FOR some time past I have been both impressed and concerned with what appears to be the thinking of a representative part of the community, to the effect that there can be no further progress; that the world is finished in its building; that there are no worth while possibilities ahead; that we must live merely by dividing up the available jobs. Unfortunately, this type of thinking has already found expression in certain of our national economic policies. To accept such a thesis is to accept a lower standard of living. There results chronic unemployment and the elimination of many of the necessities and luxuries that have become an essential part of our daily lives. On the other hand, there is a different school of thought. There are those who believe that the amount of work can be effectively expanded; that we can not only maintain our present standard of living, but progressively improve this standard by broadening the activities of industry and business through the developments of science and industrial research—in other words, that we can have more rather than be compelled to accept less.

The Century of Progress Exposition provides the perspective to consider this question. Here one is surrounded at every turn with the marvels of the age—the cumulative development of the past century, more particularly of the past two decades. In such an atmosphere the question naturally arises as to what is to be the progress during the next decades. Is there any logical reason to assume that progress is to be halted at this particular point in our development? Is it not true that out of the knowledge and experience of the past comes the inspiration that means further achievement in the future—if we have the breadth of viewpoint to properly manage our affairs?

In order to obtain a representative and authoritative viewpoint that would serve to inform and crystallize public opinion on this most important question, upon which so much in the future depends, it was my honor and pleasure to be host to some four hundred leaders of science and industry at a Dinner Conference on
May 25th, in the Hall of Progress, General Motors Building, Century of Progress Exposition, Chicago. The theme of the dinner was—"Previews of Industrial Progress in the Next Century."

As a background, I obtained an expression of opinion from a total of over seven hundred of our most important business and industrial executives and heads of educational and scientific activities as to the merits of one school of thought as against the other, based upon their individual knowledge and outlook.

On account of the great amount of interest created, I thought it essential to present, in printed form, not only a digest of the formal statements made at the dinner, but excerpts from a considerable number of the supporting opinions, headed by a message from the President of the United States. To attempt to print all, would have been impossible—the selection had, of necessity, to be more or less arbitrary. However, there is provided a cross-section of the prevailing opinions.

Universally it is agreed that industry is on the threshold of great achievements; that our progress is practically unlimited; that, in fact, the world is by no means finished. With such tremendous possibilities directly before us, we shall not be true to the traditions of our great and wonderful country if we become satisfied with a static position, either in our thinking or in our action. What we must do is to recognize the opportunities that are before us. In other words, we must realize what can be done and then direct our efforts toward that objective. There is bound to result a higher standard of living, social and economic, and a broader opportunity for countless millions.

ALFRED P. SLOAN, JR.

D I G E S T O F A D D R E S S E S

CHARLES F. KETTERING, (Chairman)
Vice-President in Charge of Research
General Motors Corporation

T HE ultimate aim of all industry, science, government and sociology is for a better life—better living conditions; better health; better food; better government; better houses; in fact, for better everything. And these can come about only in proportion as our daily routine and activities conform more nearly to nature’s laws, which we understand so poorly at the present time.

The very fact that we have a lot of trouble is the best indication of this lack of understanding. Any group of scientists and engineers can sit down and write a long list of things which can be accomplished in the future. And when these new products are presented, if the people accept them, they then become the beginning of new industries which will absorb a great many of our unemployed.

It is my impression that we are on the eve of things of an entirely different nature than the mere extension, refinement, and development of our present day scientific knowledge. I feel we have upon us in the immediate future a great change in mental attitudes toward the physical world which would bring into existence new pieces of information which will completely change our scientific viewpoint. It is not what we know that is so important. It is what we do not know. Most of what we know can be found in libraries, in the minds of people and in processes as they exist today. But we have no conception of what a small percentage this is of what there is yet to know.

As an illustration, we perhaps do not recognize it, but everything that ever moved on the earth has been moved by energy which came directly from the sun. Our coal and oil deposits, our forests, our crops and everything that lives on the earth is simply an energy contribution from the sun. We do not know, except in a very superficial way, how the energy which is given out by the sun is transmitted to the earth. We do not know how plants pick up this energy and convert it into animate carbon dioxide and water into the vital materials necessary for our existence. This, when understood, will open up an entirely new conception of things that can be done.

It is not difficult with this information in hand for even the most unimagina-
tive person to predict the propulsion of airplanes by radiated energy with the power plants located on the ground. Nor is it difficult to envision the entire system of aerial transportation which would be unaffected by fog and weather conditions in general. Most of this work is being studied today under the name of photo-synthesis—that is, how plants grow. And we have one research which, for want of a better name, we say is trying to find out why the grass is green. We must understand something of these processes of radiated energy before many of the great problems which lie ahead of us can be solved.

So much of our information today does not consist of basic understanding. It is known to us only by definitions. We say we can see through a pane of glass because it is transparent, and yet we do not know the first principle of how light is transmitted through glass. We say a copper wire is a conductor of electricity, and yet even our best scientists do not know, even in a small way, how electricity passes through one. We rub our hands together; we say they are warmed by the friction, and yet we have no knowledge today of the magnetism of friction. We know these things exist, however, because we can see the effects of them.

Each year we discover new things, which a short time ago we did not even know existed. I cannot help but feel that in a very short time we are going to break loose another great piece of basic information which will keep us industrially busy for a great many years to come.

There are many people who doubt if human progress can continue on its present standards. Still others think that we have to go back to lower standards of living. There are, however, a substantial number who, knowing something of the development of civilization, do not regard the evidence presented as justifying either a static or a retrograding standard of living.

Our civilization as a whole is new. This is the first time in the history of the world that such a civilization has been in existence. It is itself an experiment and just because we have encountered difficulty is no cause for despair. We must not give up hope of a better and more secure life.

We must also have an open-mindedness in dealing with all new problems. When Faraday was experimenting on some of his first work in electricity, a member of Parliament said: "What use can this ever be?" He replied: "You may be able to use electrical apparatus some day."

Most people think that science and industry are interested only in the development of labor-saving machinery. This is entirely a false notion. But we must not forget that for the past 50 years, when the great building of our railways, cities and industrial plants was going on, this labor saving was a most important thing because we did not have enough people to do the work. We are all very much more interested in the production of labor-producing projects and invention than we are in labor-saving. If you will only recognize how much there is yet to be done that will be of general good to the whole human family, then we need not worry, but we must be bold enough to take those forward steps which will bring back prosperity in any measure that we desire or in any measure which we have imagination enough to conceive.

GLENN FRANK
President, University of Wisconsin

It has been the essence of the American spirit to face the future with high expectancy of new and vibrant possibilities. The American has been a man of faith. He has always scorned the suggestion of surrender in the face of difficult circumstances. He needs to remember and to rely upon that spirit now.

A thousand and one voices are whispering to him that his only hope of salvation and security lies in a deliberate retreat from this age of plenty and a planned return to the age of scarcity. Tonight some of us are undertaking to challenge the soundness of this whispered advice.

There is no dodging the fact that the relentless advance of physical science and industrial technology has confronted us with unprecedented difficulties. The development of scientific processes has moved with airplane speed. The development of social policies has lumbered on at a stage-coach rate. Research in the physical sciences has produced social changes faster than research in the social sciences has perfected social controls. All sorts of maladjustments have occurred. And the result has been a race between scientific progress and social instability, with social instability, for the time being, in the lead.

The blunt truth is that the revolutionary results of physical science and industrial technology have brought us to a cross-roads where decisions that will determine our destiny must be made.

There are only two choices now open to us. We can call a halt on scientific research and technological advance until they no longer put so many strains on the traditional structure and functions of our social order. Or we can put our brains to the business of making such readjustments in our political, social, and economic policies as will enable us to take full human advantage of this new age of science, technology and plenty.

The first choice is unworthy of the American tradition. The second choice would mean that the spirit of the pioneers is not dead in us.

To me the most disturbing fact of the time is the number of Americans, in
high position and low, who are falling victim to a defeatist mood, apparently assuming that progress has come to a dead end, that science and technology have been too efficient in producing a limitless output at low prices, and that the thing to do is to plan a lesser output at high prices.

