The Things Which Men Can Do

The greatest raw material the world possesses is human talent. And the greatest hope we have for the creation of a better world is the profitable use of that talent

For most Americans, I would guess, the energy crisis appeared at first to be just one more of those relatively minor but nonetheless deeply annoying personal trials that seem to be characteristic of our time. Lining up for gasoline, watching the TV picture shrink during a brown-out, reading something in the paper about still another utilities rate hike—when were they going to solve these problems and get things back to normal?

But gradually the annoyances began to blend into an emerging reality that was neither small nor temporary. Something indeed had gone very wrong. Our economic-social game plan—in essence producing more of everything into the indefinite future—was clearly out of whack. The frantic rate of material growth that we had come to consider normal was not only exposed as anything but normal but also clearly not sustainable. In other words, the throwaway society expired of sheer overindulgence—A.D. 1973.

Thus we have entered, mostly unaware and surely unprepared, the new era of scarcity. And the question that faces all of us, particularly those of us in the university world, is what our response to this challenge will be—because it is certainly the most profound challenge our generation and the next will be called upon to deal with.

The purely physical side of the problem is not difficult to perceive, though it wasn't widely understood until the Arab oil embargo—our economic Pearl Harbor—occurred in October. With or without the embargo, however, and whether or not you buy the theory that the oil companies are conspiring, the United States is emphatically short of petroleum and all other usable forms of energy.

Energy is the cause célèbre of the moment, of course, and the issue that has earned me and my colleagues in the industry a number of hard looks and harder words. I am afraid we are going to have to get used to that because the energy problem is going to be with us for a long, long time—even if the Arabs have a change of heart tomorrow and start all-out pumping. I won't get into the reasons for saying that. If you read anything more oriented toward current events than the *National Philatelic Review* you know the specifics of the energy debate as well as I do. It's a well-covered story.

But energy is only one item on our vanishing commodities list. We seem to be running out of practically everything. Food is scarce and expensive. Arable land is low. And we're apparently heading for a host of scarcities of raw materials, including bauxite, copper, lead, zinc, manganese, magnesium, and iron ore. The situation is producing a hoarding psychology. Johnny Carson talked about the paper shortage on his show recently, and the Safeway stores in the Baltimore-Washington area reported that the next day they were cleaned out of every piece of paper down to the last napkin.

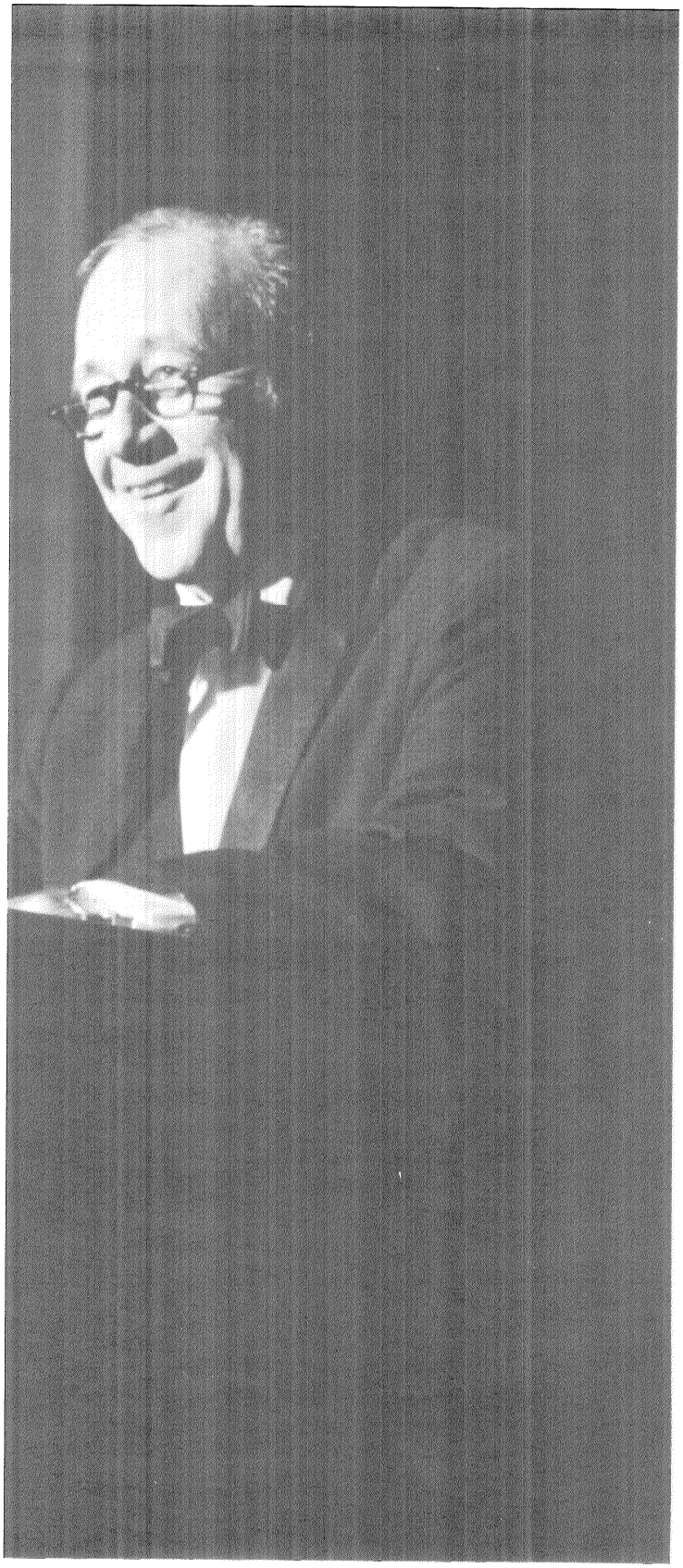
But amid all shortages, the crisis of scarcity is certain to generate at least one surplus. I am speaking of prophets, and not the financial kind, though in certain cases that may happen too. I refer to the emergence of men and women who, in the words of the poet Archibald MacLeish, are "familiar with the shape of the future and willing to share their familiarity with others."

