

### THE SOUTH WIDENING HER FIELD OF AGRICULTURE.

BY FREDERICK MOORE.

Prof. H. W. Wiley, chief chemist of the Department of Agriculture, returned recently from an extended tour through the Gulf States. The Professor was the guest of the southern railroads, and the object of his expedition was to meet the members of the various southern agricultural and grange associations, some of which were then in session. The conclusions drawn from the trip, as given in a report on his return, can be summed up about as follows:

The South is fully alive to the advantages of scientific agriculture. Cotton is no longer king everywhere along the South Atlantic and Gulf. Georgia and Alabama are now producing profitable sugar crops. Dairy products are being widely exported through all the Southern shipping ports. Everywhere the enterprising farmer of the far South is suiting his crops to his soil, cultivating his farms to improve them, not to impoverish them, and widening the field of his activities, so that one interest aids another, to the vast betterment of the whole.

Through central Georgia sugar cane grows almost as far north as Macon. Cassava, one of the new crops of the South, is being produced in large quantities. The sight of these two crops and the growths of sweet potatoes, which there abound, show plainly the prosperous condition of agriculture in that State.

Thomasville and Cairo, Georgia, are the great centers of the sirup industry. From Cairo the annual export amounts to 15,000 barrels. There American sirup-making has reached its best development, and the business has increased ten-fold in the past five years. The American consumer is tired of sirups made up largely of glucose and sugar waste. To meet the new demand the Georgia consumer has taken to producing a sirup made from the whole cane—what was known formerly as "cracker sirup." It is the best cane sirup produced, altogether pure and wholesome.

Hitherto sugar cane could not be grown in Georgia with sufficient profit to encourage competition with the growers of the tropics. Now, with a developed cane, particularly suited to that soil, the planter not only grows cane at a profit, but raises from 30 to 35 tons to the acre, harvests his crop in eight months instead of fourteen, turns out a product fully equal in flavor to that of the hotter countries, and gets one-sixth of the entire cane weight in sugar.

Cassava, sweet potatoes and cane are proving more profitable in southern Alabama than cotton. This is the first successful departure from cotton-growing the section has ever made. Previously the shift had been to truck farming, and the effort had failed because the distributing markets are too far away. But the new products do not require immediate delivery. Cane is put to its usual uses, and the bagasse fed to cattle. This feed produces the very manure fertilizer the soil needs, so that dairy and farm interests both reap a second benefit from the sugar interests in the State. Sweet potatoes are a staple and valuable crop. They find a ready market at all seasons. But now the farmer in sweet potatoes raises not only a good potato for shipment and consumption, but also a rich, sweet yam for conversion into starch.

Cassava, however, is the real starch plant. It is destined to displace the potato of the North as a basis for food starches. Arrowroot, tapioca and starch puddings are constant and growing articles of food, and are all made from starch. The South can supply a better starch for the purposes of such manufacture than the maker has been able, heretofore, to obtain. For laundry purposes cassava starch is at least as good as any other kind.

In all these States the field of agricultural labor has noticeably widened. The velvet bean is now grown and used for hay. Alfalfa, as a southern crop, is rising to an importance scarcely less than it has attained in the West. Beggar weed, formerly considered a pest, has been found to produce good hay, and it still grows

as readily as when the farmers fought so vigorously to exterminate it. Sorghum, grown as a forage plant, yields three or four crops a year, and one acre is thus able to support more cattle than a considerably larger number of acres devoted to ordinary grazing. Hereford, Devon and Jersey cattle are found everywhere—registered stock of the finest breed. Grade cattle or cattle bred from the registered stock, and the native beef, is supplementing the old, low-grade beef formerly so much in evidence. Milk and butter are being produced and marketed in great quantities, products unknown to the section eight years ago.

Florida is recovering splendidly from the disastrous freeze of five or six years ago. The crop of oranges last season amounted to 2,000,000 boxes. The year after the freeze it was 500,000. Within a few years the output will reach 5,000,000. This fruit is, of course, of the very highest grade. The Florida seedless orange has now a market importance second to no other.

While cotton and sugar are still the great staples



A GEORGIA COTTON FIELD.



