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WORK AND HUMAN SATISFACTION

M. JACK MURDOCK



A speech presented at a
1966 Portland Chamber of Commerce seminar

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Cover Photo: Jack Murdock receiving honorary degree from
University of Portland.

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Introduction: Mr. Jack Murdock, Chairman of the Board and one of the founders of Tektronix Corporation. Tektronix, I think, is fondly thought of by those of us who have the privilege of living in the Northwest as one of our own. It certainly stands preeminently in the field of its product and the field of the oscilloscope and I think the story of Tektronix must include a story of one of deep understanding of human relationships within a corporate business enterprise. Jack Murdock. (Applause)

Jack Murdock: Well Mr. Chairman, ladies and gentlemen, thank you for that very nice introduction. I have my doubts though after hearing the last speaker; the standards you set are pretty high. I don't know whether I will be able to tell a story as well as he will or not — as he would or not. However, I do have copious notes here and I hope that I don't get too tangled up in getting the basic message across. I'll be speaking to you really as a very, very lay person today on a subject that I consider extremely interesting, challenging, but complicated.

About twenty-three centuries ago, a gentleman named Aristotle made the prediction that when the shuttle weaves by itself and the lyre plays by itself and loaves of bread come forth from the oven completely untouched by human hands, human slavery will end. Today's technology would make us think that his prediction has arrived several years ago. However, the fact that you are all here and I am here today to speak, I believe primarily on the effect of automation on individuals and society, might indicate that the simple removal of work from human activity is not the complete answer to our long time dream.

Since man is composed of both mind and body, he needs two kinds of tools, as I see it, to get his work done. One for mental expansion and one to do his physical or mechanical work. I suppose a pair of pliers would illustrate the simplest kind of mechanical extension of the hand — it enables you to do many things you couldn't do otherwise. Things like boats, automobiles, airplanes and so forth are extensions of the physical body's mobility that it could not accomplish by itself. But the machine age hasn't really helped too much in the solution of man's very basic desire for real satisfaction from work.

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Some people wonder if man should work at all, because we can now imagine that machines can do both the mental and the physical work of our society. This has been put forth by various people for various times—I know you have all heard this—however, I for one doubt very much that machines will completely replace human beings for a couple of reasons.

First, with regard to the so-called surplus of human talent, I wonder how many in this room have tried to get a few simple things done around the house—like housework or yard work or even tried to get some of our modern mechanical or electronic gadgets in the house repaired. If you can get it done at all, it is only with much frustration and delay, if at all. So there are still a lot of things to be done. It seems that job opportunities, the standard of living, creative challenges for human beings, all increase with mechanization—simply because we are never satisfied.

My second doubt about machines replacing us is based on the basic nature of man himself, and I am getting into an area now probably over my head after the last speaker. He knows much more about this than me. But as a lay person—some of you know I have served on the Board of the Menninger Foundation in Topeka, Kansas for the last eight or nine years—and I hear a few of the pros talk about some of these things from time to time. At Menninger's, much research has taken place, as it has across the country, regarding the nature of man, his personality, what helps him develop into constructive, effective activities, and what things keep him from doing constructive things.

First, humans seem to be gregarious animals, simply by observation. If you look at the importance of the family unit, the many group activities we all participate in, in the fact that most of us do not do very well if we are completely isolated for very long. So if you get down to some of the basic things, there are four general areas that Menningers have talked about several times, and the first and most important one here today is work. And, I am using the word work to denote any kind of constructive human activity for which someone else is willing to pay.

Work still appears to be one of the best avenues for human beings to build ego, strength, relate meaningfully to

others and to derive real satisfaction from work or from their personal efforts. Perhaps we should mention a few other Menninger observations while I am on this subject because I think they tie into automation.

Another area that healthy people participate in is play. As you can see today, many more people are indulging in recreational activities, particularly the participative types, or the spectator type sports, simply because it is easier to do and it is more accessible.

Another area that's very basic to our good health is the pursuit of knowledge, which not only requires increased time, but increased availability of information. Looking ahead a few years, it seems quite possible to me to imagine that computer library centers might become available to most all of us simply through the telephone.

