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ILLUSIONS COST TOO MUCH

When athletes enter a race, they come prepared to the best of their ability; as near to physical perfection as native endowment and rigorous training can make them, their bodies lean, their dress adequate but light. Each has assessed his own strength and weakness and measured them against his opponents'; few indulge in illusions about their own or their competitors' competence.

The world today has become a gigantic stadium where races for supremacy in economic, cultural, scientific, political, and military competence are run every day. Since the end of World War II, power has polarized in two giant combinations constantly competing with each other. In the foreseeable future there is little prospect for permanent lessening of tension between the two; hence the race promises to continue for years, with now one side, now the other ahead. This is an unhappy prospect for us who wish only to live in peace and tend to our national concerns, but one we cannot evade. The contest is a fact of international life which we must face intelligently and courageously so that we may make the right decisions and take the proper actions.

The first prerequisite is that we look at ourselves and at our opponents with the eye of an athlete who wants only to know the truth so that he may profit from it. This is assuredly not a time when we can afford to give ourselves over to complacent satisfaction with our present wealth and power. What we need is critical self-analysis so that we may detect any weaknesses we may have and rectify them--any traits or attitudes which might have been appropriate in the

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past when most Americans lived in rural communities and the United States was isolated from world events. Now that we occupy the center of the stage in world affairs such traits and attitudes may have turned into disabilities. The present is an age of lightning change in the fortunes of nations; when one major scientific discovery could alter long established power relationships; when one wrong step could upset the present equilibrium and plunge the world into nuclear war. In these parlous times we cannot afford to indulge in illusions about ourselves or allow our judgment to be clouded by the distaste we feel for our opponents' way of life. Illusions are a form of excess weight that hampers action and diminishes fitness. At this moment in history, when every ounce of strength is needed, illusions cost too much. They could cost us survival.

An illusion may be defined as a belief that has lost contact with reality. Illusions persist because they are ready-made substitutes for thought and, as James Bryce remarked, "to the vast majority of mankind nothing is more agreeable than to escape the need for mental exertion". All nations have illusions. Some cannot bring themselves to face the fact of their political and military weakness, and delude themselves about their real power; thus deluded they may then be tempted into aggression. Other nations underestimate the difficulties of managing a modern technological society and imagine it can be bought or begged from abroad and imposed ready-made upon an ancient and archaic way of life. When this fails, as it nearly always will, a disappointed and frustrated people may find solace in the illusion that it is being grievously wronged by other nations and, thus deluded, embark on disastrous foreign adventures. Our own illusions at least do not endanger the peace of the world, though they are harmful enough to ourselves and to our friends who depend on us for wise and strong leadership.

One does not have to be particularly perceptive, or exceptionally well-informed, or unusually intelligent, to discover, after some research into this matter, that certain of our national beliefs do not accord with reality. By clinging uncritically to these illusory beliefs, we needlessly handicap ourselves in the race that is being forced upon us by the totalitarian bloc. We persist in our illusions because as everyone else, we dislike having to rethink matters which we believe to have already been settled once and for all. The inertia of matter is no greater than that of the human mind --with both, the natural condition is rest; to move either produces friction and heat. With us, this general dislike for change is reinforced by a national trait that is becoming a liability --our habit of subjecting critics to opprobrium because they violate our unwritten convention that everyone ought to stick to his last and not "butt into the affairs of others."

This convention was not unreasonable when our country was sparsely populated and everyone depended upon himself alone, except in emergencies which were handled by voluntary community assistance rather than by government action; the citizen was then hardly conscious of his government. But today most of us live in crowded urban environments; our society depends increasingly on a well-ordered meshing of all human activities and hence on more and more government

controls and services. These are consequences of technology and human crowding and have little to do with political theory. In the manner we live today, many activities once considered private are now involved in national issues. I need hardly say that in democracies all citizens are legitimately concerned with such issues. They have both the right and the duty to criticize what they consider harmful to the national interest.

