

# GOLD IN NORTH GEORGIA

Department of Natural Resources Georgia Geologic Survey Environmental Protection Division

1889 - 1989

Educational Series 2

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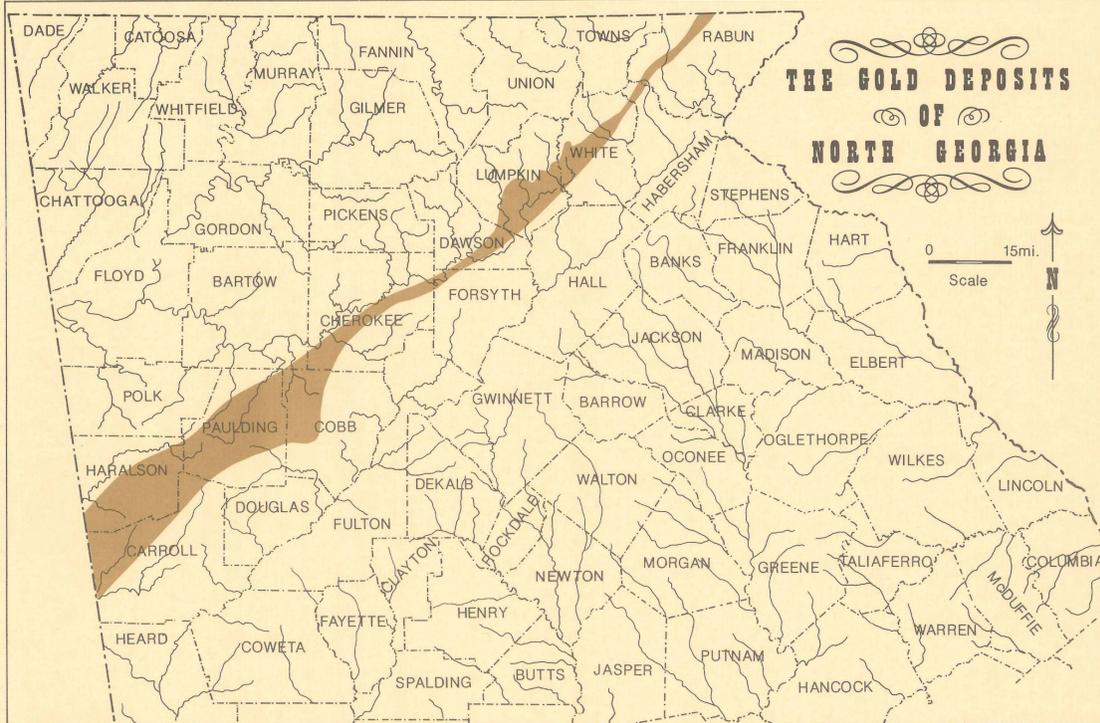
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## GOLD DISCOVERED IN GEORGIA

Georgia's first gold prospectors were the Spanish. They came to the new world seeking the legendary El Dorado, the city of gold, and they plundered much of Central and South America in their search. The expeditions of de Soto and de Luna to Florida in the 1500's also pushed northward into Georgia. Accounts by the Indians of Georgia and northern Florida of fabulous gold hordes "to the north" were probably a ruse to encourage the Spanish to move on.

The Indians of north Georgia at the time of the first European contact possessed a highly developed civilization, but they did not mine or work gold as did the Indians of Central and South America. Although the mound builders of Etowah and surrounding areas valued native copper and fashioned it into ornaments, no golden artifacts are known from the archaeological record. The Spanish likely found little or no gold, as they abandoned the search in Georgia.

In 1829, news of the discovery of gold in the mountains of north Georgia started the nation's first gold rush. Nearly simultaneous discoveries of gold in White County and neighboring Habersham and Lumpkin Counties touched off an explosion of mining activity in north Georgia. By May of 1830, Governor Gilmer estimated that between six and ten thousand persons, miners and their followers, were at work in the lands between the Etowah and Chestatee Rivers. This area, then part of the Cherokee Country, was proclaimed off-limits to miners in June of 1830, and an armed force was sent to carry out the proclamation. However, mining was not ended, and the U.S. Mint in Philadelphia received its first deposits of Georgia gold in that year, totalling \$212,000.



