lead to a great loss if the rearing is a failure. Many persons may have observed flying about in the evening in the month of June, in the squares, avenues, and gardens with ailanto plants in the neighborhood of Paris, and even in Paris itself, a large moth, with wings variegated by longitudinal bands. In winter, there may be seen hanging to the leafless branches long cocoons, of a pretty pearly gray. These are the work of the caterpillar of *Attacus cynthia*, or ailanto silk worm, introduced into France by the Acclimatization Society, under the direction of M. Guérin-Méneville. The moth is now as much at home in France as in its native habitats, as robust, as large, and as well colored as in the north of India and China. No great welcome has hitherto been given to the new comer in France. The cocoon is not very rich in silk, it is strongly incrusted, and, on this account, presents difficulties in weaving, being regarded as good only for producing floss silk—a material of little value. Attempts have have been made to wind it; but the winding yields only the single thread of the cocoon—too fine to be used, and requiring special and expensive machinery. This question has now, however, been taken up and solved by M. le Doux. He has succeeded to some extent in separating the gum from the silk, permitting the threads to be drawn with great ease, and preserving to them, at the same time, sufficient natural glue to admit of the threads of several cocoons wound at the same time being, by the operation of twilling, twisted together and giving strands of raw silk, the only kind that can be utilized in weaving. Another chief point in the discovery of M. le Doux is that this production of raw silk is obtained with the same pans and the same hand processes as ordinary raw silk, so that no objection can now be raised on the score of expense. The specimens of silk produced are of a pretty blonde color, and make charming stuffs of *écru* color. Moreover, both French and English dyers will know how to give the silk a variety of colors. The rearing of this new silk worm requires neither care nor expense. The wild moths look after themselves, and it only remains to collect the cocoons attached to the leaves or small branches. The ailanto tree of Japan, on which the worm feeds, is of rapid growth, and admirably adapted for covering waste spaces.—*London Times.*

The Kane Geyser Well.

BY CHAS. A. ASHBURNER, ASSISTANT SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA.

The Kane Geyser or Spouting Water Well, which during the past year has attracted such general attention from the "sight-seeing" public, is no novelty to the oil man. The cause of the action has been so erroneously represented that a correct explanation seems to be demanded.

This well is situated in the valley of Wilson's Run, near the line of the Philadelphia and Erie Railroad, four miles southeast from Kane. It was drilled by Messrs. Gruhout and Taylor, in the spring of 1878, to a total depth of 2,000 feet. No petroleum was found in paying quantities and the casing was drawn and the hole abandoned, since which time it has been throwing periodically—10 to 15 minutes—a column of water and gas to heights varying from 100 to 150 feet.

During the operation of drilling fresh "water veins" were encountered down to a depth of 364 feet, which was the limit of the casing. At a depth of 1,415 feet a very heavy "gas vein" was struck. This gas was permitted a free escape during the time the drilling was continued to 2,000 feet.

When the well was abandoned, from failure to find oil, and the casing drawn, the fresh water flowed into the well and the conflict between the water and gas commenced, rendering the well an object of great interest. The water flows into the well on top of the gas, until the pressure of the confined gas becomes greater than the weight of the superincumbent water, when an expulsion takes place and a column of water and gas is thrown to a great height. This occurs at present at regular intervals of 13 minutes and the spouting continues for 1½ minutes. On July 31st Mr. Sheafer (aid McKean County) measured two columns, which went to heights respectively of 120 and 128 feet. On the evening of August 2 I measured four columns in succession, and the water was thrown to the following heights: 108, 132, 120, and 138 feet.

The columns are composed of mingled water and gas, the latter being readily ignited. After nightfall the spectacle is grand. The antagonistic elements of fire and water are so promiscuously blended, that each seems to be fighting for the mastery. At one moment the flame is almost entirely extinguished, only to burst forth at the next instant with increased energy and greater brilliancy.

During sunshine the sprays form an artificial rainbow, and in winter the columns became incased in huge transparent ice chimneys.

A number of wells in the oil regions have thrown water geysers similar to the Kane well, but none have ever attracted such attention.

As early as 1833 a salt well, drilled in the valley of the Ohio, threw columns of water and gas at intervals of ten to twelve hours to heights varying from 50 to 100 feet. This well is possibly the first of the "water and gas geyser wells."—*Stowell's Petroleum Reporter.*

FRENCH FAIENCE.

The illustration on this page represents elaborate examples of French faience. The covered dish is highly decorated, and the dessert plate shows a delicacy and refinement of treatment. The handle to the beer mug on the left, in its close

FRENCH FAIENCE.

imitation of nature, is in striking contrast with the decoration of the body of the mug. A capital design, simple yet effective, and thoroughly artistic, is seen on the unpretentious pitcher on the right of the group.

The Manufactures of the West.

