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can hardly assert that they are making a last-ditch stand in a lifeboat with barely enough C-rations to go around.

The lifeboat image also suggests that our capacity has already been reached, that there is no way of expanding it or altering survival styles to better utilize what is available, and so any population growth beyond present levels means inevitable starvation for the new additions. But there are many ways of changing consumption patterns to better utilize available resources and reduce wasteful consumption as well. Each of us eating the equivalent of one less quarter-pound hamburger a week could release 11 million tons of cereal grain for human consumption rather than for animal feed. That alone would be sufficient to feed 55 million poor people on their regular diet. Or, if we started cattle on grass and only used cereal grains to "finish" them, the conversion ration of feed to live weight would drop from 9:1 to 2:1 and free cereal grains for the world's poor.

Or we might stop wasting energy that could be used to make fertilizer, and put the fertilizer we have to better use. One billion people, it is estimated, are fed by the extra crop yields that fertilizers produce. The most important fertilizer is nitrogen, which is made primarily from natural gas and petroleum. The fertilizer shortage caused by the quadrupling of petroleum prices cost India, for example, as much as 10 million tons of grain this year. Meanwhile, various oil-producing nations are flaring 4.5 trillion cubic feet of natural gas each year, ten times more than the U.S. uses annually for fertilizer production, and enough to double current world fertilizer production. In addition, the U.S. uses three million tons of fertilizer for ornamental purposes. In a time of acute shortage, these non-essential uses of fertilizer have a direct impact upon the continued existence of the world's poor. A recent *New York Times* article observed that "India, for lack of a pound of fertilizer costing 15 cents, fails to grow 10 pounds of wheat that she must try to buy on the world market for at least \$1."

This is not to say that these adaptations can go on forever—Dr. Hardin is certainly right in saying that we will eventually reach our "carrying capacity" in some areas, if we have not already. But these are adaptations we can make now, without new technologies which might provide even more efficient use of available food supplies, and with less environmental damage in the production process than presently. These adaptations can help us stabilize the world's population through somewhat more humane means than the crude methods of famine, pestilence, and natural disaster that Dr. Hardin lauds as our only hope.

He and I have no quarrel about the urgent need for a global effort to stabilize population. The impact of not quite 4 billion people upon our planet should be sufficient to persuade us—the spectre of 10 billion people by the end of the 21st century should only emphasize the peril of inaction. But as for the means to that end, Dr. Hardin and I emphatically disagree. He points out that the population of the United States, like that of other developed nations, has nearly stabilized at zero population growth. This has been accomplished without the aid of famine, or epidemics, or wholesale natural disaster. The developed world has been moving steadily toward a stabilized population with all the advantages of adequate food, disease control, remarkable good fortune with nature, and education. Apparently, then, these are no barriers to the control of population. Meanwhile, the poor of the world have suffered all these calamities, yet their population continues to grow.

In *The Lessons of History*, the companion volume to *The Story of Civilization*, Will and

Ariel Durant join other scholars in observing that "a high birth rate has usually accompanied a culturally low civilization, and a low birth rate a civilization culturally high." It has long been known that with sufficient economic growth high birth rates fall sharply. Conversely, widespread poverty tends to sustain high birth rates. Lester Brown, a recognized expert on world food and population whose credentials in this area certainly match Dr. Hardin's, argues that these suicidally high birth rates continue "for the obvious reason that families living without adequate employment, education, or health care have little security for the future except for reliance on their children." Obviously, a starving population too weak to work, or suffering irreparable brain damage because of malnutrition, cannot hope to achieve even the basic elements of prosperity.

The "benign neglect" Dr. Hardin suggests will result in precisely what he wants to avoid. Refusal to feed the poor of the world will not stop their population growth—we have been refusing to do so for years and it has not done so—it will only put us in that "lifeboat," and I doubt that we could, even if we wanted to, defend our island of affluence in a hungry, impoverished world.

Dr. Hardin's charges against current food aid programs also need to be refuted. If all those involved in the production, processing, and transportation of agricultural products can be called "special interests," then it is true that "special interests" have benefitted from purchases of American agricultural products for the P.L. 480 "Food for Peace" program. But Dr. Hardin misrepresents the case somewhat.

