium carbonate	15.0	.875
Aluminum oxide	.2	.012
Ferrous carbonate	.9	.052
Silica	38.3	2.233
Total solids	84.3	4.916
Free carbon dioxide	39.0	2.275

A. LOUCH WELL, (BENSCOT), COBB COUNTY, GEORGIA

B. BOARDING HOUSE, MAJORS MINERAL SPRING, CHATTOOGA COUNTY, GEORGIA

MUNROE SPRING

MARION COUNTY

Munroe Spring is on the Springdale Farm about 5 miles northwest of Putnam, a station on the Central of Georgia Railway. The spring is said to be beautifully located in a valley surrounded on all sides by gently sloping wooded hills. Many people are reported to visit this spring and use the water for its supposed mineral properties. A brownish precipitate occurs about the drain-way, and its irony taste seems to be the main characteristic of the water. The only improvement consists apparently of terra cotta curbing and a spring house, there being no accommodations for guests.

ANALYSIS MUNROE SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.4	.257
Chlorine (Cl)	12.0	.700
Sulphur trioxide (SO_3)	.6	.035
Carbon dioxide (CO_2)	60.0	3.499
Sodium oxide (Na_2O)	7.6	.443
Potassium oxide (K_2O)	3.1	.181
Lime (CaO)	3.5	.204
Magnesia (MgO)	2.0	.117
Alumina (Al_2O_3)	.9	.052
Ferric oxide (Fe_2O_3)	10.0	.583
PROBABLE COMBINATIONS		
Potassium chloride	4.9	.286
Sodium chloride	14.4	.839
Calcium carbonate	6.3	.367
Magnesium chloride	1.3	.076
Magnesium sulphate	.9	.052
Magnesium carbonate	2.5	.146
Aluminum oxide	.9	.052
Ferrous carbonate	14.5	.845
Silica	4.4	.257
Total solids	50.1	2.920
Free carbon dioxide	50.5	2.945

MURROW MINERAL SPRING

TIFT COUNTY

Murrow Mineral Spring is on the right bank of Little River, about 4 miles west of Tifton. The improvements consist of a bath-house, swimming pool and a pavilion. In the summer the spring is much visited by picnic parties and pleasure seekers. The water has considerable sale in Tifton and elsewhere for drinking and for medicinal purposes. It is claimed to be especially beneficial for certain classes of stomach disorders.

The spring is said to be quite large, furnishing several gallons per minute.

ANALYSIS MURROW MINERAL SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	23.4	1.364
Chlorine (Cl)	3.0	.175
Sulphur trioxide (SO_3)	3.0	.175
Carbon dioxide (CO_2)	105.0	6.124
Sodium oxide (Na_2O)	6.5	.379
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	56.1	3.266
Magnesia (MgO)	2.4	.140
Alumina (Al_2O_3)	1.4	.082
Ferric oxide (Fe_2O_3)	1.0	.058
Phosphorus pentoxide (P_2O_5)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	1.6	.093
Sodium chloride	3.6	.210
Sodium phosphate	trace	trace
Sodium sulphate	5.3	.309
Sodium nitrate	.4	.023
Sodium bicarbonate	6.0	.350
Calcium carbonate	101.1	5.890
Magnesium carbonate	5.0	.291
Ferrous carbonate	1.4	.082
Aluminum oxide	1.4	.082
Silica	23.4	1.364
Total solids	149.1	8.694

NEW HOPE SPRING

CARROLL COUNTY

New Hope Spring is located within a few hundred yards of the Southern Railway about 1 mile northeast of Villa Rica. It is in a narrow valley surrounded on both sides by rather steep hills.

The flow is 2 gallons or more per minute. The only improvement is a neat curbing of cement. An effort was made a few years ago to make this spring a local resort, but for some reason the project never materialized.

ANALYSIS NEW HOPE SPRING

Neutral

Silica (SiO_2)	17.5	1.020
Chlorine (Cl)	12.2	.711
Sulphur trioxide (SO_3)	1.3	.076
Carbon dioxide (CO_2)	36.0	2.099
Sodium oxide (Na_2O)	8.7	.507
Potassium oxide (K_2O)	3.4	.198
Lime (CaO)	7.0	.408
Magnesia (MgO)	4.8	.280
Ferric oxide (Fe_2O_3)	1.2	.070
Alumina (Al_2O_3)	.6	.035
PROBABLE COMBINATIONS		
Potassium chloride	5.1	.297
Sodium oxide	16.2	.944
Magnesium sulphate	2.0	.117
Magnesium carbonate	8.8	.513
Calcium carbonate	12.5	.729
Ferrous carbonate	1.8	.105
Aluminum oxide	.6	.035
Silica	17.5	1.020
Total solids	64.5	3.860

NORWOOD SULPHUR SPRING

HOUSTON COUNTY

This is a small sulphur spring situated in the edge of a swamp about 8 miles southeast of Fort Valley and within 2 miles of the branch of the Central of Georgia Railway extending from Fort

Valley to Perry. With the exception of a wooden curbing and a bath pool, also constructed of wood, there are no improvements about the spring. It flows about 1 gallon of water per minute, which has a distinct odor of sulphuretted hydrogen. The water is supposed to be of value in the treatment of skin diseases, especially when used for bathing purposes. The spring seems to be known only locally and its water is used chiefly by those residing in the immediate surrounding section.

ANALYSIS NORWOOD SULPHUR SPRING

Light saline-sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	5.5	.321
Chlorine (Cl)	5.0	.292
Sulphur trioxide (SO_3)	7.5	.437
Carbon dioxide (CO_2)	42.9	2.501
Sodium oxide (Na_2O)	2.6	.152
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	2.0	.117
Magnesia (MgO)	1.2	.070
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	1.5	.087
PROBABLE COMBINATIONS		
Potassium chloride	1.3	.076
Sodium chloride	4.9	.286
Calcium sulphate	4.9	.286
Magnesium chloride	1.6	.093
Magnesium sulphate	1.5	.087
Aluminum sulphate	3.0	.175
Ferrous sulphate	2.9	.169
Silica	5.5	.321
Total solids	25.6	1.493
Free carbon dioxide	42.9	2.501

OAK MOUNTAIN SPRING

TALBOT COUNTY

Oak Mountain Spring is in the extreme western part of Talbot County, 2½ miles northeast of White Oak, a station on the McDon-

ough-Columbus branch of the Southern Railway. This spring is beautifully located for a resort at the base of White Oak Mountain and within easy reach of the railroad. The improvements consist of a small hotel and a number of cottages, together with a bath house. The spring is a small chalybeate spring, furnishing only about 1 gallon per minute. The water has an irony taste and throws down, on standing, a rather copious yellowish-brown precipitate. The spring has quite a reputation as a mineral water.

ANALYSIS OAK MOUNTAIN SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	38.0	2.216
Chlorine (Cl)	5.2	.303
Sulphur trioxide (SO_3)	10.0	.583
Carbon dioxide (CO_2)	72.9	4.251
Sodium oxide (Na_2O)	13.0	.758
Potassium oxide (K_2O)	3.1	.181
Lime (CaO)	12.1	.706
Magnesia (MgO)	7.7	.449
Aluminum oxide (Al_2O_3)	2.1	.122
Ferric oxide (Fe_2O_3)	9.8	.572
PROBABLE COMBINATIONS		
Potassium chloride	5.0	.292
Sodium chloride	4.6	.268
Sodium sulphate	17.8	1.038
Sodium carbonate	6.5	.379
Calcium carbonate	21.6	1.260
Magnesium carbonate	16.2	.945
Aluminum oxide	2.1	.122
Ferrous carbonate	14.2	.828
Silica	38.0	2.216
Total solids	126.0	7.348
Free carbon dioxide	55.3	3.225

OMAHA SPRINGS

JEFFERSON COUNTY

This group of springs is located in the northwestern part of Jefferson County. They are situated in a dense grove at the base

of a rather precipitous hill-slope, 2 miles south of Avera, a small station on the Augusta Southern Railroad. One of the largest of these springs from which a sample of water was secured for analysis flows something like 100 gallons per minute. The main improvement consists of a well-built hotel of 24 rooms. The water from these springs is said to have a considerable sale in Augusta.

The analysis, as given below, shows that the water is quite free from mineral matter and therefore well suited as a table water.

ANALYSIS OMAHA SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	5.2	.303
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	1.0	.058
Carbon dioxide (CO_2)	26.2	1.528
Sodium oxide (Na_2O)	2.5	.146
Potassium oxide (K_2O)	.4	.023
Lime (CaO)	.8	.047
Magnesia (MgO)	.8	.047
Alumina (Al_2O_3)	.4	.023
Ferric oxide (Fe_2O_3)	.8	.047
PROBABLE COMBINATIONS		
Potassium chloride	.7	.041
Sodium chloride	5.2	.303
Magnesium sulphate	1.5	.087
Magnesium carbonate	.6	.035
Calcium carbonate	1.4	.082
Ferrous carbonate	1.1	.064
Aluminum oxide	.4	.023
Silica	5.2	.303
Total solids	16.1	.938
Free carbon dioxide	25.2	1.470

PALMER SPRING

MERIWETHER COUNTY

This spring is located on lot 75, 1st district, near Pigeon Creek, in the extreme southeastern corner of Meriwether County. The

nearest railroad station is Chalybeate, on the Atlanta, Birmingham and Atlantic Railway. The water as it escapes from the spring is said to give off a faint odor of hydrogen sulphide. The flow is 2 gallons per minute. There are no improvements, and the water, apparently, is but little used.

ANALYSIS PALMER SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	27.6	1.610
Chlorine (Cl)	5.2	.303
Sulphur trioxide (SO_3)	10.5	.612
Carbon dioxide (CO_2)	82.7	4.823
Sodium oxide (Na_2O)	8.9	.519
Potassium oxide (K_2O)	4.7	.274
Lime (CaO)	31.5	1.837
Magnesia (MgO)	11.0	.641
Alumina (Al_2O_3)	.7	.041
Ferric oxide (Fe_2O_3)	2.0	.117
PROBABLE COMBINATIONS		
Potassium chloride	7.4	.432
Sodium chloride	2.8	.163
Sodium sulphate	16.9	.985
Magnesium sulphate	1.5	.087
Magnesium carbonate	20.0	1.166
Calcium carbonate	56.2	3.278
Ferrous carbonate	2.9	.169
Aluminum oxide	.7	.041
Silica	27.6	1.610
Total solids	136.0	7.931
Free carbon dioxide	46.4	2.706

PARKER SPRING

LAURENS COUNTY

The Parker spring is located one-half mile west of Lovett. It flows from a hillside and furnishes 7½ gallons per minute. The water is supposed to possess medicinal properties, but so far it has been used mainly for domestic purposes.

ANALYSIS PARKER SPRING

Neutral

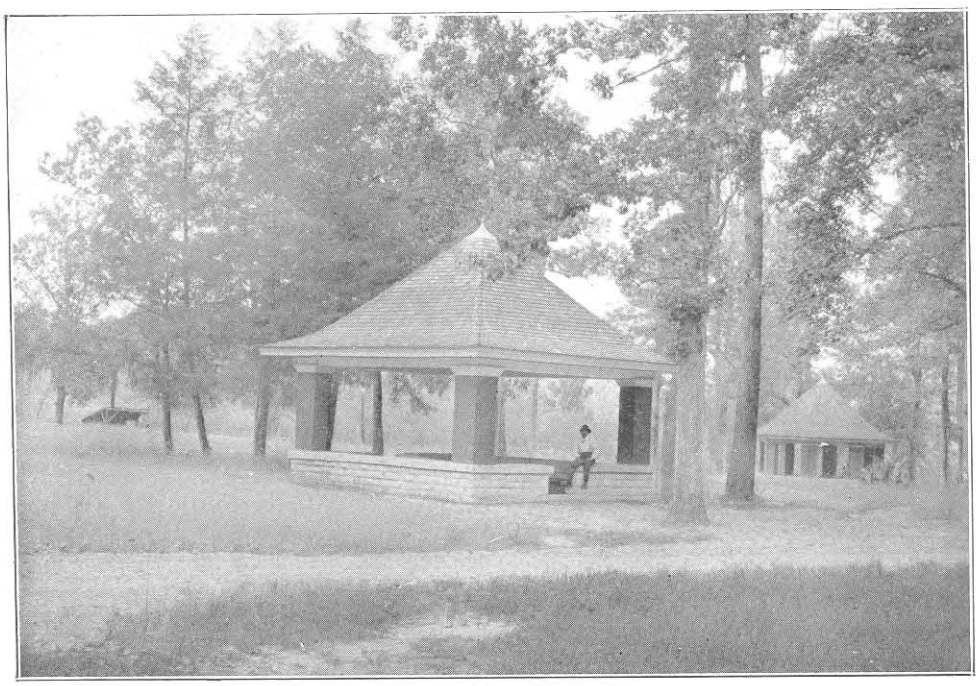
CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	14.0	.816
Chlorine (Cl)	4.4	.257
Sulphur trioxide (SO_3)	2.0	.117
Carbon dioxide (CO_2)	7.5	.437
Sodium oxide (Na_2O)	3.8	.222
Potassium oxide (K_2O)	.1	.006
Lime (CaO)	2.1	.122
Magnesia (MgO)	1.4	.082
Alumina (Al_2O_3)	.3	.017
Ferric oxide (Fe_2O_3)	.3	.017
PROBABLE COMBINATIONS		
Potassium chloride	.2	.012
Sodium chloride	7.1	.414
Magnesium chloride	.2	.012
Magnesium sulphate	3.0	.175
Magnesium carbonate	.6	.035
Calcium carbonate	3.7	.216
Ferrous carbonate	.4	.023
Aluminum oxide	.3	.017
Silica	14.0	.816
Total solids	29.5	1.720
Free carbon dioxide	5.5	.321

PHOENIX SPRING

DADE COUNTY

This spring, which is owned by the Phoenix Iron & Coal Company, is situated on the west slope of Lookout Mountain in Dade County, about 5 miles north of Rising Fawn. It emerges as a bold stream from the fissures in the Bangor limestone. The water is quite clear, but it deposits a heavy precipitate of calcium carbonate. This deposit, which is a porous, rather soft material, forms a layer several inches in thickness in the bed of the branch flowing from the spring. The spring is somewhat inaccessible, owing to the steepness of the mountain slope on which it is situated, and, as a consequence, is seldom visited.

A. HOTEL, MERIWETHER WHITE SULPHUR SPRINGS, MERIWETHER COUNTY, GEORGIA



B. MERIWETHER WHITE SULPHUR SPRINGS, MERIWETHER COUNTY, GEORGIA

ANALYSIS PHOENIX SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	6.5	.379
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	2.1	.122
Carbon dioxide (CO_2)	158.4	9.238
Sodium oxide (Na_2O)	3.0	.175
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	80.4	4.688
Magnesia (MgO)	8.7	.507
Alumina (Al_2O_3)	2.6	.152
Ferric oxide (Fe_2O_3)	1.2	.070
PROBABLE COMBINATIONS		
Potassium chloride	1.3	.076
Sodium chloride	5.7	.332
Magnesium sulphate	3.1	.181
Magnesium carbonate	16.2	.945
Calcium carbonate	143.6	8.375
Aluminum oxide	2.6	.122
Ferrous carbonate	1.7	.099
Silica	6.5	.379
Total solids	180.7	10.509
Free carbon dioxide	86.8	5.062

PIGEON MOUNTAIN IRON COMPANY'S WELL

WALKER COUNTY

This well is located among the foot-hills of Pigeon Mountain, on lot 154, 8th district, Walker County, 1½ miles from Noble, a station on the Central of Georgia Railway. The well, which is 4 inches in diameter, penetrates rock for 90 feet, its entire depth. The water has a distinct odor of sulphuretted hydrogen and forms, on standing, a yellowish precipitate. The static head is within 20 feet of the surface. The water has been used chiefly in supplying a mining camp.

ANALYSIS PIGEON MOUNTAIN IRON COMPANY'S WELL

Sodic-alkaline-calcic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	18.8	1.097
Chlorine (Cl)	57.0	3.324

Sulphur trioxide (SO_3)	68.6	3.983
Carbon dioxide (CO_2)	360.5	21.023
Sodium oxide (Na_2O)	223.9	13.057
Potassium oxide (K_2O)	4.2	.245
Lime (CaO)	74.0	4.315
Magnesia (MgO)	37.2	2.170
Hydrogen sulphide (H_2S)	13.2	.770
Alumina (Al_2O_3)	.5	.029
Ferric oxide (Fe_2O_3)	1.5	.087
Lithium oxide (Li_2O)	none	none
PROBABLE COMBINATIONS		
Potassium chloride	6.7	.390
Sodium chloride	88.7	5.173
Sodium sulphate	122.2	7.126
Sodium bicarbonate	300.5	17.524
Sodium bisulphate	22.4	1.306
Calcium carbonate	132.1	7.703
Magnesium carbonate	78.1	4.555
Ferrous carbonate	2.3	.134
Aluminum oxide	.5	.029
Silica	18.8	1.097
Total solids	772.3	45.037
Free carbon dioxide	93.2	5.436

PINE MOUNTAIN SPRING

HARRIS COUNTY.

This spring is located at the foot of Pine Mountain on land lot 226, 5th district, Harris County, about 3 miles southeast of West Point. The water from this spring is now being put on the market at West Point and elsewhere as a pure table water. The spring is quite bold, furnishing by careful measurement 12 gallons per minute. It is unimproved, but is favorably located for a resort.

ANALYSIS PINE MOUNTAIN SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	11.0	.641
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	3.6	.210
Carbon dioxide (CO_2)	12.0	.700
Sodium oxide (Na_2O)	3.1	.181
Potassium oxide (K_2O)	.9	.052
Lime (CaO)	2.2	.128

Magnesia (MgO)	2.1	.122
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	2.8	.163
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	4.6	.268
Sodium sulphate	1.5	.087
Calcium sulphate	4.0	.233
Calcium carbonate	1.7	.099
Magnesium sulphate	4.1	.239
Aluminum oxide	1.0	.058
Ferrous carbonate	4.1	.239
Silica	11.0	.641
Total solids	33.5	1.951
Free carbon dioxide	6.3	.367

POINT ANDREWS MINERAL WELL

Bibb County

Point Andrews Mineral Well is located about 4 miles west of Macon within a short distance of the White Oak Mineral wells. It is a dug well 80 feet deep and is said to supply a large volume of water. The water from this well has been put on the market in Macon both as a mineral and a drinking water, but at present it is used only for domestic purposes at the residence near by.

ANALYSIS POINT ANDREWS MINERAL WELL

Calcic-magnesic-saline

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	45.0	2.624
Chlorine (Cl)	191.0	11.138
Sulphur trioxide (SO_3)	171.7	10.014
Carbon dioxide (CO_2)	148.0	8.632
Sodium oxide (Na_2O)	54.0	3.149
Potassium oxide (K_2O)	1.2	.070
Lime (CaO)	170.0	9.914
Magnesia (MgO)	83.3	4.858
Alumina (Al_2O_3)	2.0	.117
Ferric oxide (Fe_2O_3)	2.2	.128
PROBABLE COMBINATIONS		
Potassium chloride	2.1	.122
Sodium chloride	101.7	5.931

Calcium sulphate	254.0	14.812
Calcium carbonate	117.0	6.822
Magnesium sulphate	33.5	1.954
Magnesium chloride	171.5	10.001
Aluminum oxide	2.0	.117
Ferrous carbonate	3.6	.210
Silica	45.0	2.624
Total solids	730.4	42.593
Free carbon dioxide	88.0	5.132

POLAR ROCK MINERAL SPRING

FULTON COUNTY

Polar Rock Mineral Spring is 4½ miles south of Atlanta only a short distance from Lakewood and near the Hapeville public road. The spring is large, furnishing approximately 7 gallons per minute. It is well protected by stone curbing and a glass covering. The water flows directly into the bottling house which is well arranged and is kept in a neat and sanitary condition. The water is sold chiefly in Atlanta and is largely used as a drinking water. There are no accommodations for guests.