To restrict production and to raise prices as a general policy is, to me, not liberalism but reaction, not statesmanship but surrender, not creative advance but cowardly retreat. That way lies the subsidizing of inefficiency. That way lies the sabotage of superior management that knows how to bring both the cost of production and the price of products down. That way lies a permanent and perilous lowering of living standards for the swarming millions. It was not for this that the pioneers built their blood and sacrifice into the foundations of this nation.

More goods at lower prices is the logical goal of an age of science and technology!

To me it is incredible that, in a world of tragically unfilled human need, we should now set upon the Quixotic attempt to increase welfare by destroying wealth or declining to create it. Our ancestors fought valiantly over the centuries to conquer famine. Are we now to say that their conquest has been too decisive? After the sweat and science of generations have brought us out of an economy of scarcity into an economy of plenty, are we to confess that we are incapable of managing plenty, and deliberately legislate a modified famine? I think history will pass a bitter judgment upon us if, in the midst of such manifest need, we take this road in dealing with the difficulties now confronting our farms and our factories.

Two things must, I think, be done in our schools, colleges and universities to help prevent our taking this suicide's road.

First, from one end of our school system to the other, we must rebuild our curricula around a spinal column of political, social, and economic studies which reduce to utter simplicity and intelligibility the plain principles of organization and operation that must govern the work of an age of science and technology if its magnificent mechanism for producing abundance is to serve instead of sink us. These studies must be organized, not in terms of traditional academic objectives, but for the avowed social purpose of training a generation of citizens to play a productive role in the creation, comprehension, and control of a workable social and economic order in an age of plenty.

Second, the universities and research institutes must organize to insure an earlier and sufficient spreading of the social and economic effects of the discoveries of the physical scientist and industrial technologist. Under the research system to date, the social scientists get into the game too late. They wait until the discoveries of the physical scientist and industrial technologist radically upset old social and economic arrangements and then come along as a kind of wrecking crew to clean up after the catastrophe and to suggest ways of preventing its recurrence. That has proved too costly a procedure socially. From now on the physical scientists and the social scientists must work hand in hand. We must devise a new method of continuous cooperation between the physical scientists and the social scientists in all our research centers. The social scientists must be kept informed of what the physical scientists are up to, not after the physical scientists have completed their researches and worked social and economic havoc with their results, but from the very beginning of the researches. If the chemists or physicists are on the trail of a new idea in 1934 that may prove workable in 1954, the social scientists should know it in 1934, not in 1954. And, through all the twenty years between 1934 and 1954, the social scientists should be considering ways and means of making this new idea help instead of hamstringing humanity if and when it becomes workable. If we can invent such a method of sustained cooperation, we can shorten, by at least a decade, the lag between the swiftly changing processes and the slowly changing policies of our national life.

These are, in my judgment, the two major lines along which the universities and research institutes can best help us to take full advantage of this economy of science, technology and plenty, instead of running away from it and taking a coward's refuge in a policy of repressing, restricting, and reducing our maximum productive capacity.

The machine has not betrayed us. We have betrayed the machine. Science and technology have given us the means by which we may emancipate the race from poverty, drudgery and insecurity. If we now prove incapable of using these means to the full, the verdict of history upon us will be that we were a people strangled by our own success.

ARTHUR H. COMPTON
Professor of Physics, University of Chicago

THE scientist is society's scout who goes far into nature's new territory and brings back a report of what lies there. Almost every new wave of technological advance has followed upon some important new discovery by these scientific scouts. The studies by Watt and Carnot of the properties of steam ushered in the first great era of mechanical power. The discovery of electro-magnetic induction at the beginning of the Century of Progress which has just passed made possible the electrical industry with the great changes in living which that has implied. In the discovery of electrons and their emission from hot wires was born that vigorous youth, the radio industry. Such examples are sufficient
to indicate that with further advances of science, new industries may be expected to arise which will change our mode of life, much as our present way of living differs from that of our grandfathers.

Contrary to the thought sometimes expressed that the great findings of physics and chemistry have already been made, there seems no indication that our discoveries have begun to exhaust the possibilities of nature. On the other hand, techniques for making discoveries have been so developed, and the number of trained men carrying on scientific research has so rapidly increased, that we may expect the next generation to see more great advances in science even than the last. The direction of science's immediate future is indicated by the lines of study which are just now being emphasized. A telescope mirror of four times the light-gathering power of our present best instrument is being constructed which will enable man to see farther into space than ever before. Great high voltage equipment is almost completed which will form a new tool for investigating the inner citadel of the new atom, where its precious store of energy is hidden. Powerful instruments are being built for observations in different parts of the world to study those mysterious visitors from outer space which we call cosmic rays. The methods of physics and chemistry which have proven so effective in their own fields are being extended to the study of growing cells with striking results.

Our telescopes and spectroscopes have shown us rather definitely the size of our vast universe. It is reasonable to suppose that we shall soon find some knowledge regarding the ancient history of that universe. Has it been in operation forever, or did it start at some more or less definite time in the ancient past? If the latter guess is correct, we may hope to learn the when and perhaps the how of that great beginning. One approach to this question comes through the cosmic rays which have perhaps been coursing through space since the beginning of the world, and may thus carry with them an account of those beginnings we are already making in the laboratory of Madame Curie and elsewhere,—artificial radioactive elements. Where will these lead? Very probably to the creation of useful new forms of matter. There is a remote possibility that such experiments may lead to a new store of available energy, and if so, the magnitude of that energy should be tremendous. We do not yet know, however, whether this great store of atomic energy can be put to our use, much less can we suppose its how.

In an age when available power is a problem of great importance, the possibility of synthetically preparing chlorophyll, and through its action in the store of the power in the sun in a more efficient way than can be done through the growth of plants, is an enticing one. It would seem highly probable that physical and chemical methods of making artificial living cells will be developed. Enough progress toward understanding the processes involved has already been made to predict that this further great step is probably in the not distant future. This of course has little direct relation to life in its more complex forms, such as plants and animals. It required millions of years for nature to evolve these organisms. Nevertheless, if artificial life in its simplest form can be produced, its significance in supplying man with new powers and in changing perhaps his complete mode of existence can hardly be over-estimated.

Perhaps these glimpses into what the future of physics and chemistry may have in store will serve to suggest the great possibilities which are yet ahead. Unless civilization utterly fails us and removes from the followers of science the means whereby research can be carried on, we may confidently anticipate a continued and rapid growth of our knowledge of nature and with that knowledge a growth of man's powers.

Harvey Wiley Corbett
Corbett, Harrison & MacMurray, Architects

First and foremost in the heart of every man and woman is the desire for a new, a better and a cheaper home.

The oldest activity in the world is the making of human shelter, and the methods of doing it today are about as old fashioned as in the days of the Pharaohs. Such new comforts and conveniences as we enjoy now, bath-rooms, ice-boxes, radiators, electric light, etc. are all industrially produced, and we could not afford a single one of these comforts if they were not so mass produced. Why stop with the mechanical comforts?

Let industry take this last and final step and produce the shelter as well as the comforts. Let us make this oldest human activity industry's newest venture and see if industry can do for the habitation machine what we already know it has done for the transportation machine.

Such a national and international authority as Mr. Kettering has publicly stated that today America needs twenty-five million new homes. It will take a hundred billion dollars to supply the new homes of the new era and take care of one-half of us. That means a hundred billion paid to ourselves for work and material.

I maintain that industry can now step forward—produce these twenty-five million needed homes,—reemploy idle labor on a vast scale, rehabilitate idle plants,—reopen sources of raw materials and definitely establish recovery on a sound and permanent foundation.
Industry alone can do this thing. Industry through quantity production can do for human shelter what it has already done for human comfort in a thousand other fields. Always giving more and more for less and less, always giving a better product for less money. The home of the immediate future will be to the home of the present what this year's latest model motor is to the horse and buggy of forty years ago. Industry can take the headache out of home building, coordinate all the factors from land to finance, deliver a house, more beautiful, more permanent, more varied in plan arrangement, erected and ready for occupancy within a week from the time the order is placed with no disturbance of the ground, no littering of the surroundings with debris, no noise of construction, no carting away of waste and all this at half the present cost.

