to making a good part of the oral output of Chomsky and others available, for promptly sharing his last addition to his set of interviews with me, and for welcoming the inclusion in this book of several pieces from his archives; to Black Rose Books, and in particular Dimitri Roussopoulos, for welcoming the reprinting of a number of pieces from the two books by Chomsky that I edited for them; to Wayne O’Neil, and to Louis Kampf and Richard Ohmann, for a few much-needed precise references; to Carlos Torres for having taken the all-important first step (and the no less decisive more recent ones); to Catherine Fountain, for her research assistance; and to Octavio Pescador for his help with correspondence related to the permissions. As always, Judith Strozer’s daily supply of what’s most valuable, Daniel Otero’s warm and stimulating presence, and David Otero’s long-distance nearness, have made all the difference.

Carlos-Peregrín Otero
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Introduction

Chomsky's education-for-democracy: enlightening mental growth

by C. P. Otero

Democracy and education are central topics in the work of Noam Chomsky. This is not surprising. His parents, who were both teachers, provided a very stimulating and thought-provoking environment at home and sent him to a Deweyite experimental school (Oak Lane Country School) run by Temple University from the time he was two until he was about twelve, that is, roughly from early 1931 to 1943.¹

These two complementary experiences (at home and at school) were perhaps the most decisive ones in Chomsky's life. To this day he remembers them vividly and fondly. In contrast, he barely remembers anything about his years in high school (a sort of "black hole" in his life, he has repeatedly said—with easily detectable abhorrence), although the high school he attended was considered to be the best in Philadelphia, his hometown. As for his experience at the University of Pennsylvania, where he did his undergraduate work (and ended up doing his early graduate work), after one year or so he was more than ready to drop out. It was a connection with an outstanding professor of linguistics who shared his political views (Zellig Harris) that luckily came to the rescue. The rest, as they say, is history.

Not only was his father, William Chomsky, a teacher and outstanding scholar ("one of the world's foremost Hebrew grammarians"—obituary in the New York Times, July 22, 1977), but his main field of interest was education (for most of his life he served as a college professor of Hebrew and Jewish education), and his writings all had an educational purpose.² Naturally enough, he was "very much influenced" by John Dewey, the major American intellectual figure of his time and "the greatest American social philosopher" (Selection 15 below), one of whose central interests was democracy and education: "[the elder Chomsky's] own main work (pedagogy), both teaching and writing, was explicitly Deweyite," and so was "his general point of view about the world, mostly,"
in the words of his oldest son (personal communication)—a likely heir apparent of Dewey’s mantle, it will be suggested below. In fact, shortly before his death, William Chomsky described the major objective of his life, echoing Dewey, as “the education of individuals who are well integrated, free and independent in their thinking, concerned about improving and enhancing the world, and eager to participate in making life more meaningful and worthwhile for all.” And he appears to have been thoroughly successful in at least one case: it is hard to improve on his words as a description of his oldest son as an individual.

However, the roots of Noam Chomsky’s interest in education go well beyond his formative experiences—even beyond his experiences as an educator and, more generally, beyond his work as a student of culture and as an activist. They are at the very core of his inquiries as a scientist and a philosopher. One of the most important consequences of his investigations into the nature of language and the human mind/brain is that, as we will see, they provide the most decisive evidence and argument available in favor of one of the two main traditional stances on the nature of democracy and the nature of education: the one that takes democracy to be self-management, and education to be very largely self-education.

It might be helpful, then, to consider Chomsky’s contribution to what he sees as democracy—for-everyone and education—for-democracy under three headings: (1) the educator, (2) the scientist and the epistemologist and philosopher of mind, and (3) the student of culture (contemporary or centuries old, in particular intellectual history) and the activist.

