

SPIRIT IN AN AGE OF SCIENCE

The authority of the natural sciences is today unrivaled. Their intellectual foundations are secure. Teachers and students working in these fields know what they are doing and why it is important. Most social scientists feel similarly about the value of their work. They too believe in its intellectual integrity and practical importance. This is clearest in the case of economics, the most rigorous of the social sciences and the one by which all the others now measure their achievements. In our colleges and universities today, the prevailing mood in the natural and social sciences is thus one of healthy self-regard. Disagreements about methods and aims do from time to time disturb these fields, and even in a discipline like physics there are recurrent uncertainties about the direction the discipline is going.¹ But these disturbances do not upset or challenge the deeper confidence, shared by nearly all those in these fields, that they are making a meaningful contribution to well-understood and valuable goals—to the deepening of our collective knowledge about the structures of the natural and social worlds and to the practical employment of this knowledge for the improvement of the human

condition. For teachers and students in the natural and social sciences, this deeper confidence is a fact of professional life. It is something they feel justified in taking for granted. They simply know, in a way that no methodological quarrel or debate about direction can unsettle, that they are making a valued contribution to the work of higher education and feel secure in their entitlement to intellectual respect and to a share of the money and honor their schools have to bestow.

The mood in the humanities, by contrast, is one of insecurity and doubt. Talk of a “crisis” of purpose—a loss of direction, an absence of aims, a failure of nerve, a collapse of traditions—has been widespread in these disciplines since the 1960s and continues unabated today.² The lack of self-confidence that such talk reflects remains a pervasive fact of professional experience for teachers and students of the humanities. To some, perhaps, looking at the situation superficially, these doubts will seem unwarranted. After all, the worth of the humanities is regularly reaffirmed by college and university presidents and ritually endorsed by curriculum committees reviewing their schools’ programs, as it recently was at Yale.³ Humanities classes continue to be taught. Humanities departments continue to make appointments. No one is calling for their abolition. On the surface, their position appears as secure as that of the natural and social sciences. But the reality is that teachers of the humanities, unlike their counterparts in these other fields, do not share a clear and confident understanding of the contribution they make to higher education. They do not have a buoyant, collective sense of the distinctiveness and worth of what they do. They lack today, as they have for the better part of the past half-century, the relaxed and easygoing confidence in the value of their work that

scientists of all sorts share. And while those in the natural and social sciences often express a conventional respect for the humanities, their real attitude is frequently one of bemusement or even contempt for these disciplines, whose paroxysms of political correctness have made them appear increasingly ridiculous to those who value the norms of objectivity, impersonality, and coordinated, accretive discovery that lie at the heart of the modern research ideal. In the hierarchy of academic authority and prestige, the humanities today stand at the bottom.

As I have tried to show, this is the result, in part, of developments internal to the academy. It is a consequence of the humanities' own self-destructive embrace of the research ideal and of the even more destructive culture of political correctness that has gripped these disciplines for the past forty years. But it is also a consequence of developments outside the world of higher education which, in a parallel and complementary fashion, have undermined the authority of the humanities and cast doubt on their value.

The most important of these is the immense authority of science in the world at large.

Science is today the greatest authority in our lives—greater than any political or religious ideal, any cultural tradition, any legal system. We depend on science and defer to it as we do to nothing else. Politics, culture, religion, and law: in all these areas of life, different conceptions of truth and legitimacy compete. In none are the ideas of truth and objectivity accepted in the same nonpartisan spirit they are in the realm of science. Today, our very understanding of what these ideas mean is a function of their meaning in science. The truth and objectivity of science set the standard by which their more limited availability in other domains is measured. Many

things claim our respect and demand our allegiance. But nothing in the world now does so with the same insistence as science. The preeminent authority of science is the central fact of our age and the collapse of the authority of the humanities within our colleges and universities is in part a consequence of the authority that science possesses outside them.



In practical terms, the authority of science begins (though it does not end) with technology.⁴ Our lives today are conditioned to an unprecedented degree by the powers of technology, which for the most part we unthinkingly accept as a desirable and in any case inescapable fact of life. Virtually every aspect of human life is now shaped by technology, and our dependence on it and deference to it instill a respect for science at the deepest and least articulate level of lived experience. Today we live surrounded by an array of ingenious gadgets on which, in the developed world at least, the lives of even moderately well-to-do people are hopelessly dependent. There are the cooking and other appliances that have transformed the nature of housework; the telephones that put us in immediate touch with others around the world; the trains, planes, and automobiles that have obliterated the real and imagined distances that once separated the peoples and places of the earth and that have turned the dangers of travel into mere inconveniences; the televisions that provide an endless stream of images of events around the planet, at the very moment they occur; the computers, which simplify and accelerate countless tasks and place at our fingertips a world of information

larger than the real world itself; and beyond all these, beyond the gadgets themselves, the stupendous interlocking web of plants and wires that produces the energy that drives them all.

If, for the most part, we are no longer amazed by any of these things but simply take them for granted, that is because they have become such familiar elements of our material civilization that we hardly notice their existence. But the technologies in whose midst we live are now indispensable to us. Every day our dependence on them grows. Every day it becomes harder to imagine life without them. Every day our acceptance of them deepens and our deference to their powers increases. And when we contemplate the future, all we can imagine (barring a catastrophe great enough to wreck the world, at whose prospect imagination fails) is a further expansion of these powers themselves. All we can imagine is more technology: new and better gadgets that permit us to do what we want at greater speed and lower cost. That is for us today the only imaginable future, and we embrace it both because we want it and because we believe it is inevitable.