And, besides work, play and the pursuit of knowledge, the fourth area of human need is to create, and this has been referred to already and you will probably hear more about it before the day is over from other people. While there are infinite opportunities for creativity expression in the fields of music, art, improved design of housing, transportation, all kinds of tools and equipment, probably the greatest opportunity of all is in the field of figuring out how we humans can survive a little bit more constructively. Doctor Hershberg laid the groundwork for that very nicely.

Just to mention a few of our other more serious social problems, we are still plagued with war, crime, juvenile delinquency, divorces and many others, which indicates that at present, with our abundance of knowledge, we are not solving the problems very effectively. But maybe with the advent of cybernetics and automation, maybe we can begin to take more of a systems approach to some of these social problems. Separately, but no less important than what I have just mentioned, is our national safety problem. The other day I was in San Francisco and heard the President of the National Safety Foundation quote some figures like—during 1965 there were 107,000 Americans killed in all types of accidents; and about 10 million more were injured, and they estimate the total cost of these accidents in one year to be about \$18 billion, which is more than one-sixth of the national budget in 1965. Certainly,

this is going to take a very sophisticated and creative attack to solve social problems of this magnitude.

It is in the area of creativity, I think, where automation might well be a godsend to the human race. When Professor Hershberg started out, I thought maybe he was going to say all human problems are solved and there is really not much left to do, but as he went on I see there really is quite a complex problem and from my experience with technology and human problems, the human and social problems seem to be much more complicated, have many more variables than do any of our technical problems. And just to illustrate what I mean, each of us comes into this world with a significantly individual personality the very day we are born and they are significantly different that first day, and from then on each one begins to develop in his own separate individual direction. Is it any wonder that this large number of real individuals have difficulty working together and communicating with each other in a constructive manner. I think automation, in the broad sense, has the potential of enabling us to at least study the infinite numbers and variables in human behavior. But, the monster machine must indeed remain the servant of man and not his master. Well, so much for that, lets look at the record now on this automation thing we hear so much fear about.

Just two years ago, George Meany described automation as a real curse to this society with no elements of blessing in it. He commented that automation was the dominant cause behind the persistent and serious problem of hard-core unemployment in our society. But yet, on the other side of the question, we are presently in the midst of the tightest labor market ever to confront this nation, including World War II. Also, our employment rate is lower than it has been since 1944 in spite of the fact that this increasing technology has absorbed almost 13 million more people since that time. You might expect me to spend my time this morning denouncing some of the critics and provide you the volatile debate for entertainment purposes, but first, I am not a good debater and I think too much time has already gone by.

If, and let me repeat, if we are interested in achieving real progress in a free society, which I keep hearing most of us are concerned about, then effective automation properly under-

stood is really nothing more than increased productivity through technology. It can, has and will provide an opportunity to restructure many jobs so that the whole man may be challenged by a whole job. As for management, the use of the computer and the new systems approach to decision making is perhaps our most exciting possibility. To quote Fred Kappel of AT&T, "While magazine writers are worrying about how computers will do our thinking for us, I will take a different point of view here and say that their greatest impact, at least in the foreseeable future, will be in forcing us to think." In fact, my guess is that of all the tools mankind has ever had, this is the one that most peremptorily requires us to use our heads.

Now, of course, automation is a curse if we walk our vision to the past and try to solve the serious problems in manners which guarantee the preservation of outmoded institutions and techniques. Automation, on the other hand, is a blessing if we utilize the new technology effectively, while at the same time we examine what must be done in human terms to reap the benefits of our technical progress. ***Our primary task then is to unleash the creative forces in man rather than those of destruction and despair.*** I know that's a lot easier to talk about than it is to do.