1. The educator

It is the approach that takes education to be very largely self-education that underlies Chomsky’s practice, in particular his phenomenal success as an educator in the broadest sense of the term—an educator at large, if you will (he regularly gives talks and lectures all over the world to a variety of audiences, which generally find them unusually enlightening—and then he writes up as many as time allows). For many of us Chomsky is, above all, a dedicated educator and mentor—“by all odds a dedicated teacher,” Norman Mailer wrote in his perceptive “history as a novel” in “the year of the first March on the Pentagon, 1967,” after spending one night in the bunk next to Chomsky’s in some kind of detention center the police had set up somewhere, before Chomsky was transferred to a Washington, D.C., prison (where he was able to see the incredible conditions for the real prisoners). Actually, he has been reputed to be a superb educator and mentor since the time he began to tutor his classmates in the early 1940s, as his high school yearbook for 1945 attests.
There is little doubt that, as an educator, he has been exceptionally successful (far more than John Dewey or Bertrand Russell—or Albert Einstein or Richard Feynman, to zero in on four of his true peers). He has officially supervised over four score doctoral dissertations, something unheard of (to the best of my knowledge), and has contributed to the supervision of many others, within and outside the Massachusetts Institute of Technology (MIT), where his professional ascent was nothing short of meteoric: he became a full professor in 1961 (at thirty-two), attained an endowed chair in 1966, since 1976 has held the coveted position of Institute Professor (a rank reserved for about a dozen scholars of special distinction, most of them Nobel laureates), and in 1991–1992 was given the Killian Faculty Achievement Award, perhaps the most prestigious faculty award, which recognizes “extraordinary professional accomplishments by full-time members of the MIT faculty.” Many of the most distinguished contemporary linguists and other cognitive scientists were his advisees, and numerous others were registered students or auditors in his classes—or else students of his students or coworkers. There are also many who are keen students of his prolific writings, unfailingly insightful and inspiring, as I believe the small and circumscribed sample brought together between the covers of this book shows.

What is more, there is often something very special about the guidance he regularly provides to his students in a broad sense, as many acknowledgments in doctoral dissertations and books suggest. (In an even broader sense, no inquiring student of the mind/brain can, in our day and age, escape being his student—among those who really know what they are doing.) It is generally recognized that anybody working in the field of generative grammar and, more generally, cognitive psychology owes him a special intellectual debt. In the case of those who are lucky enough to share the “unique experience” of his classes and his “being so accessible for individual discussions,” that debt can become “incalculable,” particularly for beginners with “no official status whatsoever at MIT,” who seek his opinion and often discover, not without surprise, that he treats them as if they had official or quasi-official status there (the quotations are from dissertation acknowledgments). The even more special experience of being one of Chomsky’s doctoral advisees has been described by more than one of them. I’ll pick out just three, with very different backgrounds (one American, one Chinese, and one French) but comparable straightforwardness:

Working with Noam Chomsky... is a privilege few can hope for, and even four years after arriving here, I feel sometimes that it must be a dream. About Noam
Chomsky much has been said, and I agree with all of it that is good. His inspiring classes, brilliant insights, and his sharp involvement in the work of his students are just three facets of the experience of working with him. His quick reaction to any problem is such that one of my proudest moments here was when he actually had to think silently for several minutes in order to come up with an argument against me. Thursdays, the day of his class and of my appointments with him, will never be so good again.

—Diana Massam

Noam Chomsky, whose influence on me can be seen throughout the following pages, has given me invaluable advice on every aspect of the thesis and of the other aspects of linguistics and life. The extent to which he has made himself available to me and the amount of thought he has put into my work go well beyond what I or anyone else can reasonably expect. His confidence in me and interest in my work has also kept me up during the past years.

—Cheng-Teh James Huang

As the inventor of modern syntactic theory and as its most brilliant exponent, Noam Chomsky has already contributed more to this thesis than perhaps is in it. In working directly with him, I have profited crucially from the unmatched rapidity of comprehension and the immensity of theoretical imagination he routinely brings to bear on the subjects of his attention.