ANALYSIS POLAR ROCK SPRING
Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	24.4	1.423
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	30.0	1.750
Sodium oxide (Na_2O)	3.1	.181
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	9.5	.552
Magnesia (MgO)	3.3	.192
Alumina (Al_2O_3)	.5	.029
Ferric oxide (Fe_2O_3)	.5	.029
PROBABLE COMBINATIONS		
Potassium chloride	1.3	.076
Sodium chloride	5.9	.344
Calcium carbonate	17.0	.991
Magnesium carbonate	7.0	.408
Aluminum oxide	.5	.029

Ferrous carbonate	trace	trace
Silica	24.4	1.423
Total solids	56.8	3.312
Free carbon dioxide	14.5	.846

PONCE de LEON SPRING

FULTON COUNTY

This spring, which is said to have been discovered about 1870, is located in the northeastern part of the city of Atlanta in what is known as Ponce de Leon Park. It is a small chalybeate spring furnishing less than 2 gallons per minute. The water is used chiefly by the visitors to the park and by the people living in the immediate vicinity. The spring, which is surrounded by a strong stone wall, flows from a fissure in the gneissoid rock in a small ravine near the eastern margin of the park.

ANALYSIS PONCE DE LEON SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	30.20	1.752
Chlorine (Cl)	6.30	.367
Sulphur trioxide (SO_3)	3.50	.204
Carbon dioxide (CO_2)	47.50	2.770
Sodium oxide (Na_2O)	4.70	.274
Potassium oxide (K_2O)	3.45	.201
Lime (CaO)	7.00	.408
Magnesia (MgO)	4.60	.268
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	.80	.047
Ferric oxide (Fe_2O_3)	5.00	.292
PROBABLE COMBINATIONS		
Potassium chloride	5.47	.319
Sodium chloride	6.10	.356
Sodium sulphate	3.39	.198
Sodium phosphate	trace	trace
Calcium carbonate	12.50	.729
Magnesium sulphate	2.39	.139
Magnesium carbonate	7.98	.465
Aluminum sulphate	2.70	.157
Ferrous carbonate	7.25	.423

Silica	30.20	1.752
Total solids	77.98	4.538
Free carbon dioxide	35.07	2.045

POOR ROBIN SPRING

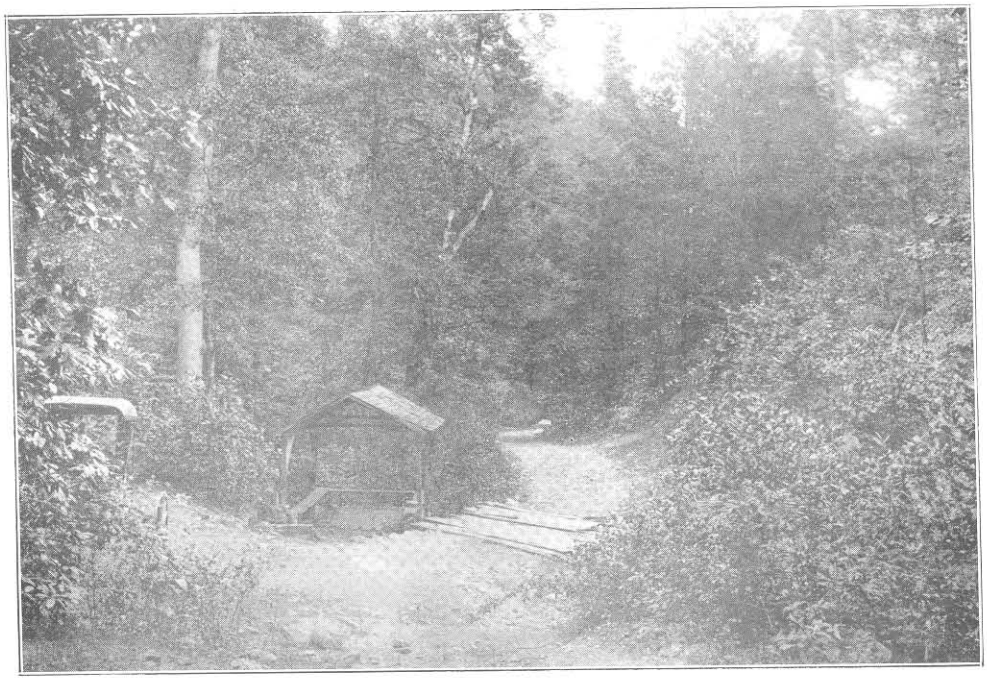
WILCOX COUNTY

This spring, known also as the Abbeville Mineral Spring, is located 1½ miles from Abbeville. The spring has long been known and within the last few years a considerable amount of the water has been sold. No information could be obtained from the owners concerning the flow of the spring or the improvements, although a number of letters requesting this information were addressed the company operating the spring.

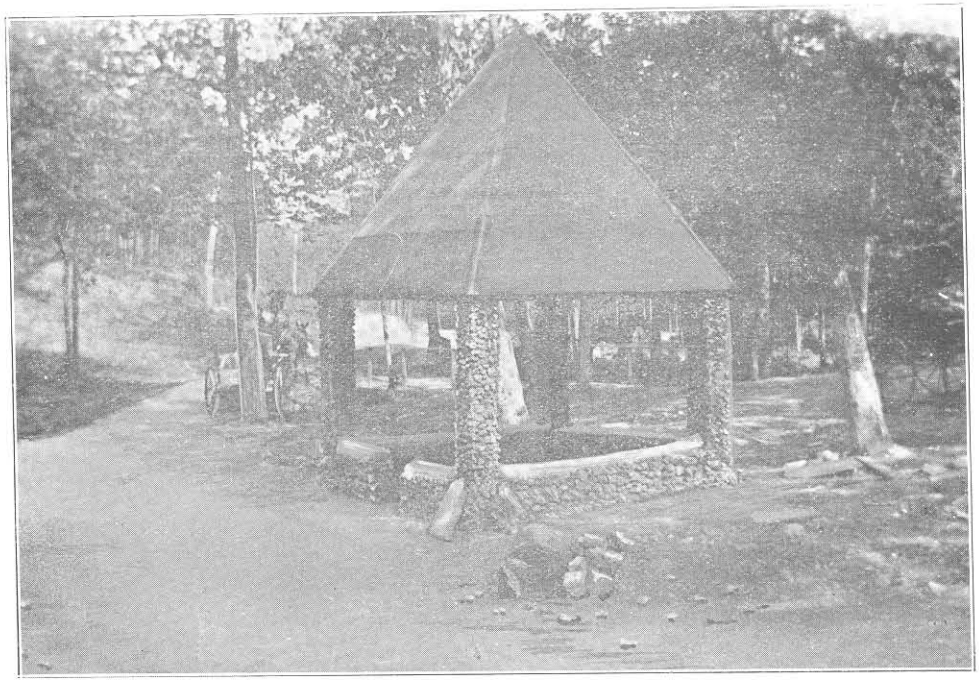
ANALYSIS POOR ROBIN SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	14.2	.828
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	1.2	.070
Carbon dioxide (CO_2)	127.1	7.412
Sodium oxide (Na_2O)	4.0	.233
Potassium oxide (K_2O)	.8	.047
Lime (CaO)	75.0	4.374
Magnesia (MgO)	6.4	.373
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	.5	.029
PROBABLE COMBINATIONS		
Potassium chloride	1.5	.087
Sodium chloride	4.6	.268
Sodium sulphate	2.1	.122
Sodium carbonate	2.6	.152
Calcium carbonate	133.9	7.808
Magnesium carbonate	13.4	.781
Ferrous carbonate	.7	.041
Aluminum oxide	1.0	.058
Silica	14.2	.828
Total	174.0	10.145
Free carbon dioxide	60.0	3.499



A. MARTIN SPRING, WHITFIELD COUNTY, GEORGIA



B. SPRING AT THE MINERAL SPRINGS SUMMER RESORT, NEAR LAFAYETTE, WALKER COUNTY, GEORGIA

PORTER SPRING

LUMPKIN COUNTY

This formerly popular summer resort is located in the northeastern part of Lumpkin County, about 8 miles north of Dahlonega. Cleveland, the nearest railroad station, is about 12 miles distant. The spring is situated at the base of one of the foot-hills of Cedar Mountain, a prominent peak of the Blue Ridge Mountains rising 3,000 feet above sea level. There are several excellent views in the vicinity of the spring from which Black Mountain and other high mountains in North Georgia may be seen. From a scenic point of view this spring is most favorably located. It is within 8 miles of Blood Mountain, one of the loftiest peaks of the Blue Ridge, and is only a short distance from the Chestatee River, which furnishes an excellent opportunity for bathing.

The improvements at the Spring consist of a hotel and a few cottages. The main part of the hotel was constructed some years ago and is now somewhat in need of repair.

The spring is small, furnishing only a few gallons of water per minute. Upon standing, the water throws down a rather copious reddish-brown precipitate. It is the intention of the present owners of this spring to begin improvements at an early date and make it a first-class modern summer resort.

ANALYSIS PORTER SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.10	.764
Chlorine (Cl)	5.10	.297
Sulphur trioxide (SO_3)	3.22	.188
Carbon dioxide (CO_2)	34.72	2.025
Sodium oxide (Na_2O)	7.82	.456
Potassium oxide (K_2O)	1.39	.081
Lime (CaO)	3.10	.181
Magnesia (MgO)	1.70	.099
Phosphate pentoxide (P_2O_5)	trace	trace
Arsenic (As)	trace	trace
Manganous oxide (MnO)	trace	trace
Alumina (Al_2O_3)	.30	.017
Ferric oxide (Fe_2O_3)	9.60	.560

PROBABLE COMBINATIONS		
Potassium chloride	2.20	.128
Sodium chloride	6.67	.389
Sodium phosphate	trace	trace
Sodium sulphate	3.99	.232
Sodium carbonate	4.37	.255
Magnesium carbonate	3.57	.208
Calcium carbonate	5.53	.322
Manganese carbonate	trace	trace
Aluminum sulphate	1.00	.058
Ferrous carbonate	13.92	.812
Silica	13.10	.764
Total solids	54.35	3.168
Free carbon dioxide	23.33	1.361

POST MINERAL SPRING

CHEROKEE COUNTY

This spring, also known as Cherokee Mineral Spring, is located within the corporate limits of Holly Springs, a few hundred yards east of the depot. It is a small spring, furnishing a limited flow. The only improvement is a concrete curbing or catchment basin. Within the last few months water from this spring has been put on the market in Atlanta and elsewhere as a mineral water.

ANALYSIS POST MINERAL SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.6	.268
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	2.9	.169
Carbon dioxide (CO_2)	7.3	.425
Sodium oxide (Na_2O)	3.1	.181
Potassium oxide (K_2O)	.6	.085
Lime (CaO)	1.2	.070
Magnesia (MgO)	.7	.041
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	1.4	.082
PROBABLE COMBINATIONS		
Potassium chloride	1.1	.064
Sodium chloride	4.8	.280
Sodium sulphate	1.9	.111

Calcium sulphate	.7	.041
Calcium carbonate	1.5	.087
Magnesium sulphate	2.0	.117
Aluminum oxide	1.0	.058
Ferrous carbonate	2.1	.122
Silica	4.6	.268
Total solids	19.7	1.148
Free carbon dioxide	5.0	.291

POWDER SPRINGS

COBB COUNTY

This group of springs is located at Powder Springs station on the Southern Railway 22 miles northwest of Atlanta. The springs have been known for more than 50 years, but owing to no improvements they have attained only a local reputation. All of the springs are small, none of them furnishing more than 1 gallon per minute. The waters from 2 of the springs, namely, 1 and 2, which are located near Powder Spring Creek, have a faint odor of sulphuretted hydrogen. The 3 analyses given below are from the 3 main springs of the group.

ANALYSIS POWDER SPRINGS

CONSTITUENTS DETERMINED			II		III	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	24.20	1.411	34.90	2.035	35.30	2.059
Chlorine (Cl)	107.80	6.287	84.00	4.899	5.60	.327
Sulphur trioxide (SO_3)	75.00	4.374	61.00	3.557	11.00	.642
Carbon dioxide (CO_2)	105.90	6.176	60.40	3.522	77.90	4.543
Sodium oxide (Na_2O)	95.40	5.564	105.70	6.164	11.50	.671
Potassium oxide (K_2O)	4.80	.280	5.70	.332	6.30	.367
Lime (CaO)	38.80	2.263	37.20	2.169	27.50	1.604
Magnesia (MgO)	7.90	.461	8.20	.478	10.00	.583
Phosphorus pentoxide (P_2O_5)	----	----	trace	trace	trace	trace.
Arsenic (As)	----	----	trace	trace	trace	trace

CONSTITENTS DETERMINED	I		II		II	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Hydrogen sulphide (H_2S)	1.00	.058	1.00	.058	.80	.047
Alumina (Al_2O_3)	1.00	.058	1.50	.087	1.10	.064
Ferric oxide (Fe_2O_3)	.04	.023	1.00	.058	1.00	.058
Lithia (Li_2O)	.012	.007	.09	.005	.05	.003
PROBABLE COMBINATIONS						
Lithium chloride	.04	.003	.02	.002	.015	.009
Potassium chloride	7.50	.437	8.70	.507	10.00	.583
Sodium chloride	171.70	10.013	131.30	7.657	1.60	.093
Sodium sulphate	10.20	.595	82.70	4.823	19.50	1.137
Sodium phosphate	----	----	trace	trace	trace	trace
Sodium carbonate	none	none	none	none	3.70	.216
Magnesium carbonate	5.00	.292	3.00	.175	21.00	1.225
Magnesium sulphate	16.40	.956	21.60	1.259	none	none
Calcium carbonate	none	none	66.40	3.872	49.10	2.863
Calcium sulphate	94.20	5.494	----	----	----	----
Aluminum sulphate	3.30	.192	3.50	.204	3.40	.198
Ferrous carbonate	1.00	.058	2.40	.139	1.45	.084
Silica	24.20	1.411	34.90	2.035	35.30	2.059
Total solids	333.54	19.451	354.528	20.673	145.06	8.467
Free carbon dioxide	103.30	6.024	22.20	2.945	43.80	2.554
Hydrogen Sulphide	1.00	.058	----	----	----	----

RIGHT-OF-WAY SPRING

Rabun County

This spring, so-called on account of it being on the right-of-way of the railroad, is also known as Oita Mineral Spring. It is on the side of Tallulah Falls public road about 400 yards north of the Tallulah Falls station, and near the end of the railroad tressel. It is a small spring furnishing only about one-fourth gallon of water per minute. The water is occasionally used by the guests of the Cliff House and other hotels, but it seems to have attracted but little attention. The overflow pipe is distinctly colored with iron oxide, indicating that the water is chalybeate, a fact also verified by the analysis.

ANALYSIS RIGHT-OF-WAY SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	8.10	.472
Chlorine (Cl)	2.80	.163
Sulphur trioxide (SO_3)	4.25	.248
Carbon dioxide (CO_2)	41.80	2.438
Sodium oxide (Na_2O)	4.10	.239
Potassium oxide (K_2O)	.20	.012
Lime (CaO)	2.60	.152
Magnesia (MgO)	1.20	.070
Alumina (Al_2O_3)	.70	.041
Ferric oxide (Fe_2O_3)	9.10	.531
Manganous oxide (MnO)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	.32	.019
Sodium chloride	4.40	.257
Sodium phosphate	trace	trace
Sodium sulphate	4.10	.239
Magnesium sulphate	2.93	.171
Magnesium carbonate	.46	.027
Calcium carbonate	4.64	.271
Ferrous carbonate	13.20	.770
Aluminum sulphate	2.20	.128
Manganese carbonate	trace	trace
Silica	8.10	.472
Total solids	40.35	2.354
Free carbon dioxide	34.50	2.102

ROWLAND SPRINGS

BARTOW COUNTY

These springs which have been long known as the location of a health resort are situated in a broken, hilly country in Bartow County, 6 miles northeast of Cartersville. Prior to the Civil War, Rowland Springs was one of the most important summer resorts in the State. White, in his statictics of Georgia published in 1849, says of these springs: "Rowland springs are too well known to need a particular description. They are becoming every season the center of fashion. Multitudes from every part of the State resort here to partake of the excellent water as well as the liberal fare of the worthy proprietor."

In recent years this resort has lost its former popularity. The buildings which are said to have accommodated at one time as many as 600 guests have all been destroyed, with the exception of one or two which are now badly in need of repair. The springs are at present rarely visited, except by people from Cartersville and the immediate vicinity. There are 2 main springs located in a beautiful grove of ancient oaks. They are both rather bold chalybeate springs each furnishing 3 gallons or more per minute and yielding a rather copious precipitate of iron oxide. The springs are within a few hundred yards of each other. The one farthest up the branch is designated No. 1, in the analyses below, and the other No. 2.

ANALYSES ROWLAND SPRINGS

CONSTITUENTS DETERMINED	1		2	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	41.50	2.420	36.2	2.111
Chlorine (Cl)	4.76	.278	5.5	.321
Sulphur trioxide (SO_3)	6.80	.397	7.7	.449
Carbon dioxide (CO_2)	138.60	8.093	103.0	6.007
Soda (Na_2O)	15.90	.927	12.7	.701
Potash (K_2O)	3.52	.205	3.6	.210
Lime (CaO)	26.20	1.528	23.6	1.376
Magnesia (MgO)	5.91	.345	4.4	.257
Alumina (Al_2O_3)	.50	.029	.7	.041
Ferric oxide (Fe_2O_3)	5.40	.315	2.6	.152
Manganous oxide (MnO)	.20	.012	----	----
Phosphorus pentoxide (P_2O_5)	trace	trace	----	----
PROBABLE COMBINATIONS				
Potassium chloride	5.58	.325	5.7	.332
Sodium chloride	3.46	.196	4.6	.268
Sodium sulphate	9.99	.583	13.7	.799
Sodium phosphate	trace	trace	----	----
Sodium carbonate	16.60	.968	13.7	.799
Calcium carbonate	46.80	2.739	41.1	2.454
Magnesium carbonate	12.41	.724	9.2	.536
Aluminum sulphate	1.67	.097	----	----
Aluminum oxide	----	----	.7	.041
Ferrous carbonate	7.83	.457	3.2	.187
Manganese carbonate	.32	.019	----	----
Silica	41.50	2.420	36.2	2.111
Total solids	146.16	8.528	128.1	7.527
Free carbon dioxide	101.52	5.920	75.3	4.391

RUSSEAU SPRING

McDUFFIE COUNTY

Russeau spring is in the northeastern part of McDuffie County about 10 miles north of Thomson. This spring was formerly much frequented, being a resort of considerable local importance. At present it is visited only by a few families from Thomson during the hot summer months. There are no improvements of importance about the spring. The flow is approximately 2 gallons per minute. The water is said to yield no precipitate, but has a slight odor of sulphuretted hydrogen.

