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## Growth Rate of Industrial Research

IN 1950 industry spent in the neighborhood of one billion dollars for research and development, and employed about 165,000 scientists, engineers, and technical assistants. This was more than twice the number employed in 1940 and nearly ten times greater than in 1927. During the past two decades the expansion of research was quite pronounced in the chemical and petroleum industries and, since 1940, in aircraft and electronics. On this evidence alone, plus the continuous stream of new products that have been coming out of our research laboratories, it would certainly appear that the health of our industry-supported science is very good indeed. But is it?

One way to examine progress in industrial research is to compare the rate at which laboratory personnel has been expanding for the past twenty years. When this is done, on the basis of data assembled by the National Research Council, it is found that the average annual rate of growth of research staffs was nearly twice as large in the depression-ridden thirties as in the prosperous forties. Similar trends may be observed in some of our most research-minded industries, such as chemicals and petroleum. In some of the newer industries, however, such as electronics and aircraft, the reverse is true.

Another way of looking at the growth of industrial research is by comparing it with changes in production activities. Although there was a continuing and rapid growth of laboratory personnel in relation to production workers, the rate of this growth was somewhat slower in the 1940s than in the preceding decade. The ratio of laboratory personnel per 10,000 production workers engaged in the chemical industries, for instance, grew by about 12 per cent per year in the 1930s and by only 9 per cent in the 1940s. In the petroleum industry the rate of growth was 50 and 30 per cent, respectively.

Not only was the rate of increase in total laboratory personnel slackening during the forties as compared with the thirties, but the composition of laboratory staffs changed. Perhaps it was indicative of better organization of research work and more efficient utilization of scientists that, in 1950, professional researchers represented a smaller proportion of total staffs than a decade earlier. Percentagewise the employment of chemists, physicists, and metallurgists declined, whereas that of engineers increased substantially. In addition to shortages of certain types of researchers during the war boom, a change in emphasis seems to have taken place—from the more fundamental work of the thirties to the more practical engineering developments during the war and postwar years.

From these trends it would appear that our industries have been drawing from the reservoir of previously accumulated knowledge at a faster rate than they have been replenishing, much less augmenting, it by means of new and more fundamental investigations. Therefore, if these trends are diagnostic of the general health of our industry-supported science, there is cause for concern.

When a business executive finds that the rate of growth in his sales is slowing down, he becomes quite concerned and looks for remedies. So it should be with science.

When, in an important segment of our economy, the growth of research staffs suffers deceleration, and the withdrawals from the fund of accumulated knowledge become greater than the deposits, it would seem wise to expand the training programs and speed up the tempo in developing new researchers. Surely this cannot be done by skimping on funds for the National Science Foundation, as the Congress has recently done.

GEORGE PERAZICH

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