—Jean-Roger Vergnaud, who also knows what it is like to get a doctoral degree in Paris

2. The scientist and the epistemologist and philosopher of mind

When considering democracy—for everyone and education—for democracy, as when considering other aspects of human endeavor, the most fundamental question unavoidably focuses on the interaction of “nature” and “nurture” or, less misleadingly, the interaction between the genetic endowment of an individual and a particular cultural environment. This, of course, takes for granted that, in a literal sense, the disjunction “nature or nurture” makes no sense at all. It should be immediately obvious that both the genetic endowment of an individual and the particular cultural environment will have to play a role in the mental development of any human being (in fact, of any animal). After all, not everyone speaks Armenian, or Basque, or Catalan . . . or Vietnamese, or Welsh, or Xhosa, or Yaqui, or Zhuang—and no one’s temper is indistinguishable from her or his temperament (in the use of these terms that takes the temperament of an individual to be made up of innate characteristics, and his or her temper to involve qualities acquired through experience). What has
to be discovered, then, is the relative importance or weight of the respective contributions of the human brain and the environment.

It does not take a genius to see that it is not the environment that accounts for the fact that a human cannot fly like an eagle nor an eagle speak like a five-year-old child. But not everyone can readily see, even less help others see, that the environment cannot possibly provide a sufficient basis for any of the seemingly miraculous things a five-year-old can do. A quick look at what children have to know to be able to do what they do without giving it a second thought immediately shows that their knowledge goes well beyond what the environment can provide. This is also true of the adult, of course.

A simple pair of expressions is enough to give an inkling of what is involved. Consider the following two (call them E1 and E2), which, obviously, are identical except for the three initial words of the second one:

(E1) Leslie expects to educate herself
(E2) I wonder who Leslie expects to educate herself

If we rely on what the environment has to offer, it is natural to conclude that the female who educates herself is the same in both E1 and E2, since the words after Leslie are the same, in the same order, in both cases. However, to our great surprise, this expectation turns out to be wrong. To begin with, in E1 we understand that Leslie is a female, while in E2 we are left in the dark about Leslie’s sex. We also understand that in E1 it is Leslie who expects to educate herself, while in E2 it is not Leslie but some other female who expects to educate herself: every speaker of English would find it perfectly natural (perhaps without hesitation, perhaps after giving it a moment’s thought) if the answer to the question implicit in E2 was something like: “You don’t really know? Laura, that’s who.” In other words, if “Laura” is the right answer to the question implicit in E2, we understand that Leslie (male or female, we don’t know) expects Laura to educate herself. In more technical terms this means that the “value” the hearer or reader has to “calculate” or compute for the “variable” herself to be able to understand E2 is not the same as the value computed for herself in E1—even though E2 contains all the words E1 contains, in the very same order. Every speaker of English “instinctively” knows that, which goes to show that the environment is too “poor” to account for those and other facts (presumably uncountably many) never actually “observed” by speakers who are not moderately competent linguists.

The crucial question now is: How do you, say, as a speaker of English, come to know this, being, as it is, radically at odds with what the information provided by the environment suggests? Did your mother or your peers tell
you? Did your teacher tell you? Just kidding. Since no one was aware of it until, a few years ago, Chomsky first had the “aha!” experience, how could anyone tell you? Does everyone discover it on their own by luckily coming across the right expression (a probability tending to zero), unconsciously realizing what’s going on, and remaining forever unaware of their mind-blowing discovery?

If the answer to these and similar questions is no, there are only two possible ways out of the impasse: (1) it is a miracle that can, in principle, occur again and again every minute of the day, or (2) the knowledge that allows every speaker of English (necessarily human) to understand the two expressions differently comes from the inside of the individual human, is simply part of the genetic endowment of the individual, part of being human; it is, in other words, an example of the “innate” knowledge discussed in some detail in Selection 1.

A more sustained exploration along these lines suggests that, actually, the better part of our knowledge comes from inside, not from the environment, even though the environment often makes a non-negligible contribution (to begin with, there is no physical growth, non-mental or mental, without appropriate “food”). If true, as it seems to be, this can only mean that in many of its uses the term “learning” (or “teaching,” necessarily understood with reference to “learning”) can be applied to the knowledge resulting from mental development or growth only colloquially, the way we speak about the sun “setting,” a question discussed in Selection 25.

It is easy to see now, after Chomsky made it plain, that the evidence in support of these conclusions provides much valuable fodder for the epistemologist, since it unequivocally suggests that it is the epistemological philosophy of Plato and Descartes, not that of Aristotle and the British empiricists, that is on the right track.

