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Productivity in the Tertiary Sector

by

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PRODUCTIVITY IN THE TERTIARY SECTOR

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The research done at the National Bureau, and indeed the work done in any institution, is influenced by the work going on elsewhere, not only in the United States, but also in other countries. To give but one example of this, I count myself most fortunate to have read the first unpublished version of Mr. Denison's book on the sources of economic growth when I was on the Research Advisory Board of another organization in the U.S.A., the Committee for Economic Development. Thus we learn from one another. Hence my discussion will be broader than simply dealing with the work done within the Bureau.

Mr. Denison has already demonstrated the need for meticulous care in making studies of productivity, the need for full attention to detail, if we are to avoid overestimating or underestimating the magnitudes that we are concerned with and the changes we want to influence. So I shall try to talk about more general questions.

Let me begin by noting—with approval!—the closer attention, now being given, as in this meeting, to the service industries and to the need to increase their productivity. Not so long ago, to talk about raising productivity brought to mind mainly the manufacturing industries. The developing economies were often led to neglect their major industry, which is agriculture. And the developed economies tended to neglect their service industries. We are beginning to appreciate that manufacturing in the U.S.A., for example, employs only about 25 percent of the labor force and that many other industries are too important to be neglected.

The service industries in particular have been growing rapidly; they are now very large. To continue with the example of the U.S.A., well over half its labor force—60 percent—is currently employed in the service industries, even excluding some marginal industries and occupations—such as communication and

Note: This paper is based on a talk on productivity in the service and other so-called “tertiary” industries, made with particular reference to the research on the subject carried on at the National Bureau of Economic Research. The talk was given at a session of the Managing Board of the European Association of National Productivity Centres, held on the occasion of the Association's Fifth Anniversary in Balatonfüred, Hungary, in September 1971. Others on the program of the session, to whom references are made in the talk, included E. F. Denison, Brookings Institution, Washington, D. C.; I. L. Manievitich, Economic Research Institute of the Academy of Sciences of the U.S.S.R., Moscow; and Z. Roman and associates, Institute of Industrial Economics of the Hungarian Academy of Sciences, Budapest.

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transportation—that might be included. Further, in the U.S.A. as elsewhere, the recent discussion of inflation has helped to draw attention to productivity in the service industries. Much has been made of the fact that the most rapidly rising prices in the U.S.A. are those of the service-type commodities. The inflation problem has also served, I may add, to focus attention on productivity at large. It is being widely recognized that the underlying source of higher real income is productivity, and incomes policies are grounded, first of all, on that vital fact.

The Growth of the Service Industries

It was years ago that the United States became what we now call a “service economy.” When I reviewed the production, employment and productivity work of the National Bureau, over a quarter-century ago, I was able to point to Kuznets’ estimates that in the interwar period the service industries were already beginning to account for around half the national income, and to employ almost half the labor force. This is why the National Bureau thought it worthwhile, at that time, to concentrate some of its efforts on these industries. Book-length studies, as well as briefer analyses, were made of employment and productivity in government, in retail and wholesale trade, in education, and in various other service industries. All these were published in the 1950’s. Most recently, Victor Fuchs’ book for the National Bureau, which came out in 1968, noted the continued growth, relative as well as absolute, of the service industries, added a good deal of other information to that provided by the earlier studies, and served to popularize the term, “service economy.”

Why has employment in the service industries grown? Specifically is it the result of an increase in the demand for the services rendered by the service industries? I think it is clear that this is indeed a factor. I judge this not only from historical data but from what economists call cross-sectional data, which are comparisons among different income

groups or countries at a particular point of time: as incomes rise, people want more of certain types of commodities. These include not only automobiles, but services associated with automobiles. People want more educational services, more health services. A striking result of the rise in the demands for these and other services, important in the United States and in other countries as well, has been the growth of government, as the National Bureau’s studies have shown. Government is not merely, in Adam Smith’s terms, the policeman, the soldier and the justice, it is also an important producer of other services, and not only by way of regulating the private part of the economy. A large part of the U. S. educational system, for example, and our health system—hospitals in particular—have for a long time been operated by the government, and government’s role in these industries has been increasing rapidly in recent years. The rise in employment in these and other governmental activities is the result of an increase in the demand for educational, health, and urban services.