According to the Department of Agriculture, all the programs of P.L. 480, have cost \$25 billion since the law's passage in 1954, about \$1.25 billion a year, and not all of that amount has been spent on food. For example, in 1973 we sent about \$25 million worth of tobacco to poor countries under the "Food for Peace" program. Even if all the average of \$1.25 billion a year were spent exclusively on food aid, it would be a relatively insignificant amount. New York City alone spends in excess of \$2.2 billion just on its annual welfare budget.

If Dr. Hardin wishes to deplore expenditures benefiting special interests at the expense of the taxpayer, he might turn his attention to U.S. military spending. Since the end of World War II, the U.S. alone has spent nearly a trillion dollars on "defense." A substantial portion of that sum has gone for weapons, the production of which puts a tremendous strain on our natural resources and pollutes our environment to a degree far exceeding that of agricultural production, while the economic benefits are enjoyed by relatively few. There might also be some question about Americans, 6% of the world's population, consuming 40% of the world's resources, a growing proportion of which have to be taken from foreign countries, and how that rate of consumption threatens our "clean beaches, unspoiled forests, and solitude."

Finally, Dr. Hardin asserts that if a world food reserve were created, the "slovenly rulers" who "lack either the wisdom or the competence, or both" to develop their nations' food supplies, will simply await the generosity of others to alleviate the suffering of their people. Given the historical reluctance of the rich to share their wealth, a reluctance Dr. Hardin amply exhibits, it would be a foolish leader indeed who based his rule and the prosperity of his people on the altruistic largesse of others. Any leader who attempted to do so would soon be deposed.

It is this sort of arrogant contempt, and not the poor's distaste for "charity," that creates antagonism towards the rich among the poor of the world. Comfortably ensconced

by the accident of birth in an affluent, well-fed, highly-educated society whose fruits he has fully enjoyed (granted, not without effort on his part), Dr. Hardin shows little hesitation in condemning those not born into his "lifeboat" to a fate he has helped create for them with his overconsumption and refusal of aid, while he airily dismisses their suffering with earnest sermons on how it is really for their own good.

Hardin's Law asserts that "you can never do merely one thing." The thing Dr. Hardin would do is keep us, the rich, from feeding the poor. In doing that one thing, what else would he do?

Sincerely,

MARK O. HATFIELD,
United States Senator.

ALBERT SHANKER DISCUSSES EDUCATIONAL NEEDS

Mr. MONDALE. Mr. President, recently, Albert Shanker, president of the American Federation of Teachers, delivered a creative and thoughtful speech at the National Press Club covering the needs of education.

In it, Mr. Shanker recommended a three part program to improve educational opportunities for Americans of all ages by taking advantage of the increasing supply of qualified educators now available. He proposed an internship program for the training of teachers designed to assure that teachers, like doctors, have extensive on-the-job training and experience rather than stepping directly from college into a job.

He suggested encouraging lifelong educational opportunities, through the establishment of educational sabbaticals, perhaps every 7 years, to permit adults to continue or expand their educational experiences.

And he recommended a national program of early childhood education to help provide children with educational opportunities during the critical early years of life that can make the difference between success and failure in school.

Mr. President, as one who is vitally interested in expanding and improving educational opportunities for all Americans, and interested in preschool education and quality day care opportunities especially, I found Mr. Shanker's comments to be very interesting. I ask unanimous consent that a copy of his speech, and of a *New York Times* article describing his speech be printed in the RECORD.

There being no objection, the speech and article were ordered to be printed in the RECORD, as follows:

SPEECH BY ALBERT SHANKER

Mr. Chairman, ladies and gentlemen, I guess I should ask for an invitation back here, because I'm going to go ahead with my remarks, then I'd like to come back to respond to the introduction.