What we sometimes forget is that the critic in a democracy occupies a position that is quite different from the place he would hold in authoritarian countries. The minority that rules there without the consent of the people cannot tolerate any social criticism for this amounts to censure of its conduct. Criticism, if allowed, would in time undermine the power of the minority. The ruling minority therefore appropriates for itself the majesty of the sovereign state and brands all criticism as lèse-majeste. Its personal desire to escape censure is thus camouflaged by making the voicing of popular discontent an unpatriotic act. At times something of this kind is attempted in democracies by groups claiming to speak for the nation -- a false claim on the face of it for it is we, the people -- all the people -- who are the sovereign nation. In consequence, all social criticism in democracies is in essence self-criticism. Criticism and controversy do not endanger democracy; they are inherent in the right of a free people to discuss national issues; hence they are an essential part of the democratic process. The process is weakened if we are intolerant of those who question our beliefs; if we retain toward the critic an attitude that may have had its place in pioneer societies but that is no longer appropriate.

This attitude makes it particularly difficult to dislodge illusions in which various pressure groups have acquired what one might describe as a "vested interest". In such cases, the lonely critic confronts powerful and wealthy organizations who fight unscrupulously for their favorite illusions. Illusions obfuscate national issues; they prevent the people from seeing the issues clearly. Were the issues fully understood, action might be taken to put the national interest above the particular group interest. But one of the main objectives of pressure groups is to prevent this from happening. Seldom do these groups realize that ultimately everyone suffers if the national interest does not prevail. Their eyes are fixed on the short-run advantages to be gained at all cost for themselves; not on the country's long-term interest. The most difficult problem in any democracy, as Madison clearly saw, was how to "break and control the violence of faction". And Theodore Roosevelt, greatest teacher of democracy this country ever had, reserved his most biting censure for special interest groups who tear the nation apart by their determined effort to prevent the people from putting national above special interests.

In the long history of mankind, short and rare have been the periods when people were privileged to govern themselves. Most of the time, man has been subject to government by the few who claim to possess superior knowledge of how to govern. Even now that democracy is accepted by many countries and has the secret allegiance of millions who are still suppressed by self-imposed

minorities -- even now democracy's friends are not certain that in any real emergency, when great knowledge, wisdom, and self-sacrifice must be demanded of a democratic people, they will justify their privileges and rise to the challenge.

Today democracy is being put to the test -- perhaps the final and decisive test. An old authoritarianism in new clothing now claims that it alone can handle the problems of this technological and scientific age. The uncommitted world watches the contest. Upon us, as the strongest democracy, rests the responsibility of proving that a democratic people can govern wisely, act promptly, and voluntarily accept necessary sacrifices. In the contest between totalitarianism and democracy, we defend our Western way of life and not only our own freedom but that of all free peoples in the world.

In the hope that it will serve a useful purpose, I should like to explore with you some beliefs that -- in my opinion -- have become costly illusions. No more can be done in a short speech than to probe around the circumference of this large subject and essay a partial and tentative statement. It is not as important to list all our illusions as it is to recognize the need to take stock periodically and, if necessary, to readjust beliefs, habits, and attitudes to the realities of a rapidly changing world. I shall limit myself to a discussion of illusions that arise from what I believe to be misconceptions about our high standard of living.

To raise this standard year after year appears to have become our nation's highest objective. It is widely believed that we have answered every question one might raise about the progress, power, or international position of the United States if we can but show that this year's Gross National Product exceeds last year's -- never mind that this year's dollars have depreciated in value! I should like to state emphatically that I regard the belief that our high standard of living guarantees political and military supremacy -- automatically, as it were -- as potentially our most dangerous illusion.

The inference we draw is in the nature of a non-sequitur, or at least one that needs to be qualified in important respects. The proper conclusion to be drawn from the premise is that a high standard of living guarantees an exceedingly pleasant and agreeable life. It may also, provided proper action is taken, insure political and military supremacy. It all depends on how the nation's industrial productivity is utilized. Of course, without such productivity no nation can today be powerful, for power depends upon ability to produce large amounts of complicated military hardware. But there the relationship between productivity and power ends. When industrial production is largely devoted to consumer goods and services, even a very productive country may find itself outpaced militarily by another whose over-all productivity is smaller but concentrated in the military sector. It is now no longer possible to quickly convert manpower and industrial plants from civilian to military production when war threatens or has already broken out. Not only will there not be time enough to do this, but today's armaments must be produced in plants designed specially for the purpose. This is a

consequence of a revolution in military technology that has enormously increased the complexity of armaments.

