

If it is true that tyranny bears the germs of its own destruction because it is based upon powerlessness which is the negation of man's political condition, then, one is tempted to predict the downfall of totalitarian domination without outside interference, because it rests on the one human experience which is the negation of man's social condition. Yet, even if this analogy were valid—and there are reasons to doubt it—it would operate only after the full realization of totalitarian government which is possible only after the conquest of the earth.

Apart from such considerations—which as predictions are of little avail and less consolation—there remains the fact that the crisis of our time and its central experience have brought forth an entirely new form of government which as a potentiality and an ever-present danger is only too likely to stay with us from now on, just as other forms of government which came about at different historical moments and rested on different fundamental experiences have stayed with mankind regardless of temporary defeats—monarchies, and republics, tyrannies, dictatorships and despotism.

But there remains also the truth that every end in history necessarily contains a new beginning; this beginning is the promise, the only “message” which the end can ever produce. Beginning, before it becomes a historical event, is the supreme capacity of man; politically, it is identical with man's freedom. *Initium ut esset homo creatus est*—“that a beginning be made man was created” said Augustine. (*Civitas Dei*, Book 12, ch. 20) This beginning is guaranteed by each new birth; it is indeed every man.

J. ROBERT OPPENHEIMER

“The Sciences and Man's Community” (1954)

The explosion of two atomic bombs over Japan in August 1945 suddenly made J. Robert Oppenheimer (1903–67) the most famous scientist in the world, with the exception only of Albert Einstein. Oppenheimer was dubbed by the press as “the Father of the Atomic Bomb” for having led the team of scientists and engineers that created the new weapon. Oppenheimer's standing as an icon and as a source of wisdom in an apparently science-defined era was sustained during the postwar years when, while serving as the chief science advisor to the government of the United States, he proved to be a compelling voice in public debates about the meaning of the scientific enterprise. The essay reprinted here exemplifies his vindication of science's potential to contribute to a more humane and democratic future. Oppenheimer's other writings in this genre are collected in a posthumous volume edited by Freeman Dyson, *Atom and Void: Essays on Science and Community* (Princeton, 1980).

In 1954 Oppenheimer was purged on the basis of extravagantly manipulated accounts of his communist connections prior to his entry into government service. The purge took the form of a withdrawal of a “security clearance” which was required for anyone advising the government on the science and technology of weapons. Oppenheimer's mistreatment soon became one of the most discussed examples of the zealotry and recklessness of the McCarthy Era. In truth, Oppenheimer had been very close to the communist movement, but the many scholarly studies of his life and career establish that he cut off his communist connections when he joined the bomb project in 1942. Oppenheimer was not among the several participants in that project who passed classified information to the Soviet Union. The historical record shows that Oppenheimer, while often imperious and incautious, was indeed an American patriot.

The best of the many biographies of Oppenheimer is Kai Bird and Martin J. Sherwin, *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer* (New York, 2005). Detailed studies of many aspects of Oppenheimer's career, written on the occasion of the centennial of his birth, are collected in Cathryn Carson and David A. Hollinger, eds., *Reappraising Oppenheimer: Centennial Studies and Reflections* (Berkeley, 2005). A valuable account of Oppenheimer's role as a public commentator on issues in science's relation to culture is Charles Thorpe, *Oppenheimer: The Tragic Intellect* (New York, 2006). An excellent study of Oppenheimer's complicated political and personal relationships with fellow physicists Edward Teller and Ernest O. Lawrence is Greg Herken, *Brotherhood of the Bomb* (New York, 2002).

Oppenheimer spent the first half of his career at the University of California at Berkeley, where he, along with Teller and Lawrence, led in the development of the premier physics department in the world. In 1947 Oppenheimer left Berkeley for Princeton, New Jersey, where he served as director of the Institute for Advanced Study until his death twenty years

later. A man of broad interests in the arts and humanities as well as science, Oppenheimer became an emblem for his generation's hope that the sciences and the arts could function harmoniously. He was known for the frequency with which he quoted the poetry of John Donne, and for his ability to offer his own translations from Sanskrit, the classical literature of which he studied while a professor of physics at Berkeley. Oppenheimer's humanistic as well as his scientific and political engagements are themes of *Dr. Atomic*, the opera about his life written by composer John Adams in 2005.