The last few weeks here in Washington the concentration has been on conferences and summits and mini-summits on questions of inflation and questions of unemployment. These are being explored by economists, labor leaders, experts in fields of health and education and welfare and I would like to spend the time that I have discussing some of the impact of the current problems with inflation and unemployment on the schools of our country, some of the . . . and then go to some of the proposals which the American Federation of Teachers and I are advancing as solutions to these problems and then

to indicate what some of the implications are in terms of what is about to happen with teachers and their organizations and their activities as a result of these problems which they see and as a result of the programs which they are offering as solutions.

Now, I'd like to just pinpoint several of these problems of inflation and unemployment as they hit the world of education in particular. First, I'd like to point out that for the first time since the depression of the 1930s, we have what is a so-called "surplus" of teachers. Of course, during the '30s it was not unusual that many people, not being able to get jobs, spent a long time in college and then, we still have teachers in New York City who remember, for instance, that they waited 8 years before there was an opening in the school system and they waited during that period of time. As a matter of fact, there was a group in the 1930s called The Unemployed Teachers Association. It was one of the largest organized groups in the city. Well, we now have across the country over 250,000 people who have been educated and have been prepared to go into teaching careers and who now find they're unable to get into the profession for which they prepared.

Furthermore, Mr. Gallup took a poll recently and he found that at the present time, there are one and one-half million students enrolled in colleges who state that it is their intention to become teachers and that they are preparing for teaching as an occupation. I'm not talking about elementary and secondary teaching where there are now approximately two million teachers employed.

Now, the problem is complicated by a number of other factors. We have the usual turnover of teachers which has existed for many years with people coming into teaching and then finding that they would leave after 2 or 3 years. And the reason for that was that, first of all, there were other jobs to go to, and that's not true during this period of recession and depression. There's no other place for them to go so they're staying.

Then there is the impact of unionization on teachers. There is no longer the greater attractiveness of other jobs now that unions have improved salaries and working conditions within the school system. And we also have within the school system the fact that there is a declining birth rate and that in each year of the next 10 years we already know that there will be fewer and fewer students in school.

So that we have colleges producing a large number of teachers. We no longer have an exodus of teachers to other jobs. We have a declining number of students within a school, and to add to all these problems with the general recession outside and with also, as a result of relaxed international relations, at least as the government sees it, a shutdown of a large number of war industries; we have a large number of scientists, engineers, mathematicians, technicians who were previous in other industries who are now trying to come into the field of teaching. So that we have an employment problem—or an unemployment problem—for the first time. This is not the kind of problem which exists in other fields. When teachers are unemployed, they generally do not just stay home.

They don't collect unemployment insurance because for the most part they're not covered by it; but essentially what is happening is the teachers are accepting other jobs at lower level qualifications—middle management and other jobs in industry—and then the middle management people are accepting still other jobs, and the general result, of course, is the 5.4 . . . 5 to 6 percent unemployment. What happens is that each educated—more educated—group takes a position at a lower level resulting in a massive push-out of the people of lower skills at the bottom, and then you get your

massive unemployment rates in some areas and in some age groups and in some ethnic groups of as high as 50 percent.

Now, the second point that I'd like to mention in terms of impact of the inflation and unemployment on the education role at the present time has to do with the money problem. The government's policy in terms of tight money and high interest rates. That is, of course, felt in the private sector and construction is practically stopped. It's almost impossible for any middle-income person to purchase a home these days, but the effect on city and state governments and the effect on school systems has been devastating.

You know that most school systems in this country do not receive state aid from the state authorities or federal aid from the United States government at exactly the time they need it. They don't start getting their money on Labor Day when school opens and they don't get it in convenient weekly or monthly installments. And if they are to utilize this money, and they're to have programs that last through an entire school year, they have to borrow the money at the beginning of the year and then pay back when the federal and state governments pay that money to the school districts.

Now, once upon a time—a year or two or three years ago—it used to be possible for school districts and for cities and for state governments to issue short-term notes at rates like 4 percent and 4½ percent and in the course of one single year as a result of the interest policies of our government that short-term money has gone from 4 to 8 percent. Now, I do not have a national figure on what that is costing school systems around the country, but I can tell you that one city in the United States—the city of New York—is spending this year one, \$170 million in interest on short-term money as a result of this increase in rates.