This is no idle, imaginative dream. Many capable, resourceful, inventive minds have been at work for years, evolving the technique that makes this thing industrially possible. No effort for broad social betterment could be so far-reaching, so incentive toward better citizenship more powerful, no contribution to the beautiful life more vitally important.

CARL R. GRAY
President, Union Pacific Railroad

TRANSPORTATION in some form underlies every human activity. In a country of great inland distances, rail transportation is basic. The steam locomotive, in matters of speed and economy, has limitations on account of weight. To accomplish higher speeds with safety and justifiable economy our hopes are based upon the development of lighter weight trains, powered by Diesel engines, each providing its own electric traction.

Safety, so important to travel, has been given primary consideration in this development. There will be no lowering, but rather a raising, of the present especially high safety standard.

To secure greater speed, the weight has been reduced to the extent that two of the streamline trains will weigh less than one of the old steel steam trains of equal capacity. The lighter weight is being provided by the use of aluminum alloy, with articulated cars or units permitting from 60 per cent. to 70 per cent. less wheels, and with practical elimination of slack.

The power problem is being met by the genius of General Motors through its Winton Division, which has produced a light weight, high speed Diesel engine; and advanced construction ideas permit a low center of gravity, specifically reducing impact on curves.

Again, these articulated units allow of air conditioning in its most advanced form, preserving an even temperature, under all conditions, with complete change every four minutes.

The streamline design has already demonstrated its value. It requires no great stretch of the imagination to foresee the possibilities of this new form of transportation. In a transcontinental journey the saving of a business day is clearly in the picture. Altogether the railroads face the future with new and novel possibilities almost wholly unknown even a year ago, when the Union Pacific authorized purchase of its first streamlined three car train with a 600 h.p. engine. Even then, this was the limit. In the brief time intervening, the further development of the Diesel engine successively from 600 h.p. to 900 h.p. and to 1200 h.p. has permitted us with confidence to order a six-car train, and then two nine-car trains. The first three-car train, fresh from the factory, has made an initial trip of 12,000 miles without the slightest untoward incident. A million and a quarter people have checked through the train, and many millions more have seen it en route. The interest has been continuous and intense. Apparently the old glamour which surrounded the Iron Horse has returned with renewed vigor to its modern counterpart.

Contrary to some belief, the railroads through the years have consistently advanced, and have readily embraced each possibility which science has supplied. They will just as readily adapt themselves to motorized rail transportation, and mechanical genius has in this challenge great opportunity for new service to mankind.

ROBERT E. WILSON
Vice-President and Director of Research, Standard Oil Company of Indiana

WHILE as scientific investigators we have gone far afield in our search for new knowledge, it is nevertheless true that in reality we have hardly scratched the surface of our own backyard. The most important discoveries from the standpoint of human welfare are those still to be made.

Practically everyone knows that water is called H₂O because its molecules consist of two atoms of hydrogen and one of oxygen. Every chemist has been taught to analyze water and to detect traces of impurities down to less than one part per million. Its physical properties have also been measured with extreme accuracy. Had you told a chemist two or three years ago that he did not really know the composition of water, he would have been grossly insulted. Nevertheless, within that short time chemists have discovered that pure water, which has always been considered a single substance, actually contains about one part in five thou-
sand of a heavy variety of water, the properties of which are quite different due to the presence in its molecules of a newly discovered kind of hydrogen atom, twice as heavy as ordinary hydrogen. Means have been worked out for laboriously separating this heavy water from ordinary water, and it has been found to have physical properties strikingly different from those of ordinary water—for example, it freezes at thirty-nine degrees instead of thirty-two degrees Fahrenheit. Certain plants and fish placed in concentrated heavy water have been unable to survive. On the other hand, it has been discovered that many growing things appear to have a slight preference for heavy water, so that the proportion of heavy water in certain trees is slightly higher than in the ordinary water bathing their roots.

Heavy water can, of course, be split up to secure this heavy hydrogen, and these heavy atoms of hydrogen can be inserted into thousands of other chemical compounds, giving products which will undoubtedly differ more or less from the ordinary products containing ordinary hydrogen, just as heavy water differs from ordinary water. Undoubtedly hundreds of chemists will be working, for many years to come, on the simple yet difficult process of inserting one or more atoms of heavy hydrogen into various familiar compounds and seeing whether the resulting products are sufficiently more desirable to justify their commercial manufacture, even at considerable cost.

Another important recent development in this field relates to sea water. For millions of years, rains falling on the land have dissolved out most of the water-soluble substances and washed them into the sea. The ocean today contains enough salts to cover the entire United States to a depth of nearly two miles. The existence of this treasure-house of salts has long intrigued both the chemist and the promoter, but as yet the first large commercial plant to recover any of these valuable salts from sea water has been built within the last two years on the coast of North Carolina, the first substance recovered in paying quantities being bromine. Since pumping and other handling costs are covered by extracting the bromine, the recovery of other materials, for example, gold, is quite within the realm of possibility. The total gold content of sea water has been estimated at more than seven billion tons, but it is present in such extremely low percentage that most of us will probably see no more of it than we do of ordinary gold. Potassium chloride, a necessary fertilizing ingredient which has been washed out of the soil during past ages, may be recovered and restored thereto.

Other recent discoveries about water are even more important to human welfare. Only recently have chemists begun to learn a little about the how and why of controlling the water content in various parts of the body. Replacing common salt in a man's diet with certain other normally harmless salts causes rapid loss in weight and mental depression, due largely to de-hydration of the tissues. On returning to the use of common salt, there is a rapid gain in weight and a feeling of exhilaration lasting several days, due to the restoration of water to these tissues.

Reduction of the water content of cancerous tissue by certain chemical means has recently been found to greatly retard its growth and such observations may very well lead to eliminating this age-old scourge of the human race.

Scientific discovery is still in its infancy because even the most common things around us are not yet fully understood, to say nothing of the complex processes which go on daily within us. Certain it is that the contributions of scientific research to the health, to the wealth, and to the happiness of man during the next century will far outstrip all that it has contributed during the past century of progress.

M. H. AYLESWORTH
President, National Broadcasting Company

WHEN Senator Marconi recently celebrated his sixtieth birthday he said that he hoped to surprise the world in a year or two as he did in 1901 when he thrilled the human race with the first trans-Atlantic signal. Marconi was only twenty-seven on that historic day. And at sixty he is aware that the science of wireless, which he gave to the world, is comparatively but a day old.

Radio's possibilities are unlimited. Owen D. Young's timely remark in 1920 applies to 1934, "the principal asset in radio is still the unknown." The radio discoverers are still sailing uncharted over that ocean of science which no man owns.

Radio today is pulsing with the lifeblood of new industries that will rise within the years to come, giving employment to additional thousands of men and women.

Facsimile radio, that is, the sending of pictures and printed matter through the air, is looming on the horizon of science. It is uncanny to watch the radio pens sketch drawings and words in the laboratories. But as we watch the activity of the tiny radio pens as they dart across the paper, they seem to move with a businesslike sweep that means they are going some place. I believe the day will come when you will turn on the facsimile receiver when retiring and in the morning the paper tape will tell the story of what flashed through the sky while you slumbered. You will find road maps, fashion designs, comic sketches for the children and no end of things, for whatever a pen can portray facsimile radio will handle.
Television, of course, dreamed of since man first realized radio was more than a toy or a craze, is one of the big hopes of the radio industry. Mr. David Sarnoff tells me that television is on its way. Research experts are reporting excellent progress. But it requires time and a good deal of money to launch a new industry such as television. And you know television images have standards up to which they must live.

The future of radio is no idle dream. With the wondrous vacuum tube pulsing as the heart, radio as we know it today, is but the foundation of new industrial activity destined to serve mankind in all hemispheres.