The so-called hurricane of automation that some people claim is going on, would really have to show up in the record either as a rapid increase in net unemployment or rapid increase in the rate of productivity. But neither of these consequences in extreme is apparent in the last decade or so during a time which automation has made its greatest advance. The record indicates the rate of unemployment now is something under 4% , significantly below the 6.7% of only 1961. It's presently the lowest since 1944. In terms of productivity, the rate of growth of output per man hours calculated, or if you calculated on the 1909 basis of the U.S. Department of Labor, has accelerated only from an average of 2% per year during the period of 1909 to 1947 to now an average of about 3% a year over the span of '47 to 1966. We might well pause to reflect in 1905, 225,000 Americans were busy making wagons and ten years later the automobile industry came in and displaced all of them. But, by today, we now have over 2 million people building automobiles and I haven't any idea how many more

people are involved in the various industries composed of the suppliers of materials and parts to automobiles.

It seems like there is a general observation here that new products always create new jobs. In General Electric, for instance, over 40% of their employees now work on products that were nonexistent 12 years ago. And right here at home Tektronix, which as most of you know, was a brand new industry in 1946, today employs over 6,000 people, derives 50% of its revenues from products developed in the last five years and, 13% in just our last fiscal year. And oddly enough, our largest single market today is the computer industry. Just try to estimate the number of people gainfully employed in the computer industry alone in manufacturing, selling and servicing. All new jobs, nonexistent a decade or so ago.

With rare exceptions, during the last 150 years in this country, labor and capital somehow have been able to keep the work force of this country occupied about 95% of the time. This really is a remarkable record, one that is the envy of the world. It seems to me that it would be extremely immature at this time to conclude that the record cannot continue indefinitely even with some improvement. There can be no greater disservice, indeed no greater active contempt, than to substitute easy slogans or overgeneralizations for scrupulous honesty in analyzing these crucial issues.

Now, let's take a couple of minutes to look at some of the creative aspects of automation. The easiest jobs of course to automate are those which are repetitive and monotonous. Such jobs do not allow for much development of the potential yet untapped in the majority of human beings. Many of the entry jobs that have allegedly been disappearing have typically been deadend jobs anyway, going nowhere. And meanwhile a great many new jobs have been created. This is especially so in the trades and service industries. Obviously, there has to be some displacement in the most skilled jobs that are being eliminated by automation. But let us perceive this as an opportunity instead of a problem.

Doctor Hershberg, I think, made a good fundamental point that people get satisfaction out of doing something worthwhile. Well here's a chance for more people to do things worthwhile. What about the chance to finally tackle and re-

solve such problems as those of functional illiteracy, the war of the obsolescing skills? What about it being a chance to do something for those traditionally ill-equipped to win? Might this be a chance to convert the work force into a real dynamic force such as society has never before seen? In my opinion it is the very process of automation that has and will continue to free men from the monotonous tasks of the assembly line. A man's work must be perceived and understood as an integral part of life itself.

You say, how do we do this? ***I believe we must concentrate upon education techniques and improvement or training.*** It is essential to the fast changes of an automated society. The closer one gets to the technology of the future the more clearly one sees how it demands more, not less, from men. Companies will probably, therefore, as a fact of competitive life, take on an aura of institutions of higher learning. Rapid accelerated development of human talent is the answer, that is to upgrade, maximize, and elevate the human capacity. In George Gallup's recent book, *The Miracle Ahead*, we find a related challenging thought. "In the whole history of man, no generation has been taught to expect change, to be prepared for change or to seek change." Perhaps now is the time to start teaching a little bit about change. While automation does not result in a net destruction of jobs, it certainly does pose problems of adjustment and relocation of labor effort. A much more creative, deliberate and intensive program will be needed in the future, I'll admit, than has prevailed in the past to train and retrain our labor force for the interesting assignments that lie ahead. But, I would like to remind you that haste may cause us to administer medicine for a non-existent disease, lest we really make the patient, in this case the national economy, sick. If we do achieve security from automation, but in the process lose real freedom, we would hardly represent a worthwhile achievement. As Alfred North Whitehead said, "The art of progress is to preserve order amid change and to preserve change amid order."