Technology is a tool and the countless gadgets on which we now depend are at bottom nothing more than an accumulation of tools. Every tool is a device for increasing our power to reach some end or perform some task. In this respect, our modern technologies are no different from earlier, more primitive tools. But their vastly greater power constitutes a difference of kind, not merely degree. It sets them apart and gives birth to ambitions undreamt of before.

Modern technological tools increase our power exponentially. They give us the power to control what human beings have never been able to control before. They allow us to extend or avoid limits that earlier generations had to accept as their fate. Today, we control

the temperature in our homes with furnaces and air-conditioning units. We correct our vision with laser surgery. We extend our lives with pacemakers and chemotherapy. And everyday conveniences, like airplanes, telephones, and cameras, make it possible for us to overcome once-fixed limits of time and space. They make these limits less of a hindrance to our desire to go where we want, speak with whom we wish, and recall the past with the vividness of present perception. Modern technology expands the limits of human action to an unprecedented extent and in doing so reveals with greater clarity at every step the ambition that lies behind the modern technological order as a whole—the ambition to eliminate every constraint that prevents us from doing as we please.

Even the most enthusiastic admirer of technology is unlikely to think we can reach this goal. Some limits will always remain. Our actions will always be subject to constraints of one kind or another. But even if the goal of a life without limits can never be reached, it remains the end that technology strives to attain. It is the guiding purpose that gives technology its meaning and value. A technological advance has meaning and value *because* it carries us further in this direction, and the limits that at any given moment confine our freedom to live and do as we wish are, from a technological point of view, merely a challenge to be overcome through some new and better technology that will enable us to supersede them.

Technology is in this sense an anti-fatalistic force, the greatest the world has ever known. For its defining aim is to transform fate into freedom—to change what we must accept into something our powers permit us to accept or not as we choose. The goal of technology is the completion of this transformation. This is not a goal we can attain. But it is a meaningful goal nonetheless, since we can

approach it ever more closely over time. The purpose of technology, and hence its meaning, lies in the pursuit of this meaningful if unattainable goal.

Our dependence on technology and the authority it possesses in our lives are a consequence of our deep attraction to this goal. For the desire to push back the boundaries of fate is one of our oldest desires and the fantasy of erasing these boundaries completely one of our deepest dreams. But while the desire itself is primordial, the opportunities that modern technology affords for its satisfaction are entirely unique. Technology gives us grounds to be increasingly impatient with anything that frustrates the fulfillment of this desire. The promise of technology is that we can now for the first time confidently plan on making steady progress toward the age-old human dream of a perfect freedom from fate, with no end of further progress in sight. The new inventions that appear every day give this promise credibility. They confirm that at last we are in a position to do what we have wished to do from the start. They promise to release us from the prison house of fate in which our ambitions have been confined. The authority of technology in our lives today is as deep as the archaic desire for control whose fulfillment it brings within reach. That we cannot imagine our lives without technology and do not wish to do so is more than a sign of its authority. It is that authority itself.

The authority of technology extends backward to the science that lies behind it, though again not always in ways that we notice. Few of us understand much of the science that underlies the technology we use every day. None of us grasps it all. In this sense, we live surrounded by devices on which we depend and whose operation we do not comprehend. But we also know that someone

somewhere understands how each of these things works, that each, though perhaps not comprehensible to you or me or anyone we know, is comprehensible to the human mind.⁵ And we also know that this comprehension is based on a knowledge of how the world works, of its structure and laws, and that it is this knowledge of the world that makes it possible for human beings to create the technical devices we employ in our everyday lives. And if these technologies work as well as they do, that can only be because the scientific knowledge on which they depend is accurate and true. The technologies whose practical utility we recognize thus validate the theoretical understanding of the world from which they spring. They validate the truths of science. They derive from these truths and give us reason to accept them. The authority that technology possesses in our lives and over them thus flows backward to the science whose truth is confirmed by the effectiveness of the technology its discoveries enable us to produce.



In speaking of “science,” I have in mind first and most emphatically the modern sciences of nature that emerged from the intellectual revolution of the sixteenth and seventeenth centuries. The contemporary sciences of the natural world all derive from methods and ideas first formulated in the revolution that began with Copernicus and ended with Newton. These had important medieval and early modern precursors, and their views have been substantially revised by later thinkers. But it was during the century and a half that separated the most famous works of these two thinkers that the

science of nature assumed the form, and acquired the authority, it possesses today.⁶

Many factors contributed to this development. Some were conceptual, such as the new theory of motion that replaced the old Aristotelean idea of natural place and prepared the way for Cartesian, and later Newtonian, mechanics.⁷ The invention of new tools of observation played a role as well. With the telescope, study of the heavens was no longer limited, as it had been before, to what can be seen with the “naked” eye. And with the clock, periods of motion, and hence rates of change, could be measured with previously unattainable precision.⁸ The development of mathematical techniques that permitted the formalization of basic concepts like acceleration and that allowed for the creation of a unified world picture expressible in abstract formulae made an essential contribution too.⁹

Another factor of great importance was the refinement of the experimental method, a uniquely fruitful technique for aligning theory and observation.¹⁰ An experiment is a controlled experience that has been artificially shaped to isolate certain of its features. The purpose of an experiment is to expand our ability to reason about the experiences we have. If we had to take our experiences as they come, as “lump sums” whose elements cannot be isolated and independently scrutinized and whose causal significance can therefore not be separately assessed, our capacity to reason about them would be severely constrained. The experimental method is a technique for liberating our powers of reasoning from the limits to which sense experience otherwise confines them, while at the same providing a mechanism for testing the soundness of reason’s abstractions against experience itself.