MORRIS FISHEIN
Editor, American Medical Association Journal

The life of man upon this earth is seventy years. A child born today may expect to live sixty years instead of the thirty-five years it could expect in 1833. More has been accomplished in the last fifty years than in the previous fifty centuries. Yet there remain many infectious diseases and plagues not yet under control which may devastate mankind and strike again into the hearts of men the fear of pain, disease and death.

Diseases once limited to savagery and the tropics are now seen in the temperate zone among civilized men. The cause of influenza is not yet known nor is there any specific origin established for epidemic encephalitis. The advances of civilization may bring with them new disease hazards. Cancer, the most dread disease, has come to be considered the natural end of life for the aged—its cause and specific methods of treatment not yet determined. The prediction that the specific causes of diseases of unknown origin will soon be found is more than justified by the speed with which modern research proceeds.

Medicine owes a vast debt to other sciences. The physicists, the chemists, and the engineers are as much responsible for some of the tremendous achievements of medicine as are the laboratory investigators and the physicians at the bedside. The microscope, the X-ray, and innumerable other devices have vastly extended the sense of vision. Electrical apparatus has made it possible to test accurately the functions of organs like the heart and tissues of the nervous system. The chemists have developed new remedies.

The whole purpose of medicine is to make healthier, stronger and more efficient human beings. Already success can be demonstrated. The boys and girls entering universities today are on the average two inches taller and weigh seven pounds more than did their parents and grandparents who entered these same universities in previous generations. With the discovery of the vitamins and with the newer knowledge of nutrition, even better bodies will be available in a few generations. It is, moreover, reasonable to predict that the knowledge now available for controlling the birth of the unit and the degenerate, eliminating hereditary strains that lead invariably to weak bodies and to disease, will be applied to more civilizes communities in the future for the advantage of all mankind.

Outstanding among recent discoveries have been those concerned with the glands. The glands regulate the size of the human being, the shape of his body, the speed of his living, and many of his functions. Yet only a beginning has been made in the available knowledge.

If there is any one phase of medicine which predominantly demands study for the benefit of mankind in the coming century, it is that concerned with the mind of man rather than with his body. The physician believes that the happiness and health of mankind depend on a retention of the recognition of the human being as an individual. If the advance in the science of medicine has established any one fact, it is the fact that no two human beings are alike and that the retention of the status of the human being as an individual is of vital significance to him in times of suffering and disease.

The nineteenth century marked the beginnings of research. The twentieth century finds mankind accumulating information faster than he can use it. The twenty-first century should find order introduced into chaos and happiness for all. Problems of distribution in medical care make it difficult for many people to avail themselves of all that medicine now offers. The medical profession of the future must determine ways for overcoming these difficulties. It seems vital to establish the fundamentals of good medical care and to assure every individual of at least these fundamentals.

In the great Century of Progress Exposition of the twenty-first century medicine will again no doubt be outstanding in its contribution. We shall see the majority of mankind approximating the three score years and ten, which is the normal biological cycle of man. We shall see a beginning of some control over the reproduction of the unit and the degenerate. Infections diseases will be eliminated. The bodies of little children will be better nourished. The better utilization of more leisure time will decrease the nerve strains and stresses now associated with both mental and physical breakdown. Yet disease will continue to take toll of mankind. The frontiers of disease move onward as the control of diseases makes progress. The germs change their nature. New generations of men lose their immunities of the past. New machines, new chemicals and new methods of living bring new hazards which must be investigated. The medical
profession is a forward-looking, eternally vigilant and ever hopeful body of men to whom science is a god and service an ideal.

WALTER B. PITKIN
Professor of Journalism, Columbia University

We want to tell the 1934 Consumer what lies ahead. In 1949, following an extensive investigation patterned along the lines of General Motors Customer Research, the world's 20 largest corporations got together on a life-term installment program for goods and services. They offered each subscriber complete equipment for living—food, clothing, a home, an auto, a plane, television, and a world-travel ticket good on all trains and boats—all for a flat monthly payment. In 1953 they threw in a life and disability insurance policy. In 1959 they added medical service complete.

At the close of business in 1966 there were 556,432,000 customers on the books of the Life, Liberty & Happiness Company.

Then a queer thing happened. Governments became rapidly obsolete. Politics died out. The bread lines in outlying districts were full of ex-aldermen and impoverished statesmen. People had everything they wanted. They felt secure from birth to death. Whenever they needed new shoes or a new car or a week-end ticket to Afghanistan, they called up the Service Station of the Life, Liberty & Happiness Company.

So there wasn't a live political issue left. Just a lot of laboratory problems. There still were fleas in the summer time, and mosquitoes too. The winters were too cold up north, and the summers too hot down south.

At the end of 1969, an agreement was reached whereby the asylums of the country filled all political offices with harmless nuts suffering from delusions of grandeur. Uniforms and brass bands were furnished. Paper and ink for proclama- tions were available at all hours of day and night. And all the asylums were closed up. One keeper in each city hall and State capitol had to be maintained, just to be sure that nobody took the inmates seriously.

Then, on July 4, 1981, the last fly swatter on earth was publicly burned on the Century of Progress Grounds in Chicago. Long before then, the last flea, bedbug, cockroach, beetle, mite, and other pest had been conquered. With politics and insects removed, the human rate at last began to progress, in a Big Way. Wars ended. So did sickness. So did food shortage.

Early in 1960 everybody realized that long-distance transportation, except for pleasure, would soon cease. Each populated area was producing its own food, clothing, and other necessities in tremendous excess of local needs.

This local self-sufficiency came about through three revolutionary inventions, all anticipated around the mid-twentieth century. First, there was the small electric power unit, which, perfected around 1957, made useless the colossal superpower systems of earlier times. Generators photovoltaic and generators electrochemical, some as small as alarm clocks, were turned out by the tens of millions. Power was made wherever and whenever needed. In 1965 the average American family was using 25,000 kilowatt-hours every year—or about 40 times as much as in 1944. With it, they heated and cooled their homes, regulated the humidity of air, grew their Fancy winter vegetables, cured themselves of colds, healed all ordinary bruises and cuts, and operated their television.

The second invention was the local control of climate. From the air conditioning of homes and factories, first popularized in your day, engineers and scientists worked steadily toward air conditioning of entire cities from central plants. This became universal around 1988. Long before then, though, Alfonso G. Miffin, the eminent Guatemalan climatologist, obtained funds to build his first super- wind trap around Winnipeg. This extended about 20 miles around the northern and western limits of that city. It was one mile high and twelve wheel tiers deep. The wind was slowed down from 50 miles per hour to ten as it filtered through this trap; and its pressures were all converted into electricity which was then used in Winnipeg for warming the outdoors through an ingenious system of air flues laid underground.

The following winter, the people of Winnipeg were growing spinach all over their lots and going around without overcoats. In 1989, Russia ordered 500 miles of the super-wind trap and set it up around Moscow, which at once became the most popular winter resort in Europe and Asia.

By 1997, 89,000 miles of the traps were in service; and 6,000,000 square miles of sub-arctic lands hitherto too cold for crops and comfort became thickly populated and fertile. The world population began to rise again, until it reached its present amazing record of 5,000,000,000 souls.

The third invention that revolutionized life for the average man was the electrochemical technique of stimulating seeds before planting them. A few people know that the Russians began this way back in 1950. But not until 1971 did they finish their research. Then farmers in central Michigan were growing cotton better than Georgia ever produced; farmers in central Siberia were growing two crops of winter wheat every year; farmers in California and Florida were all taking four crops a year off their fields. The cost of living dropped so low that any man could get along passably on an income from ten hours of work a week.
EXCERPTS
FROM REPRESENTATIVE STATEMENTS

Message from the President

... I assure you the Federal Government will continue its efforts to stimulate employment, increase American values and bring about progressively higher standards of living. As I have said before, private business can and must help. The nation will remember those who are helping. It also will remember those who believe that our progress in this world is finished and who make no constructive contribution in the present emergency. I count with confidence on the loyalty and support of the nation's industrial leaders. ...

FRANKLIN D. ROOSEVELT.

