

THE PETROLEUM OIL WELLS OF BAKU.

We have at different times described the great establishment of Messrs. Nobel Brothers, at Balakhani, adjacent to Baku, and the operations conducted there. The boring of oil wells, the pumping, refining, and other processes, are not the only task which the petroleum industry of Baku has to carry out. The transport of the article to the consumer has also to be accomplished. It is known that for many centuries past there has been more or less trade in naphtha with Persia and other neighboring regions. The great problem was to get the oil into Russia, and send it into all the principal towns of that widely extended country. The distant position of Baku made this a most difficult undertaking. The oil has first to be sent in steamers to Astrakan; but at the mouth of the Volga, owing to its shallow water, a transshipment into barges has to take place. Some of the oil is sent on by the river, but the greater part is transported by railway. Trucks of a peculiar form have been made for this purpose, and they are now to be seen at all the principal railway stations of Russia.

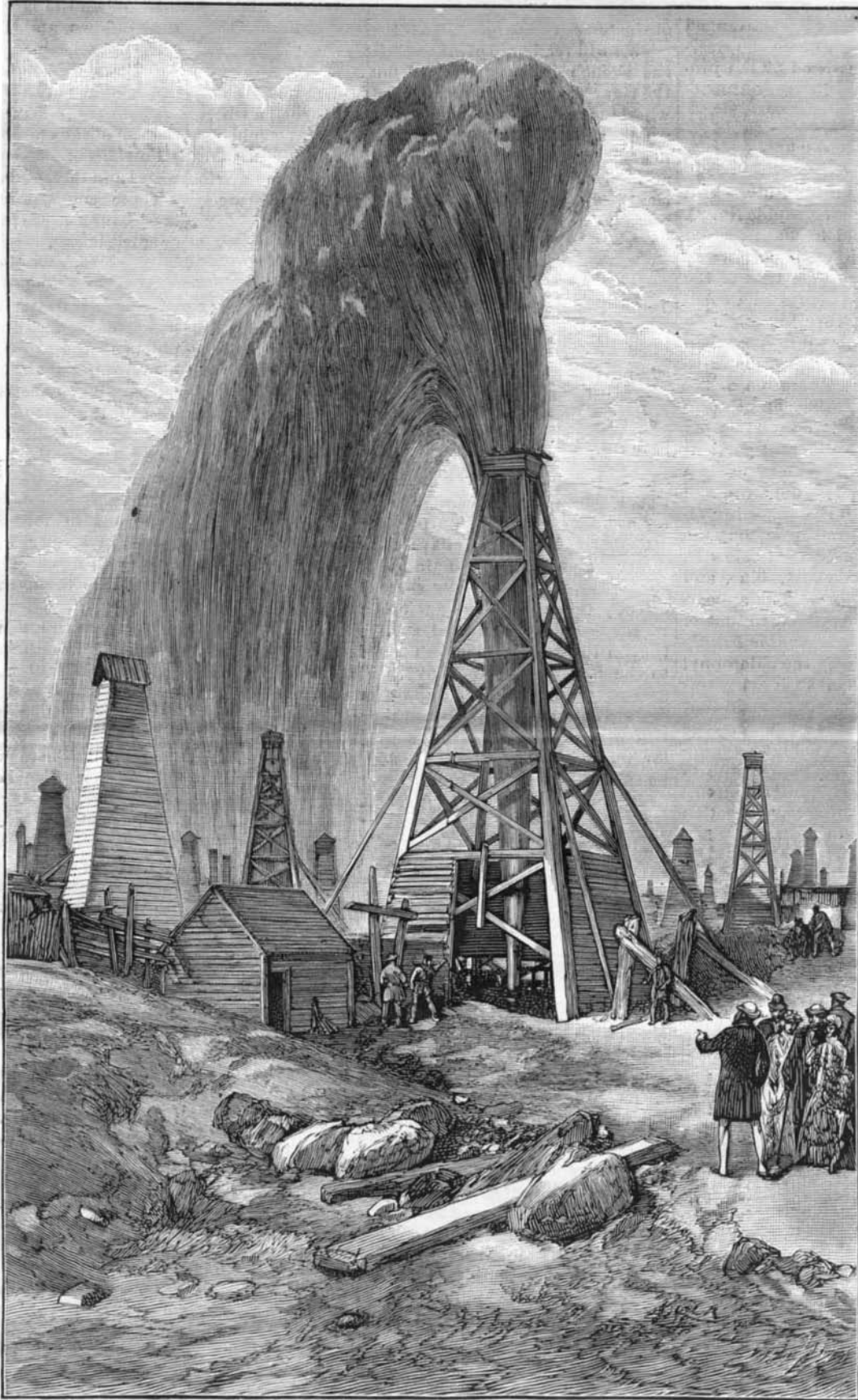
Messrs. Nobel Brothers, who have brought all the science of Europe, as well as the experience of the Americans, to bear on the manufacture of the oil, have also carried their ability and energy into the organization of transport. They have a splendid fleet of iron screw steamers, fitted up with tanks, which carry the oil to the Volga, with barges carrying it on to Tzaritsin. At this town they have a large depot, from which they send the oil by rail to depots in all the principal towns. By these means they now supply the whole of Russia, says the *Illustrated London News*, to which we are indebted for cut and description, and the American oil has been entirely driven from that country. They have begun to extend the supply into Germany; and it may be looked upon as only a question of time when a great part of Europe will receive its petroleum from Baku. Among many projects connected with this new industry is the proposal to lay a pipe, to act like a siphon, from Baku to the Black Sea, and thus to deliver the oil at Poti or Batoum, and by steamers thence to carry it not only over the Black Sea, but over the Mediterranean. The cost of such a pipe line would be great, for the distance is over 500 miles; so, at present, it is only talked about; but, if the supply of petroleum at Baku continues in undiminished quantities, this is likely to become an accomplished fact at no distant date.