The nature of modern war gives an edge to totalitarian countries since they need not persuade their people to forego comfort for preparedness. The decision to do so is made by the small group who have arrogated to themselves the life-long job of ruling over their voiceless compatriots. It is natural for this group to look upon their country as a personal possession to be carefully developed so as to enhance its value. Given their avowed aim of world conquest, the development of military and political strength will necessarily take precedence over all other developments. Only insofar as it contributes to this strength will the desire of their people for goods and services take on importance. Ordinarily, modern methods of propaganda are sufficient to keep the civilian standard of living at a low level, for propaganda can delude people into believing that they are better off than others, or that sacrifice is necessary to defend the fatherland against imminent attack. Thus deluded they will work obediently for small personal gain.

We used to think that a totalitarian economy could never be as productive as a free one. We must now revise this belief. Such an economy can be more productive in items that enhance political and military power; it will probably never be as productive in items that enhance the people's comfort and well-being. It is the former, however, that counts most in the race for world supremacy.

In democracies the people decide--through their voting power--how much of the national product shall be collected in taxes and invested in the public sector of the economy; how much retained to support a high material standard of living for themselves. Except in periods of national emergency, it is hard for all the people to feel that their personal fate is inextricably involved with that of their country and that in any conflict between personal advantage and national strength, enlightened self-interest must choose the latter. On the other hand, for a small group of totalitarian rulers this sense of involvement with their country comes without conscious effort. Then again, it requires self-sacrifice of a high order for a democratic people to decide voluntarily that they will forego some of the fruits of their own productivity in order to safeguard the right of future citizens to live in freedom and decency, whereas it is easy for totalitarian rulers to demand sacrifices of their people since the rulers themselves do not share in these sacrifices. This is only another way of saying that in a democracy the state exists for the people, whereas in a totalitarian country the people exist for the state. This fundamental difference must be factored into all our attempts to compare the technological and productivity levels of democratic and totalitarian societies.

What counts then is not productivity per se but how a nation's productivity is used. Strange as it may seem to us, at the present state of technological development, our high civilian standard of living may prove an actual liability in the contest with the totalitarian powers. And for the following reasons:

First, by combining a high technological level in the scientific and military sector with an almost preindustrial standard of living for the mass of their people,

modern totalitarian countries in wartime get the best of both types of civilization--the technical advantages of an industrial nation with regard to ability to wage war, and the hardihood and resilience of a preindustrial society with regard to ability of the civilians to fall back upon their own resources if need be, and to survive under hardships that might break a more civilized people accustomed to modern amenities.

Self-sufficient communities, used to a simple and frugal life, give a country at war great civilian strength. To illustrate, let me refer to a book on Soviet Strategy in the Nuclear Age by Raymond L. Garthoff. He reports that, although Russia in but a few months during 1941 lost control of 40% of her population; 60% of her coal, iron, steel and aluminum production; 40% of grain production; 95% of key military industries; 4 million soldiers and nearly two thirds of her tanks and aircraft, she was not beaten but survived and eventually returned to the attack. This is not to minimize the importance of the help she received from us. It is merely to point out that Russia was able to bear destruction comparable to that of a nuclear war and rally again. We must not underestimate the military advantage that totalitarian countries possess because they combine advanced levels of technology in the public sector with frugality in the private sector of their economy.

It is true that people used to an affluent life have individual possessions on which they can draw when war cuts off or reduces the supply of civilian goods. But they have also become so used to comfort that they may have trouble maintaining morale and efficiency if wartime shortages lower their living standards too drastically. It would seem prudent to play it safe and count the low civilian standard of living in totalitarian countries as a plus factor for them which we must counterbalance in some way.

A second reason why our high standard of living may prove a liability is that the intricate system of interlocking economic relationships that maintains our affluent society can easily be disrupted by the breaking of but a few links. To illustrate this point, take the family car, a key item in the American standard of living. Because we prefer to ride to work in our own car, mass transportation is not commercially profitable and has therefore not been adequately developed. Obviously, transportation by private car costs a great deal more in oil and service than mass transportation, especially transportation by rail which utilizes fuel far more economically than automotive transportation. If the oil supply were shut off or limited by the enemy in wartime, some American communities would find themselves without adequate means to transport workers from home to plant or office.

