prominent, as by its connection in Alabama, it is destined to form eventually a great freight line. Several small lines have been built within the past year, shortening the distance from Macon to Augusta. The Cartersville and Van Wert road, a short line, but one of much local importance, will be completed in a few months. The Atlantic and Gulf road also expects to run a branch north to Columbus during 1871. While Georgia can lay claim to having one of the best railroads in the South, she is disgraced, too, by, without doubt, the meanest. The Muscogee road is a shame to any people, and especially so to a corporation that is able to do better.

In Florida only 44 miles have been built, being the extension of the Florida Central from Lake City west. A number of roads are projected, and bonds appropriated to build them, but none are likely to be finished at present. A line is projected north and south through the State to some point on the mainland near Key West.

In Alabama the greatest progress has been made, there having been built 276 miles of road, and there is, at least, as much more in progress. The miles constructed are chiefly on roads in progress, the only completed line being the Selma and Montgomery. The Alabama and Chattanooga Company are rapidly completing their line. The North and South R. R., a line of much importance, is nearly completed. From Selma to Memphis the road is being rapidly built, as is also the Selma and Mobile. The Eufaula and Selma has been in great part graded, and some parts laid with iron. The Savannah and Memphis, from Opelika to Decatur, has been laid with iron about 30 miles, and is under contract the rest of the route. Many of these roads are intended to assist in developing the great mineral interests of the State. There have been some improvements in the old railroads of the State, not, however, so much as in Georgia, and in this respect the Selma, Rome, and Dalton is the only one which can lay any claim to being first-class.

In Mississippi 128 miles have been built, being a portion of the Selma and Memphis, and the New Orleans and Mobile; also a few miles of the Alabama and Chattanooga. The old railroads of the State have been somewhat improved, especially the N. O., Jackson, and Great Northern. The principal proposed railroad of this State is a continuation of the latter line from Canton to Decatur, Ala.

In Louisiana forty miles have been constructed, being chiefly the Southern Pacific line from Vicksburg to Shreveport. Several lines are proposed in this State, all looking to connection with Texas. The one just alluded to is being rapidly completed.

The Alabama and Chattanooga Co., are said to be endeavoring to control all avenues to the Southern Pacific R. R., by buying up old lines and building new. In this they have rivals from St. Louis and Memphis on the north and New Orleans on the south. One of their own lines, also, starts from New Orleans. The rivalry cannot but be of benefit to the people and the country.

In Tennessee 155 miles have been built, chiefly short branch lines or spasmodic efforts towards commencing great trunk lines, as the building of 30 or more miles on the Cincinnati, Cumberland Gap, and Charleston R. R., and a like number on the Blue Ridge, etc. All the railroads in which the State is interested are to be sold; they will undoubtedly fall into Northern hands and then be completed.

In Arkansas 90 miles have been built, being the line called Memphis, El Paso, and Pacific, from Memphis west. Another line from Memphis to St. Louis, running up the river in this State, is in progress. Lines are also in progress from St. Louis to the western part of the State and through the Indian Territory.

In Texas 132 miles have been built, being parts of various roads. The future of this State in the railroad line is certain to be great. The character of the country enables them to be built cheaply, the State grants public lands to them, and the fertile soil attracts emigrants, who demand this character of progress. The Southern Pacific skirts its northern border and a half dozen lines shoot up from the south to connect with it, while transversely, others are being constructed or planned.

Such is a brief sketch of the railroad progress of the South. That the next ten years will show a still greater progress, there is no doubt. A point of note in all these new lines is, that they are being completed with the latest improvements. Steel rails are not required, but the fish-bar joint and continous rail tell of comfort, in the future, for those traveling South. The first completed line of road over which mails and passengers were carried, was in the South, yet since that she has lagged far behind. It is frequently thus that pioneers are outstripped in the race of progress by those who adopt their ideas, and there is every probability that we shall be able to show England the best railroad, as we have already the best locomotive. Thus, too, the South has had to learn from the North the perfection of steamship and railway transportation, both in freight and passengers, although she first inaugurated them in this country.

New Use of Dolomite.

We are all of us familiar with the lime light produced by the heat of the oxyhydrogen jet impinging upon a pencil of lime. It now appears that a prism cut out of the mineral dolomite will emit a light as powerful if not superior to the calcium light. The dolomite is made up of nearly equal parts of the carbonate of lime and magnesia, and the combination of these two earths produces effects superior to what can be obtained from either of them alone. The light is said to be suited for photographic purposes, especially for copying pictures. As dolomite is an abundant rock, its application for purposes of light may prove of peculiar value.

ON BLOOD AND ITS USES.

Blood is the liquid which circulates in the arteries and veins of animals. It is made up of colorless substances dissolved in water, and of red undissolved particles diffused through the liquid. It has a saline taste peculiar to the animal from which it is drawn, and modern microscopic research has shown that it is possible to distinguish not only the species of animal from which the blood is taken, but also from what function of the body it was derived.