This map of north Georgia shows the boundaries of present-day counties, major streams, and the boundaries of the Dahlonge Gold Belt.

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### Gold Mining in Georgia Declines

Many factors combined to bring an end to the commercial mining of gold in Georgia. The first surge of miners to the gold fields were attracted by the quick profits to be made by the mining of easily worked placer deposits. Anyone with a strong back and a gold pan could hope to strike it rich. As the placer deposits were worked out, many people turned away from mining. The development of hydraulic mining techniques brought renewed interest and increased mining activity, but eventually, the saprolite deposits began to play out as well. With the shift to underground mining, mining methods became even more sophisticated and required larger outlays of capital. This reduced the number of people willing to continue the search for gold. But continue it did.

In 1848, only twenty years after the Dahlonega gold rush began, the first strike was made at Sutter's Fort, California. Many of the miners of north Georgia left for the far west, hoping to duplicate the success they had experienced in the early days of the Dahlonega strike. A headlong rush to the hills of California began, to be followed in only ten years by another to Pike's Peak, Colorado. The forty-niner's race to California was only the start of a vast westward migration. These two western gold fields drained much of the unskilled labor and most of the skilled miners from the eastern United States. A third major blow to the gold mining industry in Georgia was the advent of the Civil War. All available manpower was poured into the war effort, crippling the mines even as gold prices soared.

Gold mining in Georgia never recovered its former strength, although it did resume after the Civil War and continued for some years. Each time an advance in mining technology occurred, it brought with it a rise in production, but the overall trend was one of decline. Eventually all the highest grade ores had been exhausted, or mining them was beyond the technology of the time. The last year that any significant production was recorded for Georgia was 1934.

### Is There a Future for Gold Mining in Georgia?

Is this the end of the story of Dahlonega's gold rush? Perhaps not. Two major factors may eventually combine to alter the end of the tale.

From the time of the coinage act of 1792, until March of 1933, the price of gold was established by Congress. This changed in 1933, when the price of gold was first allowed to float. The price rose to \$29.62 per ounce, from its previous statutory price of \$20.67 per ounce. By 1934, the price had risen again, to \$35 per ounce. Gold prices were rising while production of gold in Georgia was reaching new lows.

Gold prices eventually levelled off, and they remained constant until the 1970's, when they suddenly went through the roof. Unprecedentedly high prices were set on the world market for gold, as high as \$800 per ounce.

In the years since gold production ceased in Georgia, gold-mining technology has made enormous strides. Soaring prices have led to the development of new methods for processing even the lowest grades of ore. Mining companies today can extract amounts of gold so small that they cannot even be seen with the naked eye, and the cost of producing that gold is dropping. An ounce of gold that cost \$236 to produce in 1984, could be produced for \$200 an ounce in 1988. Very large mining operations can bring their production costs even lower by processing huge quantities of ore at one time.

So the end of the tale may not have been told. Many gold mines in Georgia were abandoned due to factors that no longer apply today. Reduced labor force, high capital outlay requirements, and technological limitations all played a role in the demise of Georgia's gold mining industry. But rising gold prices and declining production costs might make a second look at Georgia's gold region both practical and profitable. Georgia's gold fields, mined long ago, using methods primitive by today's standards, may not have yielded all their secrets. The miners of Georgia's first gold rush may have left behind enough gold for a second.

### Gold Mining Methods and Equipment

Early prospectors in the gold region used simple tools in their search. The swift mountain streams of the Georgia hills yielded the first gold to prospectors equipped with little more than a gold pan and common sense.

