Since the advent of the Harvard Economic Service and a few other professional Statistical Service Bureaus, we can generally tell in which direction general business is moving. Having this knowledge we can very easily project the average demand cycle one year in advance. Some business men would feel reluctant to hazard an attempt to forecast their own business which is running with or ahead of the security market. This chance is a very essential element of any industry. Production must be against future needs, consequently it is up to the management to solve the probable market. It cannot be left to the storeroom foreman who lacks keen judgment of the future business outlook, but depends upon immediate past requirements which, in our business, are sometimes misleading. Therefore, assuming that our "B" curve will follow the same course as the average demand cycle,[2] it remains only to translate the estimated monthly items which are still, in terms of Standard Deviation, above and below normal, back into the units in which the series was originally expressed. The cycles are converted to percentage deviation by multiplying them by the standard deviation. The percentage deviation for each month is added to the appropriate seasonal index. Each of these percentages is then multiplied by the corresponding ordinate of the trend line. The resulting figures are the tentative estimates of probable course for next year. The kernel of this method lies in the accuracy with which you can forecast general business conditions.

I have devoted most of my discussion to the correlation method which primarily depends upon a long period of years. I want to say a few words, before I close, on the measurement of short time series. It seems to me that many of us would like to measure our data since the close of the World War. In short series of data, we are generally interested in the seasonal variations since a period must be at least eight or ten years to point out any long time tendencies or growth.

Our first task to eliminate seasonal movements in a short series is to work out a twelve months moving average, centrally plotted, and determine the seasonal variation by Macaulay's method, as I have previously explained. The twelve months moving average should smooth out the erratic movements and be free of seasonal influences and other accidental movements, which might occur during the course of the year. The year's moving average should represent the general swing of monthly items in so far as movements and turning points are concerned. The actual monthly areas which cut the year's moving average line might be shaded to bring out the variation of monthly figures from the year's moving average plottings. (See Figure 5.) After making a study of past performances showing the number of months it takes the twelve months moving average curve to rise and then fall, you can very easily project the curve a year in advance, with some degree of surety, checking your results, of course, with your knowledge of prevailing business conditions. These plottings can be translated to monthly estimates by multiplying each figure by the appropriate seasonal variations for the group.

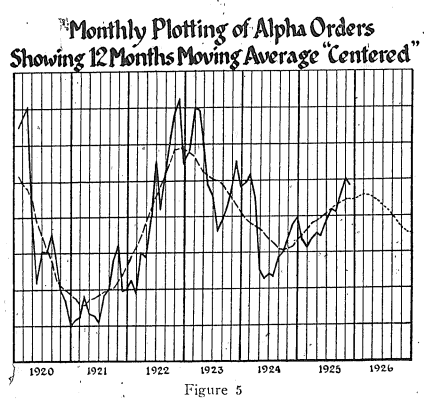

Figure 5

Another method which will usually show the trend of your own business is Mr. Joseph Barber's "Year Ago Curve," as shown on Figure 6. This curve can be easily projected into the future, thereby making a check on the other tentative estimates. Usually, a "Year Ago Curve" must be smoothed out by either a three months moving average or a five months moving average. From the resulting moving monthly average, a per cent increase of each month over the corresponding month of the previous year is found. Although this method is not statistically precise, it eliminates the seasonal variations and, to a considerable degree, the normal growth. The percentages

[2]The average demand cycle is a composite index representing the purchasing power which creates the demand for our products.

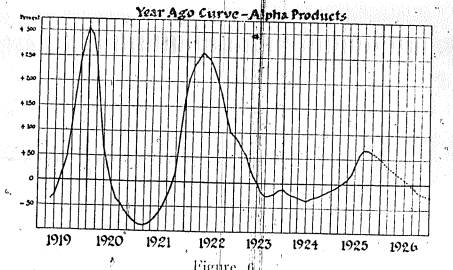

Figure 6

show only the up and down swings of business—a fairly smooth curve. After projecting the curve forward, the monthly items which show the per cent increase or decrease of each month over the corresponding month of the previous year are read off. The tentative estimates of the probable course for the following year are found by increasing or decreasing last year's monthly items by these percentages.

Forecasting in any industry which shows a relative stability when compared with general business is done in a different manner. A public utility, whether a telephone or electric light and power industry, depends, to a large extent, upon the normal developments in the uses of the telephone and electric current. On such a basis, it is very easy to develop a normal per cent increase for each year. Of course, a check can be made on this method by developing a reliable average revenue per unit, both for the telephone industry and the electric power and light industry.

In closing, I want to say that the statistical technique which I have, in part, elaborated on, is but a device to help men of keen judgment to draw their conclusions. Statistical methods, including charts and formulas, can do more harm than good in the hands of a person with no knowledge of economics and scientific management. But, nevertheless, statistical methods are indispensable to a good executive and are gaining more prominence every day. While these statistical methods of forecasting have been so far successfully operated in the Henry Disston & Sons Co., they may very easily be modified to meet the requirements of any business man.

THE excerpt below is from "The Dilemma of Thrift" in the *Atlantic Monthly*, April, 1926, page 543. The authors of this article, Wm. T. Foster and Waddill Catchings, are joint authors of "Profits," a volume in the Pollak Foundation Series which will be reviewed in a forthcoming issue of the BULLETIN. A prize of $5000 is offered for the best adverse criticism of this book, submitted to the Pollak Foundation, Newton 58, Mass., before January 1, 1927.

Progress toward greater total production and resultant higher standards of living is retarded because consumer buying does not keep pace with production. Consumer buying lags behind for two reasons: first, because, on account of corporate savings, industry does not disburse to consumers enough money to buy the goods produced, without a fall in the price-level; second, because consumers, under the necessity of saving, cannot spend even as much money as they receive. Partly on account of these savings, there is not an even flow of money from producer to consumer, and from consumer back to producer. Furthermore, the savings of corporations and individuals are not used to purchase the goods already in the markets, but to bring about the production of more goods. The expansion of the volume of money does not fully make up the deficit, for money is expanded mainly to facilitate production and the product must be sold to consumers for more money than the expansion has provided. Consequently we make progress only while we are filling the shelves with goods which must either remain on the shelves as stock in trade or be sold at a loss, and while we are building more industrial equipment than we can use. Inadequacy of consumer income is, therefore, the main reason, though not the only reason, why we do not long continue to produce the wealth which natural resources, capital facilities, improvements in the arts, and the self-interest of employers and employees would otherwise enable us to produce. Chiefly because of shortage of consumer demand, both capital and labor restrict output, and nations engage in those struggles for outside markets and spheres of commercial influence which are the chief causes of war.