In the context of this book we may take these barely outlined findings and their implications as the gist of the so-called cognitive revolution of the 1950s, the emergence of the cognitive sciences as we know them, spearheaded by Chomsky’s profound discoveries about human language and the human mind/brain—the first to extend the range of the Galilean–Newtonian style of research to the study of the human sciences in a strict sense, rarely used and even more rarely applicable. But we should keep in mind that it’s just the initial gist. The full, ongoing attempt at explanation of the human language organ as a unique major component of the human mind/brain now encompasses hundreds of tightly reasoned pages, some of which make ample use of a precise and sometimes forbidding symbolism (in particular many
pages of Chomsky's first monumental study of 1955, almost one thousand pages long). Given the centrality of language in our genetic endowment (language is generally taken to be a, if not the, defining property of humanness), the resulting new understanding, which is certainly Chomsky's most important intellectual contribution to the accumulated cultural wealth of humankind, cannot fail to be epoch-making. One not-insignificant bonus is that this precise theory of human language provides a suggestive model for other cognitive sciences (the first such naturalistic model in the history of civilization, still far from adequately put to work in other investigations of cognition).

The significance of this model for a conception, far from wholly unsupported, of democracy and education derives from the fact that it strongly suggests that cultural advance, hence cultural level, which is at the root of democracy and defines the outer limits of education, is a function of individual enlightenment. And, as Chomsky never tires of emphasizing, the fuller mental development that brings about individual enlightenment is just a very special kind of physical growth, namely, growth of the mind/brain—particularly before puberty, during the natural course of maturation. Seen from this illuminating perspective, the aim of education—for-democracy is to foster enriching mental growth in the individual, growth self-directed toward enlightenment, hence self-enlightening mental growth. Enlightening in precisely what sense or direction? Unfortunately, this is not a question with a scientific answer (at least, as of now). We return to it in the next section.

Perhaps a word should be added here about another (related) question that science has not been able to address: the emergence of the human brain (with a unique capacity for language). From the perspective just sketched it is not very hard to see that there is a strong parallelism between the (ontogenetic) development of language in the individual human and the (phylogenetic) development of language in the human species. Even the leading behaviorist of his time, B. F. Skinner, was able to see this parallelism (in his own terms, of course). Thus, in a 1966 article on the topic in Science he takes such a parallelism for granted, so at least he was consistent, something that cannot be said of a number of contemporary (neo-)Darwinians. What he also failed to see is that, just as there is no environmentalistic solution to the wonder of the growth of language in the mind of a normal child, there is no environmentalistic solution to the mystery of human evolution either.

It should be immediately obvious to anyone relatively free of prejudice that the environment (a.k.a. natural selection) can no more account for the emergence of human cognition in the species than for the growth of language
in the child. The reason in either case is that the environment is just too destitute: it entirely lacks the complex cognitive mental structures that any serious investigation of the human mind/brain must postulate. Understood in these terms, it is much easier to make sense of the objections of the creationists than of the dogmatic pronouncements of some self-defined (neo-)Darwinians.

For starters, there seems to be no way to establish the unsupported claim that you can get evolutionary rabbits out of the environment's magician's hat. In contrast, it is easy enough to turn the creationists' claim into a reasonable one: all that is needed is to substitute for it Spinoza's formula *Natura sive Deus*, "Nature or God/Divinity/Creator" (a formula much celebrated, for example, by Goethe, who was no fool), where, of course, *sive* (as opposed to *aut*) is an identifier, not the disjunctive "or" of elementary mathematical logic. Spinoza's formula, in turn, can be taken to be an early way of saying that "it may be that the whole of evolution is shaped by physical processes in a deep sense, yielding many properties that are casually attributed to selection," as Chomsky has recently put it.8

3. The student of culture and history and the activist

Chomsky's scientific and epistemological investigations provide, then, the most decisive evidence and argument available in favor of one of the two main traditional stances on the nature of education: the one that privileges the genetic endowment over the environment, particularly the cultural environment (which, it bears repeating, is not to say that the environment cannot make a significant contribution). This is, of course, the stance best represented by Plato and his modern heirs, a lineage that runs from Descartes to Chomsky through the British Platonists, in particular Ralph Cudworth (1617–1688), and Leibniz, to both of whom Kant was heavily indebted. The great classical liberal Wilhelm von Humboldt, a major theorist not only of language but also of democracy and education (he was "the architect of the Prussian educational system and the founder of the University of Berlin," which was consciously selected as a model by a number of modern universities), brought to the fore in Chomsky's work on intellectual history, was (unwittingly) very much in line with this Cartesian tradition in essential respects (see Selections 7, 9, 10).9