Gold is a heavy mineral. The power of rushing water can move it downstream, but wherever the flow of water slows, such as at the bends of streams, gold and other heavy minerals settle to the bottom. The gravel in the bed of a stream can be tested for the presence of gold using a gold pan. A miner or prospector scoops up a panful of gravel and water and swirls it around, allowing the lighter and coarser materials to be splashed out of the pan. The dark heavy minerals and bright specks of gold, called "colors" by prospectors, are left behind in the pan.

Deposits of gold which have been transported and concentrated by streams are called placer deposits. Some placers are remarkably rich, because they have been concentrated and reconcentrated. Many of the gold deposits mined in the early days of the Dahlonega gold rush were of this type. These deposits could be worked using little more than gold pans. One miner working steadily could move a ton of gravel a day in this manner.

Miners hoping for even bigger profits often added another piece of technology to placer mining, the sluice. A sluice, or sluice box, used the power of the stream to separate the gold from the worthless gravel. Of simple construction, a sluice was a long wooden trough, open at each end and on top. The bottom of the sluice was covered with burlap or another rough fabric, or it was fitted with slats of wood, called riffles. The sluice was either placed in the stream channel, or water from the stream was directed across it. The rough materials of the sluice's bottom slowed the flow of water across them, trapping the heavy minerals

logically, be derived from sources upstream. By following the traces of gold up the length of a stream, that source could be located. These new gold finds were not as easily worked as the placer deposits. The gold might be found in weathered rock, called saprolite, but it would not have been washed out by streams. Instead, the gold particles in the saprolite, because of their relatively greater density, would have worked their way downward towards bedrock. This, too, caused the gold to become concentrated, but tons of waste material had to be moved in order to extract the gold.

New methods were needed to mine gold from saprolite deposits. Again, water power was the answer. Streams were dammed high above the gold deposit, and the trapped water built up tremendous pressure. The water could then be aimed at the saprolite through large hoses, called giants, or could be released all at once in a flood, a method called "booming." The rushing water ate away the weathered rock very quickly, freeing the gold. Water and earth were then directed through a sluice, trapping the gold. Entire hillsides could be washed away using these methods. The techniques of hydraulic mining, developed in the gold region of Georgia, became known as the Dahlonega method. Efficient at removing gold from weathered rock, this method was also highly destructive of the countryside, and in 1927, it was banned in Georgia.

Gradually, even the saprolite deposits became depleted. Rich gold veins still remained to be mined, but they were enclosed in solid, unweathered rock. Underground mining methods, rather than open pit methods, had to be employed to reach these veins. The veins were followed by digging tunnels, either vertically (shafts) or horizontally (adits). The digging of tunnels and removal of ore were done using hand tools and explosives.

### Life and Times in Georgia's Gold Rush Days

#### The Cherokee Nation

#### The Trail of Tears

#### Auraria and Dahlonega

#### Coining and Counterfeiting

It is unlikely that the Cherokee knew of the rich deposits of gold on their land prior to its discovery in 1828. Legends persist of ancient Indian gold mines and lost hordes, but the Cherokee themselves were relative newcomers to the area. Thus, the Indians of north Georgia probably learned along with the rest of America that their lands would yield a fortune in gold.

Prior to the discovery of gold in their territory, the Cherokee lived in harmony with neighboring Georgians. They farmed and herded, attended their own schools and churches, and governed themselves. The capital of the Cherokee Nation was located at New Echota, and it was there that their bilingual newspaper, the Cherokee Phoenix, was published. The paper was printed in English and Cherokee, using an alphabet devised by a Cherokee scholar named Sequoyah.



Sequoyah, Cherokee Indian leader and scholar. He devised the Cherokee alphabet and published a bilingual newspaper, the Cherokee Phoenix. (Library of Congress.)

### United States Mint Established at Dahlonega

Auraria and Dahlonega were both towns founded on gold mining. A rivalry grew up between the two towns over which should have preeminent status as the capitol of the gold region. The establishment of a branch of the U.S. Mint at Dahlonega, in 1838, settled the question of priority forever. Gradually, Auraria began to decline, leaving only a few weathered buildings to mark its location. Dahlonega, the town that eventually gave its name to the gold belt, still thrives today.