Petroleum oil is now largely used as a fuel to heat the steam boilers in the Caspian steamers. The oil is brought to the furnace by one pipe, from a tank, while another pipe brings steam from the boiler; the oil is poured into the blast of high pressure steam, and is thereby pulverized or blown into minute particles, which become a sheet of flame underneath the boiler. If a sufficient supply of this fuel could be procured for our ocean-going steamers, many advantages could be derived from it. Among these may be noticed that it occupies less bulk than coal; a ton of *astatki*—the Russian name, which means "dregs"—is equal to about two tons of coal; but on the Caspian a ton of *astatki* is about thirty or forty times cheaper than the ton of coal. The furnaces burning this material require no stoking, thus saving hands; to vessels going through the Suez Canal and the Red Sea, and in all tropical seas, this would end the well known horrors of the stokehole. The disagreeable process, more particularly to passenger ships, of "coaling" would be done away with; and, of course, there are no ashes to raise and throw overboard. In proper tanks it is perfectly

safe—even safer than coal, the danger of which we have had experience of not long since. It would thus be cheaper than coal, safer, and its use would be conducive to the comfort of passengers and all on board ship.

A Good Idea.

In various parts of one of the largest Philadelphia printing establishments, the following fire rules are conspicuously posted: "No smoking allowed. Fire buckets must always be kept filled. All rags in use on the presses must be hung up. Rags not in use must be removed from the building daily. All waste paper must be collected and removed before closing." If such rules were posted and enforced in all the manu-



A FOUNTAIN OF PETROLEUM OIL, BAKU, RUSSIA.

facturing establishments and all the storehouses of the country, there would be fewer fires in number, and the destructiveness of the few would be materially reduced.

New Steel Works.

It is an encouraging sign that Carnegie, Phillips & Co., of Pittsburg, Pa., have commenced work on the new steel plant which they will erect adjacent to their present works in Homestead, the Pittsburg Bessemer Steel Works. The plant will consist of four 30 ton open-hearth furnaces, a plate mill, and a shearing department. The furnaces will have a total weekly capacity of 900 tons of ingots, and will occupy a building 350 feet long by 150 feet wide. One train of rolls will be erected, and will be capable of rolling plates 115 to 120 inches wide and $1\frac{1}{2}$ inches thick. The rolling department will occupy a building 250 feet long by 90 feet wide.

Cosmopolitan Geology.

The great desirability of having the systems of nomenclature and cartography employed by the geologists of the different countries of Europe not only comparable with each other, but also with those in use in America, led, some years ago, to the formation of the International Congress of Geologists, whose third session was held at Berlin during the past fall. From the reports of the work of the Congress recently published by the American Committee, under the direction of its secretary, Dr. Persifor Frazer, it appears that while the results of these conferences are as yet only provisional, there is every reason to believe that some system will eventually be decided upon which will be sufficiently comprehensive to satisfy the conditions im-

posed by the geology of the several continents. The essential differences between the local subdivisions of the rock formations of Europe and America are too great to permit the adoption of any system covering them all, and it is not the intention of the scheme now proposed to include more than the grand geologic divisions which are recognizable the world over. It is, however, highly important that these shall be generally comparable, and that the terms employed for their designation shall have equivalent meanings in all countries. A very difficult part of the work of the Congress, and one that has required much discussion to reach even the present tentative results, has been in deciding upon the line of demarkation which shall separate the several groups, systems, and series. Two formations, which in one land are separated by decided unconformity, may, in another, pass into each other by insensible gradations, and it then becomes a difficult question to decide what conditions shall constitute the true line of division.

The tendency of modern geologists to depend upon paleontological rather than structural grounds for the final classification of our rock systems has scarcely lessened the difficulty, since the distribution of fossils is by no means regular. The ultimate decision of the Congress was that, in spite of some local discrepancies, a distinct division of the formations with sharp lines of demarkation would be productive of less confusion than a more flexible system. Throughout the entire proceedings, the voice of the minority received as much consideration as possible; and though the results now published do not represent the unanimous judgment of the Congress, they are probably as near an approximation as the nature of the case permits.

At the next session, to be held in London, the final determination upon a system of nomenclature will probably be reached, and such changes in the color scheme

be made as the experience gained during the interval shall dictate. The publication of an elaborate geologic map of Europe according to the international system makes it highly desirable that the forthcoming map of the United States shall, if possible, be published in conformity with the same system. Dr. Frazer has issued a small map of Chester Co., Pa., colored in this manner, and the efficiency of the color scheme will be further tested on a selected area, with a view of its adoption in the work of the United States Geological Survey.

PROF. LONG, of the Illinois State Microscopical Society, after repeated experiments, says: "Taking all things into consideration, I am forced to believe that we have no absolutely certain method of distinguishing between butter and some of its substitutes; and that, of all methods proposed, the microscopic are, perhaps, the least reliable."