

# Introduction

## The Uncertainties of Time

Time in most ways seems so certain to us. These days, almost everyone has a watch and can measure the time that is passing. Yet nothing is in fact more uncertain than time. It is not quite a social illusion, but it is very nearly so. Consider this.

We all live in the present. Most of us think we know, or know best, what is happening now, at least in our immediate environs. Yet the present is the most evanescent of realities. The present is over the nanosecond it occurs. It cannot be recaptured. It can be recorded at most ultra-partially. It is remembered badly. Its memory and its records can easily be faked. It is rare that two eyewitnesses to the same event observe it in the same way, and rarer still that they remember it in the same way.

And yet we live in the present and are constantly making decisions, acting singly and collectively, to affect the present. Probably nothing matters to most of us as much as the present. In order to make these decisions in the present, singly and collectively, we invoke the past. But what is the past? In reality, the past is what we in the present think it is. No doubt there is a real past, but we can only know it in the present, through whatever lens we wish to apply to it. And of course, as a result, we all see different pasts. We see

different pasts as individuals, we see different pasts as groups, we see different pasts as scholars.

Not only do we see different pasts, but it is terribly important to all of us that we impose our vision of the past on everyone else. It is terribly important because the modal images of the past at any moment are a determining element in the actions of the present at that moment. Furthermore, our modal images of the past are not stable. They change constantly, almost as rapidly as the present. This is because our actions in the present require that the past be reinterpreted. The politics of the present is insistent and persistent in this regard. Governments argue about the past, social movements argue about the past, scholars argue about the past. Nor are these arguments gentle dispassionate debates. On the contrary, these debates are ferocious, often angry, sometimes death-dealing. And they are never resolved. The most that happens is that a wide consensus is temporarily built, a consensus that always has dissenters and that lasts as long as it lasts in the places in which it takes hold.

Well then, what of the future? Faced with the ephemeral nature of the present, and the ever-changing nature of the past, many flee into the future and seek certainty there. The basis of this certainty about the future can be theological or political or scientific. But since the future has not yet happened, it can never be ascertained whether these predictions are in fact correct. Predictions that involve specific short-term statements have been regularly shown not to hold, or not to hold precisely. And eschatologies are intrinsically unverifiable. Faith in the future has varied over historical time. It was unusually strong in the nineteenth and twentieth centuries. But at the end of that period, a wave of disillusionment swept the globe, and large numbers of peo-

ple lost this faith. Still, there always remain some who invest in the certainties of the future.

So here we are. We cannot know the present, we cannot know the past, we cannot know the future. Where does that leave us, and in particular where does it leave social science, which is devoted presumably to explaining social reality? In great difficulty, I should think. We are not, however, without resources. If we take uncertainty as a basic building block of our systems of knowledge, we may perhaps be able to construct understandings of reality that, albeit inherently approximate and certainly not deterministic, will be useful heuristically in focusing us on the historical options we have in the present in which we all live.

This book is an attempt to explore the parameters of such uncertain knowledge, and to suggest what might be done to enhance its value and make it more relevant to our individual and collective needs, passions, and hopes. Science is an adventure and an opportunity for us all, and we are called to participate in it, to build it, and to know its limitations.

# 1 For Science, Against Scientism

## The Dilemmas of Contemporary Knowledge Production

Science is under attack these days. It no longer enjoys the uncontested esteem it has had for two centuries as the most certain form of truth—for many, the only certain form of truth. We had become accustomed to believe that because theology, philosophy, and folk wisdom were all contestable as claims to truth, only science could offer certainty. The very modesty of the scientists' claims—all scientific assertions are subject to revision if and when new data become available—seemed to distinguish it from these rival forms of truth assertion, which scientists asserted to be ideological or speculative or traditional or subjective, hence less (even far less) reliable. For very many, the label “scientific” and the label “modern” became virtually synonymous, and for almost everyone the label was meritorious.

In the past twenty years, however, science has come under the identical form of attack to which the scientists had long subjected theology, philosophy, and folk wisdom. Now science too is being accused of being ideological, subjective, and unreliable. It has been argued that one can discern in

the theorizing of scientists many *a priori* premises that ultimately reflect nothing but currently dominant cultural views. It has been argued that scientists manipulate data and then manipulate the credibility of the public audience. To the degree that these charges can be sustained, they would of course merely be subjecting scientists to the same kinds of critical cultural judgment to which scientists have subjected all others.

Some critics, however, have gone further. They have made the case for the nonexistence of universal truth, for the necessary subjectivity of all knowledge assertions. The response of the scientists to this stronger criticism, this expression of total relativism, has been to denounce such attacks as the return of irrationalism. Some scientists have gone still further and have asserted that even the moderate criticisms of science, based on an analysis of the social embeddedness of scientific activity, have been nefarious, in that they have provided the entry onto the slippery slope that leads eventually to nihilistic relativism.