Most Americans now live in huge metropolitan belts which are spreading across the countryside. When population density reaches a given point, there is simply not enough room within the modern megalopolis to accommodate both man and his private car. Flight from urban centers into the suburbs is no solution; it merely aggravates the morning and evening rush. Transportation by private car becomes increasingly costly in time and money. In peacetime this can be borne but in wartime our dependence on private transportation by automobile could prove a liability.

So far we have not drawn the conclusion that when mass transportation becomes a vital necessity it must be provided, if need be at public expense. Certain national attitudes, abetted by those interested in the status quo, prevent our facing this very real problem and dealing with it effectively. A return to public mass transportation would indeed lower the standard of living somewhat but more on the side of prestige than on that of real comfort and efficiency. Yet this lowering of a single prestige factor would give the economy greater strength to meet emergencies.

It is advisable that we study the subject of transportation in the light of the population shift to urban centers. The totalitarian countries appear to have solved the problem in their usual ruthless but efficient way. We cannot copy them. We must devise our own solutions. The urgency of our problem is high lighted by the totalitarian solution of the problem for it gives them presently an advantage. Russia's industrial complexes are spread all over the country whereas ours still remain centralized, though we are conscious of the vulnerability of this centralization and are trying to disperse. Each Russian complex is designed to be self-sustaining, with workers living close to the plants, and farms further out. This eliminates, or at least reduces, the cost of transporting the workers to and from their places of work. If need be, they can cover the distance on foot.

An even more decentralized, self-contained system of industrial-farm-residential communities is now being established in China whose rulers are planning to go much further than Russia along this line. China's 650 million people are being organized into "people's communes" in which absolute communism prevails and everyone works at his assigned industrial or farm task--even family kitchens are being replaced by communal mess halls. This anthill existence must surely be the lowest standard of life to which any human society has ever sunk. But the advantage to the state is obvious. Each of these communes will be small enough to need little in the way of mechanical transportation, but large enough to be agriculturally and industrially self-sustaining.

So much effort and so large a part of a country's natural resources must go into modern transportation systems that the housing of workers close to their places of work gives Russia and China an advantage. One can readily see that their communities are less vulnerable in wartime than the American metropolis surrounded by its bedroom suburbs, with the worker linked to his place of work by a car moving along highways that become inadequate almost the moment they are built.

The third reason why our high standard of living may become a liability is inherent in the nature of today's technological civilization. Ours is the first civilization in the history of mankind which rests upon utilization of resources that do not renew themselves; the first that consumes its very foundations and does this faster the more it succeeds in raising the material standard of living of all its people.

Everything nonliving is finite unless it is recreated by the power of the sun's rays. This we have trouble believing, for in all his past experience man

was a puny Lilliputian whose impact on nature was insignificant and who felt lost in what seemed to him a vast, empty world. Previous civilizations were based on consumption of renewable resources—crops, trees, wind, water, and muscle power. They used nonrenewable resources either not at all or in such minute quantities that hardly a dent was made in nature's store of these treasures. Seventeenth century England, for example, consumed but 360 tons of steel annually! It is only in this latest second of man's hour on earth that a small percentage of the world's people have ceased living entirely off income and have begun using up resources capital.

Few of us are willing to accept the consequences of this revolutionary change in man's dependence on nature. We twist and squirm to avoid admitting that we must accommodate ourselves to a world finite in size and limited in resources. And so we delude ourselves by dwelling with satisfaction on the recurrence of raw material gluts on world markets and profess to see in them proof that resources exhaustion is a fable. Temporary surpluses are of course irrelevant to the basic fact that sooner or later even the largest store of capital will be exhausted if one keeps drawing from it. Market surpluses merely show that we have been overactive in scooping raw materials out of the earth, and have therefore collected them faster than we were able to transform them into machine-made goods.

Realists that we imagine ourselves to be, we have nevertheless invented a modern American fairy tale: The Curves that Never Cross. One is our population curve mounting upward in geometric progression—presently doubling in forty years, tripling in sixty-five, quadrupling in eighty years; the other is our nonrenewable resources curve, descending even more rapidly. We believe that in science we possess a genie in the bottle who will keep these two curves from ever crossing!

