

THE SULPHUR MINES OF LOUISIANA.

BY DAY ALLEN WILLEY.

The discovery that extensive deposits of sulphur existed in the State of Louisiana was made several years ago, but until recently the substance could not be obtained from these beds, owing to the distance at which they are located from the surface and the foreign bodies which intervene. Indications of sulphur have been found in various portions of Calcasieu Parish in the State named, especially in the form of springs of water strongly impregnated with this mineral. One prospector succeeded in drilling through to the bed which is now being worked, and discovered that it was not only of a high grade, but over 100 feet in depth.

For several years attempts to secure sulphur in commercial quantities failed, owing to a layer of quicksand which exists above it. The thickness of the quicksand varies. The greater portion of the bed is estimated to range between 100 and 200 feet, the sulphur itself lying at a depth varying from 600 to 800 feet. The problem of getting the sulphur through the sand without mixing the two substances has been an extremely difficult one; but it has finally been solved to such an extent, that from this bed is now coming the bulk of the sulphur produced in the United States, if we except that secured from pyrites.

Generally speaking, the following method is employed in obtaining the sulphur: Wrought-iron piping is driven through the upper formation and the sand bed, by steam-driven apparatus somewhat similar to that employed in putting down tubing for petroleum wells, but the machinery required is much more powerful. The tubing utilized is of two sizes, one for the passage of the steam, the other for drawing up the sulphur.

other material, and open at the top, so that its contents are exposed to the action of the sun and air. Here the sulphur is again solidified by natural evaporation, when, after being broken up into masses of convenient size for transportation, it becomes a com-

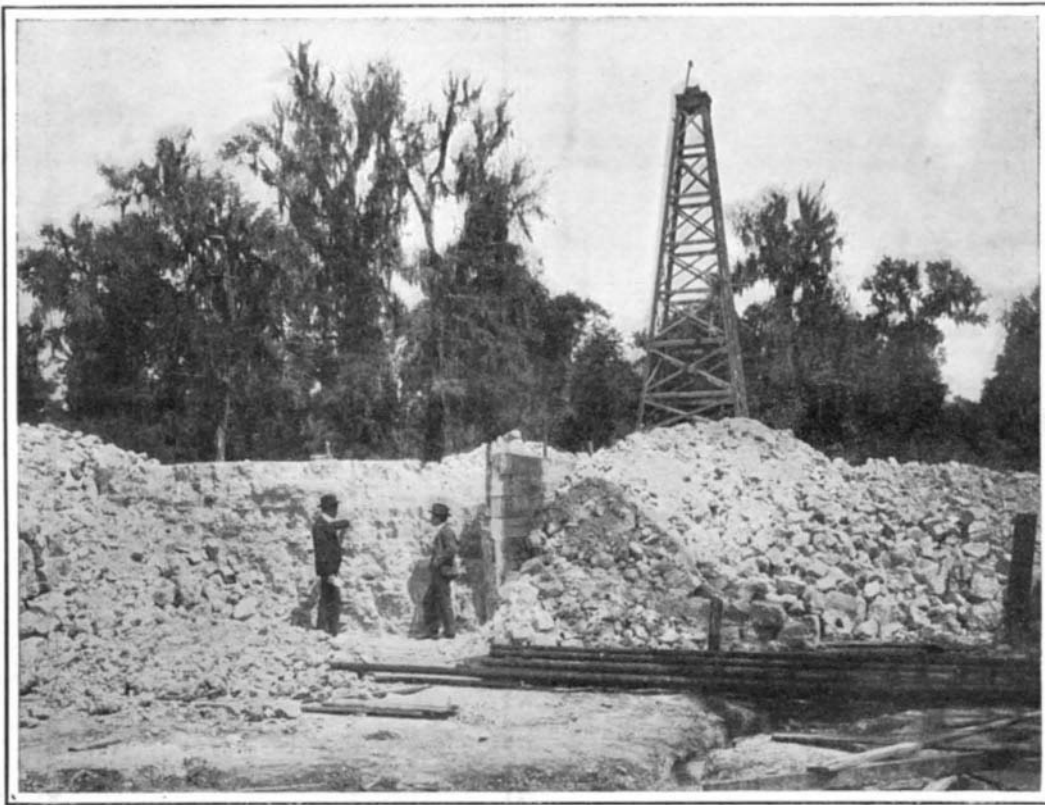
additional conduits in service, the yearly production will be over one-third of the total quantity consumed in the United States, which at present averages about 500,000 tons. But as yet only a small quantity of the deposit known to exist has been secured, for it has