Hon. Daniel C. Roper, Secretary of Commerce

... The spirit of the American people is the spirit of courage and progress. Mistakes should be regarded as guides for greater future achievements. The vast majority of American people believe, I think, that we are on the threshold of a greater era of progress and happiness than ever before in our history. Let us all join in bringing about the fully in our eventful progress.

Hon. H. A. Wallace, Secretary of Agriculture

... Some people say there should be a ban on all inventions and a moratorium on science. I say let there be more inventions and more science, but let the field of its influence also be felt in the social world, so that the tensions resulting from differential economic rigidities will not produce unnecessary explosions which might conceivably retard us very seriously in our eventual progress.

JOSEPH S. AMES, President, Johns Hopkins University

... the only solution for unemployment is the development of new industries as a result of scientific studies. Industry cannot advance except as the result of scientific work, and this in the end means that the industries themselves must furnish the money for such investigations.

CHAS. A. ASH, Director of Research, Calif. Packing Corporation

... I can visualize the products of the orchard and field of Turkestan or California served in London ten years hence with all the native freshness and taste of those freshly gathered. ... Not less interesting and romantic will be the container for these foods, which I visualize as non-metallic, transparent and non-breakable.

MAX W. BARB, President, Allen Chalmers Mfg. Co.

... It is just as possible to shut off the current of a river as it is to stop the march of science and invention. The solution of our economic ills is not through attempting to stifle those forces of progress, but rather by encouraging their future development and utilization as the basis for a higher standard of living.

ROGER W. BARSON, Economist

... I believe that business would continue to improve if the administration would cease starting new ventures and enforce the various codes and other plans which have been inaugurated.

THOMAS S. BAKER, President, Carnegie Institute of Technology

... The accomplishments of American scientists will inevitably stimulate American industry.

CHARLES A. BEARD, Historian

... Delirium is a mental disease, not a philosophy of life. Scientific invention must continue but social invention must provide an efficient distribution of wealth to supply buying power adequate to the flow of mass production.

SOOTHESES BEHN, Chairman, International Telephone & Telegraph Corporation

... I have every confidence in the future and I believe we are not going backward but forward.

JAMES F. BELL, President, General Mills, Inc.

... Industry is on the threshold of great achievements, but it must be liberalized and its expenditures intelligently directed to create new and expanding fields of opportunity.

VINCENGT BENSIX, President, Bendix Aviation

... The automobile of the future and the airplane of the future ... will go through such great change and advancement in engineering and scientific design and construction that the use of these two wonderful means of transportation will be greatly increased throughout the world.

JOHN B. BERRYMAN, President, Crane Co., Chicago

... There is no lack of potential demand for everything which can be produced.

MALCOLM B. BINGAY, Managing Editor, The Detroit Free Press

... The American business man wants business and the American working man wants work. Our native creative genius will bring about undreamed of prosperity for everybody, if it is not hamstrung by governmental bureaucracies.

E. K. BOLTON, Chemical Director, E. I. du Pont de Nemour & Company

... Among future possibilities may be mentioned new types of synthetic fibers for textile and mechanical uses which may make possible the construction of new fabrics surpassing those now made from rayon and cellulose acetate; new types of industrial and automotive finishes of greater durability; new materials of construction which may make possible substantial reductions in the cost of house construction by means of factory fabrication; and more effective insecticides and fungicides which would reduce the annual damage of hundreds of million dollars to food crops.
are available, and with that growth will come undoubtedly a steady lifting of standards of living, increased demands in volume, quality and variety for the products of industry, with a healthy interaction between education and industry which, in my judgment, is bound to contribute substantially to the well-being of the country . . .

WILLIAM L. CHERNIK, Editor, Collier's Weekly

. . . Now as seldom before we need the courage of those who look ahead calmly with a just appreciation of the tremendous forces of intelligence and good will which are bringing to solution our common problems . . .

C. M. CHESTER, President, General Foods Corporation

. . . We believe America's inventiveness is little more than started. With seventeen hundred industrial research laboratories in operation compared with two hundred twenty years ago, no other conclusion is justified . . .

E. C. CRITTENDEN, Chief, Electrical Division, National Bureau of Standards

. . . Our knowledge of the material world and its resources is greater than ever before and science goes ahead with accelerated power. There is no reason to think that the new knowledge will be less fruitful in practical application than that of the past century . . .

D. A. CRAWFORD, President, Pullman Company

. . . The amount of useful work can be steadily expanded through the application of scientific research to industrial products and production methods as especially exemplified in the great industry that you represent.

ALFRED DAVIES, Managing Editor, Scribner's Magazine

. . . Far-sighted leadership, utilizing science, industry and human engineering for constructive measures to speed the recovery already begun, will raise the general level of living standards and bring prosperity to the whole people . . .

GEORGE JACOB DAVIS, Jr., Dean, College of Engineering, University of Alabama

. . . I have faith in the ability of leaders in engineering, industry and government to solve the present problems of distribution and thereby assure employment, promote an equitable distribution of wealth and make attainable higher standards of living . . .

HARVEY L. DAVIS, President, Stevens Institute of Technology

. . . We are coming steadily to the time when industry shall put an end to poverty. No doubt remains now that we can produce what we need. The times call for men who can apply to the problems of distribution the spirit and methods of science and engineering.

WATSON DAVIS, Director of Science Service, Washington, D. C.

. . . The problem is to see continued intellectual and industrial progress, there must be continued with full vigor and adequate financial support the researches of scientists . . .

CHARLES G. DAWES, Chairman, City National Bank & Trust Co.

. . . Industry is on the threshold of great achievements. Not only the greatest steps in the improvement of industry but of human conditions and relationships as well, have added to their inception in common conditions of adversity . . .

HENRY M. DAWES, President, Pure Oil Company

. . . To concentrate thought and effort upon dividing existing things rather than on the discovery of new ones is a sure sign of degeneracy. It is the doctrine of one who would take from others rather than create for himself.

RUPUS C. DAWES, President, Davies Brothers, Inc.

. . . I hope and believe that this meeting will result in confirming the hope and stimulating the courage of the leaders of industry in the United States . . .

PAUL DE KRUIF, Writer

. . . The most important change demanded in the scientific spirit today is appreciation of the ridiculousness of the notion that want, disease, and distress, amidst potential plenty, is an insubstantial riddle or an act of God, instead of temporary—a disaster remediable by human energy, brains and cooperation.

W. A. DEL MAR, Acting Chairman, National Research Council

. . . The limits of progress are not in sight.

ARTHUR C. DORRANCE, President, Campbell Soup Co.

. . . Count me as one who believes that higher standards of living are obtainable through the encouragement of business initiative and the broadening of industrial activity . . .

ARTHUR S. DRAPEL, Editor, Literary Digest

. . . My personal view is that the standard of living will be raised, that social relations will steadily improve, that international relations will grow better. Youth is taking a serious and active part in seeking solutions of the many problems confronting us.

J. RUSCOE DUMOULIN, Executive Editor, The Christian Science Monitor

. . . While we have been facing the challenge of the present depression and a still grimmer unemployment, we have been deferring the challenges of modern science. We know that a scientific development capable of revolutionizing the nation's economy is possible whenever we are prepared to accept the social and industrial responsibilities essential to its realization . . .

LYNN H. FABIAN, President, Cornell University

. . . The increase of knowledge in the future will be even more rapid than in the past, and that application of new knowledge to life and industry will be greatly to the advantage of society . . .

JAMES A. FARRELL, Director and Former President, U. S. Steel Corporation

. . . I share with you the concern that any—
one should doubt our capacity as a nation to carry through to a successful issue our task of readjustment to an international situation, which, while presenting difficulties, does not admit of lack of faith in our future destiny.

EDWARD A. FILENE, President, William Filene's Sons Co., Boston . . . I look for a great long-term business expansion soon, comparable to the rise of the Automobile Industry following the war, because a paradoxically increased mass buying power plus a mass leisure will present unparalleled opportunities for industries, especially those providing recreation, travel, and similar services.

IRVING FISHIES, Political Economist and Professor of Political Economy at Yale University . . . With proper treatment we can reach and surpass all former records of prosperity.