One instructive way of looking at Chomsky's conception of education is to try to see it as a natural outgrowth of a streamlined and enriched form of Cartesian mentalism he has related to the centuries-old tradition, and arguably the current culmination of the Enlightenment phase of this tradition. But this is a sort of reconstructed historical idealization. What actually
happened was that he made his discoveries in blissful ignorance of their partial antecedents and then searched for predecessors.\textsuperscript{10}

From this updated and vastly enriched Cartesian perspective, “e-ducation” (literally “out-drawing”), understood as the process of drawing out something latent in a human mind or just helping it “flourish” in the proper “soil” under the “sunlight” (perhaps providing “water” or “food” when necessary), is always to be preferred to “in-struction” or, worse still, “in-doctrination” (even to gently indoctrinating persuasion, still analogous to pouring some concoction into a human mind as one may pour a liquid into a vessel). The terms education and instruction are not usually opposed in this way, but the insight has, of course, very old roots (“Teachers open the door, but you must enter by yourself,” says a venerable Chinese proverb). It is not hard to see that, for an aspiring democracy, the likely benefits of striving to bring about this kind of educational practice (a “practice of freedom” and creativity, as emphasized by the Brazilian educator Paulo Freire) could hardly be overestimated—if our incipient understanding of the human mind/brain is on the right track. (See Selection 25.)\textsuperscript{11}

Thus Chomsky cites with approval Russell’s characterization of the goal of education as being “to give a sense of the value of things other than domination, to help create wise citizens of a free community, to encourage a combination of citizenship with liberty, individual creativeness, which means that we regard a child as a gardener regards a young tree, as something with an intrinsic nature which will develop into an admirable form given proper soil and air and light.” (See Selection 9.) Chomsky also feels, as “Dewey seems to have felt for much of his life (later he was more skeptical),” that “reforms in early education could be in themselves a major lever of social change; they could lead the way to a more just and free society, a society in which, in Dewey’s words, ‘the ultimate aim of production [is not production of goods but] the production of free human beings associated with one another on terms of equality.’” And he goes on to emphasize Dewey’s view that it is “illiberal and immoral” to train children to work “not freely and intelligently, but for the sake of the wage earned,” because in such case their activity “is not free because not freely participated in.”\textsuperscript{12}

The quotes are from the Prologue, an important and little-known 1994 talk. Chomsky begins by contrasting two completely different traditions of Western thought about the ideas of democracy, freedom, and justice that have developed since the French and American revolutions. One tradition, with roots in Enlightenment values, stems from the nineteenth-century working class press and organizations, evolves through left libertarian and
socialist movements, and is enriched and given much needed support in Chomsky's conception of democracy-for-everyone and education-for-democracy. This tradition, he writes in the Prologue,

included progressive liberals of the John Dewey variety, independent socialists like Bertrand Russell, the leading elements of the Marxist mainstream (mostly anti-Bolshevik), and of course libertarian socialists of various anarchist movements, not to speak of major parts of the labor movement and other popular sectors.

Although Chomsky passes over it in silence, presumably because it is not the appropriate occasion to take up the matter, the libertarian views of "the two leading thinkers of the twentieth century in the West" (in his opinion), are really undermined by the empiricistic epistemology that underlies them. It is true that classical British empiricism, which "arose in often healthy opposition to religious obscurantism and reactionary ideology" and "offers a vision of limitless progress," is historically "closely associated with classical liberal thought," as indeed it is in the cases of Dewey and Russell. But "a deeper look will show that the concept of 'empty organism,' plastic and unstructured, apart from being false, also serves naturally as the support for the most reactionary social doctrines," as Chomsky writes in his Reflections on language.