been traced a distance of fifteen miles from the present workings. Excluding the sulphur extracted from pyrites, the Louisiana deposit will yield far more than any other country where sulphur is secured from natural formation, with the exception of Italy, whose thousand mines furnish nearly 600,000 tons annually. The Italian sulphur in its original form, however, is far inferior to the American article, for the rock from which the commercial product is refined averages less than 20 per cent of pure sulphur. It is claimed that the Louisiana grade does not contain over 2 per cent of foreign matter, so that it is available as it comes from the wells for many compounds into which it is manufactured, while it can be refined at a minimum cost. While the exact percentage of pure sulphur is not made public, its high grade is verified by the fact that it is sent away by the carload to various points of consumption in this country, and but a small quantity goes to the refinery. In fact, so

much of it is being shipped to fertilizer works, that steamships leaving New Orleans have been known to carry as much as 1,000 tons as part of their cargo. It might be added that the material is transported in bulk like so much coal or iron, and is stored in the open air like this material.

As the Louisiana deposit is further opened, it is likely that this State will yield the world's greatest tonnage of sulphur, when comparison is made with other deposits now being worked. Aside from Italy, Japan is the next greatest producer of crude sulphur. Most of the Japanese grade comes from Moyoro Bay, which is located on an island about 2,000 miles north of Yokohama. Here a formation of sulphur lies on the slopes of three volcanic mountains to such an extent that it is estimated fully 1,500,000 tons can be obtained by merely digging off the surface. At present only about 16,000 tons are being secured yearly, of which 10,000 tons are shipped to the Pacific coast of the United States. Outside of Italy and Japan, the United States has no other competitors of consequence. The only other American sulphur deposits being worked are in Humboldt County, Nevada, and near the town of Marysville in Utah, but neither of these yields a thousand tons annually.