MORTIMER FLEISCHHACKER, President, Anglo California Trust Co. . . . We will soon commence a new period of expansion greater than ever before. I believe that our standards of living will eventually improve and prosperity will return.

ESKIL FOEN, President, Ford Motor Company . . . Every peak reached by this nation has been succeeded by a recession, and during the recession demands have been made that the country's progress be pegged at a given point.

F. C. FRANTZ, Research Staff, Aluminum Company of America . . . The general use of very much lighter trains and trucks to shorter time and cost of transportation will be one of the most important cultural developments of the near future.

JOHN E. GALVIN, President, Ohio Steel Foundry . . . Those who think that the world, and particularly the United States, are finished, fire me. In my opinion the average standard of living, even in our own country, is not ten percent of what it should and can be.

FRANK E. GANNETT, President, The Gannett Newspapers . . . I want to see America forge ahead developing new fields and new possibilities instead of restricting effort and dividing up present day jobs.

GARET GARRETT, Writer . . . Competition, struggle, insecurity, the shakeout of the great disappointments of all the tribulations of complete political and economic security, the very basis of our self-responsibility, such are the elements of the price of progress. People who weary of paying the price will not progress.

THOMAS S. GATES, President, University of Pennsylvania . . . By the strongest exertions, by the linking of knowledge with prudence, training and experience, by continual effort to have those who produce share in the results, the standard of living of America may be maintained and broadened.

W. A. GIBBONS, Director of Development, United States Rubber Co. . . . Technical progress in the rubber industry will produce many new applications of rubber. The manufacture of these will create new jobs and the products will contribute to the health, comfort and safety of the public.

ARTHUR M. GREENE, Jr., Dean, School of Engineering, Princeton University . . . Progress has not reached its limit at present. To admit this would merely be to give up all for which we have striven during the last century.

SIMON GUGGENHEIM, President, American Smelting and Refining Company . . . Science has already made laboratory discoveries which are only awaiting translation into commercial use to afford a wider and bigger field for human activity than we have as yet experienced.

F. H. HAGGERS, President, Union Carbide Company . . . The defeatist mental state of some individuals today is entirely unwarranted from economic, scientific, and historic viewpoints. We are facing the future with confidence.

ROLLAND J. HAMILTON, President, American Radiator Company . . . It is my firm belief that America is still a young and virile nation, that our people demand and will attain higher and still higher standards of living and that initiative, imagination and courage will continue to be the motivating forces enabling industry to contribute its full share towards this happy eventuation.

J. O. HAMMITT, Vice-President, American Cyanamid Co. . . . The chemical industry as a whole has maintained its research activities, has improved its manufacturing processes and the quality of its products and has developed new and useful products which will contribute to greatly increased activity as soon as normal flow of private capital into industrial expansion again becomes possible.

JOHN HAYS HAMMOND, Inventor . . . I have no patience with the defeatist group, am as optimistic as ever regarding our country's future.

PHIL S. HANNA, Editor, Chicago Journal of Commerce . . . With perfectly monumental deficits already created in goods and things American people have come to regard as necessities, and with the young generation air-minded, electric-minded, play-minded and culturally minded, plus yearnings never even partially satisfied for music and travel, there is a pent-up demand which if released would in a few months tax the capacity of our productive facilities the nation over.

H. I. HAUSERMAN, President, Chamber of Commerce of the United States . . . America has not begun to reach its destined goal. Its farms need more machinery and better cultivation, better barns and better homes. Its cities are over-crowded and ill-constructed. Its factories are in need of rehabilitation. Let no one say there is not a great task before America, one that challenges its imagination and that starts it on towards the possibilities of the future.

WILL H. HAYS, President, Motion Picture Producers and Distributors of America, Inc. . . . In the great pathways of the world, no rut created by depression or temporary obstacle can halt the surge of human progress where that progress is predicated upon man's inventiveness, his genius or his art.

WILLIAM RANDOLPH HEARST, President, Hearst Consolidated Publications . . . The Century of Progress is ahead of us and not behind us. There is no reason to believe that the human mind has reached the limit of its development, or that America has ceased to be the center of intellectual development and industrial progress.

E. A. HIPCHOCK, Dean, College of Engineering, Ohio State University . . . A life spent in industry and in the engineering and scientific training of youth has proved to me conclusively that to retrogress, or even stand still, is unthinkable.

JOHN H. HOGAN, Vice-President, Continental Illinois National Bank and Trust Co. . . . The remarkable improvement made in the handicrafts and sciences of the past year refutes any theories to the effect that progress has stopped.

KENNETH C. HOGART, President, The Wall Street Journal . . . If the leaders of industry make clear that this prosperous industry is the best guarantee of a prosperous citizenry, the unique lustre which has been traditionally associated with American civilization will continue.

MAURICE HOLLAND, Director, Division of Engineering and Industrial Research, National Research Council . . . One half the people attending the Cen-
tury of Progress last year are employed in industries which did not exist at the time of the 1893 fair. The industries of tomorrow are being moulded in the University and Industrial Research Laboratories today. . . .

William E. Horchius, President, Armour Institute of Technology . . .

We are in the early rather than the late stages of an era of scientific and engineering advance. This advance will contribute greatly to social betterment and will be conditioned by the wisdom with which administrators and engineers are able to make between technical change and economic and social reactions to such change. . . .

George H. Horst, President, Baldwin Locomotive Works.

It would take full time operation of all the locomotive plants in the country for 15 to 20 years to replace existing locomotives required for normal carloadings. By far the greater portion of these locomotives are commercially obsolete and uneconomic to operate.

Roy W. Howard, Chairman, Scrip-Howard Newspapers.

Human wants are as unlimited as are the possibilities of science and invention, and those human wants can be satisfied only as individual earnings increase. . . .

O. C. Huffman, President, Continental Can Co.

The enormous purchasing power held back during the past four years is bound to be released when properly stimulated, and I believe it is up to industry and science to show that they are going ahead with the development of their products and expanding activities, offering the consumer new and improved products.

A. L. Humphrey, Chairman, Westinghouse Air Brake Company.

We come in an unfinished world; and in an age and among people eager and in- suitable for better methods, goods, services, entertainment, education. The masses of our population are intelligent, informed, instantly ready to demand and accept the new and different, if, in fact, an improvement on past practice. . . . hesitance, doubt, and pessimism are unworthy of a courageous people. . . .

F. B. Jewett, Vice-President of the American Telephone and Telegraph Company, and President of the Bell Telephone Labora-

tories . . .

If we were overnight to eliminate the results of research and development work in the field of electrical communication during the past twenty-five or even the past ten or fifteen years, the disablement of the social and industrial structure would be appalling.

Jesse H. Jones, Chairman, Reconstruction Finance Corporation.

One whose active life has included that part of the present century which has passed, nothing in the improvement of science, industry and society seems impossible or even unlikely. Experience would be entirely wasted if it had taught those in positions of leadership at the present time that we had reached the zenith.

Virgin Jordan, President, National Industrial Conference Board.

Your gesture of faith in the creative potentialities of American industry, of which the automobile industry affords such an inspiring example, is most timely.

C. F. Kelley, President, Anaconda Copper Mining Company.

Government expenditures, while justi-
tified and necessary as emergency relief measures, never made a prosperous nation. Governments as such, unless completely socialized, have no money of their own. Such expenditures simply mean the enforced levies upon those who pay taxes for the benefits.

Paul U. Kellogg, Editor, Survey Graphic.

The first charge on us is to lay down a new security of livelihood. . . .

Fred I. Kerns, Director, Bankers' Trust Company.

I believe that the voice of industry will soon be heard with full recognition of the rights of all, and that it will show the way to a renewed prosperity that can move for- ward on a sound basis. . . .

Dexter S. Kimball, Dean of Cornell University College of Engineering.

Neither history nor economic reasoning furnish grounds for believing that we have reached the end of progress and that henceforth we must live by dividing what we now have. . . .

Julius Klein, Klein, Curry & Douglas.