Now, for a little more careful delineation of the subject, not in ominous, foreboding terms that defy reasoned evaluation, but rather in a way that allows those who are truly interested in addressing themselves to a solution of problems, to

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cut out a slice and begin to define real measures for solving real problems. Since it is really human problems that we are concerned with, that is, our investment in human capital, let us begin by defining the problem in terms of the unemployed people, or the underemployed, at a time while we are in the midst of this very dynamic economy, and even in the midst of this very extremely tight labor market. If we are moving essentially from a blue collar to a white collar economy, one which offers fewer opportunities for the unskilled and undereducated, and we certainly are moving in the direction, let us not throw up our hands in despair — let's not cut off our nose to spite our face, for example artificially attempt to slow down the process of change. To the contrary, **let us accept the challenge, let us try to elevate the whole population so as to truly solve the problems of the undereducated and the unskilled.** This is a real opportunity and there is real evidence that we are not myth making, but instead are squarely confronting reality. And if we succeed, there is other evidence to indicate that we will all have much greater satisfaction with our individual lives, as has been referred to earlier in the nature of one's mental health from achievement.

When we need to define the problem, to begin, this is admittedly somewhat over simplified, but it really is truly impossible to solve poverty as such, or the problems of the disadvantaged. We first must ask ourselves in terms of people, in a society that is technologically advancing rapidly, what individuals lack what basic prerequisites if they are to be productive contributors in our society today. Where are they, what resources are presently available and already proven, that could be marshalled to some of these problem solutions? What gaps are there that must be fulfilled? And finally, and only after answering the above, how do we proceed? Well, let's start with the people problems.

The 1960 census show that 60% of our adult population, that is about 58 million people out of 99 million adults, haven't even completed high school. So if you look into this area of competence, there seems to be four basic areas of definable people problems that lend themselves to immediate solutions. The first category are those individuals who possess not only no marketable skill but they have no basic skills in either

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reading or arithmetic. The second category would be those individuals who are literate all right but have no particular marketable skills. The third category would be people who possess both of the above but due to advancing technology find their skills obsolescing. And the fourth group could be differentiated only because solutions are available unique to their problem and that is a burgeoning part of our population known as the high school dropouts.

Well, where do we find these people? 80% of the 15 million functional illiterates are presently employed, mostly by industry in the private sector of our economy, and I believe the functional illiterate term here is used to refer to people with lower than fifth grade reading and arithmetic skills. In the second category, most of these people who are literate but have no particular skills are presently employed in today's labor market. The third category, those that are obsolescing, that have obsolescing skills due to technology progress are still mostly all employed in industry, but the fourth area is really the trouble spot. We have still around a million dropouts per year from the public schools. The real performance level at the time of dropout is usually only about half of the grade they're in even so. This group has the highest incidence of unemployment of any of the four groups I have just mentioned. It contains more than 45% of this country's total unemployed.

So you might say, well, what are some possible solutions to this kind of a problem? Well, first of all the functional illiterates, I guess we have to give them some basic education. And I have heard a lot of people say that these people are not educable, but there have been many demonstration projects underway recently that prove the contrary. It is possible to elevate a person four grade levels in reading and arithmetic in an average time of 160 hours with a cost of only \$150.00. This means that an individual who is now in the third or fourth grade level can be rapidly brought to a point well above the national average of ninth grade in less than 350 hours at a cost of around \$300.00. This is not fiction but a proven fact, it's actually going on right now. I know of eight major American corporations that are doing this and I am sure there are many more that I don't know about, but some of them are companies like Diamond Alkalai Company of Houston, Texas, the Chemical Bank,

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New York Trust Company, New York City, College Life Insurance Company of Indianapolis, Corn Products Company of New York.

We might also mention that considerable pilot work has been done in basic education and also typing in the New York office of the NAM. I happen to be on their board of directors at the present time so I hear a little of this. But, they've decided that industry can solve a lot of its own problems if they would just have the confidence to tackle them. And so they are trying some experimental research type projects right back there in New York City. One recent class of six dropout teenagers who tested in grade levels between 3.9 and 9.3 at the start, after six weeks had progressed an average of three grade levels. That's pretty fast. However, they have been taking a slightly different approach than most of the more conventional educators. They assume, first of all, that if these people dropped out of school there is something about the environment maybe that isn't conducive to their learning, so they have changed the environment entirely in this experiment. Instead of having these people come to a formal classroom with a professional teacher and 40 or 50 of them sit down in chairs, why they take them in small groups around a table with somebody who is a non-professional but has the basic belief that these people really want to do something if they just knew how, and the results are proving fantastic. Another thing they have tried recently back there is a program on teaching typing skills to, I believe the initial experiment was with all Negro and Puerto Rican dropouts. And using a program learning technique and audio teaching equipment, a secretary can be trained to conduct this course in one day. The results of this course have brought these girls in from six to seven weeks up to a typing speed of 40 to 55 words per minute at a total cost of \$8.00 per week per student including books.