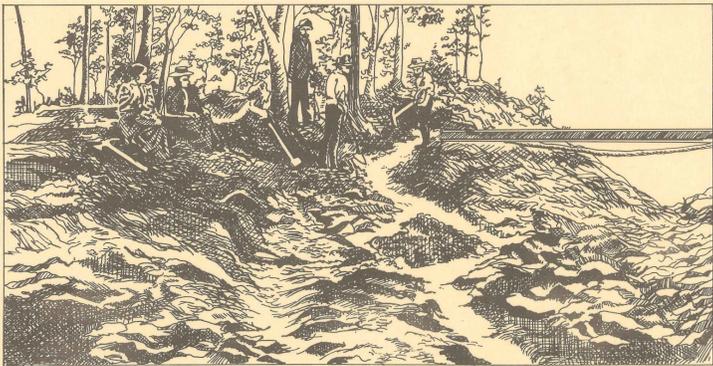
The discovery of gold in Indian territory altered the lives of the Cherokee people forever. Before 1828, settlers had shown little interest in the mountainous portions of Georgia, which were too steep for cotton farming. The discovery of gold, however, made these lands desirable. In 1831, the Cherokee Country was surveyed and divided into 160-acre lots, 40-acre lots in the gold region. In 1832 a lottery was held to distribute the lands to white settlers.

The Cherokee residents were given two years to vacate their lands. Some of the Indians left, but there were many holdouts. The last Cherokees in Georgia were rounded up by Federal troops in 1838. The forced migration to new lands in Oklahoma became known as the Trail of Tears. Four thousand people died en route.

With the influx of settlers and miners, towns like Auraria and Dahlonega sprang up and flourished. Auraria, on the Etowah River, was settled first. The name Auraria was derived from the Latin word for gold. Dahlonega, located near the headwaters of the Chestatee River, takes its name from a Cherokee word, taulauneka, meaning yellow money. These were frontier towns, their populations composed of miners and their families as well as owners of mining-related enterprises. Merchants and smiths, tavern keepers and ministers swelled the ranks of the gold seekers. For a brief time, Auraria even boasted its own newspaper, the Western Herald.

One profession that was not represented in the early mining days was banking. The first bank was not established in the gold district until 1834. Merchants in the rough-and-tumble frontier towns sold goods for cash or gold only; no credit was extended. In a region with many merchants but no bankers, transactions were often carried out in unmined gold. Gold dust and bars were available but inconvenient. Currency was so scarce that Spanish coins were circulated legally until 1857.

The lack of banks and currency in the gold region prior to 1834 inhibited commerce, but it opened the door for individual enterprise. During this time, private citizens were not prohibited from coining their own money. Such coinage was not considered counterfeiting. One private coiner was Templeton Reid of Gainesville, who began minting coins in 1830. These coins were stamped with Reid's name and with their value. Oddly enough, because these coins were worth more than their face value, Reid's private coins were frequently counterfeited.



Placer mining at the White Path Gold Mine, Gilmer County, Georgia. (After McCallie and King, 1896.)

and gold. In this way, the sluice mimicked the action of the stream. Another method of collecting the tiny particles of gold was with the use of an amalgam plate. In this method, a metal plate coated with mercury caused the gold particles to cling to it, allowing their later removal. Either way, a sluice allowed a miner to move much more gravel each day than was possible with gold pan and manpower alone.

Eventually, all the placer deposits were either claimed, or were beginning to play out. Miners had to look further for new gold deposits. Gold carried in streams must,

Because of the difficulty of extracting gold from unweathered ore, the methods of separating the gold from the worthless material, called gangue, were elaborate. First, the ore had to be crushed. This was done in a water-powered mill, called a stamp mill. Heavy weights were raised and dropped repeatedly, crushing the ore to gravel. Chemical methods, such as chlorination or treatment with potassium cyanide, or mechanical methods, such as flotation with oils, could then be used to extract the gold from the unweathered ore.