We are at a stage of industrial development at which stage of business reconstruction as a result of the feeling that the present industrial technique should be sanctioned as adequate, and be firmly entrenched through codes or other official devices. The result of this relentless zeal and courageous resourcefulness of our industrial experts have been largely responsible for lifting this country out of many previous crises.

Parke R. Kem, President, Drexel Institute.

Our greatest leaders in technical education realize that science stands only at the beginning of its possibilities for the enrichment of human life. During the past century the applications of new discoveries in chemistry and physics have given employment to uncounted millions and have raised the standard of living in all civilized nations.

J. L. Kraft, President, Kraft Phenoce Cheese Corporation.

New inventions and products ready to be exploited, when added to the regular volume of business, plus replacements and modernization, are sufficient to absorb present unemployment, providing industry can be assured it is safe to proceed.


. . . Improvements in continental transporta-
tion facilities, a broader spread of education in this country, and a consequent growth of interest in the news are, I think, certain to result in a corresponding growth of business.

R. P. Lamont, Former Secretary of Com-
mmerce.

I am enough of an optimist to believe

that industrial history will again repeat itself and that the next fifty years will witness further displacement of labor from the older pursuits, and the further development of many new products and new services which will afford employment to those displaced and supply the ever-expanding wants of our people.

David Lawrence, Editor, The United States News.

Anybody who believes that the progress of the world is finite is quite as unreasoning as this at stage of business reconstruction as a result of the feeling that the present industrial technique should be sanctioned as adequate, and be firmly entrenched through codes or other official devices. The result of this relentless zeal and courageous resourcefulness of our industrial experts have been largely responsible for lifting this country out of many previous crises.

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Among significant developments I believe to be impending are: extensive new chemical industries based on water, gas and on the waste gases of the oil refineries; new type of road construction using five hundred to one thousand tons of steel per mile; production of ethyl alcohol gases and fuel for cattle and hogs from waste lumber industry; general use of oxygen and enriched air; metallurgy and industrial heating and many new methods of construction for new types of dwellings.

E. E. Loomis, President, Lehigh Valley Railroad

American railroads are doing more research and experimental work today than ever in their history. Results are certain to make transportation more comfortable and efficient.

Robert L. Lund, Vice-President & General Manager, Lambert Pharmacal Company

It is a fact that more than half of the people of the United States are engaged today in industries which did not exist thirty-five years ago. This progress will continue.

Alvan Macauley, President, Packard Motor Car Company

The threats overhanging industry have much to do with holding back progress and development.

Bernard MacAdam, President, MacAdam Publications

Industry is on the threshold of great achievement, but to accomplish this, business must be allowed to work out its own problems without governmental interference. The dream of every patriotic citizen is to elevate the standard of living not for a favored few but for all our people.

L. B. Martinson, President, The Aviation Corporation

We confidently expect to produce flying equipment, within the next three or four years, capable of carrying upward of thirty tons of payload at speeds above two hundred miles per hour, that can be operated at a cost per ton mile sufficiently low to attract greatly increased patronage and consequent revenues.

M. Lee Marshall, Chairman, Continental Baking Corporation

I agree with you that industry is on the threshold of great achievements despite a setback which is temporary during the next decade great achievements which will create employment for all labor.

Des, W., Jr. & C. H. Mayo, Mayo Clinic

Recent discoveries in medicine are leading to astonishing results, and give a prospect that the life of man will soon reach the Biblical promise of three score and ten. America bases her hopes of sound democracy on education so that government which now is controlled too largely by emotions may be more intelligently administered. The medical profession is one of the great forces in bringing about social progress.

Cyrus H. McCormick, Chairman of the Board, International Harvester Co.

In my judgment the principal future developments in our field will be continued improvement in the efficiency of our products and a much broader use of mechanical power.


Basic social and economic principles are unchanged and the world will continue to advance. Leaders of industry must hold to this truth and by research and development increase the volume of useful work for improving the welfare of our own people and the vast share of the you, possessions of the world. Government cannot long prevent and should not interfere with this natural incentive and occupation.

T. Moses, Chairman, Chairman of Board, Nash Motor Co.

I am one of those who believe in the future of our country... I do believe that industry as a whole must be given a fairly free hand to permit complete development, or we will be fighting for a lost cause.

Dr. Arthur A. Noyes, California Institute of Technology

In my own field, chemistry, and in assembling data, I feel sure that if scientific and industrial research are stimulated and not handicapped there will result in the future as in the past a stimulation of the wants of men and a much greater employment of labor than the unemployment resulting from displacement of old industries.

R. E. Olds, Chairman of Board, Reo Motor Car Company

We have merely scratched the surface in scientific research and industrial development, and if not hampered by too much Government regulation, there should be during the next decade great achievements which will create employment for all labor.

W. F. O'Neil, President, General Tire & Rubber Co.

New inventions, changes in style, new things, require five to seven times as many people to sell them as it does to manufacture them. This means the creation of new jobs, individual jobs along the American ideal.

William S. Paley, President, Columbia Broadcasting System

Nothing is more certain than the assurance that this century's marvelous scientific discoveries are only hints of the extraordinary secrets nature has yet to reveal. Adequate research, and nothing is more obvious than that our use and application of these discoveries for human welfare must be extended beyond where we can see satisfaction.

Frederick B. Patterson, President, National Cash Register Company

We need little fear of the defeatist attitude of those who feel there are no worthwhile possibilities ahead, but I do share with you some concern over the fact that recently the expression of this point of view has opened some new questions.

Dr. Raymond Pearl, Professor of Biology, Johns Hopkins University

Already we know how in the laboratory to increase the power of lower organisms to utilize their available resources in food material and energy for vital processes, such as growth and duration of life from three to ten times over their usual performance with corresponding relative increases in size,
longevity, and so forth. Developments and applications along these lines are likely to come in the not too distant future... J. Howard Pew, President, Sun Oil Co. ... I have noted a tone of pessimism in many expressions regarding the country's economic and social future. This mental attitude constitutes a greater obstacle to rational effort than anything that inheres in the real facts of our situation. ... The Honorable Aylee Pember... This great country with its great past can and will get out of this slough of dejection.