By freeing reason from its dependence on the given facts of

experience while simultaneously creating a means to check our theories in a systematic way against a novel set of artificially created facts, the experimental method made the idea of limitless progress toward a perfect understanding of the natural world seem more plausible than it had ever been before. It made it an idea that scientists could confidently adopt as their goal. The experimental method enabled scientists to redescribe the world in rational terms of the greatest possible abstraction and at the same time to demonstrate that their description of it accurately depicts the world as it truly is—to undertake the fusion of mathematical and empirical truth, the mathematization of reality, that has been the hallmark of all scientific knowledge ever since.

The truths of modern science, expressed in mathematical terms, are thus arrived at by a manipulative method that permits us both to use our experience and to transcend it—using experience to confirm what we think while freeing us from all experiential limits on our power to think about it. These scientific truths, which are the product of our intellectual manipulation of the world, in turn enable us to construct tools for its practical manipulation. They provide us with the knowledge we need to increase our practical powers of control and many have seen in the expansion of these powers the motive and goal of science itself.

Francis Bacon, for example, famously observed that we seek knowledge for the sake of power—that knowledge *is* power.¹¹ There is considerable truth in this. We want to know how the world works because we want to know how to make it work as we wish, and the great technological powers that modern science places in our hands not only confirm the truths of science but supply one of the principal motives for seeking them in the first place. But Bacon's famous

dictum leaves something important out of the account. It is true, but only a half truth. For while modern science has vastly increased our practical powers of control and enjoys the authority it does in part because its discoveries provide the foundation on which these powers rest, its authority has another source as well. Science today enjoys the authority it does not only on account of the practical inventions that flow from it and from their capacity to satisfy our desire for control, but because it satisfies more fully than any other form of knowledge we possess a second elementary desire, the desire to understand.

We want to know how the world works for the sake of such knowledge itself, apart from any practical benefits it yields. The desire to understand is a distinct, and distinctively human, desire. It is not the same as the desire for control. But it is as old and as deep, and the authority of modern science is a function not only of the practical powers it puts in our hands, but also of its capacity to satisfy our desire to understand the world for the sake of the pleasure that such understanding affords.

“All men by nature desire to know,” Aristotle remarks in a matter-of-fact way at the beginning of the *Metaphysics*.¹² He compares the pleasure we take in the satisfaction of this desire to the pleasure of sight. We enjoy looking at things, he says, not just because it is useful to do so—because we must look at them to find our way about—but because it is intrinsically delightful as well. According to Aristotle, the pleasure we take in understanding the world is like this too.

Many animals might be said to be “curious” about the world—cats famously so. But except in the case of human beings, animal curiosity is limited to the surface of things. Is there a mouse behind

the chair? Or a bird behind the song in the garden? Human beings are curious about these things too, but they are also, and uniquely, curious about something else as well. They are curious about the organizing structure of the world that lies beneath its surface. We want to know not only *whether* something is the case—is there a deer in the woods?—but also *why* it is the case—why do deer appear at certain times and not others? This latter, distinctively human curiosity seeks a knowledge of the causes or reasons for things.¹³ And while a knowledge of causes and reasons can be put to practical use, the possession of such knowledge is also, Aristotle says, intrinsically rewarding. Among the animals, we alone are moved to investigate the structure of the world, and we alone experience the understanding this produces as something delightful in itself.

If our study of the world is motivated, as both Plato and Aristotle say, by “wonder,”¹⁴ by our human curiosity about the reasons and causes for the world’s being as it is, the pleasure in which our investigations culminate might be described as a kind of wonder too—as our astonishment that the world has a structure that explains it and that we are able to comprehend this structure ourselves.¹⁵ The human study of the world thus both begins and ends in wonder, and the wonder it produces is a state we enjoy for its own sake and independently of the utility of the discoveries that fill us with astonishment—independently of what these discoveries are good *for*.

Science is the name we give to our study of the world. It begins in ignorance and the desire to understand why things are as they are. It starts with amazement, which the dictionary defines as being filled with wonder. Science aims to replace ignorance with understanding, puzzlement with comprehension. But its goal is not to

make our wonder at the world disappear. Science does not seek to eradicate wonder, in the way that other activities, like eating and drinking, eradicate the states (of hunger and thirst) that provide their motivation. It transforms the nature of our wonder, from wonder *about* things to wonder *at* them, to amazement at the structure of things and our capacity to grasp this structure ourselves.

The first kind of wonder is characterized by the absence of understanding. That is what gives rise to the search for knowledge. The second is characterized by the presence of understanding, which is its very source. One kind of wonder is therefore defined by the presence of precisely what is missing in the other. They are related in the way that the beginning and end of all developmental processes are, in Aristotle's view, always related, the beginning being marked by the absence of and longing for what the end actually possesses.¹⁶ Every such process is therefore a fulfillment and not just an interval between two different states. Science is in this sense a fulfillment too. For the states of wonder in which science begins and ends are related as longing to achievement, privation to possession, and the movement from one to the other is the realization of a uniquely human potential whose attainment brings us, Aristotle says, a pleasure distinct from the useful powers it yields.