ANALYSIS RUSSEAU SPRING

Saline-calcic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	39.4	2.297
Chlorine (Cl)	5.3	.309
Sulphur trioxide (SO_3)	136.0	7.931
Carbon dioxide (CO_2)	129.0	7.523
Sodium oxide (Na_2O)	25.3	1.475
Potassium oxide (K_2O)	1.7	.099
Lime (CaO)	111.4	6.496
Magnesia (MgO)	14.7	.857
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	1.0	.058
PROBABLE COMBINATIONS		
Potassium chloride	2.5	.146
Sodium chloride	7.0	.408
Sodium sulphate	49.1	2.922
Calcium sulphate	134.0	7.814
Calcium carbonate	100.5	5.861
Magnesium sulphate	44.0	2.566
Aluminum oxide	1.0	.058
Ferrous carbonate	1.5	.087
Silica	39.4	2.297
Total solids	379.0	22.159
Free carbon dioxide	88.0	5.132

SATTERFIELD SPRING

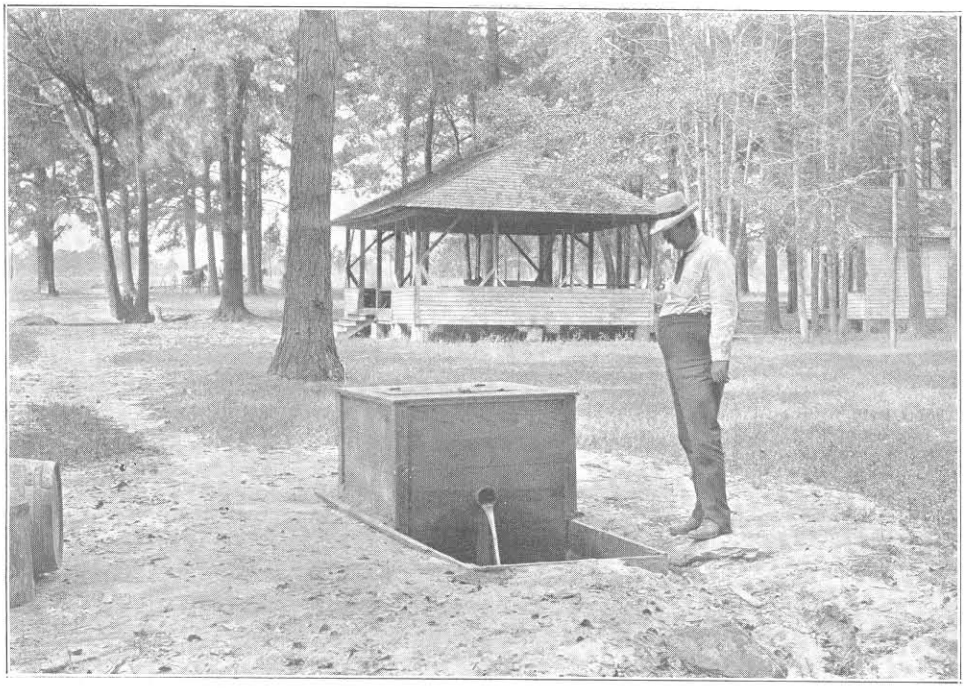
BARTOW COUNTY

The Satterfield Spring is in Bartow County about 2½ miles northeast of Cartersville. The spring is located on the road-side near the head of a hollow in the quartzite hills. Within the radius of a hundred feet of the spring from which the water was taken for analysis are 4 other springs. The main spring which is supposed to possess medicinal properties flows 2 gallons per minute. It is well protected by a marble curb, the only improvement. The water is said to have a limited use in Cartersville. Its purity from a mineralogical standpoint seems to be its chief characteristic.

ANALYSIS SATTERFIELD SPRING

Neutral.

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.20	.245
Chlorine (Cl)	2.00	.116
Sulphur trioxide (SO_3)	2.00	.116
Carbon dioxide (CO_2)	36.50	2.128
Sodium oxide (Na_2O)	1.20	.070
Potassium oxide (K_2O)	.65	.038
Lime (CaO)	.55	.032
Magnesia (MgO)	.50	.029
Ferric oxide (Fe_2O_3)	.55	.032
Alumina (Al_2O_3)	.05	.003
PROBABLE COMBINATIONS		
Potassium chloride	1.03	.060
Sodium chloride	2.30	.114
Calcium sulphate	1.34	.078
Magnesium sulphate	1.50	.087
Ferrous sulphate	.37	.021
Ferrous carbonate	.53	.031
Alumina	.05	.003
Silica	4.20	.245
Total solids	11.32	.639
Free carbon dioxide	34.70	2.023



A. MIONA SPRINGS, MACON COUNTY, GEORGIA

B. OAK MOUNTAIN SPRING, TALBOT COUNTY, GEORGIA

SCOTT MINERAL WELL

GORDON COUNTY

This well is located in the northwestern part of Gordon County near the eastern base of Horn Mountain, 3½ miles southwest of Sugar Valley. The well, which was originally put down as a prospect hole in search of coal by Mr. W. M. Scott, of Atlanta, about 20 years ago, is 2 inches in diameter and 156 feet deep, and it flows through a 1½ inch discharge pipe 2 gallons of water per minute.

The Scott well begins in the lower beds of the Fort Payne chert and extends to the base of the Chattanooga black shale. As the water is reported to have been struck in fissures in the rock lying just below the black shale, it no doubt comes from the upper part of the Silurian formation. The water has a rather decisive taste and forms about the overflow pipe a yellowish precipitate. Locally, the water has quite a reputation as a mineral water.

ANALYSIS SCOTT MINERAL WELL

Alkaline-saline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	20.20	1.178
Chlorine (Cl)	5.60	.327
Sulphur trioxide (SO_3)	59.60	3.476
Carbon dioxide (CO_2)	141.40	8.981
Sodium oxide (Na_2O)	8.20	.478
Potassium oxide (K_2O)	3.50	.204
Lime (CaO)	68.30	3.983
Magnesia (MgO)	21.60	1.260
Alumina (Al_2O_3)	.40	.023
Ferric oxide (Fe_2O_3)	1.80	.105
Phosphorus pentoxide (P_2O_5)	trace	trace
PROBABLE COMBINATIONS		
Potassium chloride	5.55	.324
Sodium chloride	4.88	.258
Sodium sulphate	12.87	.751
Magnesium sulphate	64.80	3.779
Aluminum sulphate	1.34	.078
Calcium sulphate	13.96	.814
Calcium carbonate	111.70	6.514

Ferrous carbonate	2.61	.152
Silica	20.20	1.178
Total solids	237.91	13.848
Free carbon dioxide	91.26	5.322

SEARCY SPRING

SPALDING COUNTY

This spring is located on land lot 179, 2nd district, of Spalding County, about 1½ miles east of Griffin. The flow is about 1 gallon per minute. The spring is unimproved, being used only for domestic purposes. It is supposed by its owner, Mrs. W. E. H. Searcy, to possess medicinal properties, but the small percentage of mineral contents, as shown by the analysis below does not seem to bear out this fact.

ANALYSIS SEARCY SPRING

Neutral.

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	11.0	.641
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	4.3	.251
Carbon dioxide (CO_2)	33.3	1.942
Sodium oxide (Na_2O)	4.6	.268
Potassium oxide (K_2O)	.7	.041
Lime (CaO)	2.2	.128
Magnesia (MgO)	.9	.052
Alumina (Al_2O_3)	.1	.006
Ferric oxide (Fe_2O_3)	.4	.023
PROBABLE COMBINATIONS		
Potassium chloride	1.1	.064
Sodium chloride	5.8	.338
Sodium sulphate	4.1	.239
Magnesium sulphate	2.7	.157
Calcium sulphate	.3	.017
Calcium carbonate	3.7	.216
Ferrous carbonate	.5	.029
Aluminum oxide	.1	.006
Silica	11.0	.641
Total solids	29.3	1.707
Free carbon dioxide	31.5	1.837

SHAMROCK SPRINGS

TELFAIR COUNTY

The so-called Shamrock Springs are 1⅓ miles northeast of McRae, near the Atlantic Coast Line Railway. The water supply at this local resort at the time of the writer's visit some 5 years ago was obtained from a 4-6 inch bored well 140 feet deep. The well is cased to 40 feet and flows about 150 gallons per minute. The improvements consist of a small hotel, a number of cottages, and a large bath or swimming pool. The resort has a local patronage, chiefly from McRae and Helena. Its attractive location in a shady grove of oaks, hickorys and magnolias makes it a popular local resort during the summer.

In addition to the water being used for bathing and other purposes at the local resort a limited amount of it is shipped to points throughout South Georgia.

ANALYSIS SHAMROCK SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	42.6	2.484
Chlorine (Cl)	10.0	.583
Sulphur trioxide (SO_3)	3.9	.227
Carbon dioxide (CO_2)	159.5	9.302
Sodium oxide (Na_2O)	9.2	.537
Potassium oxide (K_2O)	2.1	.122
Lime (CaO)	86.1	5.021
Magnesia (MgO)	16.2	.945
Alumina (Al_2O_3)	.3	.017
Ferric oxide (Fe_2O_3)	.2	.012
PROBABLE COMBINATIONS		
Potassium chloride	3.3	.192
Sodium chloride	13.5	.787
Sodium sulphate	2.3	.134
Calcium carbonate	153.8	8.970
Magnesium sulphate	3.9	.227
Magnesium carbonate	31.3	1.825
Aluminum oxide	.3	.017
Ferrous carbonate	.3	.017
Silica	42.6	2.484
Total solids	251.3	14.653
Free carbon dioxide	75.3	4.391

SILOAM SPRING

FULTON COUNTY

This spring is situated in the southeastern portion of Fulton County near Lakewood, about 4 miles south of Atlanta. It is a small chalybeate spring, furnishing less than a gallon per minute. The water formerly had a limited sale in Atlanta. It has a slightly astringent taste and forms, upon standing, a slight reddish-brown percipitate of iron sesqui-oxide. The spring is surrounded by a stone curbing, but otherwise there is no improvement.

ANALYSIS SILOAM SPRING

Alkaline. Calcic-magnesic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	27.60	1.610
Chlorine (Cl)	6.30	.367
Sulphur trioxide (SO_3)	1.75	.102
Carbon dioxide (CO_2)	40.40	2.356
Sodium oxide (Na_2O)	8.48	.495
Potassium oxide (K_2O)	2.16	.126
Lime (CaO)	5.60	.327
Magnesia (MgO)	4.80	.280
Alumina (Al_2O_3)	.30	.017
Ferric oxide (Fe_2O_3)	4.50	.262
PROBABLE COMBINATIONS		
Potassium chloride	3.43	.200
Sodium chloride	7.71	.450
Sodium sulphate	3.23	.188
Sodium carbonate	4.91	.286
Magnesium carbonate	10.08	.588
Calcium carbonate	10.00	.583
Ferrous carbonate	6.98	.407
Aluminum oxide	.30	.017
Silica	27.60	1.610
Total solids	74.24	4.329
Free carbon dioxide	26.20	1.528

SIMMONS MINERAL SPRING

PICKENS COUNTY

Simmons mineral spring is located on land lot 236, 12th district, Pickens County, about 1½ miles northwest of Jasper. This is a

small chalybeate spring furnishing 2 gallons per minute. The water has an irony taste and throws down a reddish-brown precipitate on standing. The spring has quite a local reputation as a mineral spring. It is unimproved, not even being protected with a curbing.

ANALYSIS SIMMONS MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	21.7	1.266
Chlorine (Cl)	5.2	.303
Sulphur trioxide (SO_3)	5.8	.338
Carbon dioxide (CO_2)	126.6	7.343
Sodium oxide (Na_2O)	11.6	.676
Potassium oxide (K_2O)	6.2	.362
Lime (CaO)	16.9	.988
Magnesia (MgO)	3.1	.181
Alumina (Al_2O_3)	3.5	.204
Ferric oxide (Fe_2O_3)	5.2	.303
PROBABLE COMBINATIONS		
Potassium chloride	9.9	.577
Sodium chloride	.8	.047
Sodium sulphate	10.3	.600
Sodium carbonate	11.9	.693
Calcium carbonate	30.2	1.762
Magnesium carbonate	6.5	.379
Aluminum oxide	3.5	.204
Ferrous carbonate	7.5	.437
Silica	21.7	1.266
Total solids	103.3	5.965
Free carbon dioxide	102.0	5.949

SMITH WELL

Gwinnett County

The Smith well is on land lot 216, 5th district, Gwinnett County, near Grayson station. This in an ordinary dug well used for domestic purposes. The water is said to rise ordinarily from 6 to 8 feet in the well, but during extremely dry seasons the water becames low. The peculiar taste of the water has long attracted the attention of the owner, James A. Smith. Cleaning out the well is said to have no effect on the taste of the water.

ANALYSIS SMITH WELL

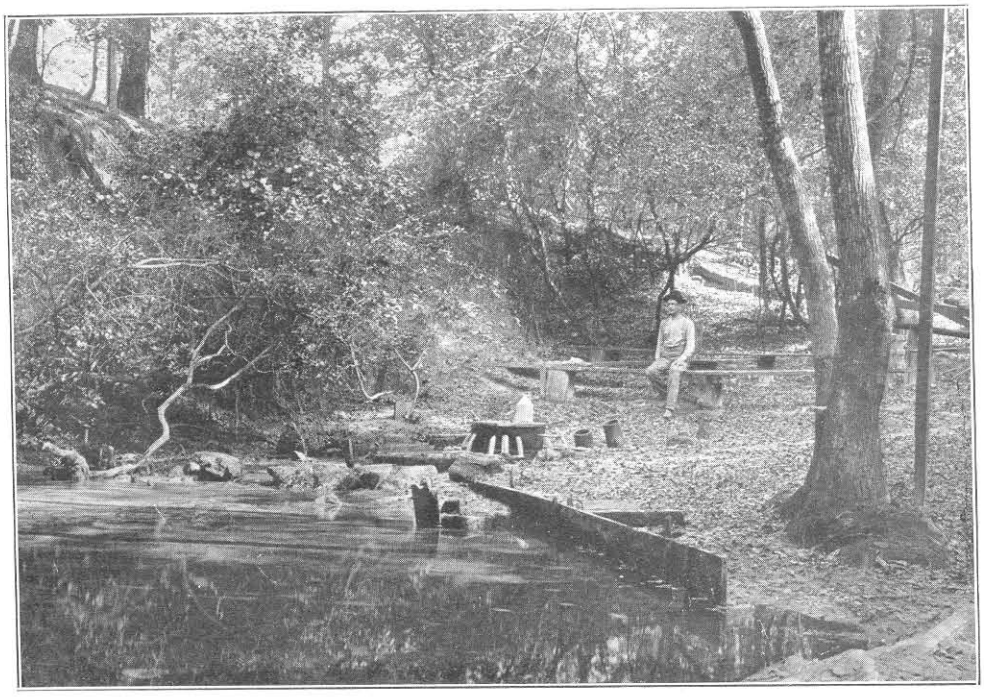
Sodic-saline—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.3	.775
Chlorine (Cl)	156.2	9.108
Sulphur trioxide (SO_3)	4.7	.274
Carbon dioxide (CO_2)	8.0	.466
Sodium oxide (Na_2O)	107.0	6.240
Potassium oxide (K_2O)	4.8	.279
Lime (CaO)	22.0	1.283
Magnesia (MgO)	25.0	1.458
Nitric acid radical (NO_3)	50.0	2.916
Alumina (Al_2O_3)	30.0	1.749
Ferric oxide (Fe_2O_3)	4.8	.279
PROBABLE COMBINATIONS		
Potassium chloride	7.6	.443
Sodium chloride	155.0	9.034
Sodium nitrate	68.5	3.995
Calcium chloride	22.2	1.296
Calcium sulphate	8.9	.519
Calcium carbonate	12.9	.752
Magnesium chloride	59.0	3.441
Aluminum oxide	30.0	1.749
Ferrous carbonate	6.9	.402
Silica	13.3	.775
Total solids	384.3	22.406

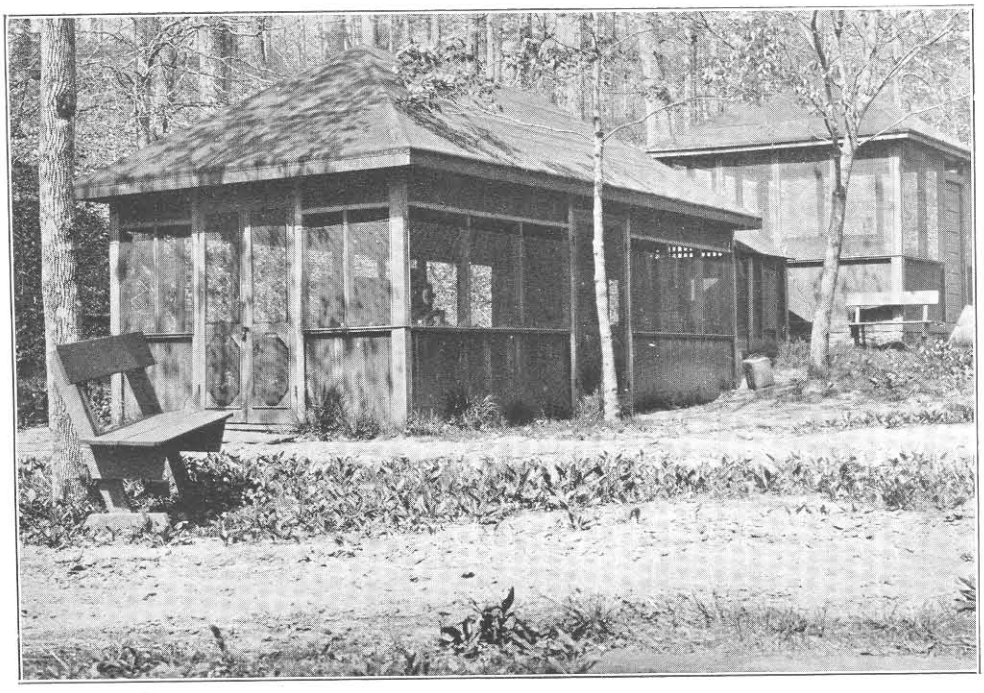
SPENCER SPRING

HALL COUNTY

This spring, owned by J. W. Spencer, is located on land lot 146, about 1 mile from the court house, in Gainesville. It flows 3 gallons per minute and is reported to possess medicinal properties. The spring is unimproved and apparently almost unknown, even locally, as a mineral spring. The water is said to possess a slight "inky" taste, and yields a small iron precipitate in the drainway. It has been used chiefly for household supply.



A. OMAHA SPRING, JEFFERSON COUNTY, GEORGIA



B. POLAR ROCK SPRING, FULTON COUNTY, GEORGIA

ANALYSIS SPENCER SPRING

Alkaline-calcic. Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	23.7	1.382
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	10.6	.618
Carbon dioxide (CO_2)	52.6	3.068
Sodium oxide (Na_2O)	14.9	.868
Potassium oxide (K_2O)	2.1	.122
Lime (CaO)	25.1	1.464
Magnesia (MgO)	3.1	.181
Alumina (Al_2O_3)	3.2	.187
Ferric oxide (Fe_2O_3)	5.1	.297
PROBABLE COMBINATIONS		
Potasium chloride	3.3	.192
Sodium chloride	4.3	.251
Sodium sulphate	18.7	1.091
Sodium carbonate	7.5	.437
Calcium carbonate	44.8	2.613
Magnesium carbonate	6.5	.379
Ferrous carbonate	7.4	.432
Aluminum oxide	3.2	.187
Silicia	23.7	1.382
Total solids	119.4	6.964
Free carbon dioxide	27.0	1.575

SULPHO-MAGNESIA ARTESIAN WELL

COBB COUNTY

The Sulpho-Magnesia Artesian well referred to in the description of the Artesian-Lithia well, like the latter well, was put down with the view of locating anthracite coal. The well is 2 inches in diameter, 750 feet deep, and furnishes by continuous pumping about 1,000 gallons per hour. The water has a faint odor of sulphuretted hydrogen. It has been used in the manufacture of ginger ale and also as a mineral water. The only improvement near the well is a small building used for storage and for bottling works.

ANALYSIS SULPHO-MAGNESIA ARTESIAN WELL

Alkaline-calcic-lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	18.00	1.050
Chlorine (Cl)	7.70	.449

Sulphur trioxide (SO_3)	3.00	.175
Carbon dioxide (CO_2)	120.50	7.027
Sodium oxide (Na_2O)	15.00	.875
Potassium oxide (K_2O)	5.10	.297
Lime (CaO)	35.00	2.041
Magnesia (MgO)	6.00	.350
Alumina (Al_2O_3)	1.25	.073
Ferric oxide (Fe_2O_3)	.87	.051
Phosphorus pentoxide (P_2O_5)	.35	.020
Arsenic (As)	trace	trace
Bromide (Br)	trace	trace
Manganese (MnO)	trace	trace
Lithia (Li_2O)	2.50	.146
PROBABLE COMBINATIONS		
Lithium chloride	7.20	.420
Potassium chloride	3.74	.218
Potassium bromide	trace	trace
Potassium sulphate	5.07	.296
Sodium sulphate	1.19	.069
Sodium phosphate	.66	.039
Sodium arsenite	trace	trace
Sodium carbonate	24.75	1.443
Magnesium carbonate	12.60	.735
Calcium carbonate	62.50	3.645
Aluminum sulphate	5.45	.318
Ferrous carbonate	2.61	.153
Silica	18.00	1.050
Total solids	143.77	8.386
Free carbon dioxide	82.73	4.825

SULPHUR SPRING

CHATTAHOOCHEE COUNTY

This spring is 14 miles southeast of Columbus on the Seaboard Air Line Railway, within a few hundred yards of Sulphur Springs station. The spring is a bold, sulphur spring furnishing 6 gallons per minute. The water has a strong odor of sulphureted hydrogen, a slightly acid taste, and throws down about the spillway a whitish precipitate. The spring has long been known and its water is supposed to possess valuable medicinal properties. The water has a local use only. The improvements are a terra cotta curbing and

a small pavilion to protect the spring from the direct rays of the sun.