Culturally, this is where we are today worldwide. We find ourselves in a conflict of mutual name calling in the ongoing struggle for the control of resources and of institutions of knowledge. It is time we took stock and reflected on the philosophical premises of our scientific activity and the political context of the structures of knowledge.

How do we know that a new scientific claim is valid or even plausible? Amid the reality of an ever increasing degree of complex specialization of knowledge, for each specific scientific allegation, all but a very small number of persons are bereft of a capacity for individual rational judgment either about the quality of the evidence proffered or about the tightness of the theoretical reasoning applied to the analysis of the data. The "harder" the science, the truer this is. If,

therefore, any of us reads in a general scientific journal, say, *Nature*, or in a sophisticated newspaper, say, the *Times of India*, that scientist X puts forward a claim to new knowledge, what leads us to credit it as reasonable? We tend to use the criteria of cumulative attestation by reputed authority. We rank loci of publication of the news on a reliability scale. We do the same with the people who make comments on the new proposition. Where do we get such reliability scales for the testimony of the journals or the quoted scholars? Such scales seldom exist in written form. Hence we in fact get these reliability scales from further reliability scales. If other “serious” people we know say that *Nature* is a prestigious, reliable journal, then we generally believe that it is. It is easy to see how much such implicit reliability scales build on each other.

What keeps them from crumbling like houses of cards? We rely on the likelihood that the multiple “experts” in any given narrow domain of knowledge will keep a close eye on each other and will speak up loudly and publicly if the quality of the data is poor or the quality of the reasoning is thin, or if contrary evidence is neglected, or *a fortiori* if there is actual fraud. Thus quiescence among the relevant experts is taken to be consent, and this consensus reassures us and allows us to incorporate new truths into our personal knowledge-storage system, whereas disputation arouses skepticism in us about the truth claim. This means that we do not defer to single experts but rather to self-constituted communities of experts.

But what makes us believe that a community of experts that speaks more or less with a single voice merits our respect and our credence? We give them respect and credence largely on the basis of two assumptions: they are well trained by creditable institutions, and they are reasonably

disinterested. It is as a pair that we value these criteria. We assume that specialized knowledge is difficult to acquire, demanding long and rigorous apprenticeship. We put our faith in formal institutions, which in turn are evaluated by reliability scales. We assume that comparable institutions check each other, and thus that worldwide mutual evaluations ensure the reliability of such explicit and implicit scales. In short, we trust that professionals have appropriate skills, and most particularly the skill to evaluate new truth claims in their fields. We credit credentials and reputations.

In conjunction with our faith in credentials, we trust the relative disinterestedness of the scientists. We believe that scientists (unlike, once again, theologians, philosophers, and purveyors of folk wisdom) are psychically ready to accept any truth that emerges from an intelligent reading of the data, without feeling the need to hide these truths or to distort them or deny them.

It is precisely these claims to a combination of good training and disinterestedness upon which the skeptics of the past twenty years have focused. On the one hand, they have argued that professional training has often, perhaps almost always, been so organized as to omit important elements in their analyses or to distort such elements. This is only in part a function of the social bases of recruitment of scientists. To be sure, to the extent that scientists are disproportionately drawn from socially dominant strata worldwide, it may be thought that the selection of problems may suffer distortion. This seems quite evident for the social sciences but appears to have been true for the physical sciences as well. Even more important has been the choice of theoretical premises, the use of defining metaphors. Here the scientific bias has been less visible, more deeply buried. This has led the critics to go beyond the question of deliberate bias (prejudice)

to the question of structural or institutionalized bias (of which the scientist may be unaware). If all this were true, then the training would have been inadequate, even possibly negative.

Of course, it is not merely a question of training but of norms. The norm of disinterestedness is central to the institutionalization of modern science. Even if this norm is violated by one or another scientist, it is presumed that the norm is sufficiently strong as to constrain the tendencies to violate it. Disinterestedness presumably means that the scientist will pursue enquiry where the logic of his analysis and the patterns of his data lead, and will be ready to make public the results even if such publication could damage some social policy the scientist supports or the reputations of colleagues he admires. The very concept of disinterestedness presumes an unhesitating choice by the scientist for honesty rather than dishonesty. But of course in the real world it doesn't work like that. Scientists are subject to many pressures: external ones from governments, influential institutions or persons, peers, internal ones from his or her super-ego. We all, without exception, respond to such pressures up to a point. Furthermore, there is the Heisenberg principle writ large. The process of investigation, the procedure through which the observations are made, transforms the object of investigation. Under certain circumstances, it transforms it so much that the data obtained are quite unreliable.