It may seem implausible that this old, Aristotelean way of thinking should have any relevance to science today. After all, the scientific revolution of the sixteenth and seventeenth centuries began by repudiating Aristotle's conception of nature, with its "entelechies" and other vital powers, and by replacing his picture of the world with a strikingly different one in which all causes are mechanical and mathematically measurable. Moreover, for Aristotle, the knowledge in which our study of the world concludes, and our curiosity

about it is fulfilled, consists in the understanding of what he calls “being *qua* being” and the contemplation of God—in metaphysics and theology.¹⁷ Modern science rejects these completely, as it also rejects the assumption, so important to Aristotle’s thought, that the world has a fixed and final structure which the human mind can grasp completely. Today, we know that science is an endless process with no final terminus yielding ultimate and unsurpassable knowledge. We know it is an inquiry that is forever probing deeper into the structure of the world without exhausting the questions that remain to be asked. We know that science is a series of defeasible discoveries, each destined to be displaced by those that follow, in the way that classical mechanics has been displaced by quantum theory and Mendel’s understanding of genetics by molecular biology.

These are fundamental differences between our conception of scientific knowledge and Aristotle’s. But his claim that we take pleasure in such knowledge for its own sake and pursue it, among other reasons, for the intrinsic satisfaction it affords, remains as true today as when Aristotle made it. The character and content of science change from one age to the next. But the desire to understand the world is ageless, and the pleasure we take in the satisfaction of this desire is perennial too.

Today, the modern sciences of nature surpass all other modes of human knowledge—religious, philosophical, historical, and literary—in their capacity to satisfy our desire to understand. From this knowledge, great powers flow and these powers satisfy to an unprecedented extent the human desire for control. But quite apart from its utility, which is manifest in the expanding arsenal of modern technologies on which we all depend, our scientific understand-

ing of the world commands the authority it does in our civilization because it satisfies more fully than any other kind of knowledge our desire to understand. The natural sciences now have a near monopoly on wonder. They have by far the greatest power to produce in us that condition of amazement that is the result of every successful investigation of the world. We defer to the natural sciences and admire them on account of their unrivaled capacity to produce this condition, and if we sometimes lose sight of the intensity of the pleasure we take in the satisfaction of our desire to understand, that is only because it is almost always accompanied by the equally intense pleasure we take in the expansion of our powers of control.

Our deep dependence on the modern technological order, outside of whose web of power-enhancing gadgets few today venture, even in imagination; our recognition that the marvels of modern technology have all been wrung from the world by the deepening knowledge of its structure that the natural sciences afford; and the capacity of these same disciplines to provoke, even among those with no scientific training at all, a sense of wonder at the intelligibility of the world and our ability to grasp it—an experience that once only other forms of knowledge could produce: all these today conspire to give the natural sciences and their practical products an incomparable authority in the world at large. The natural sciences validate themselves with the useful results of their discoveries. They set the standard by which the solidity and objectivity of other forms of knowledge must be measured. They illuminate the world and bring it under our control. They gratify our desire for control and our desire to understand, and their capacity to satisfy so powerfully both of these desires at once is the source of the unique authority the

natural sciences possess in the world today. Theirs is the dominant authority of our age.



The same is true, though in a more limited way, of the social sciences. The knowledge that is produced by the social sciences does not, of course, manifest itself in practical inventions of the same indisputable utility as those that flow from the discoveries of the natural sciences. But we now look to the social sciences for objective guidance in solving an ever wider range of social and political problems and rely to an increasing degree on the technologies of management their methods and ideas allow.

Modern political societies are no longer administered through a combination of statesmanship and personal allegiance and on the basis of common sense and anecdotal knowledge. These may have been adequate for the politics of the past. But for the modern nation state, whose political, legal, and administrative apparatus touches virtually every aspect of human life and regulates many in exquisite detail, more systematic and impersonal forms of knowledge are required.¹⁸ Much of this apparatus is today in the hands of experts whose authority derives from their possession of a rigorous and objective understanding of the structures and systemic forces that condition the work of politicians and administrators. Indeed, these very structures are themselves typically the product of what is sometimes called “social engineering” or “institutional design”—of a process deliberately directed toward the achievement of specific functional goals and guided by a methodical understanding of the means

required to reach them, which the experts who possess and apply this understanding look to the social sciences to supply.

Every political society is always, to some degree, an inheritance as well as an artifact. It is always, to some degree, a product of history and chance as well as of self-conscious design. But the political societies of the modern world are, to an extent unprecedented in the whole of human history, artifacts constructed according to a plan. They are the products of decisions made by experts relying on systematic and impersonal knowledge—on social science as opposed to the wisdom of the statesman—and requiring for their administration the continuing application of such knowledge to the challenges of social and political life.

Those who live in these societies understand this condition intuitively. They know that the organization of their societies depends upon a managerial expertise that is sufficiently reliable to give those responsible for maintaining the complex machinery of social life the guidance they need to do so. And they understand, confidently if not always clearly, that the expertise in question is the fruit of the social sciences, which in this way come to possess a powerful authority themselves.