I am constantly astonished to what extremes intelligent people will go to avoid facing the limitations of mankind. I have seen it seriously proposed that the United States at one stroke solve its problem of population growth and resources exhaustion by packing ten thousand people a day off into space, there to dig for minerals which will then be sent back to earth. Like the suggestion that we can feed an infinite number of human beings on seaweed—which personally I find a most distasteful prospect!—this "solution" to resources exhaustion disregards man's biological needs and limitations. He does not, after all, live on bread alone, or excuse me, on seaweed alone. He needs enough space around him to retain a sense of individuality and freedom; he needs contact with nature, and he will deteriorate as a human being if these necessities are denied him.

Even should we decide that man is to be reduced to but two functions, tending his machines and consuming their products, the "space solution" overlooks the fact that to supply the army of space-borne emigrants with enough food, oxygen, water, and fuel and to clothe them in the proper space suits would make such tremendous inroads into our resources capital that the whole thing strikes me as a highly fanciful venture. I don't believe we know as yet just what we must provide to make sure these latter-day pilgrims will safely land on their space targets and be able to return to earth, should they wish to do so, but we can get an inkling when we remember that merely to get them into orbit will require about 100 pounds of fuel per pound of pay load!

We cannot realistically appraise our position relative to that of our totalitarian opponents unless we eschew science fiction and accept the fact that we live on a finite earth; unless we are fully aware of our dependence on nonrenewable raw materials and understand that these resources are like uninvested capital--capital which draws no interest. We must fully comprehend that the rate at which this capital is used up is an exponent of population growth and the increase in living standards. Under these circumstances, the rate of capital consumption is obviously an important factor in the relative position of competing nations. For when national rates of capital consumption differ significantly, the nation that uses its capital faster than its opponent will in time be in a less favorable position; the long-run advantage lies with nations whose austere standard of life conserves their resources capital.

Our high standard of living makes such heavy inroads into our capital of non-renewable raw materials that, because of it, we bequeath to future generations of Americans a diminished national inheritance, thus placing them in a weakened position in the contest with the totalitarian powers. Of course, we have a perfect right to do this for we are a free people. There is nothing to prevent us from emulating Madame de Pompadour and shrugging off responsibility with the frivolous phrase: After us the deluge. But let us not delude ourselves. Let us face up to the fact that when we use up the nation's capital in nonrenewable resources we mortgage the future for the sake of the pleasures of today.

Russia and the empire over which she exercises control now possess all the fuels and minerals needed for their industries. Our own raw materials position has been worsening in the last few decades.

From an exporter of copper, lead, zinc, petroleum, iron, oil, and lumber we have become an importer of these materials. Though two world wars have made great inroads, the main reason for this change from exporter to importer has been our lavish consumption of resources to sustain a continuously rising standard of living for our rapidly growing population. At mid-century we consumed annually 18 tons per person in materials; including 14,000 pounds of fuels and the metals winnowed from 5,000 pounds of ores. According to the Paley Report, "there is scarcely a mineral or fossil fuel of which the quantity used in the United States since the outbreak of the First World War did not exceed the total used throughout the world in all the centuries preceding." Not only are we consuming our own resources capital, we are also making heavy inroads into the resources capital of the rest of the world. Robert C. Cook in the symposium Perspectives on Conservation remarks: "we appear to have grievously impaired the rights of the people of many lands. The fantastic increase in the levels of living in the United States has been at the expense not only of our own resources, but of those of the rest of the world as well. The gargantuan scale of this drain of the world's resources was set forth by the Twentieth Century Fund in 1955." According to the Fund, with but 6% of the world's population, the United States consumes today as much of many raw materials as all others combined. This means that per capita we deplete irreplaceable natural resources eight times faster than the rest of the world.

Of course, we pay for these resources but this may be small consolation for the more thoughtful citizens of backward countries who watch this drain on their national resources. It cannot be halted because the money it brings is needed to keep the wolf from the door. But logic and reason have little impact on strong emotions. The native reaction is apt to be that here go the resources that might in the future have supported a higher technological civilization in their own country; they go to enrich still more what is already the richest country on earth. In a world where the majority of the people are undernourished and ill-housed, where most of them own fewer possessions than the average American family discards, the spectacle of our affluence is more likely to win us enmity than friendship. Our loss, of course, is Russia and China's gain. Their own standard of living is not so high as to cause envy, yet high enough relative to conditions in most backward nations that it can be made to seem effective proof of communism's alleged efficiency.