What else? Has a relatively small rise in productivity in the service industries also helped to swell the ranks of workers in these industries? It is clear, if we start from the usual measure of output, that productivity in the service industries has not, on the average, risen as rapidly as productivity in the other sectors of the economy. The figures provided, for example, in John Kendrick’s book on productivity trends in the United States, give one the clear impression that output per manhour, or output per weighted manhour (taking account of the quality of labor), or output per unit of labor and capital combined (“total factor productivity”) has not risen as rapidly in such industries as trade, banking, health and government, as they have done elsewhere. But to what extent is this a result of the fact that we are not measuring output as accurately as we would like? And not only output, but also input? In fact, is not the apparent failure of productivity in the service industries to grow as rapidly as in other industries merely

or largely a fault of our measurement?

Of particular concern, in this connection, is the matter of change in quality of product. Mr. Denison has already stressed the fact that it is very difficult to measure improvements, or worsening for that matter, in the quality of output. There is no doubt that difficulties exist. But we do measure some quality changes now, as the National Bureau's report on the U. S. price statistics has indicated. Nor do I believe it is, or will always be, impossible to measure other quality changes. Nothing is impossible: many of the quality changes thought of in purely qualitative terms not many years ago—for instance, color—have since become quantified.

Whatever the outcome of work in progress by Griliches and others on this problem of measurement, failure to cover quality change adequately is particularly troublesome for assessing the service industries and for understanding the growth of their output and productivity. No one can confidently estimate what quality adjustment would do to the figures. Yet I find it difficult to believe that the output of the health industries, for example, can be adequately measured by such simple quantities as the number of hospital beds occupied, or the number of hours that doctors give us. There has been much discussion in the United States of the fact that we have a doctors' shortage, that when you see a doctor he can give you only ten minutes and a shot of penicillin. But the shot of penicillin is the important thing, and what has happened of course is that the physician's productivity has improved enormously, so that if we measure his output by the number of hours he spends or by the number of visits, we are seriously understating the output of the medical industries. What I am saying is that in some service industries, at least, productivity *has* advanced rapidly—probably more rapidly than in the economy at large.

There are similar biases, upward or downward, in other service industries. Let me use trade as an example. One of the major developments that has occurred in the United

States and spread to many other countries, is the development of the supermarket, a retail food store of large size in which the customer goes to the shelves and picks out what he wants to buy. In this way the customer is contributing his labor, and this surely entails some revision of our concept and measurement of input. The rise in productivity in trade may, to that extent, be overstated. In any case, we cannot understand what is happening in the supermarkets or why they have displaced the small retail store (except where they are protected by governmental regulation) to the extent that they have, unless we take such things into account. The customer may also be getting some additional output out of his participation. There is a certain amount of pleasure that women—and men too—get in going around and looking over the display of goods, picking out what is most attractive, and not having to wait in the queue for the clerk. On the other hand, the customer may be getting less service in the way of credit or delivery. An interesting study on all this was made for the National Bureau by David Schwartzman some years ago. His paper appears in one of our *Studies in Income and Wealth*.

It may be asked how the statements I have made, that productivity in some of the service industries may have been rising much more rapidly than the measured figures suggest, can be reconciled with the rise of prices in the service industries. There are at least two possible replies. First, the measured prices, as well as the measured outputs, are incorrect. That is, the price reflects not only relative real cost but also quality. It is quite possible for an industry to show a high rate of productivity increase *and* a rising price, even in the long run, if the improvement in quality—not allowed for in the measurement of either price or productivity—is great enough. Second, the supply situation may prevent the quick movement of factors of production into the industry in response to a rapid increase in demand. That is, the paradox may be a short-term phenomenon. An example of

an industry in which a spurt of price might have arisen because of an unusually rapid increase of demand is provided by the governmentally supported health services in the United States, which I have already mentioned. The expansion of government support, as well as the spread of Blue Cross and other prepaid medical care programs, have led to a big demand for hospitals, doctors, etc., which could not be met in the short run without an increase in price. An increase in price does not necessarily mean a low rate of increase in productivity.

Heterogeneity of the Service Industries

The diversity of productivity trends in the service industries, to which I have just alluded, deserves some special attention.