The house called "science" . . . is a vast house indeed. It does not appear to have been built upon any plan but to have grown as a great city grows. There is no central chamber, no one corridor from which all others debouch. All about the periphery men are at work studying the vast reaches of space and the state of affairs billions of years ago; studying the intricate and subtle but wonderfully meet mechanisms by which life proliferates, alters, and endures; studying the reach of the mind and its ways of learning; digging deep into the atoms and the atoms within atoms and their unfathomed order. It is a house so vast that none of us know it, and even the most fortunate have seen most rooms only from the outside or by a fleeting passage, as in a king's palace open to visitors. It is a house so vast that there is not and need not be complete concurrence on where its chambers stop and those of the neighboring mansions begin.

It is not arranged in a line nor a square nor a circle nor a pyramid, but with a wonderful randomness suggestive of unending growth and improvisation. Not many people live in the house, relatively speaking—perhaps if we count all its chambers and take residence requirements quite lightly, one tenth of one per cent, of all the people in this world—probably, by any reasonable definition, far fewer. And even those who live here live elsewhere also, live in houses where the rooms are not labelled atomic theory or genetics or the internal constitution of the stars, but quite different names like power and production and evil and beauty and history and children and the word of God.

We go in and out; even the most assiduous of us is not bound to this vast structure. One thing we find throughout the house: there are no locks; there are no shut doors; wherever we go there are the signs and usually the words of welcome. It is an open house, open to all comers.

The discoveries of science, the new rooms in this great house, have changed the way men think of things outside its walls. We have some glimmering now of the depth in time and the vastness in space of the physical world we live in. An awareness of how long our history and how immense our cosmos touches us even in simple earthly deliberations. We have learned from the natural history of the earth and from the story of evolution to have a sense of history, of time and change. We learn to talk of ourselves, and of the nature of the world and its reality as not wholly fixed in a silent quiet moment, but as unfolding with novelty and alteration, decay and new growth. We have understood something of the inner harmony and beauty of strange primitive cultures, and through this see the qualities of our own life in an altered perspective, and recognize its accidents as well as its inherent necessities. We are, I should think, not patriots less but patriots very differently for loving what is ours and understanding a little of the love of others for their lands and ways. We have begun to understand that it is not only in his rational life that man's psyche is intelligible, that even in what may appear to be his least rational actions and sentiments we may discover a new order. We have the beginnings of an understanding of what it is in man, and more in simple organisms, that is truly heritable, and rudimentary clues as to how the inheritance occurs. . . .

We have seen that in the atomic world we have been led by experience to use descriptions and ideas that apply to the large-scale world of matter, to the familiar world of our schoolday physics; ideas like the position of a body and its acceleration and its impulse and the forces acting on it; ideas like wave and interference; ideas like cause and probability. But what is new, what was not anticipated a half-century ago, is that, though to an

atomic system there is a potential applicability of one or another of these ideas, in any real situation. Only some of these ways of description can be actual. This is because we need to take into account not merely the atomic system we are studying, but the means we use in observing it, and the fitness of these experimental means for defining and measuring selected properties of the system. All such ways of observing are needed for the whole experience of the atomic world; all but one are excluded in any actual experience. In the specific instance, there is a proper and consistent way to describe what the experience is; what it implies; what it predicts and thus how to deal with its consequences. But any such specific instance excludes by its existence the application of other ideas, other modes of prediction, other consequences. They are, we say, complementary to one another; atomic theory is in part an account of these descriptions and in part an understanding of the circumstances to which one applies, or another or another.