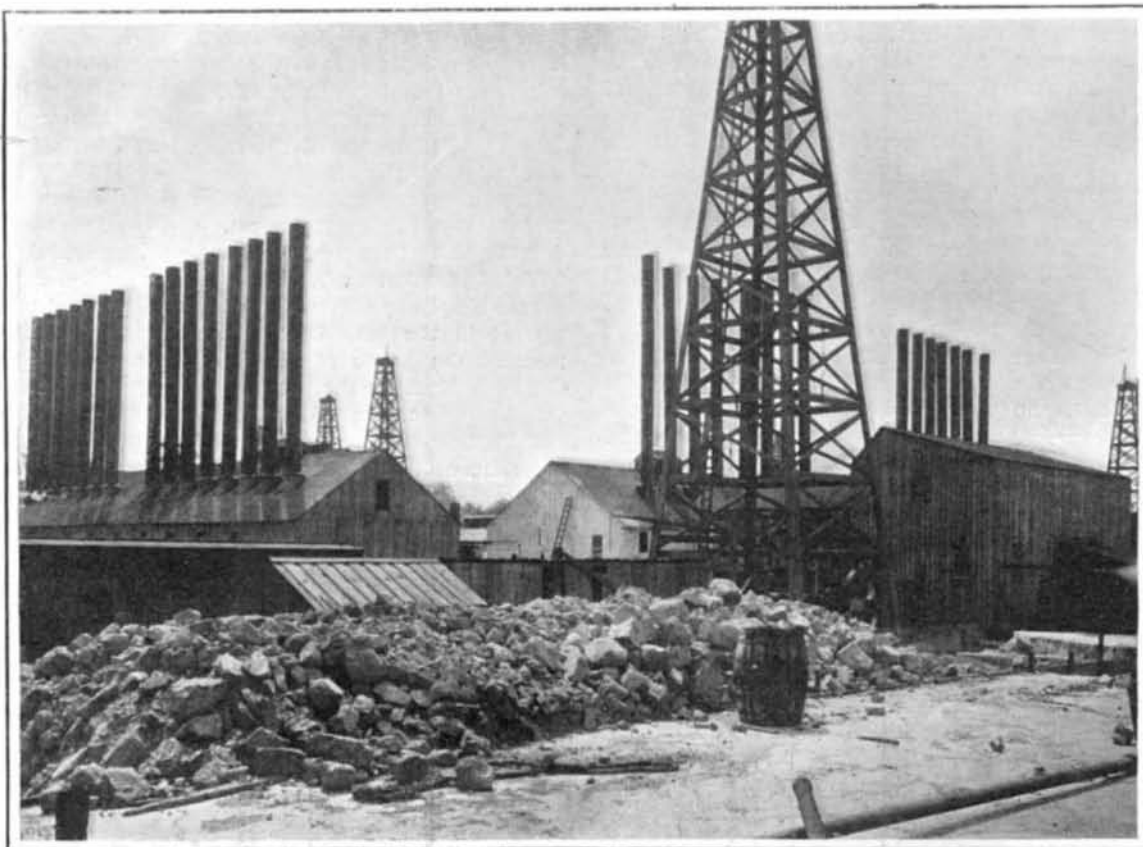
It is understood that at present about twenty pipe lines have been driven into the Louisiana bed, the material being extracted through tubing four inches in diameter. The maximum capacity of the plant will be about forty wells when the present enlargement is completed. The present industry is situated in what is known as the coast prairie, a short distance from



Sulphur Ready for Shipment by Rail After Solidifying in the Drying Vats.

mercial product ready for shipment to the refinery or point of consumption.

As mentioned above, the quantity of sulphur secured from the Louisiana deposit has already assumed such proportion, that with the exception stated it is furnishing the bulk of the American supply. The operations are as yet conducted by one company, and much secrecy is maintained as to the average output. The plant is now being enlarged on such a scale that the present output probably will be doubled, when all of the conduits now being put down are in operation. With the



General View of a Sulphur Mining Plant Which Yields a Thousand Tons of Sulphur Daily.

The steam pipe is connected with a pump and boiler of sufficient power to force a jet from the surface to the sulphur. The contact of the steam with the material, which in its natural state is in a solid form, converts it into liquid; in other words, melts it so that it can be drawn up through the discharge pipe by means of air pressure. This is supplied by a series of powerful compressors, which bring the liquid sulphur to the surface, in the same manner as a column of water is carried by pneumatic pressure for irrigation and other purposes, the conduits being installed in pairs side by side.

The end of each discharge pipe is set in a vat of suitable proportions. This vat is usually a shallow excavation in the ground, lined with concrete or some



Pumping up the Liquid Sulphur into the Vats Where it is Evaporated.

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the town of Lake Charles and in the southwestern part of the State. Geographically, it is believed to form a portion of what is called the Gulf coast oil belt, which includes the Jennings petroleum field, also the Beaumont and other fields in eastern Texas.

A RAILROAD COACH CONSTRUCTED IN FORTY HOURS.
BY THE ENGLISH CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

An interesting feat was recently performed at the Parel Works of the Great Indian Peninsula Railroad,

When the task was resumed on Wednesday morning, the coach had reached the stage shown in our second photograph, which was taken immediately after starting. The underframe was completed and the roof laid. Of the total gang, sixty-six of the men were carpenters, and these now busily set to work preparing the doors, windows, seats, and other accessories, while nine upholsterers were simultaneously engaged upon the cushioning and trimmings for the seats, blinds, and so forth. In the afternoon all erecting work had been

also completed, so that at 4:30 in the afternoon, when the third photograph was taken, the task was ended, and the coach ready for the rail. The actual working time spent upon the undertaking was forty hours, from the moment when the men set to work on Monday morning.