Whatever doubts one may have about the measurements, it is clear that there is very considerable diversity in the rate of increase in output per man, per man-hour or any other way of measuring productivity in the service industries. A striking illustration of that is provided by what is often thought of as a single industry: the industry of hairdressing. Though hairdressing seems like a trivial sort of industry to study, the National Bureau did make such a study, precisely in order to get at the intra-industry diversity. There are in fact really two industries here: barber shops and "beauty parlors." The two have behaved quite differently. Employment in the barber shops, in the United States, has not grown as in beauty shops, nor has barber-shop productivity grown the way it has in the beauty shops. Of course, as we all know, even barbers use mechanical devices today. In fact, one can hardly find a barber in the United States today who uses the brush and bowl for getting up a lather. But the use of new equipment and new technology has advanced far more rapidly in beauty parlors, as the ladies can attest.

Whether you accept the figures as they are, then, or make adjustments for quality and what not, it is apparent that the service sector, viewed from the standpoint of productivity,

is a highly diverse group of industries. In many of them productivity has increased even more rapidly than in material producing industries, whereas in others it has increased very slowly.

Having mentioned capital, let me emphasize that one should not generalize too readily and say that the service industries are peculiarly industries in all of which the use of capital per worker is small or rising slowly. This would be wrong; it is true for some, but it is equally true for some non-service type industries. Keynes, for instance, believed that one of the doubts about the future of capitalism stemmed from the fact that, as capitalistic economies grow, demand grows also for the output of the service industries; that these industries tend to use very little capital per worker; and that this would tend to lead to a relative decline in the demand for capital. The consequences, in his view, posed a very serious danger of stagnation. I think that he was wrong on that, as events and studies since World War II have demonstrated.

Similarly, one should not generalize too readily about rates of technological change. One of the most rapidly growing industries in terms of technological change has been a service industry, computers, which turns out numbers rather than tangible goods. And this has helped push up rapidly the productivity in other service industries. For instance, the banking industry in the United States is becoming a book-keeping operation, in which the banks provide—at low cost—various book-keeping services to a widely dispersed population.

This brings me to raise a related question: does it make sense to talk about the service industries as if they constituted a homogeneous group; or to talk, as we often do, about the primary, secondary and tertiary sectors? This classification may have been useful at an early stage of our knowledge, when A.G.B. Fisher and Colin Clark first emphasized the differences among these industries. But at this stage of our knowledge it seems more sensible to think, not of primary, secondary, and terti-

ary industries, but rather of industries in which productivity has apparently not risen rapidly, and to distinguish these from industries in which productivity has risen rapidly. And then to ask ourselves, why the difference?

I think that this kind of a classification would be more useful than talking about the tertiary industry, with all its implications and connotations, and thus repeating the previously accepted notion that all these industries, by their very nature, are bound to show small technological change. This could be a serious mistake, as the story of agriculture—a “primary” industry—tells us. Farming has for centuries been thought of as an industry in which diminishing returns were bound to result in a decrease—or at most a very slight increase—in the rate of growth of output per manhour or per hectare. Relatively slow growth was in fact the experience in the United States—but only until the mid-1930’s. Since then U. S. agriculture’s productivity, measured in almost any way, has increased far more rapidly than in the rest of the economy. I think that this tendency to make forecasts based on implicit (or explicit) assumptions of doubtful character, to be misled by the connotations of our terminology and by fixed ideas, could lead to serious misjudgments of what may happen in the future.

My suggestion that the classification according to primary, secondary and tertiary industries be replaced by one based on the degree of productivity change can be carried a bit further, of course, and should be. Another useful type of classification could be income-elasticity of demand. Indeed, I would suggest crossing these classifications.

Potential for Increasing Productivity in the Service Industries

Whether or not we take the level or rate of growth of productivity in the service industries to be understated, on the average, I believe there are great potentialities for improvement, or for further and more rapid improvement. I have already noted the appli-

cation, in some service industries, of larger amounts and newer types of capital equipment and of new technologies. I see no reason to doubt the possibility, sooner or later, of their application in other service industries.