One might say that our very success in realizing man's age-old ambition to escape poverty and backbreaking toil works to our disadvantage because it arouses envy. This is true but it is not the whole picture. Our material wealth is also resented because we seem to have carried it to excess. But most of all, perhaps, because we have been using our high material standard of living to support a claim that Americans are more intelligent, better educated, and all-around more competent than other people. As a nation we thus take an attitude that is quite similar to one that used to prevail in class societies where the handsome, the rich, and the wellborn looked complacently upon the misery of the masses, firmly convinced that the misery was well-deserved and that their own favored circumstances were but the just desert due superior human beings.

In our personal lives, few of us would take this attitude. It runs counter to everything America stands for. The ancestors of nearly all Americans came here because they were certain that poverty was no sign of inferiority, nor wealth one of human excellence. It is strange that in judging nations we now tend to feel that superiority is proved by ownership of more cars, telephones, or TV sets than are found elsewhere. We pay lip service to American ideals, but what has us virtually mesmerized is the sheer quantity of all the material objects we possess. It is difficult for us not to be smug about this and to urge the poor countries of the world to do as we do so that they too will become as rich and advanced as we are!

Yet when one seeks for the causes of our affluence one is struck less by our alleged superiority than by our extraordinary good fortune. Three factors are mainly responsible for our standard of living--ample natural resources, a mass market, and modern technology.

Our wealth in resources is a fortuitous circumstance for which present-day Americans can take little credit. No other emigrants from Europe, setting forth across the seas, found so large and rich and virtually empty a land as those coming to the United States; nor one so favorably situated geographically and climatically. In taking the country from the Indians we concluded the most advantageous real estate deal in the history of mankind.

Our mass market comes through population growth and the historical accident that 17th and 18th century relations between England, France, and Spain were such as to preclude the carving up of this continent in the manner that Africa was carved up in the 19th century. When we won independence, this was already a huge country. The ease with which we expanded across the continent was a result of the weakness of the countries whose colonies we absorbed.

The third factor which produces our rich society—modern technology—is of European origin. To be brought to maximum use, technology needs a resource-rich area with a mass market. We were the first country large enough to make maximum use of technology. The European countries were too small to benefit fully by their own technical inventiveness. Not until Russia began to apply technology to the exploitation of her own vast land were we faced with competition on something close to equal terms. I need not remind this audience that for some years now Russia's industrial productivity has grown at a rate faster than our own. It remains to be seen whether Western European productivity will not catch up with ours once the European coal, iron, atom, and common market community is fully established.

Modern technology is thought by many Americans to be a unique American achievement. This illusion is nourished by our mass media, advertising having made of bragging a fine art. To look at the splendid color layouts and the jubilant reports of new discoveries, inventions, gadgets, and nostrums, one would never guess how much we owe to Europe in basic research—that fountainhead of technology—or how impressive is Europe's scientific creativity—the most important human talent in this scientific age.

What would you consider the single most important modern technical development? It is utilization of electric power. Our present way of life would grind to a halt if electricity ceased to flow. We have no other energy that could take over all the functions performed today by electricity. Europeans developed it. What are the other principal forms of energy we use?—steam, internal combustion, atomic energy. The first two were invented and developed by Europeans; in nucleonics they did nearly all the theoretical work. What are our most important modern weapons? The list is long but let me remind you that the tank, the jet fighter, and the guided missile originated in Europe; the atomic and hydrogen bombs were developed here, it is true, but largely by European-educated scientists. Or take transportation. Steam and diesel-driven locomotives, refrigerator cars, and the automobile—all came from Europe. Among means of communication, wireless, radar, and sonar were invented abroad. Most of our great medical discoveries came from there—more vaccines and inoculations are European than American; more antibiotics, too—such as the sulphas and penicillin. Reading the list of Nobel prize winners in physics and chemistry is a sobering experience. During the first half-century that these awards were made, England received in proportion to population $2\frac{1}{2}$ times; Germany, 3 times; Holland, 4 times; and Switzerland, 5 times as many awards as we. In the field with which I am most familiar—physics and nuclear power—nearly all the important theoretical work has been done by Europeans. In theoretical physics, Europe has produced some 15 to 20 men of high originality in the last hundred years against one American; of twelve important discoveries

that contributed to our understanding of the atom and nuclear fission, eleven were made by Europeans, one by an American. Between 1934 when Fermi published his epoch-making report on fission and 1940 when war closed down many European universities and laboratories, 133 major scientific papers on atomic fission were published--only half a dozen of these by Americans.