In the construction of the carriage 600 feet of Australian timber was used, and all this had to be machined, planed, cut, and accurately fitted. The woodwork department had to make 19 doors, 92 windows, and 92 shutters, which had to be hung and fitted. The engineering staff had to erect all the steel underframe, the necessary material for which was simply delivered to the erecting point.

The car upon which this Indian record was established is of the typical local service variety. It measures 62 feet in length by 9 feet 6 inches wide. The steel underframe is 60 feet over all, and is carried upon two four-wheeled bogies placed 40 feet apart from center to center. The internal fittings are somewhat intricate, as the coach is of the composite type, there being the conductor's compartment at one end, followed by the first-class accommodation, capable of seating six passengers. Then follows a spacious third-class compartment seating forty-eight persons, with a small compartment for the accommodation of twelve females, who in accordance with the Hindoo custom travel separately.

Beyond this is a small space for the stowage of baggage. The car being intended for suburban work, running in either direction, the seats are of the turnover pattern.

The railroad authorities expressed themselves as highly satisfied with the efficiency of the staff, since the native is not apt to be hurried over his work. Fortunately, the men entered into the enterprise with commendable zeal, determined to establish a record for native labor. In such circumstances and under such conditions, it is difficult, even when a programme

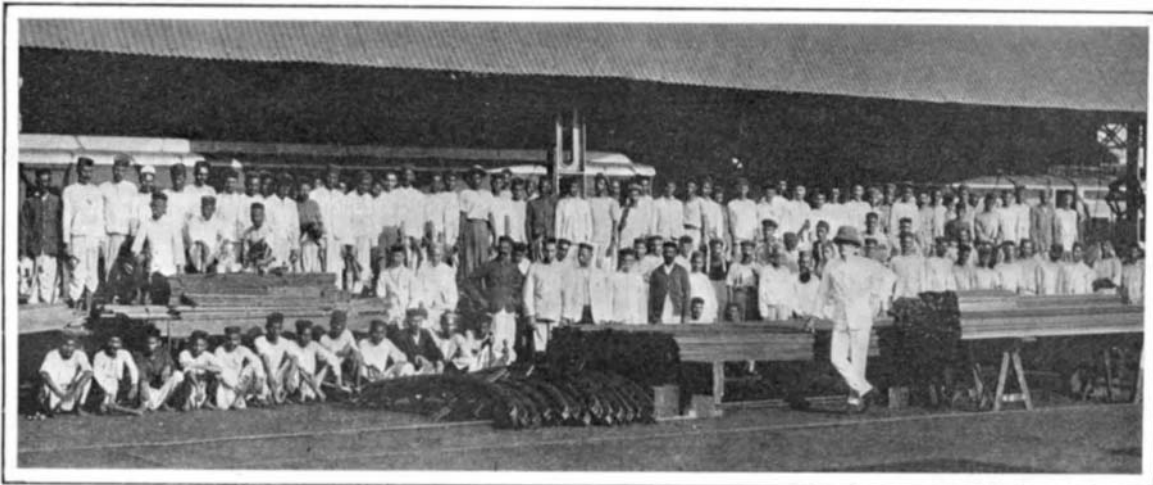


Fig. 1.—Men and Material Ready for the Start on Monday Morning at 8:30.

which in view of the peculiar conditions prevailing, and the fact that it was accomplished entirely by native labor, proverbially slow, is most remarkable. In the early part of this year the company required a special type of trailer coach, to be used with a small tank locomotive, at extremely short notice. Under the circumstances, it was decided to test the capacity of the works and the native laborers in regard to rapid construction.