Furthermore, the self-interest of the scientific corporation may impinge on the training program. The system of professional certification of professionals, justified on the basis of preserving disinterestedness, permits the corporation to limit entry into the profession globally for motives that are extraneous to, even antagonistic to, the principle of disinterestedness. Yet political intrusion into the process of certification



(the opposite of the corporate autonomy of professionals) may do the same thing. It seems to be Scylla and Charybdis.

But if competent training and disinterestedness erode as guarantees under close scrutiny, on what basis can we rely upon the pronouncements of experts? And if we cannot rely on such pronouncements, how can we ever accept the validity of scientific claims, at least in all those fields about which we claim no direct competence?

There is one strong answer to such acute skepticism. If we do not rely upon specialists, how can we ever know about most things? From what other source can we derive more reliable judgments? Will we in fact do better if we reject all specialists on the ground that their claims to authority are in fact specious? We can translate this into a major practical issue that most of us face regularly: maintaining our health. On the one hand, modern science tells us that living organisms may malfunction, "become ill." It also tells us that, in many situations, medical interventions may repair the malfunctioning. It further tells us that, in many cases, absent such intervention, we shall "get worse," even die. On the other hand, we know that contemporary doctors disagree on diagnoses, on prognoses, and on treatments. Furthermore, we know there have been disagreements over time (the prescriptions of 1990 are quite different from those of 1890) and, to some extent, over space. And we know there are iatrogenic maladies.

If we have a high fever, we may seek advice and assistance. If we are not ready to take it from the physician-scientist, from whom are we ready to take it, and on what grounds? Obviously, it makes a difference how serious a medical intervention is recommended. Treatment by aspirin is most often viewed casually. Recommendation of complicated brain surgery makes patients hesitate. In the end, most

of us follow someone's advice on complicated brain surgery, *faute de mieux*, but whose? We hesitate to agree; we hesitate even more to bet on our skepticism.

Ergo what? It seems to me clear that we should not throw out the baby with the bath water. That is why I am using the title "For Science, Against Scientism." By scientism I mean the claim that science is disinterested and extra-social, that its truth claims are self-sustaining without reference to more general philosophical assertions, and that science represents the only legitimate mode of knowledge. It seems to me that the skeptics of recent years, in many cases simply reviving ancient critiques, have shown the logical weakness of scientism. Insofar as scientists defensively protect scientism, they will delegitimize science.

Science by contrast seems to me an essential human adventure, perhaps indeed the great human adventure. Science seems to me to consist of two relatively modest but absolutely crucial claims: (1) There is a world outside and beyond the perception of any one of us that has existed and will exist. This world is not a fantasy of our mind. With this claim, we refuse a solipsistic view of the universe. (2) This real world is *partially* knowable empirically, allowing us to summarize this knowledge in heuristic theorizing. Even though it is intrinsically impossible ever to know the world entirely and completely, and certainly ever to predict the future correctly (since the future is not determined), it is eminently useful to seek to learn what we can in order to interpret reality better and to improve the conditions of our existence. Since, however, the reality of the world is ever changing, all such interpretations are necessarily transitory, and we would do well to be prudent in the conclusions we draw about practical matters. The situation we all recognize ourselves to be in vis-à-vis medical advice may be the eternal human

condition. We can never be sure of the experts, but it's unlikely we shall do much better by dispensing with them.

We are faced with all sorts of decisions, small and great. Improving the capacities of a computer, for example, is a small decision, however large in scope the consequences. It may perhaps be relatively safe for all of us collectively to allow engineers considerable free rein in this process of technological improvement, and largely to trust in their expertise. Even here, we shall of course want to subject their narrow technical decisions to larger social concerns (does the new technology adversely affect our health or the environment or public safety?), questions that are not the specialty or even perhaps the concern of the computer engineer. Constructing a world order, on the other hand, is a large decision, complex, and for most of us seemingly remote from our immediate capacities to act. The level of disinterestedness of the presumed experts (politicians or scholars) is doubtless quite low. The meaningfulness of credentials is dubious. (How much good advice have the collectivity of economists given us about public policy on the economy lately?) And yet this may be a far more urgent and important issue than improving the capacities of a computer.

What is more, most people are aware of this. Faced with this urgency, many people worldwide have turned from scientific claims to knowledge to claims based on theology, philosophy, or folk wisdom. Are we sure such alternate claims are less reliable? If so, on what basis are we so sure? This is indeed the challenge of contemporary knowledge production.

This is not the place to review the critical juncture of our contemporary world-system, something I have done often elsewhere. Let me merely assert that we are at one. The

question is whether we can offer scientific analyses that are not scientific about the historical choices before us. No doubt much underbrush must first be removed if we are to succeed. The heavy hand of scientism is part of what needs to be removed. We need to recognize that scientific choices are informed by values and intent as much as by knowledge of efficient causes. We need to incorporate utopistics into the social sciences. We need to move from an image of the neutral scientist to that of the intelligently concerned scientist restrained in the exercise of his hybris.