While it is difficult to obtain accurate statistics on functional illiterates, there is pretty strong evidence that for maybe around \$2 billion this entire problem could be solved in this country. You might say that is a staggering cost, but really not when one considers that industry alone already spends about six times that amount annually for education and in-plant training.

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Well now to get into the second and third areas here. I just talked about functional illiterates. The second and third areas, you remember, are people who are literate but who have no marketable skills, or the skills that they do have are being outmoded. Technology is presently available, applying innovative concepts in this area to enable us to rapidly accelerate efforts in learning. And an example of that would be the Dupont Company that's developed over 140 courses for specific craft skills. At this point in time, over 40,000 of their people have been trained utilizing these techniques. They are self-administered, the retention knowledge increases at any average of 35% over other methods, a 25% reduction in time and a 30% reduction in cost.

With regard to other examples of local leadership with independent high school action, one of the many examples of the local solution is the Bedford, Ohio industrial education program. There are many such programs of this nature actually in operation around the country. So far in the Bedford program, they have had 100% placement from the participants in this course, which involves both the educational system of the community and the industry. Many other communities have initiated similar programs. Among these is the Opportunities Industrialization Center, Inc. of Philadelphia. This was opened in a previously abandoned police station recently in 1964. They have already trained 1,800 graduates in industry and business with a placement rate of 85%.

Well now, to get onto the fourth and most difficult category here, the high school dropouts — as I have said, this problem is not insoluble. There have been dramatic instances where communities have cut their rate in half or even better, through constructive programs. Examples of this type of action are the Prudential Insurance Company of Newark, N.J. where people come in to their plant, their office, using their equipment after hours for learning. Company instructors and materials are provided. J. I. Case Company of Racine, Wisc. is another one. The Carson Pirie Scott and Company of Chicago, Illinois is a leading retailer with concern with the dropout problem. So they participated with the local education system, and since then there are now 25 companies in the Chicago area that have set up similar programs. We have already seen a proliferation of

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these programs across the country in a number of communities working well. They work well because the basic motivation is high, specific skills are taught that are usable in the future. And a clear relationship between education and future work is perceived. And I can even remember some difficulty I had back in the early days wondering why I was wasting time learning about a lot of things, but if we can get the education systems geared to the things as we as students can understand, students, I am sure, can go a lot further faster.

Cutting across all of these specific areas is the problem of more effectively matching people to jobs, particularly at the low and medium skill levels. The NAM is now six weeks into a project in cooperation with General Electric's Valley Forge Computer Center wherein they are hopefully going to design a computer-based instrument capable of not only matching, but more important, capable of precisely defining the real gaps that do exist between the requirements to fill available jobs in the community and the skills presently available in the unemployed population of our society.

Well, I guess we are down to about the end of this. You say, what are the possibilities now for action? While there are admittedly many problems caused by the changes taking place, perhaps they are soluble by less than a total change in our society. It also may provide us remarkable opportunities for progress. Second, it seems evident that we cannot afford to talk in generalities gravely predicting a gloomy outcome. We must attempt at least to forthrightly define the problems as they exist in reality today. And third, if you accept the foregoing, we then should use scientific methods to search out proven solutions and ways to insure their utilization throughout all the hamlets and communities of the land.