Some of the confusion on this question arises because of the difficulties, already referred to, of measuring output and productivity in service industries. How, it is sometimes asked, can productivity in government-type operations, for example, be improved if we cannot measure government output—as if measurement were absolutely necessary in order to improve efficiency? In fact, of course, while difficult, measurement is not altogether impossible in many types of government operations. For instance, in the Post Office and Treasury estimates of productivity have been made; these appear in a recent government study published by the U. S. Bureau of the Budget. The output of the postal system is measured in terms of letters carried, packages delivered, etc., and that of the Treasury, by checks written, for example. The problem of measurement, in these cases, is quite a standard one, with the only difficulty simply that of getting the information.

For other industries operated by government—the courts and the military, for instance—it is indeed very difficult to think in terms of an acceptable measure of output and productivity. But, and this is my answer to the question posed, while it is very helpful to be able to measure productivity, we need not limit ourselves to the industries or operations where measurements can be made, as I tried to indicate in my study of government activity. Useful ideas can be gained on what is impeding efficiency by careful study of the way in which the activity is carried out. While there is no measure in the United States of how our courts operate, except in terms of number of trials, convictions, etc., which are very imperfect measures, much can be learned by studying court procedures, observing the causes of delays, and comparing our courts with courts in other places.

Even in the case of the military, sensible

questions can be raised: how well, for example, does the military test the instruments which it buys and uses? There must be, I am sure, manuals in every army in the world that are handed to soldiers who operate various kinds of equipment. These manuals say that the chance of hitting a target at a certain distance falls within a certain range, given the type of gun, bullet, etc. How good are these estimates? If they are based on assumptions, they may be worth very little, in which case the efficiency of firing is going to be lower than it would otherwise be. Was a proper statistical test made, taking advantage of our knowledge of sampling? Were conditions under which tests were made carefully controlled? Was the trade-off between increased accuracy and increased cost properly calculated and taken into account? It is possible to use such approaches and tests to come up with some notion of what is impeding improvement in the productivity of any industry or activity, and how best to remove or overcome these impediments.

Certainly, we should not assume without further investigation that there is something about the service industries that precludes economies of one sort or another. Limitations on scale in the service industries, and thus on economies of scale, have been pointed to by some people. There may be severe limitations—but I rather doubt it. I believe that technological change and improvements in the control of organizations have made large changes possible, in many industries, to a scale level far above the efficient scale of earlier years. This is illustrated, to turn back to the manufacturing sector, by the automobile industry. When Alfred P. Sloan was President of General Motors in the 1920's, he spent a great deal of time on the "Twentieth Century Limited" (train) riding between New York and Detroit, and on shipboard crossing the Atlantic, as can be seen from the pictures published in his autobiography. Today, a General Motors' executive does not have to spend all that time in slow travel. If it were necessary, General Motors could not be as

large as it now is. The executive today can travel farther and more often, in order to oversee the operations of his company, yet spend less time on it. In other respects, also, the massive scale of General Motors' operations is now possible because of technological developments not available in 1920. No one could get information on its far flung operations quickly at that time. General Motors, and Henry Ford also, almost went bankrupt in 1920, when prices collapsed, because they had inadequate and very slow information on their inventories. Today, any morning, executives can get a computer print-out in any detail they want on the stock situation right up to the close of business the preceding day.

I see no reason why such scale changes would not be possible also in the service industries. In the case of medicine one can already see that the old days of the one-doctor office is no longer the only possible or always the most sensible situation. Even the average doctor now has a nurse, perhaps a clinical assistant, and all kinds of technological aids. Clinics, such as the Mayo Clinic, can now be of large size. I see no absolute limit on scale in services, except perhaps that concerned with harems!

Technological change has also served to maintain and keep viable small-scale industry by increases in its productivity. The computer has come as a tremendous aid, for instance, in economic research. Some years ago, during a meeting I attended, it was said that small provincial universities were severely handicapped because they could not afford the cost of a computer. This problem is now being solved through the use of terminals, available at a modest charge; the National Bureau is working on this problem also.

So, to return to the main point, I see significant potential for raising productivity in the now so-important service industries. Using these potentialities would mean that the goods and services which are demanded by society could be increased.

The Problem of Incentives

If we are to come to grips with the prob-

lem of increasing productivity in the service industries, we must take account of their peculiar structure and organization. For instance, in the United States the service industries are to a disproportionate degree industries run by non-profit organizations in the private sector, and by government. And, as I have said, government, and also other non-profit organizations, are already large and growing still larger as a fraction of the economy. This raises questions about improvements in their modes of operation, particularly with regard to incentives to raise productivity. Professor Manievtch pointed to this kind of question when he talked about moral and material incentives.