And, if you then move across the country, ask how much is in Philadelphia and in Chicago and in Los Angeles and in San Francisco and in St. Louis, in Milwaukee, the amount of money that could ordinarily be allocated for smaller class size, for early childhood education, for other programs within the schools, that is now being eaten up by interest, is staggering to the imagination.

Now, the third point that I'd like to make here is that the effect of this combination of inflation and unemployment is having, within the schools . . . one of the effects it is having is that is wiping out the effects of a large number of very good, valuable, affirmative-action programs which were started some years ago. And, again, I will cite just one of these. In 1966 and 1967, thousands of school para-professional teacher-helpers were employed in school districts throughout the country to work within classrooms to help to mark papers and to help hang coats up and to help children with reading problems in small groups. Almost all of these para-professionals were welfare mothers—unemployed, high school dropouts.

As a result of these programs, thousands—hundreds of thousands—across the country went back to school, received high school diplomas—in New York City, it's ten thousand—not only received high school diplomas but then, as a result of union negotiated contracts, were admitted into college and, at the present time, we have six thousand in the city of New York (para-professionals) enrolled in college programs and two thousand of them will be graduated from college this following year—ready to become teachers. Now, here's an outstanding program, mainly black and Puerto Rican, welfare mothers in 1966 and 1967 who have gone to college, who are about to graduate. There will be no teaching jobs for them and as a result of the fact that federal aid to education programs have not kept pace with inflation, thousands who are enrolled and

who are on the way to becoming teachers in future years, are now threatened with unemployment and are threatened with layoffs.

Now, I could go on with a long list of how . . . of the kind of effect this has had. Now, this is a period in which this problem of so-called "unemployment" and surplus of personnel within the educational world tangles in two different directions. We can face, within our sector, this great unemployment and stagnation, or we can use this opportunity of the personnel available to change direction within our school system and to provide services which have always been needed but which we were never able to provide; and we were not able to provide them because from World War II until the present time, the problem that the public schools of America face—the fact that more and more students were entering school each year—we have to be concerned with raising money to build buildings and we had to literally snatch teachers from the college classrooms and bring them in before the children, to start teaching immediately because we needed enough bodies to stand in front of those classrooms because of the vast teacher shortage. Every one of our cities in the late 1940s and the 1950s and throughout the 1960s on the opening day of school, the headlines in each city were—300, 500, 800, 1,000, 2,000 More Teachers Needed—Failed to Show Up.

Now, the result of that shortage of teachers was very grave. It meant we were compelled to lower standards. It meant that we were compelled to employ people who had not been properly trained and educated. It meant that we were not able to reduce class size. It meant that we were not able to do many things and I now want to point to three top priority program items—things that we should have been doing a long time ago, which we will now be able to do because of the availability of both space and personnel.

First, is the development of a national program of early childhood education. We have within our country so many who are on welfare, so many who are unemployed, so many who are not skilled, so many who are illiterate. Why? Well, the answer to that is not a simple one. It is . . . These are problems faced by every nation on the face of the earth. The one thing that we generally do know is that the longer you wait and the older a person becomes the more difficult it is to intervene, the more difficult it is to bring about success and we know through the writings and research of Benjamin Bloom at the University of Chicago and others, that more than half of the intellectual development of children takes place between the ages of 2½ and 5, before children enter school, and if they have a rich, relatively rich, intellectual environment at home and in the community, those children make it and if they do not have such an intellectually and culturally and socially rich environment in the community and at home, they don't make it.

And so, we have an opportunity here to intervene, to enter the lives of children when they're learning words, at a time when they're learning numbers, at a time when concepts are developing. We have a time to intervene before it's too late. Now, this is a program which we have been pressing for for a long period of time, but until this moment it was not a realistic one because people would say, "How can you demand that we start educating 17 million youngsters who are under 5 years of age within this country when you can't even find enough teachers for the regular elementary, junior and senior high school programs that are in effect right now?"

