

CONTINUITY AND CHANGE

Prepared by K.R. Bopp as a rough draft of a speech for T. B. McCabe to deliver at commencement exercises on 5/22/50 at Dover, Del.

A. Graduation - A Time of Stock Taking

Graduation is an appropriate time to pause and survey the road over which we have come and the direction in which we should move from here. In a democracy, it is particularly appropriate that we consider not only ourselves as individuals but also as a part of society. The development of our society can conveniently be divided into material and spiritual forces. I propose, therefore, to analyze the implications for us today of developments in these two areas during the first half of the century.

B. Material Expectations and Achievements

To those of us who have lived through this half century, or at least the greater part of it, and have gradually absorbed its increasing material offerings into our everyday living, the nature of the advance that has been made since 1900 is seldom noticed as the spectacular thing it really has been. If one could stand apart from his times, however, and compare this period with others of equal length - in the United States or elsewhere - achievements in the production of goods and services would quickly be seen as quite unique in the world's history. The economic environment in which business and banking has been carried on has been one of great technological change and unprecedented physical expansion.

Furthermore, the magnitude of this expansion was wholly unexpected. Henry L. Ellsworth, Commissioner of Patents, expressed the expectations in this field a century ago (report to Congress of January 31, 1844) in these words: "The advancement of the arts, from year to year, taxes our credulity and seems to presage the arrival of that period when human improvement must end."

While the fact of material progress is obvious, its precise measurement over long periods of time is impossible. The most important changes in our productive plant have not been those which merely permitted us to do things faster and bigger and in larger quantity, but those which have given us entirely new things and have changed standards and modes of living. Material progress, in other words, has been qualitative as well as quantitative. It would seem to be relatively easy to measure gains in the production and consumption of basic commodities such as wheat or coal. Yet the bare statistics, while significant for those particular goods, are hardly meaningful for broader considerations such as ascertainment of a general rate of progress without a great deal of subjective modification. In the case of wheat, for instance, the ability to transport and preserve fresh fruits and vegetables have changed habits of diet, and wheat plays a different and, perhaps, a smaller role. Petroleum and gas have altered the dominant position of coal as an industrial fuel, and what has happened in coal over the last fifty years is, therefore, not a true reflection of general industrial development. For many very important goods - radio and electronic equipment, for instance - the record would be nonexistent for 1900 and might not begin until a very few years ago.

In one attempt at a rough over-all measure, Professor Simon Kuznets has estimated that the value of net national product (adjusted for changes in the price level) increased by over 140 per cent from the decade 1894-1903 to the decade ending in 1938. Since that time, other figures indicate the possibility of a further increase of roughly 50 per cent.

It is at once clear that even if such statistics could be comprehensive and could be adjusted in such a way as to take account of new products and services and a changing mode of life, they would be incomplete and inconclusive

as a measure of material progress unless we also took into account the number of people participating in the production process and the number dividing up the product. For, ultimately, our progress must be appraised in terms of what it has meant for the individual consumer. Minimum support of a growing population is, in itself, something of an achievement for an economy, even if the individual producer barely makes enough for the subsistence of his family. Such a situation prevails in some parts of the world, though total output there may be increasing. This was so far from being the case in the United States during the first half of the twentieth century that to Americans the social attitudes, institutions, and living conditions of a subsistence economy seemed to exist only in a world of unreality along with Tarzan stories and South Sea Island technicolor movies. In the United States, the natural course of events, interrupted for a relatively brief though shocking period during the Great Depression of the 'thirties, seemed to be ever-increasing worker productivity and ever-increasing per capita consumption.

The population of the United States has doubled since 1900. This was the result of a large natural rate of increase and, in the early years of the century, a high rate of immigration. In the decade ending in 1910, for instance, more than half of the increase in population was due directly to a record influx of immigrants seeking new homes in a new, free land. Immigration almost stopped in the 'thirties, but not before it had had a profound effect on rapidly expanding American industry.

As population grew and industry developed, the United States became a predominantly urban civilization. In 1900 most Americans lived in the country. By 1920 this was no longer the case. In 1950 nearly 60 per cent of our population lives in cities and towns, and most of these people live within the crowded "metropolitan areas" adjacent to a comparatively few large cities.

Population in the Third Federal Reserve District, as in many of the older population centers of the East, was already urbanized in 1900. In such areas, population has become even more concentrated, though it has not grown so rapidly as in those parts of the country which were less fully developed.

Family units of 1950 are smaller than those of a generation or two ago and, although marriage and birth rates jumped considerably during the war and post-war years of the 1940's, the trend in the rate of population growth during the entire half century has been slightly downward. These facts have important implications for the future, but they should not obscure the dominant population trend of the past fifty years - that of continuous and, for most periods, rapid growth. That growth has been of such nature that it, too, has made for qualitative changes in our economy in addition to mere changes of degree. The difference between the population of 1900 and 1950 does not consist solely in a change of generations or in varying national origins. It is more important that large concentrations of people make for a type of living and for productive capacities that are different from those possible for small groups and a small work-force.

The labor force - that portion of the population available for gainful employment - has increased along with population. Young people and old people are now a smaller proportion of the working population than formerly, but between 1900 and the present time the percentage of women who work outside their own homes has grown. As the trend toward urban living implies, the proportion of the labor force engaged in agriculture, forestry, and fishing has declined drastically - from nearly 40 per cent at the turn of the century to well under 20 per cent now. Manufacturing has increased its share of the labor force somewhat as we have come to depend more and more on mechanical devices

for both production and everyday living, and this is now the largest single group. Transportation, communication, and trade employment, as well as professional services, have become increasingly important. But perhaps the most significant commentary on the change that has taken place in the nature of production and on the growing complexity of our mode of life in these United States during the last fifty years has been the expanding proportion of labor in clerical occupations. Only 2.5 per cent of the labor force was in this category in 1900. Today, perhaps as many as 10 per cent - 6 million workers - help keep the economy's accounts and records.