In mentioning moral incentives, I am reminded of a story—by Mark Twain, I believe—in which a society was imagined in which the reward was not dollars, but medals, or honorary degrees, or the number of votes one got to cast in elections. Moral incentives are indeed important, but hardly sufficient. It seems clear from the knowledge that we have gained from the study of both market and centrally planned economies that both material and moral incentives are necessary. In the service industries in particular there is a serious problem of incentives, for the reasons I have mentioned. How and what to do to develop a proper set of incentives?

Take the example of hospitals in the United States, which have increased their costs per patient treated enormously. One reason for this is simply that the quality of their services has been raised. Doctors and hospital boards talk of lives as priceless; they tend to ignore costs. A second reason is that the hospitals are too often reimbursed even when they are inefficient in doing what everyone would agree makes economic sense. In the United States, if not also elsewhere, this is a fault of the method by which the insurance companies reimburse the hospitals. There is no adequate system of incentives, except in a few areas, for hospital managements to keep costs down. There is no “profit” in curbing their desire to do their “best” for their sick patients. In many

cases, this has meant that hospitals have tended to improve the quality of their services beyond the optimal point. Doing too much good, giving too good a service, means that the other things which could be done are reduced in number or cut out entirely. Some of the studies at the National Bureau and elsewhere are dealing with such matters.

A similar problem arises in reorganizing the system of incentives in government. Recently, in the City of New York, serious fiscal problems have been caused by the demand of the police, the firemen, the garbage collectors, and others, for higher wages. In the bargaining—which is now going on—efforts are being made to get from the workers some relaxation of rules governing the amount, the kind and the quality of the work they perform. There is talk, for example, of shifting more of the highway paving or repaving to night-time hours (which would save the time of the traveling public as well as of the highway department); of closer monitoring the efforts of inspectors by computer; of turning over work to private contractors; of raising government work or productivity standards to private industry standards (as in vehicle repair work), particularly in situations where the government workers are paid wages at rates prevailing in private industry.

Incentives are affected also by legislation and regulation, and these might be improved. Reference was made above to the displacement of the small stores by the supermarkets; but in some countries there are regulations inhibiting this sort of shift. For instance, there still is in the United States the so-called “Anti-Chain Store Legislation,” and other regulations which try to protect the small store at the expense of the economy at large. Overcoming these barriers to increased productivity is a problem to be solved if the potential for raising productivity is to be realized.

When I say that there is potential to be realized, I do not mean to say that it is possible to plan an increase in productivity in any very detailed form. As every economist knows, one of the difficulties of making long-term

projections arises because the labor and capital requirements of the different industries change, for the ratio of capital or labor to output is affected by technological advance. But there is a very large random factor in technological change, which cannot be determined in advance. One can plan technological change in the large, but in detail one does not know where the pay-off will be, as Mr. Denison mentioned before. We cannot be sure that in each and every industry there will be a pay-off, but we can be pretty sure that on the average there will be one.

Concluding Remarks

I should like to conclude with a few brief remarks on points that, although interesting and important, time does not permit me to develop.

First, as I have already mentioned, the problem of inflation has stimulated interest in raising productivity in the service and other industries, in which price rises have been above average. More generally, the inflation problem has helped educate the public to the relationship between productivity and real income. It was in this context that the National Productivity Commission was set up in the United States in mid-1970 and expanded in August of this year. Though still an embryonic organization, the Commission has been giving thought to a possible pronouncement on U. S. national policy in an Act of Congress that would state it to be an objective of national policy to raise productivity. Productivity would thus be put on a more equal standing, in the Employment Act of 1946, with full employment. Senator Javits has offered, in the U. S. Senate, a number of bills which would set up a much enlarged and improved productivity commission. Along this line, in the most recent statement by the Joint Economic Committee (of the House or Representatives and the Senate) on the President's Economic Report, the minority position placed emphasis on the declaration of policy on productivity as a major source of economic growth, and proposed the establishment not

only of a permanent national productivity commission, but also of local productivity councils which would provide an additional useful means of acquiring and disseminating relevant information and generally educating the public. In this way, we would approximate the concept of productivity centers as they appear in many European countries. Not that the United States has neglected the problem; for instance, the Department of Agriculture has had a sort of productivity agency in it for a century, but the idea has not spread across the board.