THRESHING RICE IN TEXAS.

of Louisiana, other products, especially rice, have taken prominent places. What was, a decade of years ago, an arid southwest in the Pelican State and southeast of the State of Texas, producing little else than pine lumber, is now a busy, thriving rice section, with more life to it than any other farming section of the South. The numerous new ports and harbors along the Gulf coast are a decided aid to the advancement of its agricultural interests.

Wherever you go you will find that the South is alive in every sense of the word, and there is a spirit of confidence that augurs well for the future. Cotton, though still the great product of the section and yearly increasing in quantity there produced, is now simply a backbone, where it used to be the whole frame of the South. The farmer no longer watches the cotton quotations with the apprehension of a man with all his eggs in one basket. His income has not only increased greatly, but it is destined to increase more and more, and to become more reliable as his present agricultural methods of diversifying his crops continue and advance.

### Preparation of Tantalum in the Electric Furnace.

M. Henri Moissan has lately succeeded in obtaining the metal tantalum by reducing tantalic acid with powdered carbon in the electric furnace. This is the first time that the metal has been obtained in the fused state. Some experimenters have produced it in the powdered form, more or less pure, but its properties have been but little studied up to the present. M. Moissan starts with the fluotantalate of potassium, which he obtains from the mineral niobite. He decomposes this with sulphuric acid and obtains tantalic acid, which is then calcined. Tantalic acid has been hitherto regarded as infusible and non-reducible by carbon, but the experimenter has succeeded in reducing it in the electric furnace and obtains the metal in a nearly pure state. To this end the tantalic acid is agglomerated into cylinders with sugar-charcoal and after calcining is placed in a graphite crucible which is heated in the electric furnace. The temperature should be very high in order to melt the metal after it has been reduced. After heating for 10 minutes with a current of 800 volts and 60 amperes, the metal is separated in a fused state, and upon cooling has the appearance of a brilliant metallic mass with a crystalline fracture. It is nearly pure and in some cases contains only 0.5 per cent of carbon. The cast metal is quite hard and will easily scratch glass and quartz. It is not fusible in the oxy-hydrogen blow-pipe, but in this case is transformed into tantalic acid. To melt it in the electric furnace requires the use of a powerful arc. The density of tantalum has been found to be 12.79, while the powdered specimens obtained by Berzelius and Rose showed 10.08 and 10.78 respectively. The metal when reduced to powder takes fire in an atmosphere of fluorine at the ordinary temperature and gives off abundant vapors, which when condensed on a cold surface give a fluoride of the metal. In a current of chlorine the metal is attacked but slowly at 150 deg. C., but on reaching 250 deg. a combination is produced with brilliant incandescence, and a chloride of tantalum sublimes in long orange-yellow needles. This chloride is very fusible and will volatilize in an atmosphere of chlorine without decomposition. Bromine may be distilled over the powder of tantalum without giving a reaction, but at low redness it commences to give a yellow sublimate which increases at a higher temperature. The vapor of iodine does not react at 600 deg. C. If the metal is placed in a current of dry oxygen and heated to 600 deg. C. it takes fire and continues to burn with a lively combustion. No appreciable effect is produced when heated in nitrogen, and phosphorus, arsenic and antimony seem to have no action upon it. Gaseous hydrochloric acid attacks the metal and produces a white sublimate whose color becomes darker as the temperature rises. Ammonia gas is decomposed by powdered tantalum at a low red heat, and the metal darkens in color without changing weight. Sulphurous acid is reduced by the metal at 500 deg. C., giving an abundant deposit of sulphur and an oxide of tantalum. Compounds rich in oxygen, like bi-oxide of manganese, reduce the metal with incandescence. When lead oxide is heated with the metal there results a black spongy mass containing globules of melted lead. Tantalum is insoluble in aqua regia, but like silicon and niobium is easily attacked by nitrohydrofluoric acid. These various reactions show that tantalum has reducing properties which class it rather as a metalloïd than a metal proper. In most cases its action closely resembles that of niobium, but it is less energetic.

In the Tapestry Court of the Victoria and Albert Museum, a splendid example of late fourteenth century tapestry work is now to be seen. The tapestry comes from Hardwick Hall, the Duke of Devonshire's Chesterfield seat, where it has lain for years in a rather sorry condition. The material has been skillfully prepared and pieced together, so that it now represents what it once was, a picture about 35 feet in length illustrating some sports of the period.