The trouble is, they usually are prophets of doom. MacLeish was talking at a university commencement in 1941, and his concern was with those who believed that the tide of Naziism that had engulfed Europe was an irresistible movement of history that could not be usefully opposed. "Such prophecies," MacLeish said, "are prophecies of defeat, prophecies of negation, prophecies not of the things which men can do but of the things which men cannot do."

I think we may take encouragement from the fact that those particular gloomy theorists were wrong. In fact, thus far at least, the prophets of doom have *always* been wrong. And some of them—most, perhaps—have been quite sincere. Thomas Malthus, for example, the English economist and demographer, predicted an unpleasant end to the species in an essay published in 1798. Since population must always increase faster than production, Malthus reasoned, people would always exist on the edge of

This address was given by Thornton Bradshaw, president of Atlantic Richfield Company, at the dinner that announced the beginning of Caltech's campaign to raise $130 million.

BY THORNTON F. BRADSHAW



starvation. While all the results aren't in, it does seem clear that Malthus was wrong, because he failed to foresee the new and more productive methods of agriculture that men would invent.

Much more recently the Club of Rome made its well-known judgment that the world had reached the limits of growth because each potential road to expansion was in some way effectively barred, either by a shortage of raw material, environmental problems, or some other factor. I believe that the Club of Rome's theory will turn out to be as erroneous as the Malthusian theory because it, too, ignores the great x-factor—man's remarkable ability to cope with his condition.

The historian Barbara Tuchman has this to say about the human factor: "As our century enters into its final quarter I am not persuaded despite the signs that the end is necessarily doom. The doomsayers work by extrapolation. They take a trend and extend it, forgetting that the doom factor sooner or later generates a coping mechanism.

I have a rule for this situation, too, which is absolute. You cannot extrapolate any series in which the human element intrudes. History—that is, the human narrative—never follows and will always fool the scientific curve."

Well, I don't know how the crisis of scarcity is going to resolve itself but, relying on the Tuchman theory, I do believe that there are many things which men, and women, can do—indeed must do—to convert what could very well be an impending disaster into an opportunity of a very real kind. But to do this we must not only examine the economic and social implications of shortage, but the moral implications as well. We must not only plan to live with less than we have had, but we must also closely examine the assumptions underlying our living patterns. In the process we may discover, or perhaps rediscover, a philosophy of life that we had lost amid the discarded wrappings of the throwaway society.