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## Gold: Its Value Through the Ages and Its Uses Today

Gold has been a means of monetary exchange since antiquity. It is the standard against which modern currencies are measured. Even in unstable economic times, faith in the value of gold never wavers. But why is gold valuable? The answer may lie in its unique properties.

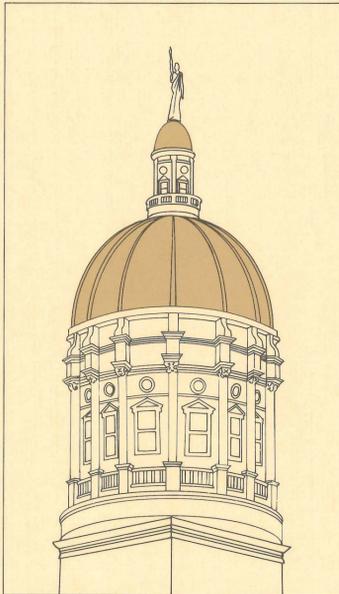
Gold is a metal. Many metals are valued for their conductivity, malleability and ductility. Because gold is highly conductive, it can transmit heat or electricity with little loss of energy. The extreme ductility of gold allows it to be drawn out into very fine wire. Gold is also malleable. It can be shaped easily by hammering or pressure. Sheets of gold, called gold leaf, can be made so thin that light passes through them. Because of these physical properties, gold is always in demand for such uses as printing and electrical circuitry.

Gold is a native element. It occurs in nature in its pure, or nearly pure, form. Although often found alloyed with silver, tellurium, or other metals, Georgia's gold can be as much as 98% pure. Because gold does not combine readily with other elements, it is enduring. Iron, which combines easily with oxygen, will eventually rust, but gold is permanent. It will never rust away. The nonreactive nature of gold, combined with its workability, makes it useful in dentistry and for specialized uses in the chemical industry.

Gold is prized for its beauty. It's yellow color and metallic luster are unique among metals. Gold does not tarnish, so its brilliance is never dimmed. The ease with which it can be worked, along with its beauty and durability, makes it a natural for personal adornment. The jewelry-making industry is one of the largest consumers of gold in the world. In many parts of the world, large caches of gold jewelry serve as portable savings accounts for their owners.

Finally, gold is rare. Although it is mined in many places in the world, its overall abundance is low. Scarcity increases the value of gold. Although seldom used today for coins, demand for gold continues to rise. Governments hold reserves of gold to back currency or to conduct international transactions. Individuals want gold jewelry to wear and gold coins or bullion as a hedge against inflation. Industry is continually devising highly profitable new uses for gold. It appears that the production of gold will never outstrip the demand.

The value of gold then, is a complex equation. Purity, permanence, rarity, usefulness, and beauty all combine to make gold valuable. Understanding these factors, however, is not enough to explain the continuing allure of gold through the ages. Somehow, the mystique of gold transcends explanation.



In 1958, the dome of the State Capitol was covered with Georgia gold. The 43 ounces of gold, donated by the citizens of Lumpkin County and the city of Dahlonega, were sent to Atlanta by covered wagon. In 1961, the deteriorating surface of the dome was restored to its former brilliance with a new application of gold leaf.

## The Geology of Gold Occurrence in Georgia

Gold can be found, in small quantities, nearly everywhere. Even sea water contains minute amounts of gold. It is only rarely that gold is found in sufficient concentrations to make it mineable or even detectable to the naked eye.

The crystalline rocks of the Appalachian Mountains yield gold, in varying amounts, from Maine to Alabama. Only in the southern portion of the Appalachians, in Virginia, the Carolinas, Alabama, and Georgia, has gold mining had economic importance. Gold has been found in almost every Georgia county underlain by crystalline rocks. Over 500 such occurrences have been reported in the State. Some, such as the Dahlonega gold belt, are extensive; others are more local in nature.