ANALYSIS SULPHUR SPRING

Light saline. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	2.5	.146
Chlorine (Cl)	4.2	.245
Sulphur trioxide (SO_3)	7.5	.432
Carbon dioxide (CO_2)	47.0	2.740
Sodium oxide (Na_2O)	2.0	.117
Potassium oxide (K_2O)	1.0	.058
Lime (CaO)	1.3	.076
Magnesia (MgO)	1.5	.087
Alumina (Al_2O_3)	2.0	.117
Ferric oxide (Fe_2O_3)	1.1	.064
PROBABLE COMBINATIONS		
Potassium chloride	1.7	.099
Sodium chloride	3.5	.204
Magnesium chloride	1.3	.076
Magnesium sulphate	1.5	.087
Calcium sulphate	3.2	.187
Aluminum sulphate	6.6	.385
Ferrous carbonate	1.4	.082
Silica	2.5	.146
Total solids	21.7	1.266
Free carbon dioxide	46.5	2.712

SULPHUR SPRING

EMANUEL COUNTY

This spring is located on the side of the public road near the margin of Big Cannouchee River swamp about 5 miles southeast of Stillmore. It furnishes about 3 gallons of slightly sulphurous water per minute. The water, in addition to being locally used, has been shipped to a limited extent. There is no improvement about the spring whatever, not even a curbing. It is claimed by the users of this water that it possesses distinct medicinal properties, nevertheless, the analysis shows it to be a very pure water.

ANALYSIS SULPHUR SPRING

Light saline. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	5.0	.292
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	.3	.017
Carbon dioxide (CO_2)	3.0	.175
Sodium oxide (Na_2O)	2.2	.128
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	.3	.017
Magnesia (MgO)	.5	.029
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	1.4	.082
PROBABLE COMBINATIONS		
Potassium chloride	.9	.052
Sodium chloride	4.1	.239
Magnesium chloride	1.2	.070
Calcium sulphate	.5	.029
Calcium carbonate	.2	.012
Ferrous carbonate	2.0	.117
Aluminum oxide	1.0	.058
Silica	5.0	.292
Total solids	14.9	.869
Free carbon dioxide	2.1	.122

SULPHUR SPRING

GLYNN COUNTY

This spring is near the shell road about 4 miles northwest of Brunswick. It is a small sulphur spring flowing about 2 gallons per minute. The water has a very distinct odor of sulphuretted hydrogen, and forms a rather copious white precipitate about the drainway. The spring is situated near the margin of a small run within a few rods of a grove of live oaks which form an ideal place for picnics. The only improvement is a wooden curbing. The spring is much frequented by people from Brunswick.

ANALYSIS SULPHUR SPRING

Saline-magnesic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.0	.408
Chlorine (Cl)	31.0	1.808

Sulphur trioxide (SO_3)	4.5	.262
Carbon dioxide (CO_2)	16.6	.968
Sodium oxide (Na_2O)	12.0	.700
Potassium oxide (K_2O)	1.2	.070
Lime (CaO)	4.2	.245
Magnesia (MgO)	10.0	.583
Alumina (Al_2O_3)	1.1	.064
Ferric oxide (Fe_2O_3)	1.6	.093
PROBABLE COMBINATIONS		
Potassium chloride	1.9	.111
Sodium chloride	22.9	1.335
Calcium sulphate	5.4	.315
Calcium carbonate	1.7	.099
Magnesium sulphate	2.5	.146
Magnesium chloride	21.7	1.226
Aluminum oxide	1.1	.064
Ferrous carbonate	2.3	.134
Silica	7.0	.408
Total solids	66.5	3.838
Free carbon dioxide	15.0	.875

SWIFT LITHIA SPRING

ELBERT COUNTY

Swift Lithia Spring is located near the Seaboard Air Line Railway 5 miles east of Elberton. This spring has only recently come into notice. It is a small spring, furnishing 2½ gallons per minute. The spring is protected by a granite basin set in cement. There are no accommodations at present for guests. The water is chiefly used as a medicinal water and within the last 2 or 3 years has had a considerable sale in Elberton and elsewhere.

ANALYSIS SWIFT LITHIA SPRING

Sulphated-saline-calcic-magnesic. Lithic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	39.5	2.304
Chlorine (Cl)	12.1	.706
Sulphur trioxide (SO_3)	345.2	20.131
Carbon dioxide (CO_2)	94.5	5.511
Sodium oxide (Na_2O)	32.5	1.895
Potassium oxide (K_2O)	.4	.023

Lime (CaO)	290.5	16.941
Magnesia (MgO)	11.0	.641
Alumina (Al_2O_3)	2.5	.146
Ferric oxide (Fe_2O_3)	1.0	.058
Lithia (Li_2O)	.65	.038
PROBABLE COMBINATIONS		
Lithium chloride	1.8	.105
Potassium chloride	.7	.041
Sodium chloride	19.4	1.131
Sodium sulphate	50.9	2.968
Magnesium sulphate	33.0	1.924
Calcium sulphate	490.6	28.611
Calcium carbonate	158.0	9.214
Aluminum sulphate	8.4	.490
Ferrous carbonate	2.0	.117
Silica	39.5	2.304
Total solids	804.3	46.905
Free carbon dioxide	25.0	1.458

TAMPA SPRING

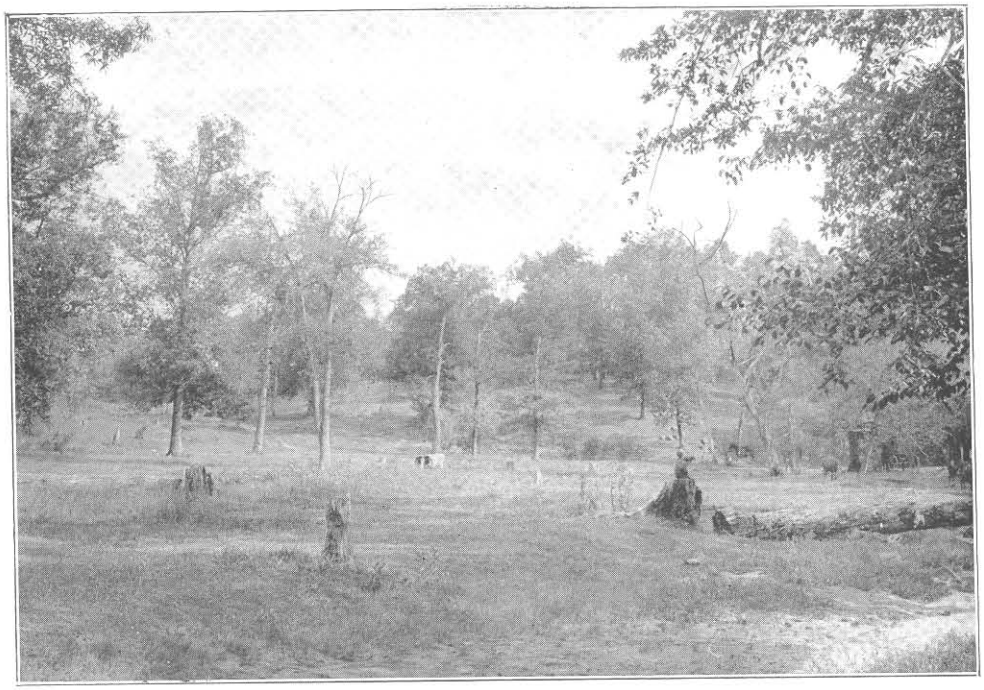
FULTON COUNTY

This spring is at Tampa on the River Electric Car line, 4 miles northwest of Atlanta. It is rather a large spring furnishing 10 gallons per minute. At the time of the writer's visit the spring was protected by a rather attractive spring house. Water from this spring was at one time sold in Atlanta as a table water, under the name of "Crystal Spring Chalybeate-Lithia Water."

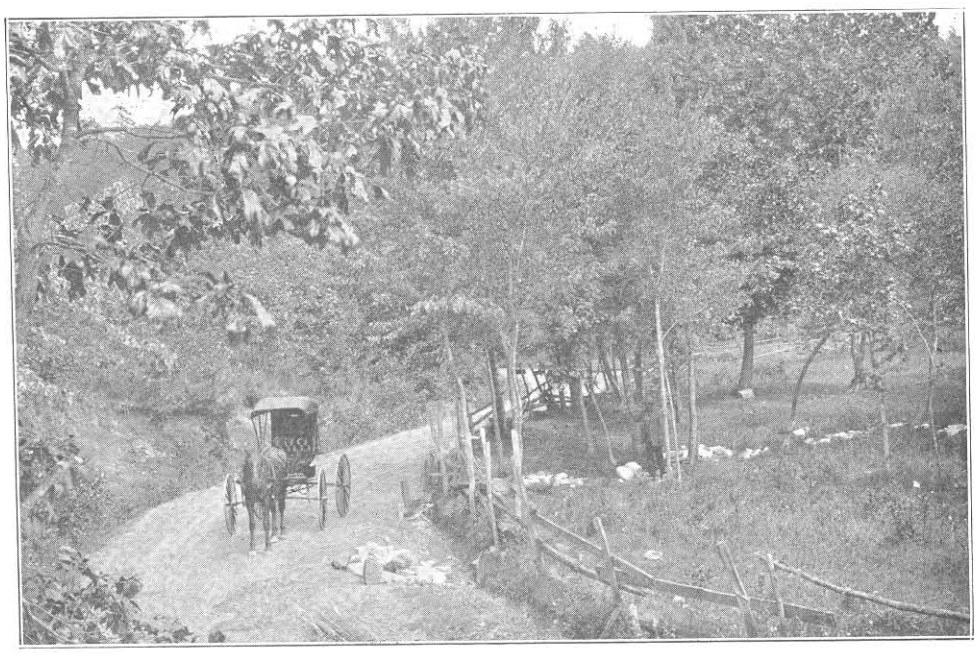
ANALYSIS TAMPA SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	15.45	.901
Chlorine (Cl)	5.60	.327
Sulphur trioxide (SO_3)	11.00	.641
Carbon dioxide (CO_2)	80.40	4.689
Sodium oxide (Na_2O)	6.89	.402
Potassium oxide (K_2O)	2.04	.119
Lime (CaO)	7.00	.408
Magnesia (MgO)	1.55	.090
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	.30	.017
Ferric oxide (Fe_2O_3)	2.60	.151



A. ROWLAND SPRINGS, BARTOW COUNTY, GEORGIA



B. SATTERFIELD SPRING, BARTOW COUNTY, GEORGIA

PROBABLE COMBINATIONS		
Potassium chloride	3.24	.189
Sodium chloride	6.70	.391
Sodium sulphate	7.65	.446
Magnesium sulphate	4.65	.271
Calcium sulphate	6.10	.356
Calcium carbonate	8.02	.468
Aluminum sulphate	1.00	.058
Ferrous carbonate	3.80	.222
Silica	15.45	.901
Total solids	56.61	3.302
Free carbon dioxide	75.44	4.399

TATE MINERAL SPRING

PICKENS COUNTY

Tate Mineral Spring, which is owned by the Tate heirs, is located on land lot 132, 13th district of Pickens County, about 5 miles southwest of Jasper, and near the Jasper-Canton public road. This is a very bold chalybeate spring, furnishing 6 gallons per minute. The water has a distinct irony taste and throws down upon standing a rather copious, reddish-brown precipitate. The only improvement is a rudely constructed bath house and a small cottage. The spring has quite a reputation locally as a mineral spring.

ANALYSIS TATE MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	9.5	.554
Chlorine (Cl)	8.6	.502
Sulphur trioxide (SO_3)	11.5	.671
Carbon dioxide (CO_2)	48.4	2.822
Sodium oxide (Na_2O)	6.4	.373
Potassium oxide (K_2O)	1.7	.099
Lime (CaO)	22.6	1.318
Magnesia (MgO)	9.6	.560
Alumina (Al_2O_3)	2.4	.140
Ferric oxide (Fe_2O_3)	4.6	.268

PROBABLE COMBINATIONS		
Potassium chloride	2.4	.140
Sodium chloride	9.5	.554
Calcium carbonate	40.3	2.349
Magnesium carbonate	1.3	.076
Magnesium sulphate	17.3	1.008
Aluminum oxide	2.4	.140
Ferrous carbonate	6.6	.345
Silica	9.5	.554
Total solids	89.3	5.166
Free carbon dioxide	17.7	1.032

TAYLOR SPRING

COWETA COUNTY

This spring, which is owned by W. L. Taylor, is located on lot 238, 1st district, Coweta County, about 2½ miles west of Haralson. The water is supposed by its owner to possess medicinal properties, being considered especially beneficial to persons suffering with indigestion. Its main use has been for drinking and general domestic purposes. The flow is about 2 gallons per minute.

ANALYSIS TAYLOR SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	49.2	2.869
Chlorine (Cl)	4.0	.233
Sulphur trioxide (SO_3)	trace	trace
Carbon dioxide (CO_2)	104.8	6.112
Sodium oxide (Na_2O)	1.8	.105
Potassium oxide (K_2O)	1.4	.082
Lime (CaO)	26.2	1.528
Magnesia (MgO)	14.1	.822
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	.6	.035
Lithia (Li_2O)	trace	trace
PROBABLE COMBINATIONS		
Lithium chloride	trace	trace
Potassium chloride	2.4	.140
Sodium chloride	3.6	.210
Magnesium chloride	.5	.029
Magnesium sulphate	trace	trace

Magnesium carbonate	29.4	1.714
Calcium carbonate	46.8	2.730
Aluminum oxide	1.0	.058
Ferrous carbonate	.9	.052
Silica	49.2	2.869
Total solids	133.8	7.802
Free carbon dioxide	68.6	4.000

THALMAN ARTESIAN WELL

GLYNN COUNTY

This well which has a depth of 400 feet is located within a short distance of the depot at Thalman. It is a flowing well furnishing 40 gallons per minute. The water as it flows from the well is said to have a distinct odor of sulphuretted hydrogen and to form a grayish-white precipitate about the spillway. The water is largely used for drinking and general domestic purposes, but it also has a local reputation as a mineral water.

ANALYSIS THALMAN ARTESIAN WELL

Sulphated-saline-sodic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	12.0	.700
Chlorine (Cl)	28.4	1.656
Sulphur trioxide (SO_3)	84.3	4.914
Carbon dioxide (CO_2)	91.3	5.324
Sodium oxide (Na_2O)	70.0	4.082
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	33.2	1.936
Magnesia (MgO)	25.6	1.493
Alumina (Al_2O_3)	2.0	.117
Ferric oxide (Fe_2O_3)	2.2	.128
Phosphorus pentoxide (P_2O_5)	.1	.006
PROBABLE COMBINATIONS		
Potassium chloride	.9	.052
Sodium chloride	46.0	2.683
Sodium sulphate	103.4	6.030
Sodium phosphate	.2	.012
Calcium carbonate	59.3	3.458
Magnesium carbonate	25.2	1.470
Magnesium sulphate	39.3	2.292

Aluminum oxide	2.0	.117
Ferrous carbonate	3.1	.180
Silica	12.0	.700
Total solids	291.4	16.994
Free carbon dioxide	51.4	2.997

THOMPSON SPRING

JACKSON COUNTY

This spring, the property of J. N. Thompson & Company, is located in militia district No. 1407, near Hoschton. It is a small spring, furnishing only 1½ gallons per minute. The water is supposed by its owner to possess medicinal properties, but apparently it has been used but little for that purpose. The branch formed by the spring is said to show a reddish precipitate, which is probably iron oxide; however, the analysis shows but little iron present.

ANALYSIS THOMPSON SPRING

Alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	35.8	2.088
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	9.4	.548
Carbon dioxide (CO_2)	68.0	3.966
Sodium oxide (Na_2O)	10.0	.583
Potassium oxide (K_2O)	2.4	.140
Lime (CaO)	27.0	1.575
Magnesia (MgO)	7.3	.426
Alumina (Al_2O_3)	.7	.041
Ferric oxide (Fe_2O_3)	1.3	.076
PROBABLE COMBINATIONS		
Potassium chloride	3.8	.222
Sodium chloride	2.8	.163
Sodium sulphate	16.7	.974
Sodium carbonate	2.7	.157
Calcium carbonate	48.2	2.811
Magnesium carbonate	15.3	.892
Ferrous carbonate	1.8	.105
Aluminum oxide	.7	.041
Silica	35.8	2.088
Total solids	127.8	7.453
Free carbon dioxide	37.0	2.158

THUNDERING SPRING

UPSON COUNTY

This spring is located in the extreme northwestern corner of Upson County within a few hundred yards of Thunder Station on the Macon and Birmingham Railroad. It is so called from a peculiar thundering-like noise which is said to have originally come from the spring. This noise has apparently now entirely ceased, but, nevertheless, there is a large amount of air escaping from the spring in the form of bubbles. It is possible that the escape of these air bubbles previous to the filling with logs, sands, etc., of the deep pipe-like cavity through which the water emerges, may have given rise to a low rumbling-like noise ascribed to the spring when the country was first settled by the whites. The spring is quite large. The water comes up with considerable force through the white sand and forms quite a good sized branch.

The sand in this spring is somewhat different from other sands in that when it is pressed in the hands it gives out a peculiar cracking sound not unlike snow when similarly crushed. This, together with the large amount of air given off and the high temperature (76° F.) seem to be the chief characteristic features of the spring.

The improvement at the time of the writer's visit consisted of a small, poorly constructed bath house. It is said that originally there was a small hotel and other buildings at the spring. The location of the spring at the base of Pine Mountain and within a short distance of Flint River adds to the attractiveness of the place as a summer resort.