And so it is with man's life. He may be any of a number of things; he will not be all of them. He may be well versed, he may be a poet, he may be a creator in one or more than one science; he will not be all kinds of man or all kinds of scientist; and he will be lucky if he has a bit of familiarity outside the room in which he works.

So it is with the great antinomies that through the ages have organized and yet disunited man's experience: the antinomy between the ceaseless change and wonderful novelty and the perishing of all earthly things, and the eternity which inheres in every happening; in the antinomy between growth and order, between the spontaneous and changing and irregular and the symmetrical and balanced; in the related antinomy between freedom and necessity; between action, the life of the will, and observation and analysis and the life of reason; between the question "how?" and the questions "why?" and "to what end?"; between the causes that derive from natural law, from unvarying regularities in the natural world, and those other causes that express purposes and define goals and ends.

So it is in the antinomy between the individual and the community; man who is an end in himself and man whose tradition, whose culture, whose works, whose words have meaning in terms of other men and his relations to them. All our experience has shown that we can neither think, nor in any true sense live, without reference to these antinomic modes. We cannot in any sense be both the observers and the actors in any specific instance, or we shall fail properly to be either one or the other; yet we know that our life is built of these two modes, is part free and part inevitable, is part creation and part discipline, is part acceptance and part effort. We have no written rules that assign us to these ways; but we know that only folly and death of the spirit results when we deny one or the other, when we erect one as total and absolute and make the others derivative and secondary. We recognize this when we live as men. We talk to one another; we philosophize; we admire great men and their moments of greatness; we read; we study; we recognize and love in a particular act that happy union of the generally incompatible. With all of this we learn to use some reasonable part of the full register of man's resources.

We are, of course, an ignorant lot; even the best of us knows how to do only a very few things well; and of what is available in knowledge of fact, whether of science or of history, only the smallest part is in any one man's knowing.

The greatest of the changes that science has brought is the acuity of change; the greatest novelty the extent of novelty. Short of rare times of great disaster, civilizations have not known such rapid alteration in the conditions of their life, such rapid flowering of many varied sciences, such rapid changes in the ideas we have about the world and one another. What has been true in the days of a great disaster or great military defeat for one people

at one time is true for all of us now, in the sense that our ends have little in common with our beginnings. Within a lifetime what we learned at school has been rendered inadequate by new discoveries and new inventions; the ways that we learn in childhood are only very meagerly adequate to the issues that we must meet in maturity.

In fact, of course, the notion of universal knowledge has always been an illusion; but it is an illusion fostered by the monistic view of the world in which a few great central truths determine in all its wonderful and amazing proliferation everything else that is true. We are not today tempted to search for these keys that unlock the whole of human knowledge and of man's experience. We know that we are ignorant; we are well taught it, and the more surely and deeply we know our own job the better able we are to appreciate the full measure of our pervasive ignorance. We know that these are inherent limits, compounded, no doubt, and exaggerated by that sloth and that complacency without which we would not be men at all.

But knowledge rests on knowledge; what is new is meaningful because it departs slightly from what was known before; this is a world of frontiers, where even the liveliest of actors or observers will be absent most of the time from most of them. Perhaps this sense was not so sharp in the village—that village which we have learned a little about but probably do not understand too well—the village of slow change and isolation and fixed culture which evokes our nostalgia even if not our full comprehension. Perhaps in the villages men were not so lonely; perhaps they found in each other a fixed community, a fixed and only slowly growing store of knowledge—a single world. Even that we may doubt, for there seem to be always in the culture of such times and places vast domains of mystery, if not unknowable, then imperfectly known, endless and open.