The Dahlonega Gold Belt was the primary gold-producing region in Georgia. The gold belt is a narrow, northeast-trending band that extends from the Alabama border in Carroll and Haralson Counties, to the North Carolina border in Rabun County, a distance of about 152 miles. The belt varies in thickness, from almost 6 miles wide to approximately one half mile wide.

The gold belt is roughly coincident with the rocks of the New Georgia Group. These rocks are metamorphic; meaning that they have been altered by extreme heat or pressure. The major rock types of the gold belt are schists, meta-graywackes, and amphibolites, along with some gneisses and iron-bearing rocks. Over time, these rocks have been faulted and complexly folded.

The most significant gold-bearing rocks of the Dahlonega area are metamorphosed volcanic rocks. Volcanic processes probably contributed higher than normal amounts of gold to the rocks as they were deposited, and when these rocks were metamorphosed, the gold was further concentrated. The faulting and folding that the rocks of the gold region have undergone provided pathways for the emplacement of gold. Hydrothermal solutions (literally "hot-water" solutions) containing the dissolved components of common minerals such as quartz and calcite, as well as rare minerals such as gold and silver, flowed along fractures and foliations in the rock. Complex chemical reactions between these solutions and the enclosing rocks caused quartz and calcite to be deposited in vein-like deposits. In Georgia, many of these veins also contain mineable quantities of gold. The gold-bearing veins are called lode deposits.

The weathering and stream transport of the material contained in lode deposits produce what is known as a placer deposit. Placers are frequently much richer than the veins from which they are derived, due to the effects of stream action. Streams concentrate heavy gold particles by washing away the lighter rock material that surrounds the gold. Placer deposits are often the first type of deposit discovered in a gold-producing region, and they are often the prospector's clue to vein deposits further upstream. Placer deposits accounted for the majority of gold mined in the Dahlonega region.

## Prospecting for Gold In Georgia Today

### Where to Look

### Prospecting Tools

### Identifying Gold

### Assays

Everyone has dreamed of finding a nugget of pure gold. But can gold be found in North Georgia today? The answer may be yes, if you know where and how to look.

Where are good places to look for gold? Streams which have their origins in gold-bearing geologic formations or which cross such formations are some of the best places to search. As these gold-bearing rocks are weathered and washed into streams, gold particles are released from the rock that surrounds them. Gold particles are heavy, and they can be moved downstream only where the current energy is very high. In places where streamflow slows down, such as along curves, gold and other heavy minerals drop to the bottom. The sand and gravel bars at bends in streams are excellent places to look for gold.

How does one look for gold? As a prospecting tool, the simple gold pan is hard to beat. Lightweight and inexpensive, it is nevertheless an efficient sampling device. With a little practice, anyone can learn to separate the heavy minerals, including any gold, from the sand and gravel of the streambed. By using a swirling motion, and plenty of water, a prospector mimics the action of the stream in carrying away the lighter weight sand, while leaving the denser heavy minerals in the bottom of the gold pan. A show of "colors," as the tiny gold particles are called by prospectors, indicates success. More serious prospectors may wish to construct a sluice box. This tool can be made quite easily from inexpensive materials. Although not as portable as a gold pan, the sluice can handle a larger volume of stream sediment at one time than is possible using a gold pan.

Is that shiny mineral in your gold pan really gold? How do you tell? Color alone can be misleading. Geologists use the physical properties of minerals to make correct identifications. These physical properties include the mineral's hardness

and luster, the ways in which it fractures or cleaves when struck, and the color of the streak it leaves when rubbed on a porcelain streak plate. All of these properties, taken together, need to be considered when making an identification.