Let me go on to a second point. A second characteristic of our school systems is that teachers, among all the professionals within our society, are probably unique in the one

respect that they go immediately from a purely theoretical academic background within the college or university and are put right into the job without any real intensive on-the-job training and without what is the equivalent for doctors, let's say, of an internship program, where after receiving the theoretical knowledge in college, the person then spends one or two or three years working with experienced practitioners in the field in order to get the practical know-how within the classroom and within the school. Now, there is no question that everyone of us who has been a student in school, knows that there are teachers who have techniques and who have methods and who have ways; and that these ways can be learned, and can be picked up by other teachers provided that they have the time to share with those who are more experienced and so the second program that we are advocating is that in the future, no person becomes certified as a teacher or be given full charge of the classroom until they have gone through a program similar to what a medical student goes through at the end of medical school in terms of internship.

Now, a third program that I'd like to suggest here. Now that we have all these college-graduated, educated people waiting around, looking for positions in teaching and we also have within our society, thousands upon thousands of people who perhaps when they were in high school made a foolish mistake; they got in with a group of friends; they decided to drop out at a particular period of time and now they're not earning much money; they're unhappy with their jobs and they're saying to themselves, "If only I had an opportunity to go back and complete my high school and to do something in college or to get these particular technical skills which I could have gotten." If only I could do that I would be glad to do it. Why should we say that each individual within our society has only one chance in life to succeed and that if he makes a single mistake in high school or if he drops out early in college, that's the end and he can never go anywhere else?

And so, what I am suggesting is a program of lifelong education—the right of every worker within our society—maybe at the end of every 7 years—to enjoy a sabbatical. Yes, Sabbaticals that now are enjoyed by teachers and by college professors, that every worker who would want to leave the workplace and go back and improve his skills in education should, every 7 years, be able to go to some institution and should be subsidized for that and the education should be subsidized as well.

A silly idea? Well, we tried it once. It was called the G.I. Bill of Rights. Yes, maybe we did it for a wrong reason. We were afraid that bringing all these G.I.s back after World War II would result in a massive recession and unemployment. But the validity of the program stands on its own. Here were millions of men who had dropped out at some point in their educational careers, who had gone out into the world, who learned how difficult it was and then came back and they were the most mature generation of college students that this country has ever known. And not only were their individual lives enhanced as a result of the educations that they received, but think of where the country would be today. Think of where we would have gotten our doctors and our computer specialists and our engineers and our businesses in the 1940s and 1950s and 1960s, if the nation had not been wise enough to make that investment in the G.I. Bill of Rights at the end of World War II; and why should we not similarly allow others who later on have decided that they ought to go back.

Now, this is a program which is similar to Medicare in a sense. If we can have Medicare for the body, there is no reason why we should not have a program of Educare for the mind. A program which throughout a person's life

says, "You have a right, at the time when you feel that you want to improve yourself, to return to improve your mind as you improve your health when you go to medical institutions."

Now, there is no reason why this should be limited to a worker on sabbatical. Is there any reason why we should not provide for every single person in an institution, whether it be a hospital, or whether it be senior citizens in homes, or whether it be prisons, any institution where a group of people are interested in improving their skills and learning? Now these are programs which we believe we are now capable of because there is the space and there is the personnel.

Now what about budget? What about finance? Isn't this going to mean more spending? Isn't this going to mean greater inflation because we're spending money for these things instead of tightening our belts, instead of cutting back? How does this relate to the proposed cuts in budget and the \$5 billion gap in the federal budget?

Well, as we sat there in the mini-summits, the thing that was very interesting about why we had to cut the federal budget back by \$5 billion, is that almost an entire page that was given to us by the President's economic advisors was made up of budget items which are the result of our failure as a society to reach millions of people in time to give them the necessary skills to be able to work and to be productive. Billions of dollars, unemployment insurance, Medicaid, food stamps, welfare costs—over \$25 billion in the federal budget—which represents money the taxpayers are paying and which also means that out there is a large and growing number of people, who, in terms of work and productivity, do not contribute—not because they don't want to contribute, but because they were not reached in time to be helped.