ANALYSIS THUNDERING SPRING

Thermal alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	8.5	.496
Chlorine (Cl)	5.6	.327
Sulphur trioxide (SO_3)	.5	.029
Carbon dioxide (CO_2)	85.8	5.004
Sodium oxide (Na_2O)	4.4	.257
Potassium oxide (K_2O)	1.8	.105

Lime (CaO)	27.6	1.610
Magnesia (MgO)	5.4	.315
Alumina (Al_2O_3)	.6	.035
Ferric oxide (Fe_2O_3)	.5	.029
PROBABLE COMBINATIONS		
Potassium chloride	2.9	.169
Sodium chloride	6.9	.402
Sodium sulphate	.9	.052
Sodium carbonate	.5	.029
Calcium carbonate	49.3	2.875
Magnesium carbonate	11.3	.658
Aluminum oxide	.6	.035
Ferrous carbonate	.8	.047
Silica	8.5	.496
Total solids	81.7	4.763
Free carbon dioxide	57.7	3.365

TOBE TATE SPRING

GORDON COUNTY

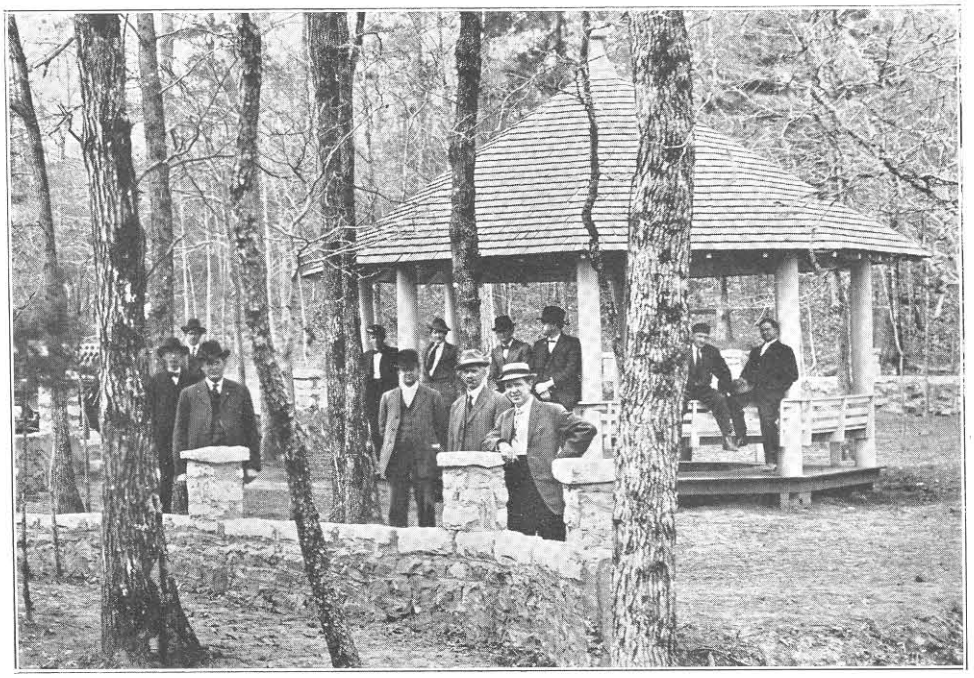
Tobe Tate Spring is a small chalybeate spring located on the right bank of Pinhook Creek in the eastern part of Gordon County, about 4 miles northeast of Fairmount. The spring is situated at the base of a cliff on the bank of the creek. It is unprotected and is overflowed during high water. The flow is less than a gallon per minute. The water, which yields a precipitate of iron oxide on standing, is used only locally. No buildings or improvements are near the spring, and judging from appearances, it is only occasionally visited.

ANALYSIS TOBE TATE SPRING

Alkaline-saline-calcic—Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	24.2	1.411
Chlorine (Cl)	14.9	.868
Sulphur trioxide (SO_3)	18.8	1.096
Carbon dioxide (CO_2)	50.3	2.933
Sodium oxide (Na_2O)	14.5	.845
Potassium oxide (K_2O)	13.6	.793
Lime (CaO)	26.6	1.551
Magnesia (MgO)	10.7	.624

A. SULPHUR SPRING, GLYNN COUNTY, GEORGIA



B. SWIFT MINERAL SPRING, ELBERT COUNTY, GEORGIA

Alumina (Al_2O_3)	1.4	.082
Ferric oxide (Fe_2O_3)	4.0	.233
PROBABLE COMBINATIONS		
Potassium chloride	19.5	1.137
Sodium chloride	11.2	.653
Sodium sulphate	19.5	1.137
Magnesium sulphate	11.7	.682
Magnesium carbonate	14.3	.833
Calcium carbonate	49.2	2.869
Aluminum oxide	1.4	.082
Ferrous carbonate	5.8	.338
Silica	24.2	1.411
Total solids	156.8	9.142
Free carbon dioxide	18.0	1.050

TRENTHAM SPRING

CAMPBELL COUNTY

Trentham Spring is situated in the southern part of Campbell County about 4 miles west of Fairburn, the county site. Some years ago the spring is said to have been quite popular as a health resort, but at present it is seldom visited, except by the people living in the immediate vicinity.

The flow is about 2 gallons per minute. Upon standing for a short time the water throws down a rather copious precipitate of yellowish-brown iron sesquioxide. The spring is located some distance from the nearest farm house in a wild and picturesque section. No improvement whatever is to be seen about the spring.

ANALYSIS TRENTHAM SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	37.60	2.193
Chlorine (Cl)	4.90	.286
Sulphur trioxide (SO_3)	18.00	1.050
Carbon dioxide (CO_2)	93.60	5.459
Sodium oxide (Na_2O)	14.90	.869
Potassium oxide (K_2O)	.83	.048
Lime (CaO)	30.75	1.793
Magnesia (MgO)	7.25	.423

Phosphorus pentoxide (P_2O_5)	.90	.052
Arsenic (As)	trace	trace
Alumina (Al_2O_3)	.63	.037
Ferric oxide (Fe_2O_3)	9.00	.525
PROBABLE COMBINATIONS		
Potassium chloride	1.31	.076
Sodium chloride	7.03	.410
Sodium sulphate	25.58	1.491
Sodium phosphate	1.80	.105
Sodium arsenite	trace	trace
Magnesium sulphate	5.39	.314
Magnesium carbonate	11.45	.668
Calcium carbonate	63.44	3.700
Aluminum sulphate	2.55	.149
Ferrous carbonate	12.60	.735
Silica	37.60	2.193
Total solids	168.75	9.841
Free carbon dioxide	58.49	3.411

TRENTON SULPHUR SPRING

DADE COUNTY

Trenton Sulphur Spring is located within the corporate limits of Trenton, the county seat of Dade County. It is a small sulphur spring furnishing only 30 gallons an hour. The water forms a white precipitate about the overflow pipe, and has a distinct odor of hydrogen sulphide. It is much used in Trenton for drinking purposes. The spring issues as a minute stream from a small fissure in the Chickamauga limestone.

ANALYSIS TRENTON SULPHUR SPRING

Alkaline-calcic—Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Salica (SiO_2)	17.80	1.038
Chlorine (Cl)	12.25	.714
Sulphur trioxide ((SO_3)	10.20	.595
Carbon dioxide (CO_2)	297.00	17.320
Sodium oxide (Na_2O)	38.00	2.216
Potassium oxide (K_2O)	5.20	.303
Lime (CaO)	84.90	4.951
Magnesia (MgO)	41.90	2.444
Alumina (Al_2O_3)	2.35	.137
Ferric oxide ((Fe_2O_3)	5.40	.315
Phosphorus pentoxide (P_2O_5)	.30	.017

PROBABLE COMBINATIONS		
Potassium chloride	8.24	.481
Lithium chloride	trace	trace
Sodium chloride	13.71	.800
Sodium phosphate	.60	.035
Sodium sulphate	18.10	1.056
Sodium carbonate	38.58	2.250
Magnesium carbonate	87.99	5.131
Calcium carbonate	151.61	8.842
Aluminum sulphate	9.40	.548
Manganese carbonate	trace	trace
Ferrous carbonate	7.82	.457
Silica	17.80	1.038
Total solids	353.85	20.638
Free carbon dioxide	165.10	9.628

UTOY ROCK SPRING

FULTON COUNTY

This spring is on Cascade Avenue 8 miles southwest of Atlanta within a few hundred yards of the south branch of Utoy Creek. The spring is quite small, furnishing less than 1 gallon per minute. It is protected by a stone curbing and a small pavilion. Water from this spring is sold in Atlanta mainly as a drinking water. No provisions are made for accommodation of guests.

ANALYSIS UTOY ROCK SPRING

Alkaline-calcic-magnesic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	33.0	1.924
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	4.2	.245
Carbon dioxide (CO_2)	82.0	4.782
Sodium oxide (Na_2O)	9.5	.554
Potassium oxide K_2O)	1.1	.064
Lime (CaO)	17.0	.991
Alumina (Al_2O_3)	8.0	.466
Magnesia (MgO)	12.0	.700
Ferric oxide (Fe_2O_3)	1.6	.093
PROBABLE COMBINATIONS		
Potassium chloride	1.9	.111
Sodium sulphate	7.4	.431
Sodium chloride	4.3	.251

Sodium carbonate	4.4	.256
Calcium carbonate	30.0	1.750
Magnesium carbonate	25.2	1.470
Aluminum oxide	8.0	.466
Ferrous carbonate	2.3	.134
Silica	33.0	1.924
Total solids	116.5	6.793
Free carbon dioxide	53.0	3.091

VERNER SPRING

GWINNETT COUNTY

This spring, which is reported to possess medicinal properties, is 2 miles north of Duluth. The water at present is used at a small hotel of 22 rooms near by. The flow is 25 gallons per minute.

ANALYSIS VERNER SPRING

Light alkaline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	14.0	.816
Chlorine (Cl)	3.9	.227
Sulphur trioxide (SO_3)	2.3	.134
Carbon dioxide (CO_2)	54.8	3.196
Sodium oxide (Na_2O)	4.0	.233
Potassium oxide (K_2O)	1.4	.082
Lime (CaO)	30.6	1.784
Magnesia (Mgo)	2.1	.122
Alumina and ferric oxide (Al_2O_3 & Fe_2O_3)	2.0	.117
PROBABLE COMBINATIONS		
Potassium chloride	2.4	.140
Sodium chloride	4.8	.280
Sodium sulphate	2.5	.146
Magnesium sulphate	.4	.023
Magnesium carbonate	4.2	.245
Calcium carbonate	54.6	3.184
Alumina and ferric oxide	2.0	.117
Silica	14.0	.816
Total solids	84.9	4.951
Free carbon dioxide	28.6	1.668

WABENA SPRING

CLARKE COUNTY

Wabena Spring, which is located within a few hundred yards of Nellie B. Avenue, in East Athens, has within the last 2 or 3 years attracted considerable local interest as a mineral spring. The water has a limited sale in Athens. With the exception of a cement curbing, the spring is unimproved. The flow is less than a gallon per minute. The water has a distinct irony taste and throws a copious yellowish-brown precipitate on standing. The spring is on a wooded hillside within a few rods of a small boggy swamp. It is owned at present by J. E. Beacham and Company of Athens.

ANALYSIS WABENA SPRING
Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	12.6	.735
Chlorine (Cl)	5.7	.332
Sulphur trioxide (SO_3)	1.0	.058
Carbon dioxide (CO_2)	100.0	5.832
Sodium oxide (Na_2O)	5.9	.344
Potassium oxide (K_2O)	.5	.029
Lime (CaO)	8.7	.507
Magnesia (MgO)	.8	.047
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	32.0	1.866
PROBABLE COMBINATIONS		
Potassium chloride	.8	.047
Sodium chloride	9.1	.531
Sodium sulphate	1.8	.105
Sodium carbonate	2.9	.169
Calcium carbonate	15.5	.904
Magnesium carbonate	1.7	.099
Ferrous carbonate	46.4	2.706
Alumina	.8	.047
Silica	12.6	.735
Total solids	91.6	5.343
Free carbon dioxide	73.5	4.296

WACO MINERAL SPRINGS

HARALSON COUNTY

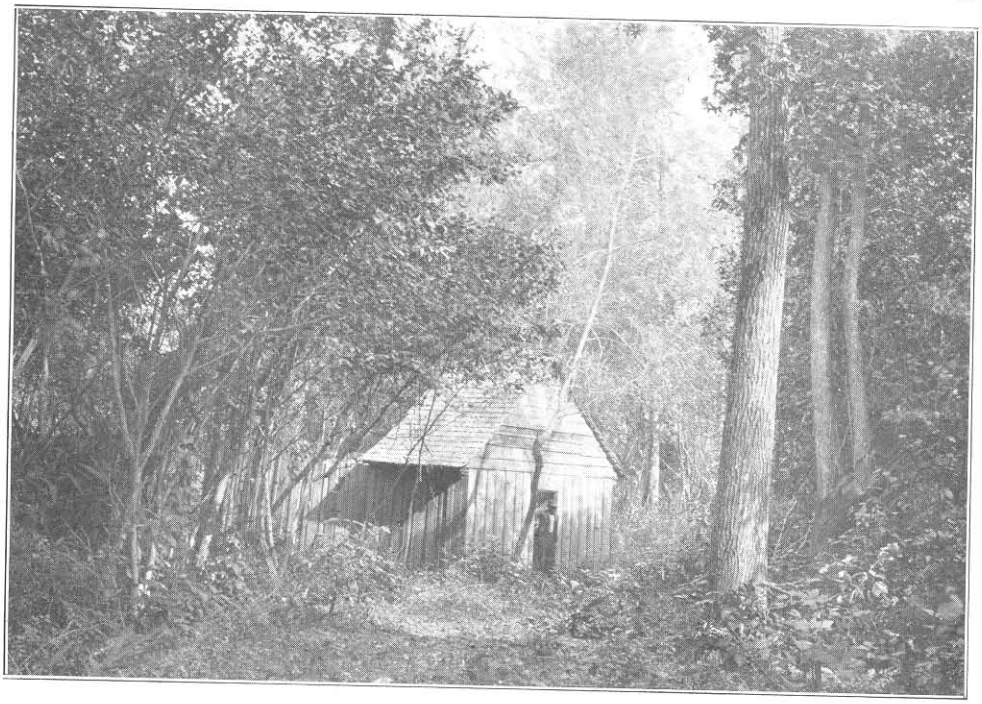
This group of springs is located on land lot 233, 7th district, Haralson County, about three-fourths of a mile southwest of Waco. The springs, which cover an area of less than an acre, are said to be more than 40 in number, but they are all small, none furnishing more than a few gallons per minute.

The springs are beautifully located in a small depression at the base of a crescent shape bluff. The only improvement at present about the springs is a small pavilion. Accommodations, however, can be had at Waco, which is only a short distance.

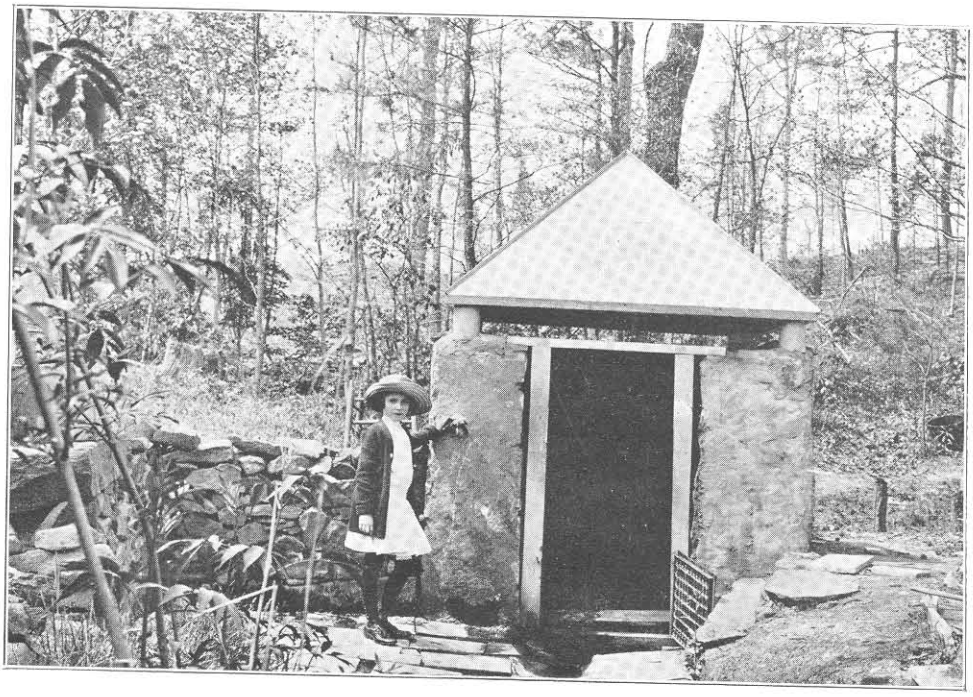
These springs have been known and used for their supposed medicinal properties since 1886. Only 2 analyses are here given of this group of springs. No. 1 is known as the Iron Spring and No. 2 as the Eye Spring, the latter being so named on account of the supposed healing properties of its water when applied to inflamed eyes.

ANALYSIS WACO MINERAL SPRINGS

CONSTITUENTS DETERMINED	I		II	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	11.0	.641	9.0	.525
Chlorine (Cl)	3.0	.175	3.0	.175
Sulphur trioxide (SO_3)	7.0	.408	5.0	.291
Carbon dioxide (CO_2)	18.0	1.049	20.0	1.166
Sodium oxide (Na_2O)	6.5	.379	3.5	.204
Potassium oxide (K_2O)	.5	.029	.5	.029
Lime (CaO)	2.0	.116	7.0	.408
Magnesia (MgO)	1.6	.093	1.6	.093
Alumina (Al_2O_3)	.4	.023	1.0	.058
Ferric oxide (Fe_2O_3)	8.6	.501	.7	.041
Nitric acid (HNO_3)	trace	trace	trace	trace



A. THUNDERING SPRING, MERIWETHER COUNTY, GEORGIA



B. UTOY ROCK SPRING, FULTON COUNTY, GEORGIA

PROBABLE COMBINATIONS	I		II	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Potassium chloride	1.0	.058	1.0	.058
Sodium chloride	4.2	.245	4.2	.245
Sodium sulphate	9.5	.554	5.5	.320
Calcium sulphate	3.1	.181	3.3	.192
Calcium carbonate	1.5	.087	10.0	.583
Magnesium carbonate	3.5	.204	3.5	.204
Aluminum oxide	.4	.023	1.0	.058
Ferrous carbonate	12.4	.723	1.1	.064
Silica	11.0	.641	9.0	.525
Total solids	46.6	2.716	38.6	2.249
Free carbon dioxide	6.0	.350	13.1	.760

WADE SPRING

Habersham Spring

This spring, owned by J. C. Wade, of Cornelia, is located in the southern part of Habersham County about 1 mile southeast of Cornelia. It is claimed that the water of this spring was originally held in high repute by the Indians for its medicinal properties. Like claims are also made by the users of the water in recent years; however, the analysis given below does not seem to substantiate such claims, unless the beneficial effect was produced by the purity rather than by the mineral properties of the water.

The spring flows 4½ gallons per minute. It is located near the head of a small ravine and is surrounded by a grove of pines, hickory, and other hard woods. There are no improvements whatever about the spring.

ANALYSIS WADE SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	7.4	.432
Chlorine (Cl)	3.1	.181
Sulphur trioxide (SO_3)	1.2	.070

Carbon dioxide (CO_2)	20.1	1.172
Sodium oxide (Na_2O)	2.4	.140
Potassium oxide (K_2O)	.6	.035
Lime (CaO)	1.6	.093
Magnesia (MgO)	trace	trace
Alumina (Al_2O_3)	3.0	.175
Ferric oxide (Fe_2O_3)	1.5	.087
PROBABLE COMBINATIONS		
Potassium chloride	1.0	.058
Sodium chloride	4.5	.262
Calcium carbonate	1.4	.082
Calcium sulphate	2.0	.117
Aluminum oxide	3.0	.175
Ferrous carbonate	2.0	.117
Silica	7.4	.432
Total solids	21.3	1.243
Free carbon dioxide	18.8	1.097

WARM SPRINGS

Meriwether County

The spring which has made this resort a famous watering place was known to the Indians and its water was used by them for bathing. The white settlers were not long in learning the valuable properties of the waters and built log cabins at an early date near the spring to accommodate invalids. The spring is located on the Southern Railway at the base of one of the foot-hills of Pine Mountain in the southern part of Meriwether County. It is the site of one of the most noted and popular watering places in the State. The improvements consist of a modern hotel, having a capacity for about 200 guests, a large number of neat and well constructed cottages, a livery stable, a large natatorium and numerous private baths. The grounds are well laid out and are kept in good condition. The nearness of Pine Mountain, which attains an altitude of 1,200 feet or more above sea level, adds greatly to the natural beauty of the place, and at the same time produces the mountain breezes which are so refreshing during the hot summer nights.

The spring flows from a quartzite ledge at the margin of a small meadow. The temperature of the water, taken at the point where it enters the baths, was found to be 87° F. The capacity of the spring is 1,890 gallons per minute. The water is always clear, and it is supposed to possess marked medicinal properties.