The authority of the social sciences manifests itself in countless ways. Today, for example, elected officials in many countries rely on opinion-testing devices to frame positions and develop strategies, and their constituents depend on these same devices to judge the performance of those in office. The effectiveness of prisons in achieving the goals of criminal punishment and the relative utility of other methods for preventing crime; the design of a process for approving new drugs that strikes an optimal balance between safety and speed; the creation of a plan for sustainable fisheries; the choice

among alternative systems of health care; the setting of speed limits for automobiles and the placement and timing of stoplights; the reform of social security; the definition of property rights in ideas: these and an endless stream of other issues that modern societies face are today debated by experts who look to the social sciences for instruction and guidance.¹⁹

The social sciences cannot always settle these debates decisively. Intractable differences of value and opinion often remain. But the knowledge they provide plays a crucial role in the formulation of the issues involved and in the evaluation of the solutions that different experts propose. Indeed, it is increasingly difficult to think of *any* problem in the expanding universe of tasks for which the modern administrative state has assumed responsibility to whose solution the social sciences are not now expected to make some contribution. In many cases, we can no longer even describe these problems, or imagine a means of addressing them, without relying on the methodical understanding of human society which the social sciences provide.

This is clearest in the case of economics. The discipline of economics plays a larger role in modern public life than any other social science. Legislators, administrators, and even judges today routinely use the vocabulary and methods of economics to frame the issues they confront and the solutions they propose.²⁰ In some areas of administration it is today nearly inconceivable that a question could be approached from any other point of view, and nowhere is it surprising to find an issue formulated in economic terms. One might without exaggeration say that economics is today *the* science of administration and policy-making—that every weighing of costs and benefits in pursuit of the greatest good (which is what policy-

makers are expected to do) is either a form of economic analysis or an ad hoc judgment with no discipline at all.

Of course, even with the instruments of economic and political power which the social sciences now place at our disposal, our capacity to control our social, political, and economic circumstances is limited. The progressive income tax is a device for softening disparities of wealth, but birth still makes an enormous difference so far as our life chances are concerned. More of what politicians do is subject to review, but much is still done in the dark. And though our power to control the market and to adjust for its systemic effects (the degradation of the environment, for example) is greater than ever before, the market itself remains a force that is unpredictable and uncontrollable in important respects—a fate that shapes our lives in ways we must simply accept.

But were it not for the technologies of social and political control which the modern social sciences enable us to employ, our lives would be more deeply and decisively determined by fate than any of us could accept or even imagine. The essential meaning of the powers with which the social sciences equip us is therefore the same as the meaning of the powers the natural sciences provide. Our modern technologies of communication, transportation, and medicine are all devices for defeating, or at least extending, the fateful limits within which we would otherwise be cabined. The modern technologies of economic and political control do the same. Their results may not be as dramatic or their powers as complete. But they press in the same direction. They are motivated by the same ambition. And we value them for the same reason too. We value them because they satisfy our desire to rid the world of fate, which takes a social and economic form (the position of the families into which

we are born, the anonymous powers of the market, etc.) as well as a purely physical one (our inability, without technological help, to speak with those thousands of miles away or live with diabetes).

Like the natural sciences, the social sciences enjoy the authority they do for another reason as well, because they enable us to understand the social world we inhabit with a precision and thoroughness never before attainable—an understanding that is a source of satisfaction in its own right, quite apart from the practical powers it yields. The nature and workings of human society were of course topics of observation and analysis long before the rise of the modern social sciences in the eighteenth and nineteenth centuries. Philosophers, historians, politicians, and others, from Plato to Tocqueville, explored these subjects in detail. But the practitioners of the new social sciences possessed something their predecessors lacked: a set of methods that enabled them for the first time to explore these age-old subjects in a rigorous fashion, to study human societies systematically and to express their laws in quantitative terms, much as the new sciences of nature had found the means to do two centuries before.

These new methods rested upon a number of simplifying assumptions about the sources and character of human motivation (the counterpart of the simplifying assumptions about the motion of physical bodies on which classical mechanics was based) and made use of novel techniques for the gathering and analysis of large volumes of information about the behavior of people in society, which in turn permitted the laws of social action to be framed and tested on the basis of something more reliable than anecdotal knowledge.²¹ The philosophers and others who, in earlier ages, had written about the nature and workings of society had had nothing to

go on but their own, unsystematic experience of the social world and their personal judgments about it. The pioneers of the new social sciences relied instead on surveys and statistics, and their contemporary descendants make use of more advanced techniques like those of econometrics. In this way, the social sciences were able to reorganize the study of social behavior along lines resembling those already well-established in the natural sciences. Rigor, objectivity, impersonality, a reliance on quantitative methods, the framing of hypotheses that are vulnerable to empirical disconfirmation—the hallmarks of understanding in the natural sciences—all these now became for the first time achievable in the study of human affairs as well.

It may be unreasonable for the social sciences to hope to attain a level of precision comparable to that of the natural sciences. The more limited extent to which they can make use of the experimental method; the relatively less refined instruments of observation they employ; and the inherently purposive nature of the human actions they study (which introduces a special kind of indeterminacy the natural sciences do not confront) all constrain the social sciences in their pursuit of precision and objectivity. But despite these limitations, the social sciences have sought from the beginning to emulate the natural sciences, in so far as this is possible, by defining the laws of social action with a degree of exactness greater than any attained before. This is what distinguishes the social sciences as a family of disciplines from the older, less rigorous traditions of study to which they succeeded, and together they have gone far enough in realizing this ambition to justify their claim to have put the study of human society on a scientific footing for the very first time.

If, for example, one compares Aristotle's brief remarks on the

economics of the household with Alfred Marshall's analysis of the firm or contemporary models of general equilibrium theory; if one contrasts Rousseau's comments about the role of public opinion with the latest study of polling techniques; if one places Madison's account of political factions side by side with any recent discussion of the dynamics of coalition formation, one is led in each case to conclude that however engaging the first, the second treats its subject with incomparably greater rigor and advances our understanding from anecdote and speculation to a deeper form of knowledge.²² It is hard to resist the conclusion that we are approaching more closely an objective understanding of how the social world actually works. And even though this understanding can never rival in its exactness our knowledge of the natural world, it satisfies, so far as such satisfaction is attainable at all, our desire to understand the mechanisms of human society for the sheer pleasure of such understanding itself.