Nirah Bates Pope, Managing Editor, Automobile Topics ... Our nation's business has already been trimmed dangerously close to the stalk and the time has now come to fertilize the soil by encouraging divergent enterprises, and especially by opening up channels for the free flow of capital and credit. A. A. Potter, Dean of Engineering, Purdue University The world is far from finished and even greater contributions to human happiness may be expected in the future if we make more use of science and its applications; if great thinking is our guide in dealing with political, social and economic problems, and if we maintain our faith in our social order, on the one hand, and the value of human initiative and in the future of this country. ... Herbert L. Pratt, Chairman Board, Scoopy Foundation Inc. ... I do not believe the way to recovery in this country is through lavish expenditure in Windschauser enterprises on the part of our government. ... H. W. Prentis, Jr., President, Armstrong Cork Co. ... Intensified activity is essential for more rapid solution of our economic problems. ... Oscar Teman, Editor, New York Herald Tribune ... I am confident that scientific and industrial wisdom will yield a way for putting to rest the same old pessimism which was current before the development of radio, motion picture, airplanes and horseless carriages. ... C. R. Richards, President, Lehigh University ... Through research and invention based upon research, new industries can be developed as marvelous as any that have been thus developed in the past. These will absorb the services of men who are no longer required in the older industries. ... Max A. Ross, Editor, Business Week ... Over the long term the welfare and happiness of the world is best advanced by the production of more things and more goods, more and more efficiently. ... R. L. Sackett, Dean, School of Engineering, Pennsylvania State College ... Social restraints are necessary but invention, discovery, and application of engineering and business enterprise should have incentives which will help to create a better deal. ... Dean H. C. Sadler, University of Michigan ... We are at the dawn of a new age; the age of alloys; newer, lighter and stronger materials and combinations than those which characterized the iron or steel age; the vapor or gas age, in the place of steam; (and) what I would designate as the electric-ray age rather than the pre-conceived electric age. ... Fess W. Sargent, President, Chicago & Northwestern Ry. Co. ... The opportunity for future development looking to greater comforts, conveniences and a wider distribution of all things that make for happiness and progress among our people was never more upon us than it is at this very moment. ... David Sarnoff, President, Radio Corporation of America ... So long as human wants remain unsatisfied, so long as industry devotes itself intelligently to satisfying those wants, and so long as scientific research peers hopefully into the unknown and discovers new processes and new services, the opportunity for great achievements in industry will exist. ... Charles M. Schwab, Chairman, Bethlehem Steel Corporation ... Given freedom of action to work out its problems, business and the nation are set for better days for a number of years to come. ... Walter Dill Scott, President, Northwestern University ... Every generation has felt that at last the climax of progress has been attained and that industry is impossible. Nevertheless the history of the world from the beginning of time indicates that there has been a constant acceleration in the rate of progress. ... William R. Seiber, Chairman, Johns Manville Corporation ... The office building in the future will be a shell structure only, that interiors may be made available to tenants quickly and economically, and designed to suit their own particular needs. ... Edwin R. A. Seligman, Economist, Columbia University ... We are only on the threshold of a far greater prosperity and an ample life. The victories of science and the utilization of the bounties of nature by the intelligence of man are only the earliest infancy. The future is well nigh boundless in its possibilities. ... E. G. Shuey, President, Standard Oil Company of New Jersey ... Not by limiting industry but by extending its benefits intelligently to the millions who do not fully enjoy them must we achieve real recovery and further progress. ... James S. Sweeney, Former Chairman of the Board, Marshall Field & Co., Inc. ... Our nation's story has been one of constant development of new industries, giving wide employment, as well as enlargement of existing fields of endeavor. ... Matthew S. Sloan, Chairman of Board, Missouri, Kansas-Texas R.R. It is impossible for anyone to view ... the marvelous advancements recorded in the southwest in all lines of endeavor without gaining a new and vivid understanding of the meaning of progress and individual initiative. ... L. R. Smith, President, A. O. Smith Corporation ... A five room house equipped with every article of furniture, linen, rugs, kitchen utensils, in a word, everything together with a garage and the lot with all improvements such as sewers, pavement, sidewalks, lawn, trees, can be sold to the working man for two thousand dollars. The profit to the manufacturer, adequate time financing cost, and every other similar type of expense. ... J. David Stern, Publisher, New York Post, Philadelphia Record, Camden Courier, and Camden Post ... Balancing of the Federal budget should wait until more normal business is restored. ... Thor. A. Sterle, Dean of the College of Engineering, University of Notre Dame ... I do not feel that we must retrogress, but rather that science and industrial research must go on to discover new ways of producing sufficient for all. At the same time we must be found for the present distribution of goods produced so that all may receive sufficient to raise the standard of living to the level that will bring peace and contentment. It seems that the most urgent thing at present is to re-establish in the minds of men confidence in our industrial and financial institutions. Without this confidence, little progress can be made. Absolute justice and fairness on the part of both employers and employees is an urgent call to restoring solidity to our business institutions and so make for prosperity and contentment. ... Mark Sullivan, Writer ... In the United States, of all the current failings perhaps the most fantastic is the assertion that the expansion of man's activities has come to an end. ...
G. F. SWIFT, President, Swift and Co. . . . American business must be given an opportunity to forge ahead, to improve its methods and to earn profits. Also high taxes are detrimental to the country's best interests. Restrictions on business incentive and enterprise react directly upon the standard of living. . . .

J. D. TOW, President, B. F. Goodrich Rubber Company . . . We believe we can rightfully look for improvements in the future.

S. E. THOMASON, President, Chicago Daily Times . . . For two years my nerves have been harassed and my digestion distressed by after dinner speakers viewing with alarm all phases of our economic and social trends.

E. C. VAN DIER, President, General Service Corporation . . . The main stimulus to progress must come in the future as in the past from constructive individual initiative.

GEOFFREY V. BERRY, Chairman, The American Rolling Mill Company . . . Neither our national development nor our industrial progress is finished any more than they were forty years ago before the first motor car was built. . . .

EUGENE L. VITAL, Director of Aeronautics, U. S. Department of Commerce . . . The belief that developments of science and industrial research will broaden the activities of industry and bring about higher standards of living coincides with our thoughts about the future of civil aeronautics. The Department of Commerce is voluntarily and enthusiastically committed to a program for the development of airplanes which hundreds of thousands of Americans can afford to own and operate. There are now only eight thousand privately owned planes in the country. . . .

FELIX M. WARING, Partner, Kahn, Loeb & Company . . . The demand for better transportation only within the last few months, on the rails, in the air and on the roads has produced speed and comfort improvements dreamed of and unheard of before—and we have by no means reached the limits. And the industries have a rich, wide and broadening field to plow and harvest. . . .

HARRY E. WARN, President, Irving Trust Co. . . . Business experience is as well sound economic theory counsel against the assumption that a saturation point has been reached in the American market or that the American standard of living has been stabilized at the present unsatisfactory level. . . .

THOMAS J. WATSON, International Business Machines Corporation . . . We have more projects under way in our research laboratories than at any time in the history of our business. . . .

EDWIN S. WEBSTER, Vice-Chairman, Stone & Webster, Boston . . . I believe there are just as great opportunities in the future for broad development of industry in general as there have been in the past.

E. R. WELDRIDGE, Director, Mellon Institute . . . Science is a benefactor of mankind and America is going forward, due to the cooperation of science with industry. The new industries created by science in the last twenty years are only a forerunner of future development. . . .

ERNEST T. WERT, Chairman, National Steel Corporation . . . Industry is keenly alive to the values derived from scientific and industrial research and is anxious to go ahead with a program of developments as the result of the research that is being carried on even at the present time, and thus produce for general consumption, improved qualities at lower prices, which certainly is a basic thing in improving the standard of living. . . .

H. S. WHEELERT, President, Pittsburgh Plate Glass Co. . . . Never has there been such unlimited opportunity for people of ambition, initiative, and ingenuity to capitalize upon the new avenues of trade that are constantly opening up in almost every line of human endeavor.

W. E. WHITNEY, Vice-Pres., in Charge of Research, General Electric Co. . . . Science today is smashing atoms, transmitting them into other elements, transforming matter into energy, and discovering new fundamental things, such as the postron, the neutron, the deutron, and now the triton. No one can foresee the applications of this new knowledge but the electron brought us long distance telephony, radio broadcasting, talking pictures, television, and scores of useful automatic controls. Surely from its newly discovered colleagues we may confidently expect in time applications of equal or greater importance. Since the stone age, men have thought the world was finished, but history shows that only one thing is certain—change. . . .

RAY LYMANN WILBUR, President, Stanford University . . . Far from being finished, the human family and our social organization are not even started. . . .

DANIEL WILLARD, President, Baltimore & Ohio R.R. . . . I cannot believe that one hundred and twenty-five million people such as those whose good fortune it is to live in the United States, are going to be willing to accept for the future a policy of stagnation which is so diametrically opposed to the policy which we have followed during the last one hundred and fifty years and which has made the United States the most desirable country in all the world in which to live. . . .

S. T. WILLIAMSON, Editor, News-Week . . . Economic gains are transitory without corresponding social gains, for the mere improvement of standards of living is not enough; with it must come better standards of life. . . .

JOSEPH WILDESHIRE, President, Standard Brands, Inc. . . . We are frankly and emphatically on the side of those who have confidence in the outlook for better business and I believe that this confidence, backed by courage and constructive work concentrated on the future rather than on the demands of the immediate present, should result in a steady improvement in general conditions.

REV. SAMUEL K. WILSON, S. J., President, Loyola University . . . It appears ridiculous to assert that material progress in this world is finished. It is just as ridiculous to assert that material progress can be real or lasting without moral progress. . . .

R. E. Woom, President, Sears Roebuck . . . With the progress of research and invention there is an ever widening field for the distribution of merchandise.
Previews of Industrial Progress in the Next Century

A Dinner Conference at the Hall of Progress, General Motors Building, Century of Progress Exposition Grounds, Chicago, May 25, 1934