This is not an entirely new idea. To mention a well-known antecedent: Kant's critique of certain aspects of empiricist doctrines is not simply an epistemological quibble, but a far-reaching argument about the nature of human freedom," Ellen Wood suggests in her 1972 book (a revised version of her UCLA doctoral dissertation). The reason, as she points out, is that whether the human mind is a responsive cog in the mechanism of nature, as in empiricist doctrine, or a creative, determinative force is a crucial question underlying all-important social choices.

From this perspective it is easier to understand Chomsky's concern, from day one, with empiricist—in particular, behaviorist—concepts of human nature, which he felt and feels are essentially manipulative and coercive. Like the Bolsheviks and other authoritarians (including many postclassical liberals), the behaviorists conceived of the brain as virtually a blank tablet upon which a particular type of consciousness may be imprinted by superior minds and farsighted leaders ("Leninist" in Leningrad at one time, "(neo-)liberal" or "conservative" or something else in either of the two Cambridges). Not surprisingly, Chomsky has always been rather concerned about these developments—particularly for political reasons, since the whole complex of ideas seemed to him to be linked to potentially quite dangerous social currents.

For him, to be well founded, a vision of a social order must be anchored
in the enduring strain of the Cartesian tradition, which has consistently argued for a conception of the human mind that is the polar opposite of the notion of the tabula rasa. Moreover, for him, as for Descartes, there is no essential variation among humans (no "degrees of humanness") apart from superficial physical aspects: a creature is either human or it is not. Thus racism, sexism, and other inequitable tendencies are a logical impossibility under his essentially Cartesian conception—if consistently applied.\(^6\) This renewed and deepened egalitarian vision, which his technical linguistic work shores up to some extent, is at the root of his more general studies of human nature and society, in particular of his conception of education. Hence the importance of the results of Chomsky's scientific and epistemological investigations, the unrivaled modern contribution toward a resolution of the centuries-old philosophical debate about the nature of the human mind.

If we have strong reasons to believe that the mind/brain, far from being empty at birth, is highly structured and rich, reasonable people concerned with democracy and education would naturally ask what, if any, is the role of the environment. It is easy to see that people grow in every sense of the word and that a high level of intellectual and moral growth cannot be all biologically inherited. What is inborn (innate) is the genetic constitution of an individual, including the basic structure of the mind/brain and the principles that determine its properties and development. The fact that the course of development is largely internally determined "does not mean that it will proceed without care, stimulation, and opportunity." All human development, including the development of moral judgment, "is heavily determined by the nature of the environment, and may be severely limited unless the environment is appropriate": "a stimulating environment is required to enable natural curiosity, intelligence and creativity to develop, and to enable our biological capacities to unfold." Not surprisingly, "if a child is placed in an impoverished environment, innate abilities simply will not develop, mature and flourish" (see Selection 3).\(^7\)

Needless to say, these and related conclusions involve questions of fact concerning human nature, for which there is some evidence, and "there are certain conclusions that one may draw from these factual judgments with respect to educational theory and practice, social theory, and the activism which naturally flows from a conscientious commitment to the conclusions of that theory." It is, then, important to make the effort required to make these judgments thoughtfully rather than "mindlessly in conformity to prevailing ideology," tacitly accepting most of "the judgments which prevail in our society" (Selection 9).
The next question, then, is: What kind of mental growth is to be fostered in the individual? In the previous section, the idea was tentatively advanced that the aim of education-for-democracy is to foster growth self-directed toward enlightenment, hence self-enlightening mental growth. Since enlightenment should come along the two basic dimensions of our human makeup, namely, intellectual and moral, we are in fact talking about the free development of intellectual and moral knowledge and insight—hopefully not wanting in wisdom. At this point we can turn to the question left unanswered before: What kind of knowledge and insight would be the hallmark of a successful self-education?

The intellectual part of the question is relatively easy to answer for a child of the Enlightenment with a capital E (the eighteenth-century aftermath of the Galilean-Newtonian scientific revolution): knowledge can be attained only through rational inquiry based on (logical) argument alone, as in the formal sciences, or based in both (factual) evidence and argument, as in the natural sciences (the deepest and most reliable repository of knowledge humans are in the process of attaining), or, at a less deep level, in the most serious investigations of animal behavior and human cultural endeavors. (See Selection 5).” Insight can come both from the sciences and “parasciences” (the humanities and the social and anthropological disciplines) and from the arts (in the broadest sense of the term).