Today, the natural sciences satisfy our desire for understanding to a unique degree. But the social sciences have a share in this as well, just as they have a share in the creation of the modern technological order that gives us such immense powers of control over our social and natural environments. From their twofold satisfaction of our desires for understanding and control, the social sciences derive the large authority they now enjoy, like the even greater authority of the natural sciences which draws on these same two sources.



Outside the academy, the natural and social sciences are valued for the powers they produce and the knowledge they provide. This naturally causes us to assign a special value to the areas of academic research from which these powers and knowledge derive. Indeed, even this way of putting things fails to express how close the connection is between the position of the sciences outside our colleges and universities and their standing within them. For viewed as academic disciplines, as subjects of instruction and fields of research, the natural and social sciences *belong to* the larger system of practices and beliefs that gives our world as a whole its dominantly scientific character. They do not support this system from without, as an adjunct to it. They are part of it. They are nodes within it. The prestige which the natural and social sciences today enjoy in the realm of higher education is thus merely a local expression of the tremendous authority that science and its products enjoy in our civilization generally.

The humanities, by contrast, do not share in this authority. They are not part of the system of science and make no contribution to it. They neither add to its practical powers nor participate in its intellectual progress. And because of this they are cut off from the most potent source of authority in the world today.

The disciplines that comprise the humanities are of course connected in a variety of ways to activities and institutions outside the realm of higher education. They are connected, most directly, to the sphere of "culture"—to museums and movies and orchestras and publishing houses. Many people make their living in this sphere, and its products are a familiar and valued part of most people's lives. We enjoy the works of culture and would be desperately impoverished

without them. But however much pleasure and fulfillment they provide, the world of culture lacks the authority that today science alone possesses.

The technological products of science affect us in decisive ways and change our lives in a common direction. Technology is in this sense a force of convergence. Even as it expands our powers of choice, it makes our lives more alike. It brings us more and more completely into a community of shared experiences, habits, and expectations. The science that lies behind technology is a force of convergence too. Its truths are ones that we are all compelled to recognize, and our recognition of them moves us steadily and irresistibly toward a community of shared belief, one that transcends all other differences of outlook and opinion.

Culture, by contrast, is neither uniform nor progressive. It tends to be a force of separation more often than one of convergence. It sets us apart, according to taste and tradition, and however meaningful its products, however much enjoyment they afford, the claim that some cultural object or activity reveals in a decisive way the universal and incontestible truth about the world is a claim we often find hard to accept, in contrast to the unreflective ease with which we accept similar claims when made on behalf of a new scientific discovery. In this sense, culture lacks the authority that science possesses, and the humanities—the academic disciplines that belong to the sphere of culture, that form nodes within it in the way the natural and social sciences form nodes within the realm of science—lack such authority too. From the wondrous achievements of science, from its engorging powers and commanding discoveries and hence from the authority of science itself, the humanities are almost completely cut off. We do not need the humanities for technology.

They cannot satisfy our desire to understand with the same decisive clarity as the natural and social sciences. What, then, do we need them for? What can their purpose and value be?

The answer is that we need the humanities to meet the deepest spiritual longing of our age, whose roots lie in the hegemony of science itself. At the very heart of our civilization, with its vast powers of control, there is an emptiness that science has created and cannot fill. It is an emptiness that many people feel and a cause of much anguish and yearning. It is the nursery bed of that great upwelling of religious feeling, of the surge of fundamentalist belief, that is such a striking feature of life today, in America and the world at large. To this yearning, which many in our colleges and universities wrongly dismiss as a kind of mindless obscurantism, the humanities offer the best response we have. Our need for them is as great as the spiritual emptiness our immense powers have bequeathed us. Once this need is named and acknowledged, the humanities will be seen to be our most durable source of wisdom in responding. Their purpose will again be clear and their authority patent. The nature and value of their contribution to higher education will once more be transparent. And the way will be opened to the restoration of the question of life's meaning to a respected place in our colleges and universities and to the reaffirmation of secular humanism.

The spiritual emptiness of our civilization has its source in the technology whose achievements we celebrate and on whose powers we all now depend.

Technology relaxes or abolishes the existing limits on our powers. There is no limit to this process itself. Indeed, every step forward is merely a provocation to go further. This might be called the

technological “imperative.” The greater our powers become, the more aware we are of the limits to which they are still subject and the more anxious to overcome them. If planes fly fast, we want them to fly faster. If medicines work well, we want them to work better. The result is a process of technological improvement that goes on forever. The end of this process, could it be attained, would be the expansion of our powers to omnipotence, the abolition of our finitude. This end of course cannot be reached. But it functions as a regulative ideal against which all technological progress is measured and from whose vantage point it is considered progress as such.