When fresh drawn it rapidly coagulates into a gelatinous mass called clot, from which a pale yellow fluid separates known as serum. The clotting can be in a measure prevented by agitating the blood with a bundle of twigs or metallic rods. We do not propose to speak of blood in the animal economy, but of its employment in the arts.

SAUSAGES.

Blood has long been employed in some parts of Germany in the manufacture of sausages, known as blood sausages. The peasants stir it thoroughly, just as it is drawn, so as to prevent the formation of clot, and afterwards mix it with the hacked meat. The sausage is not particularly toothsome to strangers, but the natives take to it very kindly.

CLARIFYING SIRUP.

For the purpose of clarifying sugar-sirup blood has long been employed, but this has ever been, as it always must be, regarded as a repulsive method for the purification of an article of diet. The principle upon which it works is the coagulation of the blood by heat, thus carrying with it the coloring matter and impurities. Where albumen can be introduced as a substitute it is found to be preferable on many accounts. The nauseous and sickening odor that comes out of the purifiers when a new charge of blood is introduced, fills half the sugar refinery, and renders the place nearly uninhabitable for several hours. It is not to be wondered at, therefore, that persons engaged in the sugar trade have tried to find a less offensive substitute. For their use, and for analogous purposes, attempts have been made to manufacture albumen from blood with very encouraging results, as we shall see further on.

ARTIFICIAL WOOD.

Artificial wood has been for some time prepared in France by compressing sawdust and blood albumen at a suitable temperature into a solid mass, suitable for cabinet work, decoration for clocks, and interior ornamentation. It is claimed that this wood is more durable than the natural growth. Shavings and sawdust are ground to a powder, and mixed with blood sufficiently diluted with water, and dried at 106° to 120° Fah., in a suitable oven. The albumen of the blood thus becomes intimately incorporated with the sawdust, and the prepared wood in the form of fine powder is put into molds, where it is subjected to a powerful pressure with a hydraulic press. The plates of the press are heated with gas sufficiently to reduce the contents of the molds to a semi-fluid mass.

Resinous woods are found to combine better with the albumen than hard woods. The artificial wood can be cut and worked in the same manner as lumber, and as it is made chiefly of refuse material, the price in France is such as to render it available for many purposes. The ground wood, after being saturated with blood albumen, has the specific gravity of 0·800, but after having been subjected to the hydraulic press it is 1·300.

MANUFACTURE OF PRUSSIAN BLUE.

Attempts have been made to employ blood in the manufacture of ferro-cyanide of potassium. 150 pounds of well-dried blood were melted with 100 pounds potash, but it was found that no more than one sixth of the nitrogen was economized. The yield ought to have been 127·5 pounds, instead of which only 19·7 pounds were obtained. It would appear from this experiment that Prussian blue cannot be economically made from blood.

MANUFACTURE OF ALBUMEN FROM BLOOD.

In Pesth, Hungary, blood is dried in about twenty-four hours, at 100° to 112° Fah., in flat iron pans; and it has been found in practice that 110 pounds of albumen can be made from 3,000 pounds of blood. The best quality is clear, transparent, and soluble in cold water, and is used for mordanting goods. It costs in Pesth 60 florins for 110 pounds, whereas it would require 16,200 eggs to make 110 pounds albumen, the cost of which would be 200 florins. The egg albumen is more expensive, but is preferred for most purposes. The second quality of blood albumen is darker in color, but is nearly all of it soluble in water, and is used by sugar refiners. It can be kept any length of time without change, is effective in small quantities, and is quite uniform in its action, so that it can be used by sugar refiners with great economy.

A more complicated process for the manufacture of blood albumen is pursued in Northern Germany. The blood is caught in round zinc pans, three inches deep, and is put aside in a quiet place until it is coagulated. Only a small part of the serum separates on the top. The coagulated blood cake is cut into small cubes, and thrown upon seives or strainers, and the serum, mixed with blood corpuscles, flows off into pans provided with movable tubes, so that at the proper moment it can be drawn off without carrying the impurities with it that may have settled on the bottom. The serum obtained in this way is run into square porcelain dishes, and exposed to a current of air at 50° to 60° Fah., and is thus rapidly dried. It is indispensable to have the blood in thin layers to avoid its decomposition from moisture.

Richter finds that the blood of buffalo yields a whiter serum than that of other animals. It may be well in this connection to remark that albumen from fish has been made of good quality, and at a fair price.

Some varieties of blood albumen have been found on analysis to contain 53 to 55 per cent of soluble albumen, and in this state of purity it can be advantageously employed in

CALICO PRINTING.

In order to fix aniline colors, it is necessary to use albumen, and as these colors are now very popular, the consumption of eggs for furnishing the requisite quantity of albumen has become enormous, and the price of albumen is raised in proportion. We understand that the use of blood albumen by the calico printer is very large at the present time, and is constantly increasing; and that it can successfully compete with the egg albumen.