ANALYSIS WARM SPRING

Thermal. Alkaline-calcic-magnesic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	22.75	1.327
Chlorine (Cl)	2.20	.245
Sulphur trioxide (SO_3)	5.10	.297
Carbon dioxide (CO_2)	83.10	4.846
Sodium oxide (Na_2O)	5.00	.292
Potassium oxide (Na_2O)	.35	.026
Lime (CaO)	28.00	1.633
Magnesia (MgO)	17.70	1.032
Alumina (Al_2O_3)	1.00	.058
Ferric oxide (Fe_2O_3)	1.50	.087
PROBABLE COMBINATIONS		
Potassium chloride	.55	.032
Sodium chloride	4.84	.282
Sodium sulphate	3.30	.192
Magnesium sulphate	1.26	.073
Magnesium carbonate	36.28	2.116
Calcium carbonate	50.00	2.916
Aluminum sulphate	2.70	.157
Ferrous carbonate	1.80	.105
Silica	22.75	1.327
Total solids	123.48	7.200
Free carbon dioxide	41.27	2.407

WASHINGTON SULPHUR SPRING

WILKES COUNTY

This is a small sulphur spring located near the corporate limits of Washington. Years ago the spring had a considerable reputation as a mineral spring, but in recent years it has been neglected and is now but little used. The water is said to have a faint odor of sulphuretted hydrogen when it flows from the spring.

ANALYSIS WASHINGTON SULPHUR SPRING

Sulpho-saline-calic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	32.0	1.866
Chlorine (Cl)	5.3	.309
Sulphur trioxide (SO_3)	380.0	22.160
Carbon dioxide (CO_2)	154.0	8.980
Sodium oxide (Na_2O)	27.0	1.575
Potassium oxide (K_2O)	2.4	.140
Lime (CaO)	296.8	17.308
Magnesia (MgO)	6.7	.391
Alumina (Al_2O_3)	1.2	.070
Ferric oxide (Fe_2O_3)	.7	.041
PROBABLE COMBINATIONS		
Potassium chloride	3.8	.222
Sodium chloride	5.8	.338
Sodium sulphate	54.6	3.148
Calcium sulphate	571.0	33.299
Calcium carbonate	110.0	6.414
Magnesium carbonate	20.0	1.166
Aluminum oxide	1.2	.070
Ferrous carbonate	1.1	.064
Silica	32.0	1.866
Total solids	799.5	46.587
Free carbon dioxide	110.0	6.414

WATSON MINERAL SPRING

OGLETHORPE COUNTY

This spring is located in the extreme southwestern corner of Oglethorpe County, 8 miles west of Maxeys, a station on the Athens branch of the Georgia Railroad. It has a considerable local reputation and is much visited during the summer by the people of the region.

The improvements consist of a boarding house and a few cottages. The spring is walled in and is also surrounded by a small neat wooden pavilion.

The capacity of the spring is quite small, being only 1 gallon in 5 minutes. The water has a faint odor of hydrogen sulphide, but

it does not yield any precipitate. The scenery in the vicinity of the spring is varied. The hills are usually well rounded and the valleys narrow. The Oconee River near by presents a good opportunity for boating.

ANALYSIS WATSON MINERAL SPRING
Alkaline-calcic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	35.40	2.064
Chlorine (Cl)	3.40	.198
Sulphur trioxide (SO_3)	3.00	.175
Carbon dioxide (CO_2)	113.80	6.637
Sodium oxide (Na_2O)	16.70	.974
Potassium oxide (K_2O)	1.27	.074
Lime (CaO)	48.20	2.811
Magnesia (MgO)	11.50	.671
Phosphorus pentoxide (P_2O_5)	trace	trace
Alumina (Al_2O_3)	.20	.012
Ferric oxide (Fe_2O_3)	1.00	.058
PROBABLE COMBINATIONS		
Potassium chloride	2.01	.117
Sodium chloride	4.02	.234
Sodium sulphate	4.47	.261
Sodium phosphate	trace	trace
Sodium carbonate	21.54	1.256
Magnesium carbonate	24.15	1.408
Calcium carbonate	86.07	5.016
Aluminum sulphate	.68	.040
Ferrous carbonate	1.45	.085
Silica	35.40	2.064
Total solids	179.79	10.481
Free carbon dioxide	53.81	3.138

WHITE ELK SPRING

BIBB COUNTY

This spring, formerly known as St. Winifred's, is located on the Edwards estate 6 miles east of the city of Macon. The place is known as Holly Bluff, and as the name suggests it is a place of much natural beauty. A large artificial lake near the spring adds

greatly to the beauty of the surroundings. There is here within a few feet of each other 3 different springs, one of which, having a capacity of 20 gallons per minute, is known as White Elk.

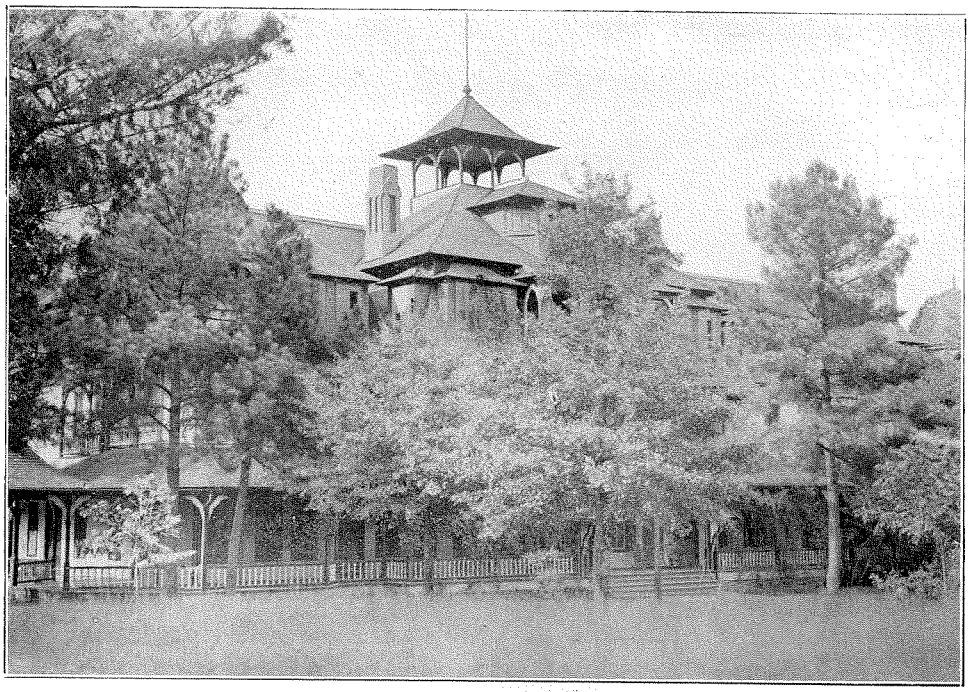
The flow of White Elk Spring is quite uniform throughout both winter and summer. The temperature of the water, 65° F., is likewise uniform throughout the year. The water emerges at an angle of about 45° from beneath a bed of impervious clay, through glazed tile into a basin of brick and cement sealed over with cement and plate glass. From the basin galvanized pipes lead directly to the bottling house where the water flows into the glass containers ready for shipment. One of the main characteristics of White Elk water is its great purity and every precaution is taken to keep the spring and surroundings in absolute sanitary conditions.

No arrangements are made at the springs for the accommodation of guests. The water is put on the market both as a table and a medicinal water.

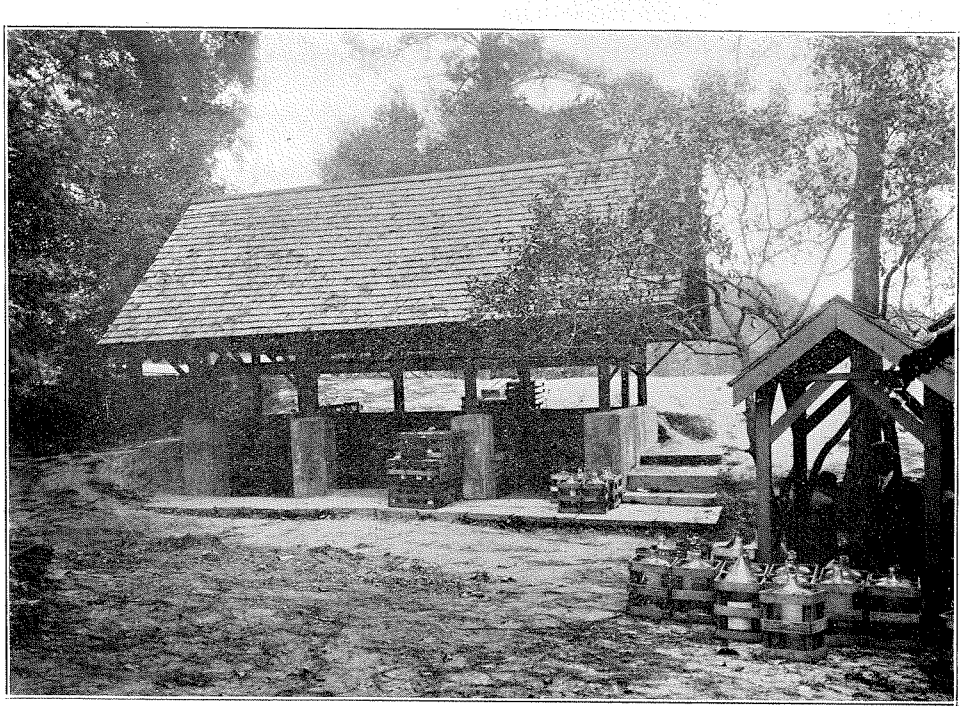
ANALYSIS WHITE ELK SPRING

Neutral

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.8	.280
Chlorine (Cl)	3.3	.192
Sulphur trioxide (SO_3)	.6	.035
Carbon dioxide (CO_2)	11.3	.658
Sodium oxide (Na_2O)	1.8	.105
Potassium oxide (K_2O)	.4	.023
Lime (CaO)	1.3	.076
Magnesia (MgO)	.8	.047
Alumina (Al_2O_3)	.2	.012
Ferric oxide (Fe_2O_3)	.6	.035
PROBABLE COMBINATIONS		
Potassium chloride	.8	.047
Sodium chloride	4.6	.268
Magnesium sulphate	.9	.052
Calcium carbonate	2.3	.134
Magnesium carbonate	1.1	.064
Ferrous carbonate	.9	.052
Aluminum oxide	.2	.012
Silica	4.8	.280
Total solids	15.6	.909
Free carbon dioxide	9.6	.560



A. WARM SPRINGS HOTEL, MERIWETHER COUNTY, GEORGIA



B. WHITE ELK SPRING, BIBB COUNTY, GEORGIA

WHITE OAK MINERAL WELLS

BIBB COUNTY

This group of wells, belonging to the White Oak Mineral Water Company of Macon, is located about 4 miles west of Macon. Two of the wells, those from which the water is now being put on the market, are within a few feet of each other, while the other two are several hundred yards distant, one being on an adjacent hill and the other in the intervening valley. They are all dug wells, varying from 50 to 70 feet in depth. It is claimed that the analyses of the water from these different wells show about the same mineral constituents.

The White Oak Mineral Water Company, is at present selling, mainly in Macon, about 200 gallons of water per day. The water is used chiefly as a mineral water. The following analysis was made from well No. 1.

ANALYSIS WHITE OAK MINERAL WELL

Sulphated-magnesia-calcic-saline

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	73.0	4.257
Chlorine (Cl)	53.0	3.091
Sulphur trioxide (SO_3)	725.0	44.903
Carbon dioxide (CO_2)	44.0	2.566
Sodium oxide (Na_2O)	75.5	4.403
Potassium oxide (K_2O)	2.4	.140
Lime (CaO)	244.0	16.328
Magnesia (MgO)	160.0	9.330
Alumina (Al_2O_3)	2.6	.152
Ferric oxide (Fe_2O_3)	5.0	.292
PROBABLE COMBINATIONS		
Potassium chloride	3.8	.222
Sodium chloride	84.0	4.899
Sodium sulphate	143.2	8.352
Calcium sulphate	551.5	32.161
Calcium carbonate	30.3	1.766
Magnesium sulphate	480.0	27.992
Aluminum oxide	2.6	.152
Ferrous carbonate	7.2	.420
Silica	73.0	4.257
Total solids	1,375.6	80.221
Free carbon dioxide	28.0	1.633

WHITE PATH MINERAL SPRINGS

GILMER COUNTY

White Path Springs are located near White Path station on the Atlanta-Knoxville division of the Louisville and Nashville Railroad 6 miles northeast of Ellijay, the county site. These springs are much frequented during the summer months by parties from Atlanta and the southern part of the State. The location is excellent for a summer resort. The springs are situated at the base of one of the spurs of Turniptown Mountain whose highest peaks attain an altitude of nearly 4,000 feet above sea level. The temperature during the hottest days in summer is always pleasant and the breezes from the near-by mountain are quite invigorating. The scenery, although not so wild and picturesque as at some other points in the State, is, nevertheless, such as can only be met with in mountainous regions. The hills and ridges are steep and rugged, while the small streams flow in deep canyon-like gorges.

There are 4 main springs in the group known as the Chalybeate, the Magnesia, the Mountain, and the Spring-House. The Chalybeate Spring is the one most noted and is the one most used by the guests. This spring furnishes between 2 and 3 gallons per minute. The water has an iron taste and yields quite abundant precipitate of brownish iron oxide upon standing for a short time.

The Magnesia Spring, located on White Path Branch a few hundred yards above the Chalybeate Spring and the Mountain Spring on the mountain side about the same distance as well as the Spring-House Spring, which is within a few rods of the Chalybeate Spring, are all small common freestone springs such as are often met with throughout the mountainous section of North Georgia.

ANALYSES WHITE PATH SPRINGS

CONSTITUENTS DETERMINED	Chalybeate Spring		Magnesia Spring		Spring House Spring		Mountain Side Spring	
	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon	Parts per million	Grains per gallon
Silica (SiO_2)	32.60	1.901	10.82	.588	9.1	.531	17.4	1.014
Chlorine (Cl)	4.90	.286	3.50	.204	2.1	.122	5.2	.303
Sulphur trioxide (SO_3)	11.90	.694	1.25	.073	3.8	.221	.8	.047
Carbon dioxide (CO_2)	46.60	2.718	28.12	1.640	6.7	.376	9.6	.560
Sodium oxide (Na_2O)	11.60	.675	3.20	.187	2.6	.151	5.3	.309
Potassium oxide (K_2O)	.60	.035	.10	.006	.8	.047	1.2	.070
Lime (CaO)	15.00	.875	3.20	.187	1.2	.070	3.5	.204
Magnesia (MgO)	3.80	.221	2.44	.142	1.1	.064	1.8	.105
Alumina (Al_2O_3)	.40	.023	.38	.022	.1	.006	0.1	.006
Ferric oxide (Fe_2O_3)	4.00	.233	2.56	.149	.4	.023	.2	.012
Phosphorus pentoxide (P_2O_5)	.70	.041	none	none	----	----	----	----
Arsenic (As)	trace	trace	none	none	----	----	----	----
PROBABLE COMBINATIONS								
Potassium chloride	.95	.055	.18	.010	1.2	.070	1.9	.111
Sodium chloride	7.33	.427	5.63	.328	2.4	.140	7.0	.408
Sodium sulphate	17.68	1.031	.46	.027	3.0	.175	1.4	.082
Sodium phosphate	1.40	.082	none	none	----	----	----	----
Sodium carbonate	----	----	----	----	----	----	1.7	.099
Calcium carbonate	26.80	1.563	5.71	.333	2.1	.122	6.2	.361
Magnesium carbonate	5.94	.346	4.28	.250	----	----	3.8	.222
Magnesium sulphate	2.91	.170	1.19	.069	3.2	.187	----	----
Aluminum sulphate	1.35	.079	.30	.017	----	----	----	----
Aluminum oxide	----	----	----	----	.1	.006	.1	.006
Ferrous carbonate	5.60	.327	3.71	.236	.6	.035	.3	.018
Silica	32.60	1.901	10.82	.588	9.1	.531	17.4	1.014
Total solids	102.56	5.981	32.28	1.858	21.7	1.266	39.8	2.321
Free carbon dioxide	29.50	1.720	19.66	1.146	5.0	.291	4.0	.233

WHITE SULPHUR SPRING

HALL COUNTY

This spring, also called Oconee White Sulphur Spring, is located 6 miles east of Gainesville and 2 miles southeast of White Sulphur, a station on the Southern Railway. The spring has been a noted

health resort for more than half a century. White, in his statistics of Georgia, published in 1849, says: "If good accommodations, fine water, beautiful scenery are recommendations of any place then the Sulphur Spring of Hall County may be put down as among the most delightful spots in Georgia." Prior to the Civil War the wealth and fashion of the State annually gathered at this resort. Later the resort lost somewhat its former popularity, but within the last few years, due largely to extensive improvements, it has regained its former position as a fashionable summer resort and is now regarded as one of the most attractive watering places in the State.

The present accommadations consist of a hotel with wide porches, attractive dining room, and a large number of bed rooms with baths, together with numerous attractive cottages built so as to accommodate from 5 to 10 people. The cottages are considered a part of the hotel. All guests are regular patrons of the hotel dining room, which will accommodate about 100. The spring is protected by cement walls and an attractive pavilion, which makes the sanitary conditions seemingly well nigh perfect. Other attractions which might be mentioned are the beautiful grounds with their well kept walks, billard and pool parlor, dancing hall, lawn tennis court, bowling alley, etc.

The spring flows less than 2 gallons per minute. The water has a distinct odor of sulphuretted hydrogen and forms about the overflow a whitish precipitate.

ANALYSIS HALL COUNTY WHITE SULPHUR SPRING

Alkaline-sodic-calcic. Sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	22.00	1.283
Sulphur trioxide (SO_3)	3.64	.212
Carbon dioxide. (CO_2)	104.00	6.065
Phosphorus pentoxide (P_2O_5)	trace	trace
Arsenic (As)	trace	trace
Chlorine (Cl)	5.25	.306
Ferric oxide (Fe_2O_3)	1.60	.093

Alumina (Al_2O_3)	.40	.023
Lime (CaO)	22.40	1.306
Magnesia (MgO)	5.59	.326
Potash (K_2O)	5.54	.323
Soda (Na_2O)	38.16	2.225
Lithia (Li_2O)	trace	trace
PROBABLE COMBINATIONS		
Lithium chloride	trace	trace
Potassium chloride	8.78	.512
Sodium chloride	1.76	.103
Sodium sulphate	4.79	.279
Sodium phosphate	trace	trace
Sodium arsenite	trace	trace
Sodium carbonate	60.14	3.507
Magnesium carbonate	11.74	.685
Calcium carbonate	40.00	2.333
Aluminum sulphate	1.34	.078
Ferrous carbonate	2.32	.135
Silica	22.00	1.283
Total solids	152.87	8.915
Free carbon dioxide	54.38	3.161

WILD ROSE SPRING

DODGE COUNTY

Wild Rose Spring is located on land lot 201, 16th district, Dodge County, 3½ miles east of Eastman. The water from this spring has been sold in the last few years at Eastman, both as a table and mineral water. This is a small unimproved spring, furnishing 2 gallons per minute. Near the spring here described there is reported a chalybeate spring, but the water from this spring has not been analyzed by this Department.

ANALYSIS WILD ROSE SPRING

Neutral.

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	5.0	.292
Chlorine (Cl)	3.5	.204
Sulphur trioxide (SO_3)	.2	.012
Carbon dioxide (CO_2)	26.0	1.516
Sodium oxide (Na_2O)	2.1	.122

Potassium oxide (K_2O)	.6	.035
Lime (CaO)	1.8	.105
Magnesia (MgO)	.9	.052
Alumina (Al_2O_3)	.3	.017
Ferric oxide (Fe_2O_3)	.6	.035
PROBABLE COMBINATIONS		
Potassium chloride	1.1	.064
Sodium chloride	4.0	.233
Magnesium chloride	.5	.029
Magnesium sulphate	.3	.017
Magnesium carbonate	1.5	.087
Calcium carbonate	3.2	.187
Ferrous carbonate	.9	.052
Aluminum oxide	.3	.017
Silica	5.0	.292
Total solids	16.8	.978
Free carbon dioxide	23.5	1.370

WILKERSON SPRING

Rabun County

The Wilkerson mineral spring has been known locally since 1861. It is on lot 22, 5th district, Rabun County, about one-half mile northeast of Tiger Mountain. The topography in the vicinity of the spring is very rugged. Within 40 or 50 rods of the spring on a small stream is to be seen a beautiful water fall which cascades over a bluff more than 100 feet in height. The spring is a small chalybeate spring, furnishing less than 1 gallon per minute. The water has an irony taste, and upon standing throws down a copious brownish-red precipitate. The water is supposed to possess very decisive medicinal properties and it is used to a great extent by the people in the vicinity.