Special drawings had to be prepared, and these were put in hand on March 1. As rapidly as possible the orders to prepare the material were assigned to the various departments, so that all material might be ready for assembling upon the same day. By the 26th of the month everything was in readiness, the consignments of the respective materials being delivered at the spot where the work of erection was to be carried out. The men, aggregating eighty-eight in number, under the direction of eight "maistries" and superintended by Mr. A. M. Bell, the carriage and wagon superintendent of the railroad, to whose courtesy we are indebted for the accompanying illustrations and details of the operation, were drawn up at 8:30 on the Monday morning, in the manner shown in the first illustration. Punctually at the half-hour they were set to work. The company were divided into various gangs, each of which carried out a particular operation. Some commenced work upon the bogie trucks and steel underframe, while others prepared the sides, ends, floors, and roof. By the time work finished for the day at 4:30 in the afternoon, considerable progress had been made.

It was decided to carry out the work without undue pressure, no overtime being permitted, the length of the working day being limited to eight hours, which ordinarily prevails in the works. The men recommenced work the following day at the same time in the morning, and maintained the excellent progress that had been established during the previous day. The underframe was sufficiently advanced for the superstructure, the end sections of which were quickly secured in position, while the floor gang at once entered and completed their work. During the afternoon the ribs for supporting the roof were fixed, and by the time work was discontinued for the day, the actual erection had been more than half completed.

completed, and when the men finished, the body had received its first priming coat of paint.

The next morning painting of the inside and outside of the coach was hurried forward. The outer covering for the roof was attached, and the carpenters and glaziers fixed the windows and doors, while the upholsterers proceeded with the seats and trimmings.

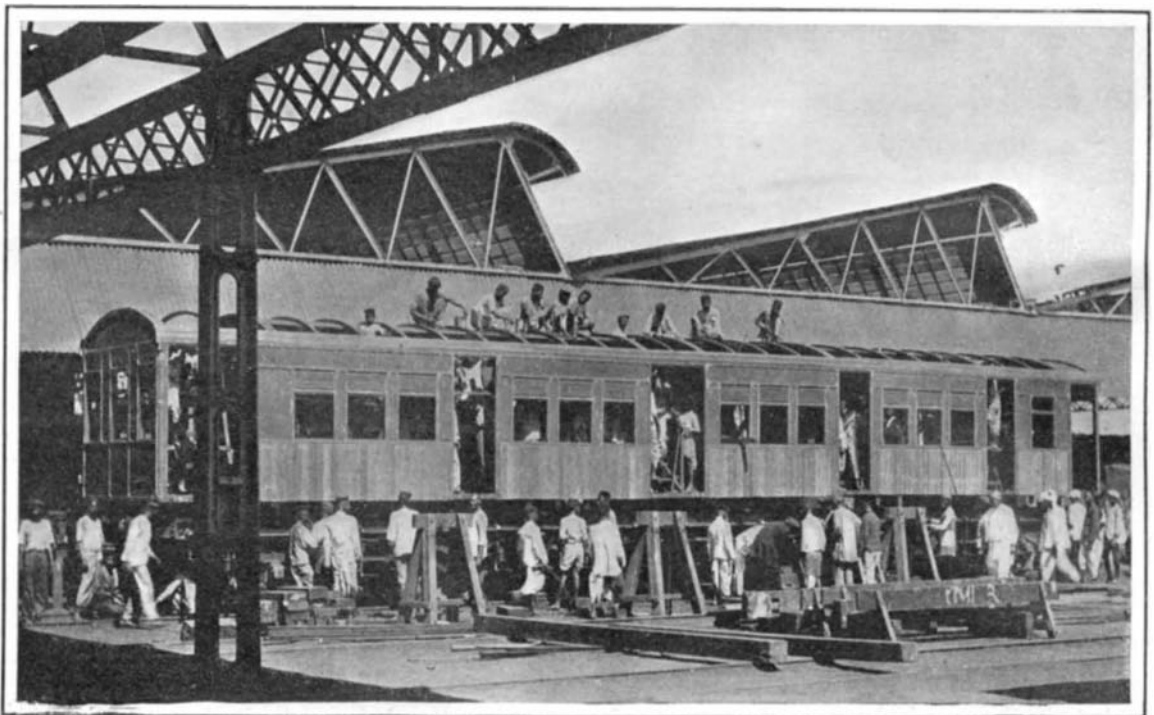


Fig. 2.—The Car on Wednesday Morning, at 8:30, After Sixteen Hours Work.