Second, I want to stress that we cannot fully understand the developments in the service industries unless we recognize that they are part of a system, that they must be viewed in the context of the whole economy. And indeed we cannot understand what happens even in the whole economy except in the context of the entire social system. We are learning that a broad view is needed. It must be broad in many ways. Labor input, especially in the service industries, includes not only the work done by paid workers, but also what comes from the family economy, as I have tried to illustrate. It is for this reason that more attention in the research of the National Bureau is being paid to the contribution of students in the educational process, to give another example. Further, what happens in the service industries is greatly influenced by developments in the non-service industries; these supply the service industries with better equipment, improved materials, and newer technology; and directly or indirectly they provide the service industries with growing markets. Productivity in the tertiary sector is a function, in mathematical parlance, of changes outside as well as inside the sector. In turn, productivity in the primary and secondary sectors is affected by developments in the tertiary sector.

The implications of the broader view are far-ranging. Consider, for example, the implications of viewing the housewife as a member of the labor force and the work she does in shopping as truly "work." Those countries

which try to keep productivity in trade high, for example, by being stingy about the number of workers employed in trade, may make serious errors by neglecting the inter-relations among industries. They will fail to see that, by trying to raise productivity in trade, they thereby impose an undue burden of time and energy on the shoppers, and lower productivity in the material-producing industries.

Mr. Denison referred earlier to another important interrelationship: between education and research and development. He referred to the receptivity of educated people to new ideas, methods and products. The interrelations are manifold. One of the studies at the National Bureau relates to the relation between education and health: educated people are able to decide more promptly when they need to go to a doctor; they are able to tell the doctor more precisely what the trouble is; they are able to understand his directions; and they are thus able, to a degree, to profit also in this way from their education. Education leads also to a better knowledge of what goods and services are worth, what jobs are available, etc. And this is obviously related to the emphasis that economists in recent years have begun to place on knowledge as a factor of production and productivity.

We must take the broad view in thinking also about international relations. One of the interesting books recently published by the National Bureau gives the proceedings of a conference on the transmission of technology across national borders. And under way is a large-scale study by the National Bureau, in cooperation with other research bureaus abroad, on technological change in different countries and industries. The study will, I expect, help to demonstrate that productivity in every country is influenced by developments abroad—it is no accident that the rise of productivity is the worldwide phenomenon described by Mr. Denison—and demonstrate also, as I think the present conference does, the benefits of international cooperation and exchange of ideas.

Third, if I am right in being optimistic

about the potential of productivity in the service industries, its release will save much labor. This will not, however, mean that labor must or will become redundant. It is true that one can make projections that suggest the appearance of labor redundancy if productivity, in the service (or the non-service) industries, should rise more rapidly than in the past. But I am optimistic about this outcome also. For projections are not forecasts; they are calculations designed to indicate possible problems. They are essentially statements of the following sorts: *if* productivity in the service industries should rise at this higher rate than in the past, and *if* demand for more goods and services should, in the economy at large, not rise sufficiently, then there would be some redundancy in labor. But the projection is a purely hypothetical statement. I would say that the economic system of the sort that operates in the western world tends to function in a way that sops up labor when productivity in particular industries or in the economy at large rises at a more rapid rate than in the past. It does not necessarily follow that a serious problem of unemployment results. There will, of course, be a problem of labor shift requiring retraining and the like; but it need not lead to sustained unemployment. It may mean, simply, more goods and services, or more leisure, or more of both. I expect the demand for goods and services will rise more rapidly than the demand for leisure, as productivity accelerates. It is one of the functions of the projections to which I am referring to pose problems of adjustment and suggest the advisability of plans for dealing with them.

Finally, let me conclude with a word of thanks. The task of raising productivity is important; it is also very difficult. It seems to me that meetings between peoples from different backgrounds are extremely stimulating, and helpful in understanding and carrying out this task. I greatly appreciate having had the opportunity of meeting so many persons engaged in this enterprise, people with whom I do not generally have contacts. I wish you well in your work.

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