ANALYSIS WILKERSON SPRING
Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	13.20	.769
Clorine (Cl)	3.55	.207
Sulphur trioxide (SO_3)	8.67	.506

A. WHITE PATH CHALYBEATE SPRING, GILMER COUNTY, GEORGIA

B. HOTEL, WHITE SULPHUR SPRINGS, HALL COUNTY, GEORGIA

Carbon dioxide (CO_2)	40.23	2.345
Sodium oxide (Na_2O)	2.27	.122
Potassium oxide (K_2O)	2.75	.160
Lime (CaO)	3.00	.174
Magnesia (MgO)	.47	.027
Alumina (Al_2O_3)	.47	.027
Ferric oxide (Fe_2O_3)	7.33	.427
PROBABLE COMBINATIONS		
Potassium chloride	4.35	.254
Sodium chloride	2.44	.142
Sodium sulphate	2.25	.131
Calcium sulphate	6.22	.363
Magnesium sulphate	1.41	.082
Aluminum sulphate	1.57	.092
Ferrous sulphate	3.39	.198
Ferrous carbonate	8.04	.469
Silica	13.20	.769
Total solids	42.87	2.500
Free carbon dioxide	37.18	2.168

WILLIS WELL

MONROE COUNTY

This well is at J. T. Willis' residence about one-half mile from Berner. It has been used chiefly to supply stock and for general household purposes. Owing to some peculiar taste the water has been thought by its owner and others to possess medicinal properties. The well is a common dug well, such as are usually met with throughout the Crystalline area of Georgia. The peculiarity of the water, as shown by its analysis, is the high percentage of chlorine present.

ANALYSIS WILLIS WELL

Saline-calcic

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	58.0	3.382
Chlorine (Cl)	200.0	11.663
Sulphur trioxide (SO_3)	4.1	.239
Carbon dioxide (CO_2)	117.0	6.823
Sodium oxide (Na_2O)	78.4	4.572
Potassium oxide (K_2O)	2.7	.157

Lime (CaO)	86.9	5.067
Magnesia (MgO)	61.2	3.569
Phosphorus pentoxide (P_2O_5)	trace	trace
Nitric acid (HNO_3)	4.5	.262
Alumina (Al_2O_3)	.8	.047
Ferric oxide (Fe_2O_3)	.4	.023
PROBABLE COMBINATIONS		
Potassium chloride	4.4	.256
Sodium phosphate	trace	trace
Sodium nitrate	6.1	.355
Sodium sulphate	7.3	.426
Sodium chloride	137.8	8.036
Magnesium chloride	132.8	7.744
Calcium chloride	28.4	1.656
Calcium carbonate	129.6	7.558
Ferrous carbonate	.6	.035
Aluminum oxide	.8	.047
Silica	58.0	3.382
Total solids	505.8	29.495
Free carbon dioxide	40.0	2.333

WOODROUGH SPRING

CHATTAHOOCHEE COUNTY

This spring is a small unimproved spring located near the Seaboard Air Line Railway about three-fourths mile west of Sulphur Spring Station. The flow is 3 gallons per minute. The water has a faint odor of hydrogen sulphide and forms about the terra cotta casing a grayish-white precipitate. The spring is located in a narrow swampy valley near a rather steep hillslope. The spring is known only locally.

ANALYSIS WOODROUGH SPRING

Light saline-sulphuretted

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	5.5	.321
Chlorine (Cl)	3.2	.187
Sulphur trioxide (SO_3)	5.9	.344
Carbon dioxide (CO_2)	38.5	2.245
Sodium oxide (Na_2O)	3.0	.175
Potassium oxide (K_2O)	1.0	.058

Lime (CaO)	.5	.029
Magnesia (MgO)	.4	.023
Alumina (Al_2O_3)	1.0	.058
Ferric oxide (Fe_2O_3)	.7	.041
PROBABLE COMBINATIONS		
Potassium chloride	1.7	.099
Sodium chloride	3.6	.210
Sodium sulphate	2.5	.146
Calcium sulphate	1.1	.064
Magnesium sulphate	1.2	.070
Aluminum sulphate	3.4	.198
Ferrous sulphate	1.5	.087
Silica	5.5	.321
Total solids	20.5	1.195
Free carbon dioxide	38.5	2.245

YOUNG MINERAL SPRING

HABERSHAM COUNTY

Young Mineral Spring is located in a deep hollow or gorge just east of the railroad at Tallulah Falls between the Cliff House and the Lodge. The spring is well protected by a curbing and is much used by the guests of the various hotels. The flow is small, being less than 2 gallons per minute. The water has a distinct irony taste and throws down a rather abundant yellowish-brown precipitate on standing. The spring is very romantically located from a scenic standpoint, being within only a few hundred yards of the brink of the Tallulah chasm.

ANALYSIS YOUNG MINERAL SPRING

Chalybeate

CONSTITUENTS DETERMINED	Parts per million	Grains per U. S. gallon
Silica (SiO_2)	4.6	.268
Chlorine (Cl)	5.3	.309
Sulphur trioxide (SO_3)	1.5	.087
Carbon dioxide (CO_2)	67.8	3.953
Sodium oxide (Na_2O)	2.7	.157
Potassium oxide (K_2O)	4.7	.274
Lime (CaO)	13.0	.758
Magnesia (MgO)	2.6	.152
Alumina (Al_2O_3)	2.6	.152
Ferric oxide (Fe_2O_3)	22.8	1.329

PROBABLE COMBINATIONS

Potassium chloride	7.4	.432
Sodium chloride	2.9	.169
Sodium sulphate	2.7	.157
Calcium carbonate	23.2	1.352
Magnesium carbonate	7.8	.455
Ferrous carbonate	34.2	1.994
Aluminum oxide	2.6	.152
Silica	4.6	.268
Total solids	85.4	4.979
Free carbon dioxide	38.8	2.263

LIST OF MINERAL WATER PRODUCERS OF GEORGIA

NAME OF SPRING	COUNTY	PROPRIETOR	ADDRESS
Abbeville	Wilcox	Abbeville Mineral Spring Co.	Abbeville
Benscot Lithia	Cobb	Benscot Lithia Springs Co.	Atlanta
Bowdon Lithia	Douglas	Bowdon Lithia Springs Water Co.	Lithia Springs
Cascade	Fulton	F. B. Magee	Atlanta
Catoosa Springs	Catoosa	Catoosa Springs Co.	Tunnell Hill
Cliff Rock	Fulton	T. H. McCrea	Atlanta, Ga.
Chalybeate	Meriwether	Chalybeate Springs Co.	Chalybeate.
Cohutta	Murray	Cohutta Springs Land Co.	Crandall.
Cox Mineral	Burke	Cox Mineral Springs Co.	Waynesboro.
Daniel Mineral	Greene	Judge Holden	Crawfordville.
	[illegible]	J. J. Rutherford	Union Point.
Duke Mineral	Polk	T. N. Duke	Cedartown
Electric Lithia	Taliaferro	Electric Lithia Springs Co.	Hillman.
Gaskin	Coffee	Mrs. Joel Gaskin	Douglas
High Rock Magnesia	Fulton	High Rock Water Co.	Atlanta
Hughes Well	Floyd	Oak Park Land Co.	Rome.
Jay Bird	Telfair	T. A. McMillan	Beach.
Menlo	Chattooga	Ledbetter Bros.	Rome.
Miller's Mineral	Baldwin	W. W. Miller	Milledgeville.
Miona	Macon	Miona Mineral Springs Co.	Fort Valley.
Murrow	Tifton	Murrow Mineral Springs Co.	Tifton.
Pine Mountain	Troup	Pine Mountain Springs Co.	West Point.
Post Mineral	Cherokee	Cherokee Mineral Water Co.	Holly Springs.
Swift Lithia	Elbert	Swift Lithia Springs Co.	Elberton.
Utoy Rock	Fulton	D. H. Demetry	Atlanta
White Elk	Bibb	White Elk Water Co.	Macon, Box 546.
White Oak	Bibb	White Oak Mineral Water Co.	Macon
Wild Rose	Dodge	W. A. Morgan	Eastman.
White Path	Gilmer	White Path Hotel Co.	White Path.

MINERAL WATER PRODUCTION OF GEORGIA—1900-1912

Year	Quantity gallons	Value	Year	Quantity gallons	Value
1900	148,500	$28,200	1907	246,800	$28,120
1901	284,976	45,521	1908	346,198	50,930
1902	419,100	60,797	1909	782,166	99,888
1903	379,517	65,252	1910	734,135	63,171
1904	305,294	45,744	1911	981,080	97,752
1905	270,249	37,619	1912	857,365*	84,681*
1906	130,900	14,535			

*Approximately—figures not verified.

CLASSIFIED ANALYSES* OF GEORGIA MINERAL WATERS

ALKALINE

Page in Text	NAME OF SPRING	LOCATION	Silica (SiO_2)	Chlorine (Cl)	Sulphur trioxide (SO_3)	Carbon dioxide (CO_2)	Sodium oxide (Na_2O)	Potassium oxide (K_2O)	Lime (CaO)	Magnesia (MgO)	Alumina (Al_2O_3)	Ferric oxide (Fe_2O_3)	Total solids	Free carbon dioxide (CO_2)
28	Albany Well	City of Albany	13.62	69.36	1.22	677.00	623.76	34.73	6.00	3.00	1.75†		1,159.37	254.43
29	Argon	¼ mile from Hillman	39.42	6.30	1.20	74.32	13.05	2.45	10.31	4.05	.45	.80	94.03	55.73
33	Beall	8 mi. S. W. of Warrenton	64.00	5.20	10.50	153.50	12.30	1.90	51.30	4.50	1.60	1.00	197.70	107.10
42	Bowman Mineral	2 mi. N. of Holton	48.70	5.60	9.90	141.60	16.40	1.80	36.20	9.80	.80	3.00	175.60	97.10
44	Brooks Mineral No. 1	8½ mi. W. of Sandersville	14.20	7.00	9.40	109.80	3.50	1.20	14.20	1.30	.40	.60	56.70	103.40
44	Brooks Mineral No. 2	8½ mi. W. of Sandersville	12.90	7.00	8.00	80.90	3.60	1.60	16.50	1.20	.60	.80	59.70	71.70
45	Broyles Mineral	Corp. limits of Ringgold	15.20	15.00	11.00	273.10	12.30	1.10	124.70	22.20	6.30	14.30	341.50	108.90
51	Cave	Cave Spring, Floyd Co	7.30	4.20	2.40	90.50	2.60	.80	35.00	18.70	1.50	trace	118.90	43.80
59	Cox Mineral	9 mi. N. E. Waynesboro	7.40	5.20	.40	115.90	2.20	1.00	70.60	2.20	.30	.40	146.70	58.60
63	Dixon Sulphur	1 mi. from Toomsboro	21.00	10.00	12.00	44.30	5.40	.60	21.30	3.30	.80	1.00	87.40	26.00
64	Duckett	5 mi. E. of Dalton	9.00	4.00	1.20	200.00	3.80	1.00	64.00	35.00	2.10	1.20	224.20	110.00
64	Duke	3 mi. N. of Dugdown	13.30	3.50	13.60	103.20	7.10	1.30	49.10	15.00	4.00	1.60	231.40	53.20‡
67	Everett	6 mi. W. of Reeves	20.50	10.20	8.86	131.00	11.82	2 83	90.40	12.20	3.40	7.20	255.31	39.67
68	Fleming	Cannon	31.00	3.50	6.70	42.60	10.30	3.30	12.20	7.20	2.20	4.40	102.50	19.70
69	Floyd	Near Plainville, Floyd Co	27.80	10.50	24.10	185.20	26.50	.80	96.00	11.20	6.70	2.40	292.80	88.40
70	Fowler	2½ mi. N. of Bullochville	41.20	7.00	3.70	83.30	15.20	3.20	18.60	6.40	.70	2.00	125.00	54.60
73	Fuller Sulphur	3 mi. E. of Fairmount	17.80	8.50	8.10	132.00	16.60	4.50	58.80	9.30	1.40	1.60	186.10	70.50
74	Garnet	1½ mi. W. of Toccoa	27.10	5.25	10.00	72.60	8.48	2.60	24.30	9.04	.40	2.20	117.63	43.85
76	Georgia Mineral	Between Ringgold and Chickamauga Park	10.20	2.80	.80	123.20	4.20	.80	57.00	11.00	.80	.30	145.10	64.80
77	Gibson Deep Well	Town of Gibson	40.90	3.00	6.70	9.10	11.00	3.20	9.00	3.40	5.00	6.80	95.80	------
79	Gordon	12 mi. W. of Dalton	15.50	5.60	14.78	182.40	10.60	2.80	82.00	12.76	.40	5.40	227.66	103.75
83	Harbon	7 mi. N. W. of Dawsonville	18.60	3.50	8.20	34.60	10.10	.80	13.00	2.60	.80	2.00	73.50	19.80
86	Hawkins Mineral	1½ mi. W. of Ball Ground	26.40	4.20	7.00	80.00	7.40	4.40	40.30	10.40	.30	1.20	143.60	36.20
87	Henderson Mineral	9 mi. S. E. of Sandersville	17.00	3.00	1.20	130.00	2.10	.70	78.20	1.50	.60†		166.10	67.60
89	Hitchcock	3 mi. S. E. of Taylorsville	27.30	3.50	10.00	54.00	9.90	1.00	23.70	7.50	.50	4.50	118.60	23.00
91	Horseshoe	Cave Spring	14.00	4.20	2.30	165.30	3.50	.90	52.10	33.30	.80	2.00	191.50	85.70
97	Jay Bird	7 mi. N. of Helena	18.60	4.90	2.80	185.60	6.50	1.30	71.80	11.00	.80	1.10	187.20	116.00
98	Johnson Mineral	2 mi. E. of Boliver Station	23.40	4.20	15.00	93.00	9.60	1.30	53.60	7.40	1.00	5.00	168.40	43.60
99	Kavanaugh	3 mi. N. E. of Columbus	35.00	7.00	50.90	133.60	17.00	2.50	82.80	7.10	.90	1.00	257.80	78.40
102	Lifsey	6 mi. S. W. of Zebulon	15.50	4.20	3.80	110.00	11.00	2.90	33.10	17.50	.70	.50	138.80	60.00
106	Magnolia	7½ mi. N. W. of Americus	11.00	4.00	10.00	98.00	5.40	.90	39.80	5.30	.40	5.70	118.70	46.20
110	Meriwether (White Sulphur)	Near Durand Station	47.10	7.00	6.60	100.00	14.26	3.40	24.50	6.00	.40	3.60	149.38	70.48
110	Meriwether (Red Sulphur)	Near Durand Station	32.80	3.50	5.20	82.60	18.70	1.90	29.00	4.60	.60	1.10	134.00	45.10
110	Meriwether (Iron)	Near Durand Station	42.10	3.40	10.20	68.50	14.70	3 40	29.50	4.50	.70	3.00	144.80	34.40

* Parts per million. † Alumina and iron combined. ‡ Other constituents will be found in complete analysis in text.

112	Miller Mineral	Milledgeville	45.60	64.00	7.00	99.00	29.07	2.50	50.70	25.70	.40	.30	257.90	53.20‡
113	Mineral Springs Summer Resort No. 1	4 mi. N. of Lafayette	23.40	4.20	10.60	117.00	7.50	2.00	47.00	14.00	1.40	8.00	173.6	64.70
113	Mineral Springs Summer Resort No. 2	4 mi. N. of Lafayette	19.00	7.00	14.00	137.00	16.00	1.80	51.00	13.30	.80	4.00	182.40	80.00
113	Mineral Springs Summer Resort No. 10	4 mi. N of Lafayette	12.00	4.20	1.60	148.00	4.70	.70	48.70	11.70	.80	1.70	137.10	96.00
113	Mineral Springs Summer Resort No. 21	4 mi. N. of Lafayette	18.00	3.50	18.30	20.00	2.20	.70	4.20	3.70	.20	8.00	61.20	18.00
118	Mozley	½ mi. N. W. of Austell	38.30	4.20	2.10	57.40	5.20	2.10	9.20	5.00	.20	.60	84.30	39.00
120	Murrow Mineral	4 mi. W. of Tifton	23.40	3.00	3.00	105.00	6.50	1.00	56.10	2.40	1.40	1.00	140.10	------
124	Palmer	Near Chalybeate, Meriwether Co	27.60	5.20	10.50	82.70	8.90	4.70	31.50	11.00	.70	2.00	136.00	46.40
126	Phoenix	5 mi. N. of Rising Fawn	6.50	4.00	2.10	158.40	3.00	.80	80.4	8.70	2.60	1.20	180.70	86.80
127	Pigeon Mountain Iron Company's Well	1½ mi. N. W. of Noble	18.80	57.00	68.60	360.50	223.90	4.20	74.00	37.20	.50	1.50	772.30	93.20
132	Poor Robin	1½ mi. from Abbeville	14.20	3.50	1.20	127.10	4.00	.80	75.00	6.40	1.00	.50	174.00	60.00
137	Rowland No. 1	6 mi. N. E. of Cartersville	41.50	4.76	6.80	138.60	15.90	3.52	26.20	5.91	.50	5.40	146.16	101.52‡
137	Rowland No. 2	6 mi. N. E. of Cartesville	36.20	5.50	7.70	103.00	12.70	3.60	23.60	4.40	.70	2.60	128.10	75.30
143	Shamrock	1 1-3 mi. N. E. of McRae	42.60	10.00	3.90	159.50	9.20	2.10	86.10	16.20	.30	.20	251.30	75.30
144	Siloam	4 mi. S. of Atlanta	27.60	6.30	1.75	40.40	8.48	2.16	5.60	4.80	.30	4.50	74.24	26.20
146	Spencer	1 mi. from Gainesville	23.70	4.20	10.60	52.60	14.90	2.10	25.10	3.10	3.20	5.10	119.40	27.00
147	Sulpho-Magnesia Artesian Well	¾ mi. N.W. of Austell	18.00	7.70	3.00	120.50	15.00	5.10	35.00	trace	1.25	.87	143.77	82.73‡
154	Taylor	2½ mi. W. of Haralson	49.20	4.00	trace	104.80	1.80	1.40	26.20	14.10	1.00	.60	133.80	68.60
156	Thompson	Near Hoschton, Jackson Co.	35.80	3.50	9.40	68.00	10.00	2.40	27.00	7.30	.70	1.30	127.80	37.00
157	Thundering	Thunder Stat'n, Upson Co	8.30	5.60	.50	85.80	4.40	1.80	27.60	5.40	.60	.50	81.70	57.70
160	Trenton Sulphur	In town of Trenton	17.80	12.25	10.20	297.00	38.00	5.20	84.90	41.90	2.35	5.40	353.85	165.10‡
161	Utoy Rock	8 mi. S. W. of Atlanta	33.00	3.50	4.20	82.00	9.50	1.10	17.00	12.00	8.00	1.60	116.50	53.00
162	Verner	2 mi. N. of Duluth	14.00	3.90	2.30	54.80	4.00	1.40	30.60	2.10	2.00†		84.90	28.60
166	Warm	Sou. part Meriwether Co	22.75	4.20	5.10	83.10	5.00	.35	28.00	17.70	1.00	1.50	123.48	41.27
168	Watson Mineral	8 mi. W. of Muxoy's Station	35.40	3.40	5.00	113.80	16.70	1.27	48.20	11.50	.20	1.00	179.79	53.81
173	White Sulphur	6 mi. E. of Gainesville	22.00	3.64	104.00	104.00	38.16	5.54	22.40	5.59	.40	1.60	152.87	54.38

ALKALINE-SALINE

38	Booz Well	Cedartown	13.40	75.20	8.80	166.60	74.80	1.70	35.30	33.60	.80	1.50	308.90	89.10
47	Carters Mineral	Near Oakman	28.30	4.20	22.00	53.30	13.00	2.20	19.20	5.30	3.10	8.50	124.50	32.50
66	Electric Lithia Well	Hill, Taliaferro Co	7.60	3.00	16.60	47.00	8.10	.80	13.40	8.30	2.40	2.90	79.30	25.00‡
81	Green, John M., Min'l.	Blue Ridge, Fannin Co	28.40	3.00	10.30	30.50	7.50	1.20	7.50	2.30	3.40	6.80	79.20	20.70
92	Hughes Mineral Well	2½ mi. W. of Rome	15.87	38.50	227.90	327.00	47.20	1.54	258.25	77.90	1.44†		823.53	153.40
94	Indian	3 mi. W. of Flovilla	23.50	14.70	21.16	62.86	40.69	2.74	17.12	3.30	1.00†		148.32	36.34‡
105	Madison	7 mi. N. of Danielsville	38.60	5.25	9.28	38.80	12.30	3.04	9.10	3.86	.10	1.00	95.84	24.90
116	Montpelier	17 mi. W. of Macon	50.00	5.30	14.70	124.00	16.10	2.40	16.80	6.00	2.20	3.00	138.10	101.30
141	Scott Mineral	3½ mi. S. W. of Sugar Valley	20.20	5.60	59.60	141.40	8.20	3.50	68.30	21.60	.40	1.80	237.91	91.26
158	Tobe Tate	4 mi. N. E. of Fairmount	24.20	14.90	18.80	50.30	14.50	13.60	26.60	10.70	1.40	4.00	156.80	18.00

† Alumina and iron combined. ‡ Other constituents will be found in complete analysis in text.