Our contributions to basic research and invention have been relatively small because we have concentrated our efforts on applying modern technology to the production of more and better goods. We have done this so successfully that poverty has ceased to be the lot of the mass of our people. It survives among persons who have had exceptionally bad luck or who are mentally, emotionally, or physically handicapped to such an extent that they cannot meet the problems that normal people are able to handle. Having accomplished this, we ought to cease our intense preoccupation with production of material things and turn to other unsolved problems. There are many of these.

A good case could be made for using our surplus productive capacity and leisure to develop a mass culture on a level as high as any previously attained by privileged minorities. It seems doubtful that this can be accomplished on a commercial basis alone, even if private help is added. We may have to follow the example of other Western democracies where public support of cultural activities, notably universities, theatres, art galleries and music, has long been accepted as the only means of supporting high level cultural activities.

Oscar Wilde once remarked: "Civilization requires slaves. The Greeks were quite right there. Unless there are slaves to do the ugly, horrible, uninteresting work, culture and contemplation become impossible." Modern technology supplies each of us with hundreds--even thousands--of mechanical slaves to whom we are shifting more and more of the world's dirty, debilitating, and routinely boring work. This gives us the means and the time for a vast upgrading of our nonmaterial standard of living. Instead we keep on collecting--squirrel-like--more and more goods. And so we miss the marvelous opportunities modern technology could give us, perhaps because of ancient fears rooted in centuries of human want and insecurity. It is as if we were the Sorcerer's Apprentice who forgot the word which would stop the magic broom.

Our machines keep grinding up the nation's capital of irreplaceable resources and turning them into a flood of goods which overwhelms us. We no longer produce to supply what we need; we now consume in order to clear away what the machine produces--a topsy-turvy state of affairs. To dispose of the flood of machine-made goods we have had to create a new industry; a ten billion dollar industry to service the machine by persuading us to buy its products. We have the strange situation where gifted men devote all their time and their considerable talents in the art of communication to creating artificial discontent in others and to stilling the voice of prudence so that we will mortgage our children's and our country's future to buy more than we need. By investing articles designed to be of practical use with a spurious prestige value, these talented people induce us to discard what is still perfectly satisfactory and buy new models--planned obsolescence is the term for this bit of modern witchcraft.

Today thrift has become not only old-fashioned but antisocial; disinterest in material possessions is made to seem a kind of treason to the American way of life because it puts a brake on the speed with which we use up our resources capital and throw last year's models on the scrap heap. To do both as rapidly as possible has come to be considered a major objective of our native genius. Thus have we carried the noble aim of plenty for everyone to such excess that men become the servants of their machines.

Meanwhile two vitally important tasks are neglected; tasks that in my opinion are far more important than producing new gadgets, new models of existing gadgets, better packaged goods, and more and still more material things. These tasks are conservation of the material foundation of our civilization and development of our human resources. The first involves less wasteful utilization of raw materials and the invention of substitutes for vanishing resources; the second better education for our children. We must not delude ourselves into believing that because we were able to create the wealthiest society in history, we shall have no trouble solving these two other tasks as well. Quite different human qualities are needed and must be encouraged.

Today we still overvalue the producers of material goods and undervalue the preservers of the materials base of modern technology and the developers of our children's minds. Respect and wealth go to men who make their living using up our limited resources capital; we even favor them by tariffs and special tax benefits. But meager rewards go to men who by reason of their intellectual endowments and their long and arduous course of higher studies are able to help us find substitutes for exhausted resources. We support those who flood the market with unsaleable goods and neglect the institutions which train future scientists and engineers who may discover how to prevent future shortages of goods. The manipulator of our intricate machines is usually better paid than the inventor who built the machines. It is significant that we were one of the last great nations to join the International Copyright Union because for a long time we saw nothing wrong in a practical businessman making a profit by pirating the intellectual output of others. We have always favored those who know how to make money by using ideas and material over those who think up the ideas or create new materials.

