

THE HOMESTEAD DIFFICULTIES.

The Carnegie Steel Works, at Homestead, Pa., several views of which are given on our first page, are among the largest of the kind in the world. Their output of steel recently has even been compared to that of the famous Krupp establishment at Essen. The immense plant, in its machinery and buildings, is all of the most modern type, embracing the most recent improvements, Superintendent Potter testifying before the Congressional Investigating Committee that, by reason of the improved machinery, "the output was 50 per cent greater than that of any other mill in the world!" This seems to be a truly enormous gain, but the improvements which have been but recently made in the machinery and methods in the manufacture of steel in large quantities are hardly appreciated by those not directly engaged in the business. The new beam mill, completed within the past two months, cost nearly a million dollars, and the entire establishment has been absolutely created within the past ten years, for it was only half a score of years ago that Homestead had less than a thousand inhabitants. Then it was an unimportant and unknown suburb of Pittsburg, while now it has over 12,000 inhabitants, substantially all of whom have obtained their livelihood and made for themselves comfortable homes by the building up of the great steel works at that point.

But at this thriving and prosperous industrial center there has been a "labor difficulty" which has attracted the attention of the whole country for the past six weeks, and, on July 6, the matter was the occasion of a bloody engagement, as of between opposing forces engaged in actual war, in which some twenty men were killed and a far larger number injured.

On July 1 the 3,800 workmen employed at the mills were paid off in full, and work was "shut down," the company having declined to sign an agreement to pay a scale of wages for the future which had been demanded for the men by the Amalgamated Association of Iron and Steel Workers, a labor organization to which all the men belonged. The men and the company had got along under a similar agreement for the three preceding years, although there had all the time been a good deal of friction, from the fact that the company found it difficult to deal with its men individually as to many details of the work, and on this account, after a failure to come to an agreement as to a future scale of wages, the company decided to no longer recognize or deal with the association as a body, but to hire all the help needed without regard to any labor organization. It may be briefly stated that the company had asked: First, a reduction in the minimum of the wage scale from \$25 to \$23 for 4x4 Bessemer billets; second, a change in the date of the expiration of the scale from June 30 to December 31; and third, a reduction in tonnage rates at those furnaces and mills where important improvements have been made, and new machinery has been added that has greatly increased their output, and consequently the earnings of the workmen. Where no such improvements or additions have been made, no reduction in tonnage rates was asked. It has been conceded by the men that the proposed reduction of wages would affect only 325 men out of the total number of employees.

From the date of the stopping of work at the steel works the plant of the company was placed practically in a state of siege by the former workmen. On the 5th of July, a sheriff's posse, in response to the Carnegie Company's demand for protection, attempted to take nominal possession and post guards at the works; but they were captured by the men and sent out of town. The company had, however, in anticipation of trouble with their workmen, been making preparation to meet it for some time previous. They had erected a high fence around their grounds, with a barbed wire strung along its top, through which an electric current might be sent; placed a great search light in commanding position, put up a big instantaneous camera at an advantageous point, and in various other ways were preparing to protect their property. As a part of this system of defense, a force of Pinkerton detectives had been engaged as watchmen, and they were to have been installed at the works in the early morning of July 6. Some 300 of the men, hired for this purpose, were, therefore, taken on two barges, in tow of tug boats, from Pittsburg to the works, which are on the south side of the Monongahela River, about eight miles southeast of its junction with the Allegheny. The fact that the company was thus moving to place Pinkerton men in its works at Homestead created the greatest excitement in the latter place.

The news was telegraphed ahead and, on the arrival of the barges, just before sunrise, the river banks at Homestead were crowded with angry and threatening workmen. It had been intended to land the men from the barges near the pump house, fully a mile within the boundary line of the premises of the company, but the crowd speedily broke down the fence and poured over the company's grounds along the steep embankment skirting the river, reaching the landing place ahead of the boats.