SALINE

Page in Text	NAME OF SPRING	LOCATION	Silica (SiO_2)	Chlorine (Cl)	Sulphur trioxide (SO_3)	Carbon dioxide (CO_2)	Sodium oxide (Na_2O)	Potassium oxide (K_2O)	Lime (CaO)	Magnesia (MgO)	Alumina (Al_2O_3)	Ferric oxide (Fe_2O_3)	Total solids	Free carbon dioxide (CO_2)
30	Artesian-Lithia Well	¾ mi. N. W. of Austell	24.30	1,032.00	148.40	163.30	876.80	6.40	160.10	21.40	.90	.30	2,159.20	80.00‡
31	Bagwell Well	S. E. cor. Chickamauga Pk.	45.00	40,039.00	1,271.00	84.50	28,855.00	212.00	3,337.50	2,430.00	53.00†		68,137.00	‡
39	Bowdon Lithia No. 1	Near Lithia Springs Station	32.60	1,101.60	151.20	129.80	946.00	24.50	163.40	15.30	2.50	1.50	2,286.70	70.90‡
41	Bowdon Lithia No. 2	Near Lithia Springs Station	48.20	558.00	86.00	152.60	505.00	8.20	123.60	11.50	.40	.50	1,332.40	77.30†
49	Catoosa (Epsom)	4 mi. E. of Ringgold	18.15	7.00	632.66	122.70	4.02	5.90	412.00	63.30	.22	2.91	1,193.36	73.31
49	Catoosa (Coffee)	4 mi. E. of Ringgold	31.00	5.60	608.00	138.28	15.90	11.27	424.80	80.28	1.00	3.00	1,258.93	44.58
49	Catoosa (Buffalo Lithia)	4 mi. E. of Ringgold	70.00	4.90	762.40	181.40	16.96	7.57	482.40	93.68	1.00	3.40	1,520.96	101.16
49	Catoosa (Cosmetic)	4 mi. E. of Ringgold	16.75	4.90	700.43	125.87	8.00	3.00	408.25	60.00	.60	.60	1,208.02	58.69‡
60	Daniel Mineral	7 mi. N. E. of Union Point	43.20	7.50	933.60	95.40	44.40	5.00	636.90	56.30	.50	1.00	1,808.39	26.00‡
85	Hardy Well	Town of Hamilton	28.00	7.10	160.00	0.0	24.00	2.80	27.00	7.30	37.00	4.30	326.40	‡
93	Illges	2½ mi. E. of Columbus	13.50	246.30	4.40	3.60	179.50	16.00	24.00	6.60	1.50†		462.30	2.50‡
103	Louch Well	Near Austell	11.60	3,134.16	485.15	95.79	2,687.58	76.94	276.21	44.43	.40	.64	6,037.93	70.10‡
107	Majors	Menlo, Chattooga Co.	65.30	5.60	137.00	77.90	11.60	.92	13.30	6.00	40.50	49.50	348.52	51.36‡
109	Medlock Well	5-8 mi. N. W. of Austell	26.20	4,799.26	641.60	93.38	3,759.19	77.47	667.05	89.20	18.40†		9,033.36	93.38‡
114	Miona No. 3	1 mi. N. of Oglethorpe	8.80	4.00	4.60	22.60	2.80	.60	1.70	.80	.80	1.60	25.40	21.70
114	Miona No. 7	1 mi. N. of Oglethorpe	10.50	15.60	4.00	58.00	9.20	8.00	4.20	3.80	7.00	6.50	74.10	48.60‡
116	Morgan Mineral Well	¼ mi. N. of Morganville	19.00	565.00	136.70	388.00	630.80	25.40	96.90	46.70	8.00	1.00	1,562.50	220.00‡
121	Norwood Sulphur	8 mi. S. E. of Fort Valley	5.50	5.00	7.50	42.90	2.60	.80	2.00	1.20	1.00	1.50	25.60	42.90
129	Point Andrews Mineral	4 mi. W. of Macon	45.00	191.00	171.70	148.00	54.00	1.20	170.00	83.30	2.00	2.20	730.40	88.00‡
135	Powder No. 1	Powder Springs Station	24.20	107.80	75.00	105.90	95.40	4.80	38.80	7.90	1.00	.04	333.54	103.30‡
135	Powder No. 2	Powder Springs Station	34.90	84.00	61.00	60.40	105.70	5.70	37.20	8.20	1.50	1.00	354.52	22.20
135	Powder No. 3	Powder Springs Station	35.30	5.60	11.00	77.90	11.50	6.30	27.50	10.00	1.10	1.00	145.06	43.30
139	Russeau	10 mi. N. of Thomson	39.40	5.30	136.00	129.00	25.30	1.70	111.40	14.70	1.00	1.00	379.00	88.00
145	Smith Well	Near Grayson, Gwinnett Co.	13.30	156.20	4.70	8.00	107.00	4.80	22.00	25.00	30.00	4.80	384.30	‡
148	Sulphur	14 mi. S. E. of Columbus	2.50	4.20	7.50	47.00	2.00	1.00	1.30	1.50	2.00	1.10	21.70	46.50
149	Sulphur	5 mi. S. E. of Stillmore	5.00	4.00	.30	3.00	2.20	.60	.30	.50	1.00	1.40	14.90	2.10
150	Sulphur	4 mi. N. W. of Brunswick	7.00	31.00	4.50	16.60	12.00	1.20	4.20	10.00	1.10	1.60	66.50	15.00
151	Swift Lithia	5 mi. E. of Elberton	39.50	12.10	345.20	94.50	32.50	.40	290.50	11.00	2.50	1.00	804.30	25.00‡
155	Thalman Artesian Well	Thalman, Glynn Co.	12.00	28.40	84.30	91.30	70.00	.60	33.20	25.60	2.00	2.20	291.40	51.40‡
167	Washington Sulphur	Washington, Wilkes Co.	32.00	5.30	380.00	154.00	27.00	2.40	296.80	6.70	1.20	.70	799.50	110.00
171	White Oak	4 mi. W. of Macon	73.00	53.00	725.00	44.00	75.50	2.40	244.00	160.00	2.60	5.00	1,375.60	28,00
177	Willis Well	½ mi. from Berner	58.00	200.00	4.10	117.00	78.40	2.70	86.90	61.20	.80	.40	505.80	40,00‡
178	Woodrough	¾ mi. W. of Sulphur Station	5.50	3.20	5.90	38.50	3.00	1.00	.50	.40	1.00	.70	20,50	38,50

† Alumina and iron combined. ‡ Other constituents will be found in complete analysis in text.

CHALYBEATE

27	Adams Mineral	Demorest, Habersham Co	9.30	10.00	12.30	66.00	7.00	1.00	17.00	5.00	3.00	45.00	148.70	21.60
32	Bartow	1 mi. E. of Emerson	7.80	3.50	trace	40.40	4.80	1.20	2.40	2.90	1.20	16.90	50.10	26.00
37	Booth Well	3 mi. S. of Argyle	7.70	10.00	1.20	104.00	6.20	.40	1.20	.90	.50	13.00	44.40	96.80
46	Calhoun	Near Higgston Station	10.00	2.80	trace	26.00	2.60	trace	1.00	.20	trace	43.70	85.80	1.00
52	Chalybeate (Magnesia)	Chalybeate Springs	41.70	5.20	7.40	105.00	12.40	2.70	21.70	10.00	1.70	4.00	136.30	72.00
52	Chalybeate (Sulphur)	Chalybeate Springs	37.60	5.00	7.00	95.10	13.70	2.60	28.80	13.50	.90	6.00	157.30	51.00
52	Chalybeate (Chalyb'te)	Chalybeate Springs	21.00	3.00	8.10	64.90	4.20	2.40	18.70	10.60	.80	4.80	99.40	40.40‡
54	Cherokee	2 mi. E. of Ringgold	19.30	4.90	16.60	123.80	5.60	3.40	61.20	3.60	1.20	15.20	186.22	67.73
56	Cohutta	L. & N. R. R., N. part of Murray Co	15.00	7.00	6.53	28.00	7.09	2.05	5.81	3.20	1.25	10.44	69.25	14.51
65	Eady Mineral	On Mill Cr., N. E. part of Heard Co	10.50	6.65	1.45	45.57	9.40	3.47	3.65	trace	8.50	.25	52.97	34.65
71	Franklin	9 mi. S. E. of Carnesville	34.40	6.12	8.24	77.80	14.84	3.52	4.30	3.75	.40	12.00	103.94	65.75‡
72	Freeman	2 mi. from Granger Station	20.60	7.00	20.90	101.00	8.30	.40	43.80	15.20	1.00	3.80	162.40	57.50
78	Glenn Ella	4 mi. W. of Tallulah Falls	7.00	5.30	1.70	32.00	4.00	.60	4.10	2.00	1.80	11.00	46.90	18.00
80	Gower	Near Gainesville	9.00	4.70	.40	52.00	4.24	1.26	.70	1.10	.10	5.20	30.27	47.37
82	Hampton	1 mi. E. of Cohutta Springs	12.75	6.30	6.12	24.40	5.08	1.55	4.50	2.61	1.45	9.66	58.34	13.85
86	Helicon	4¼ mi. N. E. of Athens	29.00	7.10	6.70	50.00	6.70	1.10	10.60	4.60	2.00	12.00	96.00	25.60
90	Hooten	1 mi. S. of Hamilton	13.00	6.00	4.20	71.20	5.60	1.10	3.60	1.50	.70	7.30	42.70	64.10‡
95	Inman Park Mineral	Inman Park, Atlanta	7.20	5.50	.60	33.40	5.40	.20	1.20	1.22	.20	6.60	32.06	27.08
96	James	8 mi. S. W. of Royston	32.00	3.20	8.00	36.60	9.04	1.00	6.00	2.20	1.60	14.00	90.40	21.80
108	Martin Mineral	2 mi. S. W. of Dalton	28.50	5.10	17.92	63.20	8.66	4.00	21.40	12.61	1.00	10.30	139.84	31.00
119	Munroe	5 mi. N. W. of Putnam	4.40	12.00	.60	60.00	7.60	3.10	3.50	2.00	.90	10.00	50.10	50.50
122	Oak Mountain	2½ mi. N. E. of White Oak	38.00	5.20	10.00	72.90	13.00	3.10	12.10	7.70	2.10	9.80	126.00	55.30
131	Ponce de Leon	N. E. part City of Atlanta	30.20	6.30	3.50	47.50	4.70	3.45	7.00	4.60	.80	5.00	77.98	35.07
133	Porter	8 mi. N. of Dahlonega	13.10	5.10	3.22	34.72	7.82	1.39	3.10	1.70	.30	9.60	54.35	23.33
136	Right-of-Way	400 yds. N. of Tallulah Falls	8.10	2.80	4.25	41.80	4.10	.20	2.60	1.20	.70	9.10	40.35	34.50
144	Simmons Mineral	1½ mi. N. W. of Jasper	21.70	5.20	5.80	126.60	11.60	6.20	16.90	3.10	3.50	5.20	103.30	102.00
153	Tate Mineral	5 mi. S. W. of Jasper	9.50	8.60	11.50	48.40	6.40	1.70	22.60	9.60	2.40	4.60	89.30	17.70
159	Trentham	4 mi. W. of Fairburn	37.60	4.90	18.00	93.60	14.90	.83	30.75	7.25	.63	9.00	168.75	58.49‡
163	Wabena	East Athens	12.60	5.70	1.00	100.00	5.90	.50	8.70	.80	.80	32.00	91.60	73.50
172	White Path Chalybeate	Near White Path Station	32.60	4.90	11.90	46.60	11.60	.60	15.00	3.80	.40	4.00	102.56	29.50‡
176	Wilkerson	½ mi. N. E. of Tiger Mtn.	13.20	3.50	8.67	40.23	2.27	2.75	3.00	.47	.47	7.33	42.37	37.18
179	Young Mineral	Near Tallulah Falls	4.60	5.30	1.50	67.80	2.70	4.70	13.00	2.60	2.60	22.80	85.40	38.80

NEUTRAL

34	Bessie Tift College	Forsyth	16.00	4.00	1.00	19.00	5.20	.30	1.80	.60	.40	1.80	32.50	16.80
35	Blue	6 mi. S. W. of Hamilton	14.80	4.80	4.09	72.60	9.03	2.78	8.63	1.06	4.62†		59.17	62.04
36	Blue Ridge Mineral	1 mi. E. of Blue Ridge	13.00	3.00	2.80	30.00	5.00	1.50	2.50	1.40	1.00†		34.20	25.70
43	Brenau College	Gainesville	4.70	3.50	.70	12.50	2.70	.60	.80	1.00	.50	.30	15.60	11.00
48	Cascade	6 mi. S. W. of Atlanta	25.50	5.10	5.60	58.80	9.50	4.00	4.90	3.00	.80	.70	65.83	49.90
48	Cascade	6 mi. S. W. of Atlanta	20.00	4.20	3.70	44.00	4.20	3.60	7.30	4.20	.70	1.60	70.70	36.00
53	Chappell	2 mi. N. E. of Columbus	4.90	7.00	1.20	31.00	4.40	1.10	1.50	.30	.90	1.00	24.00	28.20
55	Cliff Rock	8 mi. N. of Atlanta	20.00	7.10	1.00	15.00	4.00	3.50	1.10	1.00	.40	1.00	40.10	—
58	Cold	Near Bullochville	10.10	4.76	trace	57.60	9.54	1.64	1.00	1.30	.10	1.40	36.21	50.00

† Alumina and iron combined. ‡ Other constituents will be found in complete analysis in text.

NEUTRAL—Continued.

Page in Text	NAME OF SPRING	LOCATION	Silica (SiO_2)	Chlorine (Cl)	Sulphur trioxide (SO_3)	Carbon dioxide (CO_2)	Sodium oxide (Na_2O)	Potassium oxide (K_2O)	Lime (CaO)	Magnesia (MgO)	Alumina (Al_2O_3)	Ferric oxide (Fe_2O_3)	Total solids	Free carbon dioxide (CO_2)
61	Defore	Near Dry Branch	10.00	16.00	3.20	52.00	14.00	3.70	5.70	2.50	2.40	3.00	65.60	43.20
61	Demorest	In Town of Demorest	9.60	4.60	2.30	17.00	3.20	1.10	2.80	1.30	2.80	2.80	32.90	11.60
61	Demorest	In Town of Demorest	10.00	4.60	7.00	20.00	4.70	2.40	3.40	2.00	2.00	2.30	41.60	14.00
75	Gaskin	1½ mi. N. of Douglas	5.60	6.30	trace	12.00	2.70	.30	.60	1.30	trace	.00	16.60	12.00
84	Harbour	5½ mi. N. of Rome	11.50	3.50	1.40	33.50	4.20	1.00	6.00	2.00	.40	1.40	38.60	25.40
88	High Rock	Southeast Atlanta	8.50	5.20	.60	46.70	3.90	.80	2.80	3.00	.40	.30	29.90	41.20
100	Kelley	2 mi. S. W. of Cummings	8.00	3.50	trace	15.00	2.50	.60	2.20	3.30	1.00	1.00	26.50	9.90
101	Keystone (Reinhart)	8 mi. W. of Dublin	1.90	4.00	trace	28.30	2.80	1.00	2.80	.70	.10	.30	15.90	26.20
104	McCranie Well	Town of Sparks	6.00	4.00	trace	42.00	3.00	trace	.20	.20	.50	1.00	14.40	41.00‡
121	New Hope	1 mi. N. E. of Villa Rica	17.50	12.20	1.30	36.00	8.70	3.40	7.00	4.80	1.20	.60	64.50	------
123	Omaha	2 mi. S. of Avera	5.20	4.00	1.00	26.20	2.50	.40	.80	.80	.40	.80	16.10	25.20
125	Parker	½ mi. W. of Lovett	14.00	4.40	2.00	7.50	3.80	.10	2.10	1.40	.30	.30	29.50	5.50
128	Pine Mountain	3 mi. S. E. of West Point	11.00	3.50	3.60	12.00	3.10	.90	2.20	2.10	1.00	2.80	33.50	6.30
130	Polar Rock Mineral	4½ mi. S. of Atlanta	24.40	4.20	trace	30.00	3.10	.80	9.50	9.30	.50	.50	56.80	14.50
134	Post Mineral	Holly Springs	4.60	3.50	2.90	7.30	3.10	.60	1.20	.70	1.00	1.40	19.70	5.00
140	Satterfield	2½ mi. N. E. of Cartersville	4.20	2.00	2.00	36.50	1.20	.65	.55	.50	.55	.05	11.32	34.70
142	Searcy	1½ mi. E. of Griffin	11.00	4.00	4.30	33.30	4.60	.70	2.20	.90	.10	.40	29.20	31.50
152	Tampa	4 mi. N. W. of Atlanta	15.45	5.60	11.00	80.40	6.80	2.04	7.00	1.55	.30	2.60	56.61	75.44
164	Waco Mineral No. 1	¾ mi. S. W. of Waco	11.00	3.00	7.00	18.00	6.50	.50	2.00	1.60	.40	8.60	46.60	6.00
164	Waco Mineral No. 2	¾ mi. S. W. of Waco	9.00	3.00	5.00	20.00	3.50	.50	7.00	1.60	1.00	.70	38.60	13.10
165	Wade	1 mi. S. E. of Cornelia	7.40	3.10	1.20	20.10	2.40	.60	1.60	trace	3.00	1.50	21.30	18.80
169	White Elk	6 mi. E. of Macon	4.80	3.30	.60	11.30	1.80	.40	1.30	.80	.20	.60	15.60	9.60
172	White Path Magnesia	Near White Path Station	10.82	3.50	1.25	28.12	3.20	.10	3.20	2.44	.38	2.56	32.28	19.66
172	White Path Sp'g-House	Near White Path Station	9.10	2.10	3.80	6.70	2.60	.80	1.20	1.10	1.10	.40	21.70	5.00
172	White Path Mtn. Side	Near White Path Station	17.40	5.20	.80	9.60	5.30	1.20	3.50	1.80	1.00	.20	39.80	4.00
175	Wild Rose	3½ mi. E. of Eastman	5.00	3.50	.20	26.00	2.10	.60	1.80	.90	.30	.60	16.80	23.50

‡ Other constituents will be found in complete analysis in text.

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