As for ourselves in these times of change, of ever-increasing knowledge, of collective power and individual impotence, of heroism and of drudgery, of progress and of tragedy, we too are brothers. And if we, who are the inheritors of two millennia of Christian tradition, understand that for us we have come to be brothers second by being children first, we know that in vast parts of the world where there has been no Christian tradition, and with men who never have been and never may be Christian in faith there is nevertheless a bond of brotherhood. We know this not only because of the almost universal ideal of human brotherhood and human community; we know it at first hand from the more modest, more diverse, more fleeting associations which are the substance of our life. The ideal of brotherhood, the ideal of fraternity in which all men, wicked and virtuous, wretched and fortunate, are banded together has its counterpart in the experience of communities, not ideal, not universal, imperfect, impermanent, as different from the ideal and as reminiscent of it as are the ramified branches of science from the ideal of a unitary, all-encompassing science of the eighteenth century.

Each of us knows from his own life how much even a casual and limited association of men goes beyond him in knowledge, in understanding, in humanity, and in power. Each of us, from a friend or a book or by concerting of the little we know with what others know, has broken the iron circle of his frustration. Each of us has asked help and been given it, and within our measure each of us has offered it. Each of us knows the great new freedom sensed almost as a miracle, that men banded together for some finite purpose experience from the power of their common effort. We are likely to remember the times of the last war, where the common danger brought forth in soldier, in worker, in scientist, and engineer a host of new experiences of the power and the comfort in even bleak undertakings, of common, concerted, co-operative life. Each of us knows how much he has been

transcended by the group of which he has been or is a part; each of us has felt the solace of other men's knowledge to stay his own ignorance, of other men's wisdom to stay his folly, of other men's courage to answer his doubts or his weakness.

These are the fluid communities, some of long duration when circumstances favored—like the political party or many a trade union—some fleeting and vivid, encompassing in the time of their duration a moment only of the member's life; and in our world at least they are ramified and improvised, living and dying, growing and falling off almost as a form of life itself. This may be more true of the United States than of any other country. Certainly the bizarre and comical aspects impressed de Tocqueville more than a century ago when he visited our land and commented on the readiness with which men would band together: to improve the planting of a town, or for political reform, or for the pursuit or inter-exchange of knowledge, or just for the sake of banding together, because they liked one another or disliked someone else. Circumstances may have exaggerated the role of the societies, of the fluid and yet intense communities in the United States; yet these form a common pattern for our civilization. It brought men together in the Royal Society and in the French Academy and in the Philosophical Society that Franklin founded, in family, in platoon, on a ship, in the laboratory, in almost everything but a really proper club.

If we err today—and I think we do—it is in expecting too much of knowledge from the individual and too much of synthesis from the community. We tend to think of these communities, no less than of the larger brotherhood of man, as made up of individuals, as composed of them as an atom is of its ingredients. We think similarly of general laws and broad ideas as made up of the instances which illustrate them, and from an observation of which we may have learned them.

Yet this is not the whole. The individual event, the act, goes far beyond the general law. It is a sort of intersection of many generalities, harmonizing them in one instance as they cannot be harmonized in general. And we as men are not only the ingredients of our communities; we are their intersection, making a harmony which does not exist between the communities except as we, the individual men, may create it and reveal it. So much of what we think, our acts, our judgments of beauty and of right and wrong, come to us from our fellow men that what would be left were we to take all this away would be neither recognizable nor human. We are men because we are part of, but not because only part of, communities; and the attempt to understand man's brotherhood in terms only of the individual man is as little likely to describe our world as is the attempt to describe general laws as the summary of their instances. These are indeed two complementary views, neither reducible to the other, no more reducible than is the electron as wave to the electron as particle.

And this is the mitigant of our ignorance. It is true that none of us will know very much; and most of us will see the end of our days without understanding in all its detail and beauty the wonders uncovered even in a single branch of a single science. Most of us will not even know, as a member of any intimate circle, anyone who has such knowledge; but it is also true that, although we are sure not to know everything and rather likely not to know very much, we can know anything that is known to man, and may, with luck and sweat, even find out some things that have not before been known to him. This possibility, which, as a universal condition of man's life is new, represents today a high and determined hope, not yet a reality; it is for us in England and in the United States not wholly remote or unfamiliar. It is one of the manifestations of our belief in equality, that belief which could perhaps better be described as a commitment to unparalleled diversity and unevenness in the distribution of attainments, knowledge, talent, and power.