At this point you might ask, where are the so-called facts to indicate that the individual citizen, the community and the state have the potential to actually solve such problems in this very complex society? And further, with the Federal government so active in all of its manifold activities, what can we do? Well, here are a few ideas. An almost unknown American citizen, until maybe last year, published a fascinating book called "Reclaiming the American Dream." The author, Richard C. Cornuelle, whom some of you might have heard speak in Portland

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just a week or so ago, his book points out that we have almost forgotten there is a thing which he calls the independent sector in our society. By this, he is referring to the independent association of American citizens, such as churches, labor unions, trade organizations, service clubs, private welfare groups, foundations, schools, and so forth. He reminds us that the famous French student of 1805 through 1859, Alexis de Toqueville, saw three sectors in America: a then very primitive commercial sector, a carefully limited government sector, and most important of all, a very unique and vigorous independent sector, which set this nation apart from all others. In one of his works, de Toqueville said, "Americans make associations," which is his word for the independent institutions. "Americans make associations to give entertainment, to found seminaries, to build inns, to construct churches, to diffuse books, to found hospitals, prisons and schools." At that time he felt these associations were a significant key to the development of our nation. Mr. Cornuelle points out, however, since the depression of the 30's, most writers have tended to write off the very sector that de Toqueville thought most important. He feels the reason for this is the upsurge of big government has simply overawed even the independent sector itself, and certainly has tended to make most people look only in one direction for the solution of all social problems.

But here are some interesting statistics, as Mr. Cornuelle pointed out some of these assets that we have long lost sight of: In this country we have 320,000 churches with 118 million members with assets of \$15 billion. We have 100,000 voluntary welfare groups like we are all familiar with in every community of this country. We have 6,000 private foundations worth about another \$15 billion. Hundreds of fraternal and service organizations with over 36 million members. We have hundreds of labor unions with a total of about 13 million members. We have 3,500 independent hospitals and thousands more of independent nursing homes. We have over 1,300 private colleges and universities that enroll 1.75 million students, and 17,000 private schools, more than 2,000 community chests, united funds, in addition to which in the private sector of our economy, we have 4.75 million business institutions, which incidentally take on many public responsibilities that have apparently

nothing to do with making a profit.

Well, with those kind of assets among us, what about the size of the job to be done? Mr. Cornuelle says that industry itself spends billions on employee education. General Electric Company, for instance, spends more money on education than any other private or public institution in the state of New York. I have been told that IBM spends more money on education than Harvard University. Mr. Cornuelle estimates that business executives right now give time that totals up to about \$5 billion a year to charitable causes. Maybe some of you have read George Gallup's recent book, which I referred to earlier—The Miracle Ahead—but he claims that in his polls and projections therefrom, that 61 million citizens of this country would like to help improve their communities if they just knew how. Further, that they have in total agreed to donate 245 million hours per week. That's a pretty big figure. That happens to be equal to the total hours worked by all of the employees—let's see, this is equal to the monthly total employed in five of our largest industries: automobiles, food processing, clothing, railroads and department stores.

Well, it seems to me that with the problems of society that we can see and label and see solutions to with the fantastic extension possible now of the human brain by cybernetics procedure, that we certainly ought to be able to solve these problems. One of the unique differences between the independent sector of our country and the other sectors, up to now, has been the innovations in this sector don't seem to get transmitted easily from one to the other. It would seem to me that people like those of us right here in this room that would take the trouble to come down and try to learn how we do anything better, are just typical of the kind of people that could cause a lot of these things to happen.

If we make a decision to do this, I think it simply means we've got to further define the problems more precisely, we've got to find more and better solutions, and there are many solutions already existing all over the country if we can just make this information known to the rest of us; and fourth, if we can develop action systems here to do the job. While we may be able to do little more than discuss this in the remainder of today's meetings, perhaps at least these comments will provoke some

serious future thought and discussion amongst you, and looking ahead, I would hope that we would give recognition to industry's past as well as the power of our independent sector, and demand that a major role for the private and independent sectors be maintained in the solution of these major problems. With this we should be able to capture the blessings of automation and raise an even better qualified free citizenry to take our place in the years to come.

And with that I would like to simply close with a quotation of Woodrow Wilson: "The great struggling unknown masses are the dynamic force that is lifting the levels of society. A nation is as great, and only as great as the rank and file."

Thank you.