A good method of dealing with these detailed data of actual values and total possible values of output is to get the percentages of actual to total possible values and then to group them under their proper industrial classifications, applying the various percentages to the primary horse-powers known to be available in the respective detailed industries. In doing this we multiply primary horse-powers by percentages and get for the different groups of industries hypothetical figures which appear to represent the actual primary horse-power in use. This is accomplished under the assumption that the ratio of actual to available horse-power is the same as the ratio of value produced to the total possible value that can be produced. The assumption is, of course, false; but if we desire to introduce the element of horse-power into our computations, using it for all it is worth, we must make it.

Totaling the hypothetical actual horse-powers in use in the various groups and referring them to the total available horse-powers in the same groups, we arrive at the best possible estimate we can at present compute of the horse-power in use in various industries. The results obtained by these computations are illustrated and tabulated in Figure 1. It will be observed that in 1923 the capacity used varied between 57.4 per cent for the food and kindred products industries and 89.6 per cent for the paper and printing industries. The productive capacity in use of all industries averaged 74.2 per cent for 1923. Similar computations for the year 1921 showed fluctuations of used capacity between 43.7 per cent in the transportation equipment industries and 80.1 per cent in the railroad repair shops industries, with an average for all industries for that year of 61.3 per cent.

We observe two things. One is that there is a considerable range of idleness in various industrial groups; the other is that there is variation from year to year of idleness in the several industries. We cannot draw too broad conclusions from these observations because of the inadequacy of the data. We can, however, conclude that industry working even under the eight-, ten- and twelve-hour shifts is working under conditions of decidedly limited output.

Estimates based on the experience and observation of several individuals show less favorable industrial operating performance records. Thus, it is held that the fine paper industry functions at an average of 79 per cent of possible production. The flour milling industry performs at 40 per cent of capacity; the oil industry at 76 per cent; the manufactured gas industry at 50 per cent; the steel industry at from 60 to 80 per cent of total productive capacity and the machine tool industry at 65 per cent of its total possible output.

In 1922, when the Bureau of the Census undertook to estimate the total wealth of this country, it was found that the value of the manufacturing machinery, tools and implements was about one-twentieth of the value of all land, materials and equipment of all sorts in this country. In money terms it was estimated that manufacturing machinery, tools and implements amounted to 15.8 billions of dollars, while all the values in this country amounted to something like 321 billions of dollars. When we reflect that in 1900 these values were 2.5 billions and 88.5 billions respectively, we

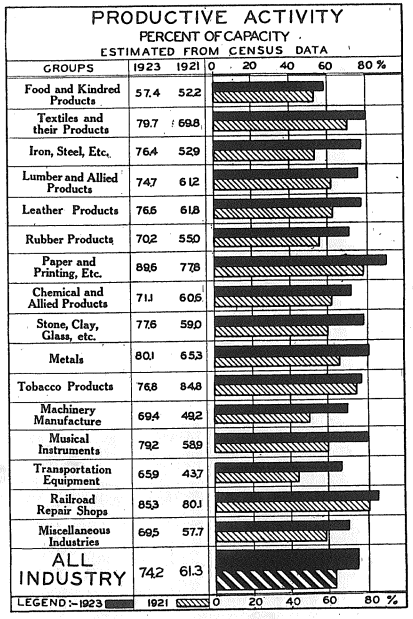

Figure 1

observe that the value of manufacturing machinery and equipment multiplied six-fold while the value of all goods and valuable materials multiplied less than four-fold. As society becomes increasingly mechanized it is reasonable to believe that the proportion of manufacturing machinery, tools and implements to the total national wealth will become larger.

Even now the investment in industrial production is tremendous. The magnitude of railroad and equipment facilities was close to 20 billions of dollars in 1922 as against 9 billions of dollars in 1900. The transportation industry, however, has gone through its era of expansion. We must realize that mechanization of industry in the future will play a dominant role in the economics of our existence. These facts are brought out to indicate that the capital investment involved in idle equipment and machinery is gigantic and promises to play a dominant part in the material welfare of our future.

Comparing census figures of the goods manufactured in 1927 with the value of farm products in 1926, the latest available figures, we find that there were 62.718 billions of dollars of manufactured materials as compared with 12.985 billions of dollars of farm products. In other words, the value of manufactured goods in this country is about five times the value of farm products. Of these 62.718 billions of dollars the total value added by manufacture amounted to 27.585 billions of dollars (see Figure 3). In other words, more than one-third of the total value of manufactured goods was imparted by the manufacturing process.

It is little wonder then that a small percentage change in the magnitude of idle equipment is of such tremendous importance to the economy of the nation. Yet in spite of all this, no serious efforts have ever been exerted in the past to measure, let alone solve, the magnitude of such an economic evil.

Reasons and Factors

The problem may perhaps be solved by a series of approaches. If a basic evil cannot be dealt with the intermediate factors which bring it on may be perhaps entirely eliminated. To do so, some basic mechanism might be conceived and utilized. It might be well therefore to examine some of these factors.

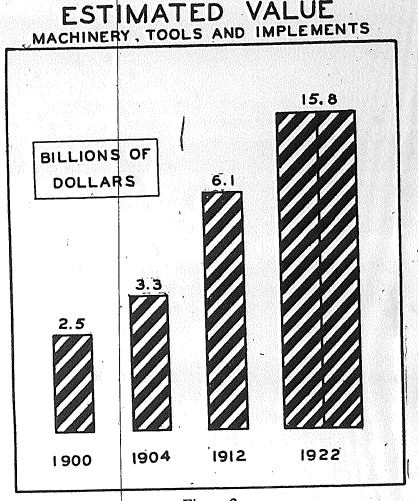

Figure 2

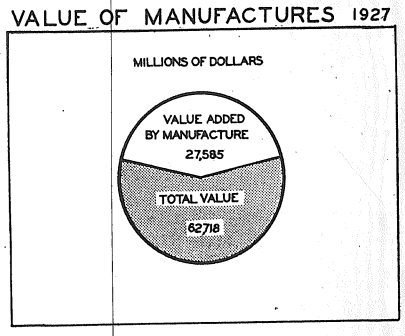

Figure 3

1. *Risk of Loss.* One very important inhibitor of full productive power is the risk of loss. Enterprisers may even be willing to turn out large volumes of business at low profits; but they are unwilling to operate in this fashion if there is a