And so, the particular program that I am talking about must be viewed, yes, as an expenditure in the short run. But in the long run the way to reduce the federal budget is to start cutting down on the billions of dollars and the \$25 billion that I've talked about, that goes to helping people who can't work. That \$25 billion represents a small fraction of what is really spent because you've got to add to that the amount spent in state and local budgets which is in addition to the amount in the federal budget and so we suggest that the monies for the programs that we are talking about is essentially an investment which, in the future will enable us to balance the budget. It is both economical in the long run and certainly, from a point of view of being humane, and considering what happens to human beings in the future it is the only way to go.

Well, the question is, "Where is the money going to come from?" Now, the administration, the President, really has two choices. One of those is the choice that Nixon took, and that is maintain high interest rates and veto all the social legislation and impound funds and cut back on social programs. If President Ford follows in the footsteps of President Nixon with respect to those two programs, then we will continue to have the economic disaster that we have today and we will continue to have inflation and stagnation and unemployment and we will be heading for the greatest depression—largest depression—most devastating—that this nation has ever seen.

But that is not the only direction in which we can go. There is another direction. And that is that we can choose to raise the money through taxation for the social programs that are necessary. We can choose, through taxation, to subsidize interest rates so that we can begin home-building again and so that the cities of our country do not have to spend \$170 million multiplied by other cities in order to borrow short-term funds. And we can at this moment in history, make use

of the economic crisis before this country to enact many of the tax reforms that should have been enacted a long time ago. But maybe the arguments that were used by the labor movements and others weren't deemed to be important enough in the past.

Today, in order to finance programs like this, and if I were a speaker from another sector, I could give a speech on the need for national comprehensive health care along the same line in a number of other fields, the monies are there. And basically, what we need is a closing of loopholes with respect to the favored treatments of capital gains as against wage income, excess profits tax, the end of the oil depletion allowance, the end of investment credit taxation. The list is not a new one. It's there. The social needs are obvious. The choice is very clear. In the one case we can have an economic upswing and provide for human needs and in the other case, neglect human needs, increase human tragedy by increased unemployment and poverty.

Now what does all this mean for teachers? These problems are problems that teachers are confronting for the first time within many generations. Teachers have not seen unemployment since the depression. Teachers have also not seen the relationship between their own jobs and their own professions and politics as clearly as they do today. Every one of the things that I have talked about has a direct political connection. Now up until 2 or 3 years ago teachers were basically divorced from politics. When I used to come to teacher meetings and talk about making political contributions to support candidates, their answer was, "Keep education out of politics." Well, what we have now is the fact that teachers can see that universal early childhood education, federal funding for teacher training, Educare, lifelong education, a tax program which is equitable, the prevention of the reimposition of the unfair wage controls without price controls . . . all these are political actions and the result is that teachers across the country are amassing funds of millions of dollars and are involving themselves in politics as they never have before. That is one outcome of our current situation.

And the second outcome is that the teachers are, for the first time, seeing that the problem goes beyond what they can handle with their own school board or with their own superintendent or with their own community, that the answer to problems that teachers face at the local level is with the President of the United States, with the Congress and with the national administration. And teachers here see that even if they were all organized in a single organization, that they would not be strong enough to bring about the necessary reforms and so, as a result of these economic problems, and as a result of these proposals . . . and that throughout the country teachers are moving toward affiliation with the AFL-CIO and there is progress at the present time, massive—organized drives because teachers have never been, never felt their vulnerability as they do now. Never have they seen the opportunities to present themselves to do so much good on the one hand and never have they so feared public education. So this is a turning point—a turning point which I believe will bring about massive teacher political involvement both with manpower and money and also a very rapid affiliation of teachers with the AFL-CIO.

SHANKER URGES WIDER EDUCATION

(By Damon Stetson)

WASHINGTON, Sept. 24.—Albert Shanker, the newly elected president of the American Federation of Teachers, proposed today a three-pronged program to improve educational services for young and old while helping to solve the problem of increasing unemployment among teachers.

Mr. Shanker suggested a national program

for early childhood education, an internship program for the training of teachers and life-long educational opportunities for older persons through educational sabbaticals, perhaps every seven years.

In emphasizing the importance of early childhood education, Mr. Shanker told the National Press Club that studies had shown the years from 2½ to 5 to be particularly important for intellectual development. With more teachers available, he said, the educational system has a chance to assist in this early development.