Then succeeded an engagement which lasted nearly all day. It has been disputed from which side the first shot was fired, but the firing quickly became general on both sides, and was kept up with occasional intermissions until three o'clock in the afternoon. The strikers secured a small brass ten-pounder cannon and kept up a fire from it on the barges from within a steel billet embrasure on the grounds, while another cannon opened fire also from the opposite side of the river. The barges were of strong build, having been made for shipping iron, and as an extra precaution they had been lined with heavy steel plates. Little impression was therefore made upon the barges by the fire of the men on the banks, and then it was sought to fire the boats, as shown in one of our views, which is reproduced from a photograph. Oil was spouted on the decks and sides of the boats by means of hose and a small fire engine of the company, but the oil was a lubricating mixture and did not burn well, and the failure of this attempt was followed by an effort to burn the boats with the flame from a natural gas pipe. The tug boats had cast loose and left the barges early in the day, and at 5 o'clock the men on the barges, seeing that there was no hope of escape, surrendered to the mob. Before surrendering they were promised protection, but on the way from the boats to the Opera House, where they were finally lodged as prisoners for the night, they were most brutally assaulted and maltreated by the mob which lined the streets of Homestead.

Within a week after this bloody exhibition of organized mob violence Homestead was taken possession of by the State militia of Pennsylvania, and a force of five or six thousand soldiers was encamped in the town and upon the hills around, their tents upon the hill-sides being visible in one of the views, and from this date, under military protection, the company has been gradually filling its workshops with non-union workmen. Another view shows the headquarters of the Amalgamated Association at Homestead, where the men have been accustomed to assemble to mature their plans, and from which the leaders directed their campaign against the Carnegie Company. The office of the latter company in Pittsburg, shown in one of the views, has a peculiar interest, from the fact that here was shot, a few days later, Mr. H. C. Frick, the managing head of all the different Carnegie establishments. A New York anarchist, a Polish Jew named Berkman, went to Pittsburg for the special purpose of killing Mr. Frick, and succeeded so far as to shoot him twice in the neck and inflict several stabs in his back. The wounds did not prove fatal, however, and Mr. Frick has since sufficiently recovered to again assume full charge of his vast business interests. It is not claimed that the would-be murderer had any direct connection with the strikers' organization, but there is only a question of degree of crime between the mob which invaded the grounds of the Carnegie Company, and for hours took part in the bloody work there on July 6, and the dastardly miscreant who, on July 23, sought to aid in carrying out the work of the rioters by killing Mr. Frick.

For the photographs from which some of our views are made we are indebted to Mr. B. L. H. Dabbs, of Pittsburg.

Artificial Precious Stones.

What promises to be a most important discovery has been made by one of our Glasgow scientists. Although imitation gems are obtainable in any required quantity, the production of crystals having the hardness, durability, and other qualities, both physical and chemical, of natural stones has been one of the unsolved problems of applied chemistry. The most advanced efforts up till now have been made in Paris, and the French specialists have at least proved the possibility of producing sapphires, rubies, and other stones by artificial means, their products being real gems, and not glasses. It is doubtful, however, if the originators of the French methods themselves claim that theirs are the methods of nature, and it is reasonable to suppose that the most natural method will be the most practically successful one. Although no geologist or chemist can declare the new process to be the process of nature, yet many analogies point that way.

Experimenters in this field may have been partly discouraged by the thought that the gems of nature were produced under conditions of enormous pressure, to which might have been added very high temperatures, and that they were in some cases the products of long periods of time. It is possible, however, that too much weight has been given to this point. In the process now under notice no such discouraging conditions are present, and the method is wonderfully simple. Even working on the laboratory scale, using small vessels, stones have been obtained over one-sixteenth of an inch in diameter, and very large numbers have been formed approaching that size. There is no reason to doubt that working on a larger scale will yield stones of any size likely to be required. The noble nature of the products is beyond doubt, as they are very hard, infusible at all ordinarily attainable temperatures, and insoluble in any acid. The bulk of the gems are