Almost everyone has heard of fool's gold. Pyrite, a mineral composed of iron and sulfur, is a shiny metallic yellow color. It is frequently mistaken for gold by the inexperienced prospector, hence its nickname. Relying on color alone to identify this mineral can lead to mistakes. But look at the following chart. When all the physical properties are examined, identification becomes much easier.

	PYRITE	GOLD
Color	brass yellow to iridescent	golden yellow
Luster	metallic	metallic
Hardness	6 - 6.5	2.5 - 3
Streak	greenish black	golden yellow
Cleavage	indistinct	none
Fracture	conchoidal, brittle	hackly, malleable

Suppose you do find a bit of real gold in your gold pan. Does this mean that your fortune is made? How do you know when further time, effort, or money might produce significant quantities of gold? One way to determine whether an economically significant proportion of gold is present in a streambed sediment or an ore sample is to perform an assay.

There are several types of assays, some quite simple, others employing highly complex scientific methods. The simplest method of all is to use a gold pan to determine the percentage of gold in sand, gravel or soil. A given weight of a sample is placed in a tin can or other container and heated overnight in a fire. The oxidized material that remains is then panned. A count of colors, gold particles, can then be made to estimate the relative

percentage of gold in the sample. Tests such as this can be performed quickly and at no cost. With practice they can be quite reliable.

Prospectors during Dahlonega's gold rush days were probably familiar with such simple assay methods as panning. When more accurate results were needed, however, they might have had their ore samples tested by means of a fire assay. To perform a fire assay, the sample is ground into a fine powder and mixed with certain other compounds, including lead oxide. This mixture is then placed in fire clay crucible and heated in a furnace. Upon melting, any gold or silver in the ore sample combines with the lead oxide and sinks to the bottom of the crucible. All the other materials in the crucible form a layer of slag, which can be discarded after it hardens.

The next step in the fire assay is to take the remaining mixture of lead, silver, and gold, called an alloy, and remove the lead from it. This is done by again heating the alloy; this time in a porous cup made from bone ash. The walls of the cup absorb the lead, leaving the gold and silver behind. The name dore metal is applied to this mixture of gold and silver. The dore metal is weighed, and the silver is dissolved using nitric acid. The gold can then be weighed, and the weight of the silver can also be calculated.

Other methods of performing assays combine fire assay techniques with complex analytical methods such as atomic absorption, neutron activation, or optical spectrography. Analytical methods such as these are performed by experts, and they are a science in themselves.

Will you ever need to have an assay performed? Probably not. Most of Georgia's readily available gold was mined prior to 1934. Any gold that remains will require sophisticated exploration and mining technology for its recovery. But there are other reasons to take up gold prospecting. It offers close contact with nature, opportunities to observe natural geologic processes, and the thrill of potential discovery. Whether or not you strike it rich, prospecting for gold can be a very rewarding hobby.

## Permits Required for Prospecting in Georgia

What rules and regulations apply to searching for gold? North Georgia is not the wilderness it was during the Dahlonega Gold Rush days. A would-be prospector cannot simply begin panning for gold anywhere in north Georgia. Once you have identified an area in which you want to prospect, you may need to obtain permission to do so. Private property should be respected at all times, and it is best to obtain written permission from the owners before engaging in any prospecting. Although prospecting is allowed without a permit on some public lands, such as many highway rights-of-way, permits are required for most public lands. For state or federally owned lands, the following agencies may be contacted for up-to-date information on any necessary permits.

For National Forests in Georgia contact the Lands and Minerals Unit of the U.S. Forest Service (U.S. Department of Agriculture) 1720 Peachtree Road NW; Atlanta GA 30367 (Phone 404-347-4592).

For National Parks in Georgia contact the National Park Service, Southeast Regional Office (U.S. Department of the Interior) 75 Spring Street SW; Atlanta, GA 30303 (Phone 404-331-5187).

For state owned lands contact the Real Estate Unit of the Georgia Department of Natural Resources, East Tower, 205 Butler Street SE; Atlanta, GA 30334 (Phone 404-656-5165).

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