After reviewing at length the conditions of the great agricultural prosperity of the West, in his instructive and suggestive paper before the Social Science Association at Saratoga, Mr. Robert P. Porter, of the Chicago *Inter-Ocean*, said:

These figures naturally suggest the inquiry, Is the West as promising a land to the manufacturer as I have already shown it is to the agriculturist? Will it attract both industries? This question has been answered in a general way by Mr. Leonard Courtney in a recent lecture. He believes that the law of distribution of labor depends upon the relative and not upon the absolute superiority of certain districts as settlements for labor. Thus, if a country were discovered where the agriculturist could work at double the advantage he had in his own country, while a manufacturer could only increase his productive energy there 50 per cent, the free course of industry would deliver the country over to agriculture, and would leave manufactures to their former seats. This was the movement at first in regard to the settlement of the nine States under consideration, and is now in the newer States, where the superiority of agricultural industry is maintained. Not so in Illinois, Indiana, Missouri, and Michigan, where manufacturing can be carried on cheaper, and labor paid better, in proportion to the cost of living, than in the Middle and Eastern States.

The West is growing more important every year in manufacturing; and in industries, where recent and reliable data can be obtained, the strides made within the past few years are surprising, and worthy of the most careful consideration of political economists. In 1878 the State of Illinois made as many more rails as the whole United States did in any one year prior to 1860. The four States of Illinois, Wisconsin, Indiana, and Kansas produced last year 266,783 tons of rails, upward of 30 per cent of all the rails produced in 1878 in the United States. Illinois and Indiana alone produced half a million tons of cut nails, over one-ninth of the total production of the country. The spring of the present year witnessed the starting of new nail manufactories at Omaha, Neb., and at Centralia, Ill. The total production of rolled iron of all kinds in the United States for 1878 was 1,555,576 tons; of this, Indiana, Illinois, Michigan, Wisconsin, Missouri, and Kansas produced 232,553, or about one-seventh. The ore in the iron regions of Michigan and Missouri is very rich and free from injurious ingredients, and is capable of being successfully employed for the manufacture of all varieties of iron and steel. Professor Newberry, one of the best authorities on the subject, has observed that in these two iron districts the inhabitants of the Valley of the Mississippi have a supply of remarkably rich and pure ores, which is not likely to be exhausted for some hundreds of years, and which, from the small amount of phosphorus which they contain, will be the chief dependence of the American people for the manufacture of steel.

To Chicago and Milwaukee, and other points on the shores of the great lakes, the ore of the Lake Superior iron regions is floated cheaply, and is manufactured where disembarked, or is distributed through the interior of Illinois and neighboring States, to be brought in still closer proximity to the coal. Already, as will be presently shown, an immense iron rail industry, second only to Pennsylvania, has grown up, based on the relations which have been briefly indicated between the ore and coal. The increase of population on the shores of these lakes within the past quarter century is without parallel in history, and twenty-five years more will witness a greater growth. The demand for iron will be greater than ever before, and will be met by the Western instead of the Eastern markets. This demand, according to Professor Newberry, must be furnished from three points or lines of manufacture: First, near the mines, where a limited quantity of iron will be produced from charcoal, and coke or coal brought as return freight; second, along the shores of the lakes, where the ore is transhipped and meets the coal from the interior, as in Chicago; third, in the vicinity of the coal mines, to which the ore is brought overland by rail, as at Springfield and at Joliet. Neither of these points or lines can monopolize the iron manufacture, since return freights must be furnished to empty coal cars, as well as empty ore vessels. The preponderance of the lake shores or the interior will be determined mainly by the point to which economy of fuel can be carried in our iron manufacture. With keen foresight and enterprise the West, and especially Illinois, has taken the newest and now most profitable branch of the iron trade—the manufacture of steel rails. The Bessemer process was introduced into the United States about ten years ago. From a volume published by the State of Pennsylvania, entitled "Iron-Making in Pennsylvania," page 58, I learn that the first Bessemer steel rails ever rolled in the United States were rolled at the North Chicago Rolling Mill on the 24th day of May, 1865.

In the manufacture of Bessemer steel rails Cook County, Ill., has already distanced Allegheny County Pa. Last year that great center of the iron trade, according to William P. Shinn, Esq., manufactured 72,246 tons of Bessemer steel rails. Chicago, during the same time, turned out 123,000 tons, and if the neighboring county of Will is counted in, the amount is increased to 178,000 tons, or 33,608 tons more than twice the entire production of Allegheny County. Last year the State of Illinois produced nearly one-third of all the Bessemer steel rails produced in the United States. In this way have Western industries multiplied until, in the absence of reliable data, it would be difficult to even approximate the aggregate production in branches of trade where no care is taken to collect statistics. A few years ago all our best furniture came from Boston. Said a leading Chicago furniture dealer to me the other day, "Not one dollar's worth is now bought east of Grand Rapids."

There is but one conclusion from these facts: That the labor of the country is gradually congregating where it can be most efficiently employed, and that manufacturing interests are bound to develop in and around the great iron and coal districts of the West, and near the vast lumber regions of the North; second, that the further the agriculturist pushes West, where his labor will be more liberally rewarded, the more important will become the manufacturing industries of the West.

Progress of the Petroleum Business.

The production of crude petroleum in the Pennsylvania oil fields for the first eight months of 1879 was 12,386,497 barrels, against 9,810,327 barrels for the same time in 1878, making an increase of 2,576,170 barrels, which is equal to about 26 per cent. So says *Stowell's Reporter.*

The number of producing wells in the Pennsylvania oil fields on the 31st of August, 1879, was 11,585, against 9,884 for the same time in 1878, making an increase of 1,701, which is equal to about 11 per cent.

The total production for August was 1,869,052 barrels.