This open access to knowledge, these unlocked doors and signs of welcome, are a mark of a freedom as fundamental as any. They give a freedom to resolve difference by converse, and, where converse does not unite, to let tolerance compose diversity. This would appear to be a freedom barely compatible with modern political tyranny. The multitude of communities, the free association for converse or for common purpose, are acts of creation. It is not merely that without them the individual is the poorer; without them a part of human life, not more nor less fundamental than the individual, is foreclosed. It is a cruel and humorless sort of pun that so powerful a present form of modern tyranny should call itself by the very name of a belief in community, by a word "communism" which in other times evoked memories of villages and village inns and of artisans concerting their skills, and of men of learning content with anonymity. But perhaps only a malignant end can follow the systematic belief that all communities are one community; that all truth is one truth; that all experience is compatible with all other; that total knowledge is possible; that all that is potential can exist as actual. This is not man's fate; this is not his path; to force him on it makes him resemble not that divine image of the all-knowing and all-powerful but the helpless, iron-bound prisoner of a dying world. The open society, the unrestricted access to knowledge, the unplanned and uninhibited association of men for its furtherance—these are what may make a vast, complex, ever-growing, ever-changing, ever more specialized and expert technological world nevertheless a world of human community.

So it is with the unity of science—that unity that is far more a unity of comparable dedication than a unity of common total understanding. This heartening phrase, "the unity of science," often tends to evoke a wholly false picture, a picture of a few basic truths, a few critical techniques, methods, and ideas, from which all discoveries and understanding of science derive; a sort of central exchange, access to which will illuminate the atoms and the galaxies, the genes and the sense organs. The unity of science is based rather on just such a community as I have described. All parts of it are open to all of us, and this is no merely formal invitation. The history of science is rich in example of the fruitfulness of bringing two sets of techniques, two sets of ideas, developed in separate contexts for the pursuit of new truth, into touch with one another. The sciences fertilize each other; they grow by contact and by common enterprise. Once again, this means that the scientist may profit from learning about any other science; it does not mean that he must learn about them all. It means that the unity is a potential unity, the unity of the things that might be brought together and might throw light one on the other. It is not global or total or hierarchical.

Even in science, and even without visiting the room in its house called atomic theory, we are again and again reminded of the complementary traits in our own life, even in our own professional life. We are nothing without the work of others our predecessors, others our teachers, others our contemporaries. Even when, in the measure of our adequacy and our fullness, new insight and new order are created, we are still nothing without others. Yet we are more.

There is a similar duality in our relations to wider society. For society our work means many things: pleasure, we hope, for those who follow it; instruction for those who perhaps need it; but also and far more widely, it means a common power, a power to achieve that which could not be achieved without knowledge. It means the cure of illness and the alleviation of suffering; it means the easing of labor and the widening of the readily accessible frontiers of experience, of communication, and of instruction. It means, in an earthy way,

the power of betterment—that riddled word. We are today anxiously aware that the power to change is not always necessarily good.

As new instruments of war, of newly massive terror, add to the ferocity and totality of warfare, we understand that it is a special mark and problem of our age that man's ever-present preoccupation with improving his lot, with alleviating hunger and poverty and exploitation, must be brought into harmony with the over-riding need to limit and largely to eliminate resort to organized violence between nation and nation. The increasingly expert destruction of man's spirit by the power of police, more wicked if not more awful than the ravages of nature's own hand, is another such power, good only if never to be used.