But there is a problem with the pursuit of this goal that has nothing to do with its unattainability. It arises from the fact that our powers have meaning for us only within the limits of human life. Their value and meaning are conditioned by our mortality. However great they may be, our powers have the meaning they do only because they are not unlimited, because we are not perfectly powerful, because we are finite beings who possess and exercise these powers subject to certain binding constraints. That we must die is a fate no human being can escape, though technology permits us to extend the length of life and to exert ever greater control over how and when we die. But it is only because we are mortal that the powers we possess have value for us and their use any meaning at all.²³

If we lived forever, our powers, however great, would have no significance. How could it possibly matter whether we exercised them one way or another, sooner rather than later? This can matter to us only within the framework of a lifetime, that is, within the boundaries of a mortal existence. That we sometimes imagine (or think we imagine) that we want to have and use limitless powers in a limitless life is an illusion that always depends on our covertly smug-

gling into our imagined picture of such an existence some essential feature of the human mortality we can never escape. In reality, the idea of immortality is for us quite unimaginable. It remains an empty abstraction. All we ever know and all we can imagine is the mortality that forms the widest horizon of our speculations and that fixes the fateful frame within which everything we have and do, including our powers and the uses to which we put them, alone has meaning for us.

In fact, we are limited in many ways. None of us, for example, can stay awake all the time. Technology helps us control when, where, and for how long we sleep. But no one can do without sleep altogether. The respite it offers from living is essential to the tiring work of life itself. Nor can any human being share the routines of everyday life in an intimate way with more than a limited number of others. Technology helps us keep in touch with family members when we are separated from them, and it certainly alters in profound ways the patterns of domestic life. But it can never enable to us to have a family relationship, or friendship, with every other human being. Perhaps if we were immortal we could do this, by rotating from one family and friend to the next, assuming that everyone else was immortal too. In that sense, it might be more accurate to say that our mortality is not merely the most impressive of our limits but the condition or sum of them all.

Mortality, so understood, is our destiny or fate. It sets a limit to what we do. On the one hand, we want to push this limit further and further back. We always want to have greater control over ourselves and the world, to be less dependent on fate. We would like not to be subject to fate at all. We have a desire for control that can never be satisfied by any degree of control we actually achieve. We

always want more. The desire for more control is inscribed in the human soul. And yet on the other hand, the meaning of all the powers we possess is dependent upon their location within a fateful limit without which the exercise of our powers would be pointless. They are not pointless only because they are directed toward the achievement of various ends, and these ends themselves would not—could not—exist for us if our lives themselves were endless. An immortal existence can have no purpose, in the strict sense of the word, and the longing we sometimes think we have for immortality is not a longing for a life in which all our purposes might finally be achieved, but for an existence that is free of the burdens of purposefulness that are the mark of our humanity—for an existence that is no longer human.

Our situation is therefore, in an elementary way, self-contradictory. For it is characterized by a longing for the abolition of the very limits that give all our longings their meaning—limits whose final abolition, were it actually attainable, would not be the fulfillment of our deepest ambition but the elimination of the ground of our having any ambitions at all, and therefore of living lives that possess any meaning whatsoever. This is the human condition, which is characterized by our subjection to fateful limits that we can neither tolerate nor do without. This is the truth about who we are.

Of course, the longing to abolish fate can never be fulfilled. Technology can extend life but it cannot cancel death. Hence it always leaves in place the limits that ground the meaningfulness of our ambitions, including the ambition for ever greater control over the circumstances of life itself. It might therefore seem that technology is consistent with the truth about our self-contradictory nature.

But this is wrong in one crucial respect. For the most important thing about technology is not *what* it does but what it *aspires* to do. It is true that technology always has limits. But from the standpoint of technology itself, these limits are an affront—something to be overcome. Technology encourages us to believe—or to think that we believe—that the abolition of fate should be our goal. It devalues the fateful features of human existence. It encourages us to view them as *nothing but* an obstacle, a challenge, something to be erased, and promotes the habit of regarding whatever limits remain on our powers of control at any given level of technological development as a wholly negative fact, one that only compromises the purposefulness and hence meaning of human life and in no way contributes to its achievement.

Technology discourages the thought that our finitude is a condition of the meaningfulness of our lives. It makes this thought appear backward and stupid. It deprives it of intelligibility. It causes us to forget the connection between mortality and meaning. It makes the effort to recall our limits and to reflect upon them seem less valuable and important. It obscures the imaginative space in which this happens, or might happen. It makes it harder for us to find this space and to inhabit it, or even to recall that it exists. Technology suppresses as a subject of contemplation and wonder the very condition on which the powers of technology themselves depend for their meaning.

Our civilization is characterized by its unprecedented powers of control. It is also characterized by its unparalleled repression of the mortal facts and this, too, is a consequence of technology. Technology obscures the truth about us. In place of the full truth, it gives us a half-truth that recognizes our limitless desire for control but denies

all value to the limits on which the meaning of this desire depends. It encourages a partial knowledge of humanity and invites us to think that this is all there is worth knowing. It encourages a kind of ignorance, and not about a trivial thing. For the ignorance that technology encourages is an ignorance about ourselves, the most important thing we could ever want to understand. It promotes an ignorance of the worst and most troubling sort, the kind we should be most eager to avoid. And yet it is precisely this worst of all forms of ignorance that is the hallmark of our civilization with its immense powers of control and its systematic devaluation of the fateful limits of human life—apart from which nothing in our lives, and least of all the powers we possess, can ever have any meaning or value for us. Increasingly today we live in ignorance of the human condition.