Conservation, too, is something that rarely excites our interest. We shall not really buckle down to conserve efficiently and intelligently what is left to us until we face the fact that even this huge country is not limitless. Conservationists have been marshalling an abundance of facts to prove that we are running out of space and getting poorer in resources. But various groups who find that conservation measures make utilization of our resources less profitable to them have the contrary interest of perpetuating the illusion that we shall always have much space and vast resources.

Because we tend to measure everything by size rather than by quality, it is easy to convince us by quoting statistics. A good case in point are forestry statistics which are often cited to prove that we now manage our forests so well that we actually have a surplus of new growth over what we cut annually. Let us

not rejoice prematurely. What these statistics do not show is that our forests are still declining qualitatively--half a century after Theodore Roosevelt and Clifford Pinchot launched the Great Campaign to Save our Forests. The real test of scientific forest management is the softwood saw timber account. This remains well in the red. Moreover, it is still true that what we harvest is predominantly high quality saw timber cut from our few remaining virgin stands, while much of what we grow is the scrubby stuff that reseeds itself on cutover land and has little commercial value.

Nor do the statistics show the very large losses suffered by forest fires, insects and the like--at least partly a result of less than perfect forest management. True, some forests are well managed today but many are in poor condition. We have a long way to go. Statistics which leave out the element of quality prevent our recognizing how far we still lag behind forestry standards that have long prevailed in Europe. There is a forest in Leiria, Portugal, that was planted seven hundred years ago and has been cut, and carefully replanted ever since. It is as beautiful and valuable today as it was in the thirteenth century.

All statistics are tricky and must be used with caution lest we be misled. Outgo and input statistics on timber are better today than fifty years ago partly because we now use only half as much wood per capita as we did then. This reduction is a result of a shift from wood to fossil fuels and synthetics, that is from renewable to nonrenewable raw materials. It is part of a general trend that is symptomatic of modern technological societies. Similarly we have shifted from natural to synthetic rubber; from silk and cotton to "miracle" fabrics. These shifts to nonrenewable materials contribute to the rapid exhaustion of these resources and must be regretted from a long-range point of view, much as they may add to present comfort and pleasure.

Our tendency to disregard quality when we make comparisons has helped to perpetuate another illusion--the illusion that only this country educates all its children beyond grade school. Until recently, the deterioration of the quality of American public education has been hidden by statistics showing huge numbers of youngsters in their late teens still going to school and more of them obtaining diplomas and degrees every year. Had we given thought to the quality of the schooling they received and to the kind of scholastic performance represented by these diplomas and degrees, we should long since have stopped deluding ourselves that we have "the best schools in the world."

This has been an unfair and one-sided speech. There has not been time to give a balanced picture of our own and our opponents' strength and weakness. I have dwelt only on our illusions not on theirs. It has always seemed best to me to correct our own weaknesses rather than to look complacently on those of our adversaries.

I am convinced that our single-minded preoccupation with production and consumption of ever larger numbers of material things is a liability in the race that the totalitarians have forced upon us. I realize that the sanctity of the American standard of living is fiercely defended by a formidable array of groups

and organizations whose economic well-being depends on the continuation of today's frenetic production and consumption of manufactured goods. To question the validity of a philosophy of continuous material growth is not popular. Of course, no sensible man will go counter to opinions held by the majority of his fellow citizens unless he believes that the reasons that once justified these opinions no longer exist; that persistence in holding on to what has now become an illusion is detrimental. It is not admiration for our opponents that induces me to bring out their strong points, but simply the desire to seek the truth; in searching for chinks in our own armor, I do not advocate that we copy slavishly what our adversaries do.

There are different ways to express devotion to one's country. For some people, love expresses itself solely in fulsome admiration of every aspect of the American way of life; for others critical analysis is part of all true devotion.

I have criticized our illusions because, in the present period of intense rivalry between democracy and totalitarianism, they prevent our making the fullest use of all our potentialities. But, in closing I should like to affirm my conviction that our potentialities are so great that, if we would but divest ourselves of illusions, seek out the truth no matter how displeasing it may at times be, and set our goals high, there is literally nothing we could not accomplish. Let us take full advantage of the opportunities offered us by this great land of ours and by our democratic institutions that enable us to develop what is best in us. Let us make full use of our greatest asset--the free human mind--which can work wonders if it is permitted to embark on voyages of discovery beyond the frontiers of knowledge.