We regard it as proper and just that the patronage of science by society is in large measure based on the increased power which knowledge gives. If we are anxious that the power so given and so obtained be used with wisdom and with love of humanity, that is an anxiety we share with almost everyone. But we also know how little of the deep new knowledge which has altered the face of the world, which has changed—and increasingly and ever more profoundly must change—man's views of the world, resulted from a quest for practical ends or an interest in exercising the power that knowledge gives. For most of us, in most of those moments when we were most free of corruption, it has been the beauty of the world of nature and the strange and compelling harmony of its order, that has sustained, inspirited, and led us. That also is as it should be. And if the forms in which society provides and exercises its patronage leave these incentives strong and secure, new knowledge will never stop as long as there are men.

We know that our work is rightly both an instrument and an end. A great discovery is a thing of beauty; and our faith—our binding, quiet faith—is that knowledge is good and good in itself. It is also an instrument; it is an instrument for our successors, who will use it to probe elsewhere and more deeply; it is an instrument for technology, for the practical arts, and for man's affairs. So it is with us as scientists; so it is with us as men. We are at once instrument and end, discoverers and teachers, actors and observers. We understand, as we hope others understand, that in this there is a harmony between knowledge in the sense of science, that specialized and general knowledge which it is our purpose to uncover, and the community of man. We, like all men, are among those who bring a little light to the vast unending darkness of man's life and world. For us as for all men, change and eternity, specialization and unity, instrument and final purpose, community and individual man alone, complementary each to the other, both require and define our bonds and our freedom.

PETER F. DRUCKER

“Innovation—The New Conservatism?” (1959)

Although most widely known as a guru of business management, Peter F. Drucker (1909–2005) was an ambitious theorist of the human condition and of the circumstances of modernity. While many conservatives of his generation focused on the virtues of the market, Drucker concentrated instead on the corporation and on the virtues of economic planning. Drucker saw the corporation as an institution basic to society, and capable of harmonizing the interests of management and workers. Drucker accepted much of the liberal left's critique of the industrial order, but rejected most social democratic programs for reforming it. He was critical of the New Deal but supported some of its measures, including the Tennessee Valley Authority, excoriated by more market-oriented conservatives. Drucker looked to enlightened corporate management to recognize the needs of workers for a meaningful life and for a substantial share of responsibility for running a business. Indeed, Drucker believed that corporations could take over many functions performed by the state. In the essay reprinted here, Drucker distinguishes between the sorts of planning (usually done by governments) that stifle innovation by excessively detailed regulation, and the planning that divides authority among a variety of agents in different economic locales. Drucker invokes a pantheon of great conservative theorists at the end of this selection, but his style of conservatism was grounded in a social vision quite different from the more rigidly individualist orientation of most prominent American conservatives of his generation, including Milton Friedman and Ayn Rand, whose writings are also found in *The American Intellectual Tradition*.

Drucker was born in Vienna of Protestant parents, was educated in Germany, and then moved to the United States in 1934. Already a prominent theorist of business management by the time of World War II, Drucker made his most distinctive and enduring contribution in 1946 with *Concept of the Corporation* (New York, 1946). A prolific writer, Drucker eventually published thirty-nine books, several of which have been translated into more than thirty languages. Among the most popular of his later works was *The Age of Discontinuity: Guidelines to Our Changing Society* (New York, 1968). Drucker spent most of his career as a professor of management at New York University and the Claremont Graduate University in California. A great coiner of phrases, Drucker is generally credited with contributing the terms “privatization” and “knowledge workers” to our vocabulary. He was also one of the first thinkers to employ the term “postmodern.”

The most discerning and informative analysis of Drucker's ideas and their place in intellectual history is Nils Gilman, “The Prophet of Post-Fordism: Peter Drucker and the Legitimation of the Corporation,” in Nelson Lichtenstein, ed., *American Capitalism: Social Thought and Political Economy in the 20th Century* (Philadelphia, 2006), 109–33. See also Daniel Immerwahr, “Polanyi in the United States: Peter Drucker, Karl Polanyi, and the Midcentury Critique of Economic Society,” *Journal of the History of Ideas*, 70 (July 2009), 445–66. Drucker tells his own life story in an autobiography, *Adventures of a Bystander* (New York, 1980).

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