It is quite clear that an era of shortages of energy and raw materials will change the present status of nations—the haves, the have-nots, and the dispossesed—and will change ways of life within those nations.

In a world of energy shortages and raw-materials shortages the highly developed, highly interdependent societies clearly have the most to lose. The United States is entering into a period of economic pause due to the energy cut-

back. We don't know how severe it will be.

We are short somewhere between 2.5 million and 3.5 million barrels of oil a day, and the impact of that shortage will translate inevitably into personal inconvenience and in some cases real hardship. And yet, given time, given a whole-hearted adoption of the conservation ethic, given a government energy policy transcending in intelligence and flexibility anything we have had in the past, and given a vigorous energy industry, we *can* cope. We can make it through the next three to four decades by developing fully and using carefully the fossil-fuel deposits that exist within our borders. And when they are gone, perhaps in 40 years or so, we hope that we will then be ready to turn to the essentially inexhaustible resources of solar and nuclear power.

Europe and Japan are far more vulnerable than we to the oil weapon—as their recent behavior toward the Arab nations (with the conspicuous exception of the Netherlands) has emphasized. The United States needs Arab oil to sustain a reasonable rate of growth during the next decade or so, or until our alternate sources of energy such as oil shale and tar sands and liquefied and gasified

The throwaway society expired of sheer overindulgence, and we have entered, mostly unaware and surely unprepared, the era of scarcity

coal can begin to power our cars and light our houses and drive our factories. But Europe and Japan have *no* alternate energy sources. For them, it is Arab oil or economic paralysis.

And so the first large implication of the crisis of scarcity is an inevitable realignment of traditional have- and have-not nations and a redefinition of their economic powers. The U.S., with 6 percent of the world's population, will no longer have the freedom to use 35 percent of the world's energy.

We may find that something of a comedown but one with rich compensations. A more prudent use of energy can produce a controlled but reasonable rate of growth that will sustain our economic strength but do so with a greater degree of attention to the human factor. If uninhibited growth means a Los Angeles that is twice as big and twice as crowded and twice as polluted as it is now, then I don't want any part of it or of any other motorized megalopolis of the future.

But other industrialized societies will have more severe adjustments to make in this approaching realignment of the haves and have-nots. I do not expect the advanced nations of Western Europe to be suddenly reduced to a poverty-stricken impotence. Such a fate is unthinkable. But France, Germany, Italy, and the rest of Europe, as well as Japan, must nevertheless begin to address the problems of employment, transportation, and leisure in ways consistent with a reduced level of material prosperity vis-à-vis the rest of the world. The only industrialized nations I can think of that will avoid the effects of this kind of economic realignment are the U.S.S.R. and Canada because of the balance that exists in those nations between industrial capacity and availability of raw material. But the rest of the industrialized nations, including the U.S., must plan ways in which to provide a quid pro quo to the countries that have raw materials to export. If Britain wants Arab oil, for example, she must give in return not a currency which is easily debased but a service of some kind, probably technological assistance.

If she wants copper from Zambia, she must be prepared to do the same, acutely conscious that the exchange is no longer between a superior and an inferior culture but between two increasingly equal parties bargaining with each other in the world marketplace on even terms and against a background of mutual respect.

Maintaining an economic balance between consuming and producing nations will obviously require considerable restraint on the part of the consumers and particularly on the part of the United States. Whatever balloons may have been floated to the contrary, the hard fact is that there is no conceivable way other than a full-scale depression for this country to achieve energy independence by 1980. Even if we are able to limit our growth to an annual average of 3.5 percent instead of the 4.5 percent of recent years, we can expect to do little more than slightly depress the rising curve of demand and thereby lessen to some degree the amount of oil we will have to import from the Middle East.

Finally, the industrialized nations must change the thrust of science in order, first, to provide new energy and raw material forms and, second, to provide the basis for the new life style. Much of the burden for this shift will necessarily fall on centers of research such as Caltech. I will have more to say about that development in a moment.