INTERNSHIPS STRESSED

Internships for teachers, he said, are needed because teachers are among the few professionals who go directly from college to jobs without extensive on-the-job training.

Mr. Shanker contended that workers or persons who had dropped out of school should have more than one chance for an education. It ought to be the right of everyone at the end of seven years, he said, to have a sabbatical and go to some institution where he or she would be subsidized while continuing or expanding his or her educational experience.

"If we can have Medicare for the body," Mr. Shanker said, "there's no reason why we can't have 'educare' for the mind."

SURPLUS OF TEACHERS

For the first time since the Depression of the thirties, Mr. Shanker said, there is a surplus of teachers, with 250,000 persons for teaching careers but unable to get jobs. In addition, he said, surveys have indicated that 1.5 million students in schools and colleges are preparing for teaching.

Mr. Shanker predicted that more teachers would be moving toward affiliation with the American Federation of Teachers and the A.F.L.-C.I.O. but he saw no immediate prospects for a merger with the National Education Association.

In a question period, Mr. Shanker said he did not aspire to succeed George Meany as president of the American Federation of Labor and Congress of Industrial Organizations. He said that he intended to continue as president of New York City's United Federation of Teachers as well as head of the national group. His salary for both jobs, he said, is \$70,000 a year.

NUTRITION AND CANCER

Mr. HUMPHREY, Mr. President, the American Cancer Society estimates that 355,000 Americans will die of cancer in 1974. All of us hope and pray that somehow we can learn to prevent cancer and to help alleviate the pain and suffering of millions of people who are victims of this disease.

At this time I would like to pay tribute to Dr. Roger John Williams, a man who not only shares these concerns but who through the years has been responsible for major advances in the field of cancer research. One of the foremost nutritionists in this country, Dr. Williams received his Ph. D. from the University of Chicago in 1919, has been a professor at the University of Texas for numerous years and is the author of a plethora of books and articles including "The Nutritional Approach," "Nutrition in a Nutshell," "You Are Extraordinary," and "Nutrition Against Disease, Environmental Prevention."

In a recent presentation in Minnesota, entitled "The Neglect of Nutritional Science in Cancer Research," Dr. Williams states that cancer research is not comprehensive due to a lack of expertise in cellular nutrition. He explains why cellular nutrition is crucial in cancer

research, claiming that cellular nutrients constitute a complex and most vital part of the environment of cells and possibly the growth of abnormal cancer cells. I think it is important that his conclusions reach as many Americans as possible. I commend his paper to my colleagues.

Mr. President, I ask unanimous consent that Dr. Williams' paper be printed in the RECORD.

There being no objection, the paper was ordered to be printed in the RECORD, as follows:

THE NEGLECT OF NUTRITIONAL SCIENCE IN CANCER RESEARCH

(By Roger J. Williams)

1. Cancer Research Not Critically Hampered by Lack of Support or Dearth of Many Kinds of Competent Specialists.

The financial support of cancer research runs into hundreds of millions of dollars annually in this country and the public mood would justify much expansion of this support if promising progress were in sight. If cancer research is failing in any degree, the primary lack seems not to be supporting funds.

Neither do we believe that a primary lack is for competent specialists of many kinds. There are hundreds of highly competent specialists who are carrying out fundamental investigations related to cancer. These may include biochemists, biophysicists, molecular biologists, geneticists, cytologists, tissue culturists, virologists, microbiologists, immunologists, electron microscopists, statistical experts, endocrinologists, radiologists, epidemiologists, pathologists and surgeons. We do not believe that the general quality of these investigations or the general competence of the investigators to do what they undertake can be questioned. However, neither do we believe that increasing the number of these specialists or increasing their support would bring about any phenomenal improvement in the over-all progress in cancer research.