The devaluation of these limits is the source of the spiritual crisis that motivates the inspired religious movements that have large and growing followings in the United States and elsewhere today. Some of these movements preach peace and others war. Some approve the separation of church and state; others abhor it. Some demand submission to church leadership. Others emphasize the saving power of individual conscience. But all condemn human arrogance and pride. All insist that we are not fully in control of our lives, that we depend on powers other than our own, that we are subject to limits we can never exceed—and all demand humility in the presence of these limits. All of these movements derive their energy and appeal from their opposition to the secular morality of the civilization that

most of their followers comfortably inhabit most of the time—from their opposition, above all, to the morality of choice that regards the expansion of freedom, of the power to do as we choose, as the preeminent if not exclusive human good. To this morality, the fundamentalist Protestant churches in America, the jihadist wing of Islam, and the Pope all oppose a morality of humility and submission, of acquiescence in our lack of control and grateful acceptance of the power of God, on which we depend and must never foolishly arrogate to ourselves. All seek to revalue the limits of human life, to turn these from something we view as an obstacle and to which we can only assign a negative value, into something we accept and whose existence is an occasion for gratitude rather than rebellion.²⁴

Different religions express this thought in different ways and draw on different traditions to do so. But the thought itself is common to the movements that comprise the religious revival we are witnessing today. It is what sets these movements in opposition to the morality of our technological civilization, even as they exploit the powers it provides. And it is what attracts their followers, who increasingly experience the devaluation of mortality that technology implies as an emptiness in which these powers themselves lack all meaning and value. The result is a spiritual crisis of large proportions. The religious movements that today call for humility and acquiescence in place of arrogance and pride are the most visible and influential response to this crisis. Their common goal is the restoration of meaning to mortality, and with that to the lives we live within the fateful frame of birth and death.

These movements offer a common diagnosis of the crisis of our age. They say it is a consequence of the “death of God” and of man’s appropriation of God’s place, of man’s assertion of the right and

power to be the self-sufficient ground of his own life, the master of his fate and hence subject to no fate at all. They call this the “godlessness” of the modern world and identify the death of God as the source of the loss of meaning that has come with the hypertrophic expansion of our human powers. And for this “disease”—which is how they see it—these movements all propose a common cure: the restoration of God to His rightful place, and the demotion of man who has usurped it. Only in this way, their prophets and preachers say, can the spiritual crisis of modernity be overcome. This is the common thread of advice that all the religious movements of our day, the militant and peaceful alike, offer their followers, and there are many who are prepared to hear and follow it.

Cosmopolitan observers, especially in our colleges and universities, tend to view such advice with bemusement and scorn. They consider it shallow and mindless. They look down on those who give and receive it. They consider them naive and possibly dangerous. But their smugness prevents them from grasping the source and magnitude of the crisis of meaning these religious movements address, and from seeing that it is a crisis in which they too are caught, along with those whose spiritual yearnings they mock.

This crisis has its source, as the leaders of these movements understand, in the devaluation of mortality that defines the powerful but pointless age we inhabit. Genuine comprehension, as opposed to the facile dismissiveness that often takes its place in our colleges and universities, begins with the acknowledgment that the crisis is real. But there is another, better response to it than the one these movements recommend. For the crisis we face is not the result of the death of God. There have been other ages, that of classical antiquity most famously, from which the love of God as these move-

ments conceive it—the love of a personal, transcendent Creator God to whom one gratefully submits—was absent, but in which the bond between mortality and meaning was recognized with a force and clarity we have forgotten. The crisis of spirit we now confront is a consequence not of the death of God, but of man. It is the forgetfulness of our own humanity, of the contradictory condition of the gloriously self-defeating animal we are, marked by a striving for infinite powers whose pursuit has meaning only within the framework of mortality, that has given rise to this crisis and to the emptiness that millions of men and women now experience in their everyday lives.

These are religion's eager recruits, for whom the call to remember God has such appeal. But it is not God that needs to be remembered. It is man. Only the recollection of humanity is an adequate response to the meaninglessness that haunts our technical powers. It is the love of man that needs to be restored: the love of the amusing, tragic, contradictory creature who yearns to be the master of his fate and transforms the world in pursuit of that ambition, but to whom, as Sophocles says, death comes in the end regardless—the inescapable end, foreshadowed from the start, which alone confers meaning on the doomed but magnificent campaign to overcome it.²⁵ Not the technological fantasy that devalues our mortality and encourages the forgetfulness of man, not the submission to a being greater than ourselves that religion recommends as the alternative (to a being who *is* that infinitely powerful creature that technology invites us to think we may reasonably hope to become), but the recollection of our humanity, the restoration of the love of man, the distressed and affectionate reaffirmation of the human condition that technology obscures and religion would have us surrender: this, and only this,

has any real promise of leading us out of the spiritual crisis in which we find ourselves today.



To find our way out of this spiritual crisis, we must learn to attend once more to our mortality. We must learn to value the meaning it confers on what we do and think, on our human loves and labors and ambitions and failures. The natural and social sciences, which we badly need in other ways, cannot help us do this. So far as understanding of this kind is concerned, the natural and social sciences are part of the problem, not its solution. It is to the humanities that we must turn for help in this regard. For the humanities are the record of our encounter with mortality, and their common subject is the very thing that technology eclipses: the fateful limits that constrain our longing for control, and the pathos of yearning and defeat that colors all our human works.

Every living thing is moved by desire. But only human beings are moved by the desire to be different than they are, to transcend their own condition through absolute knowledge, complete power and perfect self-control.²⁶ Only human beings yearn to escape the orbit of their natural condition, and this yearning for transcendence is as much a part of who we are as the impossibility of its fulfillment. The yearning and its inevitable defeat, the longing for transcendence and the fateful horizon of mortality within which it arises: this *is* our human nature, unique among the natures of all the creatures of the earth in its disquietude.

The humanities study this nature. They represent it. They med-