All the hard internal work was completed on this day, so that Friday could be devoted to carrying out the final finishing processes. On the latter day the final coats of paint and varnish were applied throughout, the electric light fittings installed, vacuum brake fitted, and various embellishments, such as door handles, hand rails, and the like, applied. The lettering was

of work is carefully drawn up, to adhere very rigidly to the details thereof, owing to the labor problem; but in this instance, owing to the organization of the European staff and their careful handling of the natives, the work was carried out without any difficulty. Had pressure been employed and overtime worked, the undertaking might have been completed in a much shorter time, but it was not deemed advisable to resort to such extreme measures in a torrid climate. At the same time, however, it demonstrated what can be accomplished with native labor when it is competently handled. On Saturday morning the coach was officially inspected, and no traces of scamping, such as might have been anticipated, were discovered, the work being carried out with as much care and thought as if undertaken in the normal manner.

Termination of the Glidden Tour.

As we go to press the last stage of the Glidden tour—124 miles from the Rangeley Lakes, Me., to Bretton Woods, N. H.—is being traversed. Fifty-eight cars are still in the tour, thirty-six being contestants for the Glidden Trophy, and fourteen of these still having perfect scores. In order to eliminate some of the latter, checkers were placed every 15 miles apart instead of every 25. In all probability ten or a dozen cars will finish the tour on an equal footing, and consequently no one car can be said to have won the trophy. The tour has given a complete demonstration of the ability of the American machine to traverse, at a relatively high speed and without serious breakdowns, the worst roads in civilized communities in North America.

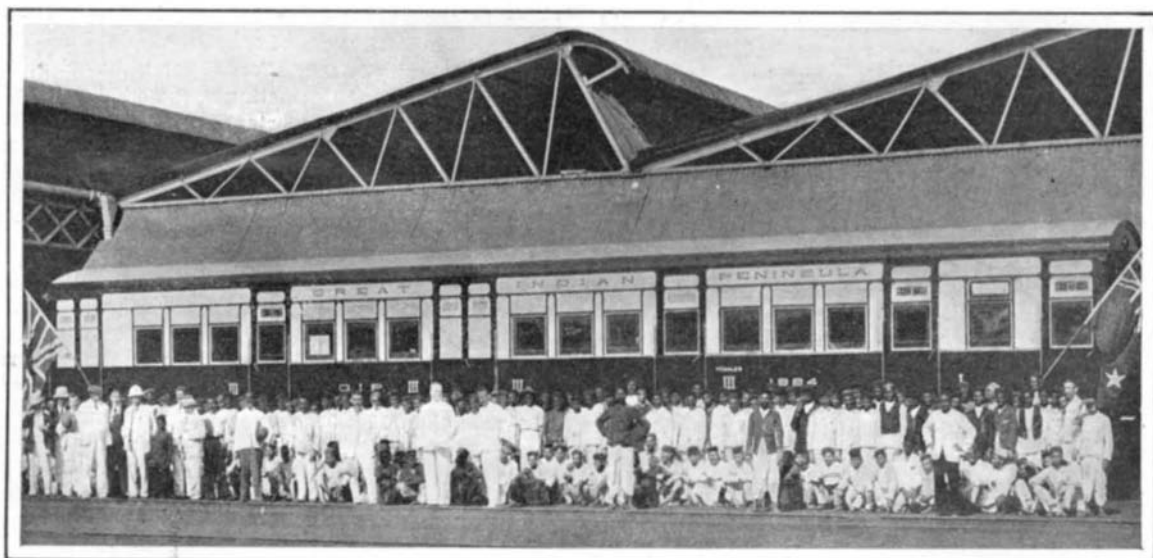


Fig. 3.—The Finished Car on Friday at 4:30 P. M.
A RAILROAD COACH CONSTRUCTED IN FORTY HOURS.