The increase in the number of people at work has been much greater than that in total working time. In 1900, the ten-hour day, six-day week was standard. Today the average work-week is not much over 40 hours, even if the longer work-week of agriculture is taken into account. A Twentieth Century Fund survey estimates, in fact, that although the rate of production had climbed by 80 per cent between 1910 and 1940 the total man-hours worked hardly ever exceeded that of the former year except for war years. This is simply another way of saying that the productivity of the American worker has been greatly increased. The introduction of new processes and massive investment in plant and machinery - on the farm and in offices as well as in mines and factories, the technique of mass production, scientific management, and work rationalization, all developed in this half century - have made it possible for us to work much less and produce much more.

Increases in output per man-hour and per worker varied considerably among industries and trades, with the greatest gains being made in manufacturing and smaller ones in construction and "white collar" trades. On the average, it is estimated, output per man-hour has been increasing at a rate of slightly

under 2 per cent a year. Actually, the rate has not been steady. The introduction of new techniques has made for periods of accelerated improvement, and progress sometimes has been interrupted by war and adverse economic conditions. But confidence in our physical ability continually to produce more, more efficiently, for more people has never waned. The record of production in the United States during the first half of the twentieth century continued to heap scorn upon the gloomy Malthusian prophecy of a century before.

The basic implication of this phenomenal material achievement for us today is clear. As individuals we must develop flexibility and the capacity to adjust rapidly to further material changes. Revolutionary changes may be expected even in those areas which, relatively have scarcely been touched. Let me cite a specific illustration. Within the last year a national magazine pictured on its cover an artist's conception of the automatic digital computer, an electronic calculating machine of the greatest complexity, that solves mathematical problems and their physical counterparts heretofore considered insoluble. Such a machine contains hundreds, perhaps thousands, of vacuum tubes, each of which operates hundreds of thousands of times a second in its work as a computing unit. Numerical data and operational orders are put into the machine by means of a kind of teletypewriter. The machine stores this information in its "memory", consisting of mercury tubes or magnetic tape. Once started, the machine recalls the numbers assembled in its memory, in the sequence demanded by the orders its operators have given it. It puts the results of intermediate calculations back into its memory for future use. It can make simple comparisons of numbers and undertake alternate courses of action depending upon the results. When the computation is finished, the machine types the answer and its human operators reel it off the ticker-tape. A half-century

ago this was the stuff of which fantastic adventure stories were made; even today it seems a little unreal to most of us - unreal and somewhat frightening.

C. Spiritual Expectations and Achievements

The story is quite different if we move from the material to the spiritual realm. As Professor Robert Warren of the Institute for Advanced Study has written: "The nineteenth century was an age of faith. It believed in its ideas, it believed in its institutions, it believed in itself. Because it was an age of faith, it was an age of miracles. Because it was an age of miracles, it was an age of pride - pride in its actual achievements and in its ultimate powers. ... In retrospect, at least, the literature of the early years of the current century gives an impression not so much of complacency as of fulfillment, of ultimate or penultimate realization, of arrival at or just outside a desired haven." You may recall that there was no air of sadness but only one of fulfillment in the quotation I read you from the 1844 report of the Commissioner of Patents.

In contrast, the perfection of that incredible instrument - the atomic bomb - did not strike the people of the world primarily with admiration for the achievement but with fear of the implications. The razing of Hiroshima with a single atomic bomb highlighted the urgent necessity of preventing the mastery of our physical world from leading to our destruction. People in all walks of life suddenly realized that the fundamental issue arises not from the recalcitrance of nature but from man's inhumanity to man. To many this came with the shock of a new idea, but it should not have surprised anyone who actually has read his Bible. Persons of profound insight, such as poets and philosophers - whether by reason of intuition or intellect - have been

emphasizing it for centuries.

The calm assurance with which the nineteenth century faced the future has given way to alternating personal moods of unreasoning hope and equally unreasoning despair.

The atomic bomb is but one illustration of the fact that improvement in human relationships is our most urgent problem. Hitler's seizure of power in Germany is another. Why did this happen in a country whose educational system had long been considered one of the best - if not the very best - in the world. The educational failure evidently was not in technical training. The seeds of decay were sown when Germans - especially the teachers - began to believe and act on what they read into Nietzsche's Zarathustra and Beyond Good and Evil. Once a people devote themselves to more efficiency in achieving goals without reference to choosing among goals on the basis of moral values, such as justice and dignity of the individual, they are lost - easy dupes of demagogues.

D. Conclusions

My conclusions are not at all novel. I am not sure I have presented them convincingly. It may be that conviction comes only with direct personal, not merely vicarious, experience. I must confess that the conclusions mean more to me and I hold them more firmly today than twenty years ago. In part they are negative. We cannot trust as guides on society's great adventure either those who would have us play the fringes rather than wrestle with the real meaning and significance of life or those who would have us sacrifice individual liberty and freedom of mind and conscience.

I cannot express the positive conclusions better than by quoting from Goethe's Faust. The first quotation is from the very first scenes

"What you have inherited from your forebears,
You must earn in order to make it your own." (lines 682-683)

The second is among Faust's very last words. Faust calls it "the last conclusion of wisdom":

"Only he deserves freedom - as indeed life -
Who daily must achieve it anew." (lines 11,575-11,576)

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