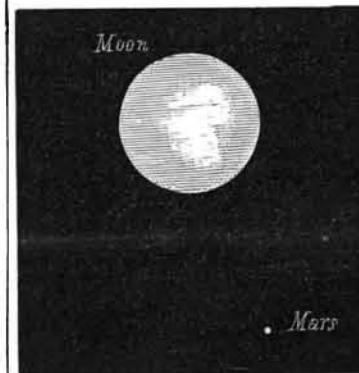
white or rather colorless sapphires. They are compact and transparent crystals, and many specimens have a splendid luster. By subsequent treatment some of them have taken on the sapphire blue.

Some of the specimens seem to contain a small amount of carbon. This element is sometimes present in small quantity in natural emeralds, a fact not generally stated in books on the subject. In a few specimens the proportion of carbon seems to be considerable, and there are present individual crystals having physical properties more nearly allied to the diamond than to the sapphire. In nature diamonds are often found associated with other gems. In any case the products contain little or no silica, this compound being the characteristic ingredient in all kinds of glass. Apart from the possibilities of the process in the direction of producing the diamond, the chief point already established is that of having found an easy method of crystallizing alumina. The Oriental ruby, Oriental amethyst, and other gems coming under the heading "Oriental," are all of them only variously colored sapphires, and alumina forms the chief constituent of the series.

There is little doubt that the process will yield the ruby and other varieties. Apart from ornamentation, their hardness will fit them for mechanical purposes, and their cutting power is remarkable, perhaps due to the small amount of carbon already spoken of. The author of the process has sought the opinion of several of the foremost men of science, and their general verdict has been very favorable. The discovery may prove to be one of the most important yet made in mineralogical chemistry, and the future developments both commercially and scientifically difficult to estimate. The originator of the process is Mr. James Morris.—*Glasgow Herald*.

THE MOON AND MARS.

A most interesting spectacle in the southern sky, in connection with the recent near approach of the planet Mars, was presented on the evening of August 7, when the planet was for some hours apparently



very near the full moon, as shown in the accompanying view. When one remembers that the planet was some 35,000,000 miles away from us, while the moon's distance is only about 240,000 miles, that the diameter of the planet is just about twice that of the moon,

and that the planet itself has two small moons coursing around it at a rapid rate, it was not necessary to call up the further comparisons, almost everywhere entertained, as to the probability of life on Mars and the absence of life on the moon, to render the sight one well worthy of attracting and holding the attention, aside from its beauty as a mere spectacle.

THE LOOPED PATH OF MARS.

My father, Professor Richard A. Proctor, was very much interested during his lifetime in the study of the miniature earth, Mars; and about which now the scientific world is especially interested. In his magazine *Knowledge* for March 31, 1882, vol. 1, he makes reference to a map, published in an earlier number (March 24), of the looped path of Mars, designed by himself. With regard to it, he wrote as follows: "There are some 600 positions of the planet (all separately laid down before the path was carried through them), and the constructions for these involved many hours of labor." The following is the illustration of the looped path, with the accompanying descriptive text, as written by my father:

"Many even of those who have read the usual descriptions of planetary motions, in our text books of astronomy, are perplexed by the way in which the planets pursue

Their wandering course, now high, now low, then hid, Progressive, retrograde, and standing still.

"Mars, Jupiter, and Saturn during the last few months have given striking illustrations in the skies (as indicated in our maps) of their strange and at first view fantastic and irregular motions. Mars, in particular, traverses a singularly devious course upon the background of the starlit heavens. It has seemed to me that it would be interesting to exhibit the real course of this planet, the one of all the sun's family whose path, with reference to the earth, has the most complicated form. Of course, in reality this planet travels around the sun in an ellipse which is almost circular in form, though considerably eccentric in position. The earth also pursues an elliptic path, smaller in size, still more nearly circular in form, and much less eccentric. But viewed from the earth, the planet Mars, in consequence of the combination of these two circling (but not strictly circular) motions,