IN PHOTOGRAPHY.

Albumen paper has become very popular in photography, and some of our large manufacturers of photographic material use many gross of eggs in the preparation of the paper. If the blood albumen could be made sufficiently white and pure to be used as a substitute for the albumen of eggs, it would be a great boon to artists.

IN AGRICULTURE.

Blood is a powerful manure, and has long been used for this purpose. It is also employed in making cements, in mixing with coarse pigments for protecting walls from the action of the weather, in making animal charcoal, and as a coloring matter.

The above are some of the uses to which blood is applied in the arts.

Frendeet.

Sir S. W. Baker, the famous African explorer, states in his exploration of the Nile tributaries, that he was often called upon, in his capacity of physician, to treat diseases among the natives; but there was one complaint that baffled all his skill, and he was obliged to leave it entirely to the Arabs. It is caused by drinking water from table land pools. Frendeet commences with a swelling of one of the limbs, with intense pain; this is caused by a worm, several feet in length, but no thicker than a packthread. The Arab cure is to plaster the limb with cow dung, then prick the skin in many places with a red hot lance, to form doors, as they term them, for the escape of the worm. In about a week one of the wounds formed by the lance will inflame like a boil, and from it the head of the worm will issue, when it is seized and fastened to a small piece of wood, and gently wound daily, until, in the course of a week, the entire worm will be extracted, unless broken during the operation, in which case severe inflammation results.

Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers, and hope to be able to make this column of inquiries and answers a popular and useful feature of the paper.]

1.—LEAKY CISTERNS.—What is the best method of stopping leaks in a wooden cistern? Is there any cement that will adhere to the wood, and which can be used for this purpose?—L. B.

2.—What is the best solder for aluminum? Is there not a better recipe than the following? Aluminum, 16 parts; tin, three parts bismuth, one part. This will do, but I wish to obtain a solder which will not change in the mouth when used for dental purposes.

3.—TURNING LATHE.—There is a lathe in the shop I work in, that no man in the shop can turn a true cylinder on, when the centers are straight. What is the trouble? I have worked on this lathe, and find that the centers being set straight, the cylinder will be one sixty fourth of an inch larger at the tail stock than at the cone. We get along by setting the tail stock over, as though we were going to turn a taper. What I wish to know is, why the lathe will not turn a true cylinder when the centers are straight, everything else about the lathe being in place? There are several machinists in the shop; all have tried to find the trouble and failed.—M C. R.

4.—GALVANIZING STEEL SPRINGS.—How can I galvanize steel springs without injuring the temper?—W. G. B.

5.—How can I fasten sheet copper to rough or smooth cast iron without rivets or bolts?—J. W. B.

6.—I wish a recipe for a leather cement, such as is used by belt manufacturers.—B. B. G.

7.—BROWNING GUN BARRELS.—Will some practical man tell me how the fine clouded brown on the fine double guns of the present day is produced, with full details of the process?—E. H. B.

8.—STEAM PUMP FOR HIGH PRESSURE ENGINE.—I am concerned in a steam tug. The cylinder is 16x16, and, as usual with small high-pressure engines, the pump, which is ample, is not the least troublesome item. Our first engineer inserted a waste pipe in the air chamber, and by means of a stop-cock let off, at each stroke, so much of the pumped water as he did not want in the boiler. The next man made use of the "sea cock" to throttle back so much of the water that the pump required as he did not want in the boiler. I object to both methods as unengineer-like, and propose to govern the quantity injected by making the stroke variable. Will your engineer correspondents please give an opinion on each of the modes, and say what way is generally adopted or considered best?—P. D.

9.—TOUGHENING BRITTLE HORN.—How can horn that has become brittle by age become tough again?—R. A. C.

10.—How can I tan or cure sheep's pelts with the wool on so that the skin may be soft and pliable, and the wool uninjured?—B. F. P.

11.—BRASS CHAIN.—How can I make a solder to braze brass wire rings? I want to make brass chain, and have the solder dip yellow, the same as the brass wire. I have tried silver solder, but that turns black on dipping in acid. I want the solder to melt at a low heat, that is, about the same as silver solder, cherry red.—G. H. H.

12.—BOILER FIRING.—How can I fire up my boiler so as to keep up seventy pounds pressure? The boiler is 8½ feet long and 42 inches in diameter. It is used for a tannery. I can run all my other machinery, but when I grind bark I cannot keep up pressure; must stop twice per hour to raise steam, even with all the other machinery detached. I commence grinding with seventy pounds and run down to sixteen pounds. The boiler is an upright one, and I use the best of wood for fuel when grinding. The smoke stack is red hot six feet above the boiler. The size of the engine is 8x24 inches. When running, every time I fire up I lose five pounds of steam. I feed hot water, and have a good draft, and would like to know if I could not save the heat passing through the stack and use it for the boiler. The engine runs sixty-five revolutions per minute.—M. S. M.