

improving in this direction, and it is the opinion of those well versed in trade matters that there will soon be a decided change for the better. It is certain that the companies intend to keep a bold front. There is no talk of such a thing as a stoppage at present, but if coal accumulates to the extent to make it necessary it will be ordered.

The Money Value of an Emigrant.

The immense tide of immigration, says the *United States Economist*, that annually contributes to our population, that are continually swarming to our shores from the most populous regions to aid in the progress of civilization, naturally suggests the inquiry, what is the money value of an immigrant? A prominent German statistician, in an able treatise on the price of labor, distinguishes three periods in the economic life of each man, two unproductive and one productive period. The first comprises the raising and education of the individual, and continues until he reaches his fifteenth year. It is, of course, not only unproductive, but causes considerable outlay. The second, extending from the fifteenth to the sixty-fifth year, is the productive time of life. The third comprises the unproductive years of old age after sixty-five. The first is the juvenile, the second the labor, and the third the aged period.

It is only during this productive period man is able to subsist on the result of his own labor. In the juvenile period he is dependent on the assistance of others, and in the aged period he has to live upon the accumulated fruits of the productive years. Whether or not the child in its first period lives at the expense of his parents, there must be means for its maintenance and education, and as nature does not spontaneously furnish those means, and as they cannot be provided by others without danger of impoverishment, if not replaced, they must be obtained by labor. This labor is performed during the productive period, in which the following three objects are to be attained, viz:

The payment of the expenses incurred for the support and education of the child in the juvenile period.

The satisfaction of the daily wants, and the maintenance of the productive power of the individual.

The laying up of a surplus fund for his sustenance during the aged period. Thus the cost of the bringing up and education of a man constitutes a specific value, which benefits that country which the adult individual makes the field of his physical and intellectual exertions. This value is represented by the outlay which is necessary to produce an ordinary laborer. An immigrant, therefore, is worth just as much to the country as it costs to produce a native-born laborer of the same average ability.

It is evident that the capital value which a grown-up able-bodied immigrant represents is different according to his station in life and the civilization of the country whence he comes. The wants of a skilled and unskilled laborer from the same country differ widely. Those of the Englishman are different from those of the Irishman. The German must be measured by another standard than the Mexican or South American. Their mode of life, their economical

habits and practical pursuits, have little in common; and hence the benefit to the country of adoption varies according to their respective previous relations. It is certain, however, that each immigrant brings, independently of his personal property, a certain increase of wealth to this country, which increase is paid by the country from which he comes, and accordingly must be credited to it.

In order to arrive at the most accurate possible estimate of this addition of wealth, it is necessary to inquire into the cost of raising and educating in this country a man whose means of living are wholly derived from his physical labor.

It has been computed that the cost of raising a manual laborer in Germany is 40 thalers a year for the first five years of his life; at 50 thalers for the next five years; and at 60 thalers from the eleventh to the fifteenth year, thus arriving at an average of 50 thalers per year, or 750 thalers in all. Assuming that in this country subsistence costs about twice as much as in Germany we are not far from the truth in assuming the expense of bringing up an American farmer or unskilled laborer for the first fifteen years of his life to average 100 thalers per year, or a total of 1,500 thalers, equal to about \$1,125. An American girl will be found to cost only about half of that, or \$560, for the reason that she becomes useful to the household from an early age. Allowance must be made, it is true, for the fact that about one-fifth of the emigrants are less than fifteen years old; but this is fully balanced by the great preponderance of men over women, and by thousands who represent the highest order of skilled labor. Hence it is not unsafe to estimate the capital value of each male and female emigrant to be \$1,125 and \$560, respectively, for every person of either sex, making an average for both of \$840.

The Metal Industries of France.

According to recent statistics the total cast iron manufactures in France in 1882 were 2,033,104 tons, an increase over the production in 1881 of 146,754 tons. The output in 1882 of iron manufactures was 1,074,054 tons, an increase of 47,764 tons over the previous year. In 1882 the production of steel was 454,053 tons more than in 1881. In merchant steel proper there was a falling off of 193 tons as compared with the year previous, but in the manufacture of steel rails there was an increase of 28,899 tons, and in sheet iron 2,931 tons. Iron rails, on the other hand, fell off in 1882 some 1,452 tons. There seems to be at present a little improvement in the steel-rail trade. Late advices say that the steel works in St. Etienne are engaged on good orders from the Southern Railway, which aggregate 15,000,000 francs in value. They are also extensively engaged on armor-plates for the French navy. In the north of France there is said to be considerable activity in the steel and iron interests, this being a radical change from the condition a few weeks previous. In the Haute-Marne district the iron-mills are quite busy, but in some of the other iron-producing districts trade is less active, operators awaiting an expected increase in the demand. While prices of both steel and

iron manufactures are quite low, the general condition of the metal industries in France seems to be in a healthful and reasonably satisfactory condition.

Original Discovery of Iron and Steel.

In an address on technical training, delivered before the Alumni Association of Lehigh University, Thomas M. Drown pictures the discovery of metallic iron and steel in this way: "Nearly all the early discoveries in the arts were the result of accident or hap-hazard experiment. We can well imagine that a fire large and intense enough to reduce iron from its ore must often have been made in accidental contact with surface ore, and that the presence of the metal in the ashes must have attracted attention. This observation once made, there would follow a series of experiments to determine the conditions under which the metal was produced, and the substances necessary for its production. It would not long escape intelligent observation, that a certain brown earth, or may be a black rock, was the substance which yielded the metal, and that fire was the necessary condition of its formation.

But the iron thus accidentally produced—a mixture of metal, cinder and ashes—was of no value till further experiment revealed the fact that the metal could when hot be united by hammering into one mass, with the separation of cinder and other extraneous matter. The discovery of this property prompted still further experiments to be made. The irregularity of the product would suggest the more perfect control of the fire, and small furnaces would be built. In the course of time it would be noted that the iron was not uniform in hardness, and an accident would be sure to reveal the fact that sometimes the metal, when suddenly cooled in water, would become intensely hard. This new line of investigation would result in the production of steel."

Old Building Material.

An extensive trade in second-hand building material, says the *Builder*, has been carried on uninterruptedly for fifty years, and is largely supported by builders and joiners. The stone and brick of an old building is used in the construction of a new one, the lime-whitened bricks making the inside of the outer walls and the partitions, and the stone going into the foundations. But it is not generally known that the inside wood-work is used again, frequently without radical alteration. Many builders prefer this old timber because it is thoroughly seasoned. The richer woods which are admired for their color acquire mellow tones by age and become more valuable as the years pass. Furniture of mahogany and rosewood that has outlived several generations is much handsomer than that made from new wood. But it has added value as mere material. An article made from the old wood will retain its integrity in all its joints; its shrinking days are over. For the same reason the timbering, wainscoting, and flooring of old buildings have an added value, although the selling price is less than that of new material.