In underdeveloped countries that are rich in raw materials —primarily in the Middle East and in Africa though to a degree in the Far East and South America—other problems are beginning to surface in the realignment process. One of them, not surprisingly, is money. They literally have too much of it, at least in terms of their own internal investment needs. We have developed figures showing that, if the Arab nations produce oil according to our projected requirements, by 1976—two years hence—

they will have built up a floating balance of about $150 billion. By 1980, again assuming that they produce all the petroleum we ask, monetary reserves in Arab hands will amount to more than $300 billion.

Since loose investment capital in such incredible volume would wreak havoc in even the strongest of the world's monetary systems, we must take what measures we can to limit oil imports. Excessive reliance on Arab oil also poses security threats that we are only too aware of. But whatever limitations we attempt to impose, the Arabs will be selling us oil, and a lot of it, for years to come, though probably not in the amount we would like. They will also be selling it to Europe, Japan, and developing nations that can afford it. And so the question arises as to how countries such as Saudi Arabia will handle their new affluence. And the political power that comes with it.

Will the raw-materials-rich countries make the same mistakes we have made, falling into the "more is better" trap? Or will they make more responsible and more livable decisions, particularly with regard to the needs of their third-world neighbors? The feeling is growing, even within the Middle East itself, that the oil-rich countries should be using their wealth to provide development capital for countries such as Egypt, Syria, and Jordan, rather than giving them weapons of war. An Arab Marshall Plan—perhaps a Faisal Plan—would siphon off funds which could not be profitably invested in the industrialized nations anyway and could take over some of the aid to developing countries which the industrialized nations, burdened by ever higher energy costs, could no longer shoulder.

Indeed it is the third world, where the deprived scratch out marginal existences in places such as India, Southeast Asia, and Central America, that is most gravely menaced by the crisis of scarcity. For the third world the problem may be very simply stated: In a developing shortage of materials and a developing scarcity of energy resources, how can poor nations avoid losing all hope for further advancement? With the international market pressuring the price of fuel ever higher, how can nations with neither resources nor industrial capacity obtain energy sufficient for their basic needs? These countries have no leverage to exert, no bargaining pressures to apply. They can only hope that the balance of humanity will respond to their condition and act forthrightly to remedy it.

There you have the triple implication of the crisis of scarcity—industrialized nations abruptly and permanently losing the base of their prosperity, cheap raw-material imports, while simultaneously having to cut back grossly wasteful life styles; emerging raw-materials-rich nations swamped by an embarrassment of riches and power; third-world nations threatened with the possibility of being priced out of the small percentage of the world market they are now able to control.

We must not only plan to live with less than we have had, but we must also closely examine the assumptions underlying our living patterns

But, as we have been frequently reminded in recent days, the Chinese character for the word "crisis" is made up of two others—one meaning danger, the other meaning opportunity. The crisis of scarcity thus presents an opportunity as well as a danger to all of us. For those of us in the industrialized nations it can mean the development of a life style more in tune with nature and with our basic needs as humans. If the fuel shortage means we can't go back to nature in a $15,000 recreational vehicle because it only gets five miles a gallon, we still can go back on foot, and undoubtedly find it more recreational in the bargain.

If the crisis forces us to pay more attention to our basic needs—needs such as clean air and water, reasonable material affluence, and an end to the throwaway society —then it will have proved to be an opportunity indeed.

If the crisis enables the raw-materials-producing countries to develop their full strengths and potential without aping the mistakes of the industrialized nations, it surely will help to correct the chronic material and political imbalance which is perhaps the single greatest threat to peaceful coexistence of the human family. Indeed, if the crisis awakens men to a fuller realization of their fundamental interdependence, then it can mean a renewal of hope for the third-world peoples. Selfishness and overindulgence having failed, we can perhaps turn to the task of fashioning a more just distribution of the world's goods.

In fact, I strongly believe that while the adjustments we face will be far from simply decided or easily made, the shortages of energy and materials are in the final analysis more opportunity than danger—particularly for private institutions of higher education such as Caltech. The greatest raw material the world possesses is human talent. And the greatest hope we have for the creation of a better world is the profitable use of that talent—through individuals and through human institutions.

Caltech is one of the institutions that has done great service in the past. With the proper level of support and continued encouragement, that record of service will prove, I am sure, only a prologue to far greater contributions to the scientific, social, and moral orders. I will always be grateful that I was here to share in the initiation of a new era of growth not only for Caltech but for the broad cause of human progress in which it serves. □