2. Cancer Research Not Comprehensive; Lack of Expertise in Cellular Nutrition.

In no public or private institute dealing with cancer research anywhere in the world, are there groups of real experts in cellular nutrition. By an expert in cellular nutrition I mean one who has a grasp, or at least seeks to have, of what is currently known about all the cell nutrients and how each enters nutritionally into cellular metabolism. Such experts, it may be taken for granted, would have a keen desire to explore for more insight into these processes. The entire gamut of all cell nutrients would be in the purview of such experts—the minerals, trace minerals, amino acids, purines, pyrimidines, sugars and all the vitamins which function in this way. If there are unrecognized missing links, these should be the cause of deep concern, because as long as there are "unknowns" among the cellular nutrients crucial gaps are present with respect to our knowledge of the whole process. No cell can be even passably nourished unless it gets some supply of every single needed item.

The current lack of expertise in the field of cellular nutrition is indicated by the fact that many elementary questions in this area are unanswerable on the basis of present knowledge and those who grow cells in tissue culture are often unconcerned about the exact chemical composition of their culture media. Some pertinent questions are: How do the nutritional requirements of different types of cells in the body differ from each other? Do most cells which are capable of becoming malignant have complex nutritional requirements comparable to the complete needs of the body as a whole? When healthy cells become malignant, how do their nutritional requirements change? Do carcinogens often act by disturbing cellular nutrition? If so, how? To what extent do

the cells in our bodies normally or abnormally nourish each other? (There is strongly suggestive evidence that glutamine and perhaps inositol, lipoic acid and many other substances are produced by some somatic cells and are required nutritionally by other cells.) Yet definitive knowledge on this vast subject is lacking in spite of its extreme pertinence to the important question "Do endogenous carcinogens function to induce 'spontaneous' cancers?")

If there were groups of real experts in cellular nutrition in the cancer field, there would be numerous up-to-date books, articles and reviews dealing with the subject of how nutrition, and cellular nutrition in particular, are related to cancer. But these books, articles and reviews do not exist. In "Cancer Research," Cumulative Index for 1966-70, there are only 2 entries under Nutrition in contrast to 110 under Cell(s).

3. Why This Omission From Cancer Research?

The primary cause of lack of attention to cellular nutrition in cancer research lies in the neglect of nutritional science by medical schools and medical scientists in general.^{1,2,3} This has persisted for at least sixty years.

Somehow the idea seems to have become established in medical circles very early that those who dealt in nutrition, vitamins and the like were interlopers if not imposters and presumably in league with those who would advocate wholesale self-medication to replace professional medical care. Anyhow it seemed to the opinion makers that nutrition was not a subject which was worthy of the serious attention of true medical scientists. Later, when the existence and reality of vitamins were firmly established this attitude changed only slightly and Western medicine seemingly adopted the opinion: Yes, the vitamins are valuable in a limited way for the treatment of a few specific diseases, most of which, however, are of little interest today.

If there had been broader perspective, especially in the light of modern knowledge, it would have been recognized that vitamins (and all other nutrients) enter intimately into all metabolism, and that whenever metabolism is involved (which is *always*, in living things) nutrition is crucial and must be understood. In keeping with an anti-nutrition bias, however, physicians were sometimes taught not to "believe in vitamins", which is about as ridiculous as it would be not to believe in protein, amino acids, calcium or iodine.

The neglect of nutrition in medical schools became so obvious and compelling that Senator Schweiker of Pennsylvania introduced a bill into the U.S. Senate in 1973 providing for a substantial appropriation to insure that physicians would be taught something about nutrition.⁴ It is unbelievable how far removed from nutrition the thinking of many medical scientists is.

4. Why Cellular Nutrition is Crucial in Cancer Research.

I see clearly the need for insight into cellular nutrition, partly because of my special interest in this field. I published my first paper dealing with cellular nutrition in 1919, and years later discovered pantothenic acid in pursuance of this initial interest. The scientific background on which this need rests is firm and can be stated simply if we accept as a basic problem the need to understand fully why and how cancers originate. Both of the two basic types of factors which enter into this problem, hereditary and environmental, must be explored fully in any comprehensive cancer research program, and the environmental factors cannot possibly be fully explored without serious attention to cellular nutrition. Cellular nutrients constitute a complex and most vital part of the environment of cells.

Cellular nutrition is most complicated and embraces the complete assortment of two or

Footnotes at end of article.