Our understanding of the moral part of the question is much thinner, at least as of now. But, as Chomsky never tires of repeating, underlying it all is the truism that everyone is fully responsible for the foreseeable consequences of their actions—or inactions, as the case may be. It is also fairly clear that there can be morally retarded people (moral morons, if you will), as there are intellectually retarded people (intellectual morons).

Truly educated people would agree in at least that much, it would seem. But the specifics are something else. Like Russell, Chomsky stresses that “in the absence of compelling reasons to the contrary, one should be quite cautious about trying to control someone else’s life and character and mode of thought,” a hypothesis with “political and social as well as pedagogic consequences for the educator and teacher.” There are, then, “significant consequences to one’s thinking or thoughtlessness about these issues, and a corresponding personal and professional responsibility.” For example, in a certain sense, “control of behavior” of the type generally advocated before he wrote his 1959 review of Skinner’s book “will be abhorrent to the person who accepts the humanistic conception of education” (Selection 9).

There are many things no one can prove. One directly relevant in this
connection is that it cannot be proved that some system of authority and domination, whether it is patriarchy, slavery, feudalism, "modern" private corporatism, or other authoritarian institutions, including schools, is unnecessary. This being the case, what matters is that the burden of proof is on those who claim it is necessary, as Chomsky has made abundantly clear. Reasonable questions about human concerns can be answered only by experiment, but the initial negative assumption (what the statistician calls the null hypothesis) about any state autocrat or town autocrat or school autocrat or any other species of autocrat is that they are not needed: no one should be able to dictate any solutions. The reason is that no one knows enough about human affairs to predict the best outcome in advance with much confidence. There is no substitute for wide-ranging discussion and analysis. This is why, for Chomsky, the first thing is to remain very skeptical. As he told an interviewer in February 1999:

The world's a complicated place. Anything you look at, whether it's a molecule or international society, there are many different perspectives you can take, and you'll get very different answers depending on which perspective you take. That's a standard problem in the sciences. Why do people do experiments? Doing experiments is a creative act, an effort to try to peel away things that you believe, rightly or wrongly, are irrelevant to determining the fundamental principles by which things are operating and see if you can find something simplified enough that those principles will actually be apparent and then try to rebuild some picture of complex reality from that, never getting anywhere near it because reality is just too much of a mess, too many intervening factors and so on. Any experiment in the hard sciences is attempting to discover a perspective which will be illuminating. That approach is all the more necessary when you look at things as poorly understood, as complex, as human affairs. You have to discover a perspective from which interesting things seem to appear, recognizing that at best you'll capture one significant aspect of a highly complex reality. You hope it's an important one.

There is another respect in which Chomsky's contribution to a better understanding of a crucial question, closely related to his essentially Cartesian conception of a (libertarian) social order and deepened egalitarian vision, is teeming with consequences, in this case for the immediate possibility of truly revolutionary cultural and social advance. The question at issue is the genetic relation between two forms of organization, for him both tyrannical (See selection 7):

- state socialism/fascism of the totalitarian variety
- state (private) "corporatism," U.S.-style
Most people would now agree that the Bolshevik system brought about by Lenin and Trotsky, sometimes referred to as "really existing socialism" by both admirers and critics, was "turned into an even greater monstrosity by Stalin," and that (at the time) actually existing fascism/Nazism, which had been brought about a few years later by Mussolini and Hitler and their nanoclones (all the way down to Franco), deserved no less high marks in the realm of monstrous inhumanity. But not many people unfamiliar with Chomsky's thought will be prone to see what we might call "really existing capitalism" (since it isn't really capitalism in the earlier sense of the term) or, more transparently, state (private) corporatism, as a tyrannical system.19

From the perspective of Chomsky's updated Cartesian conception of the human mind, the two, Bolshevism/fascism and U.S.-style private corporatism, are actually similar in fundamental ways. Russell had observed early on the "extreme similarity between the Bolshevik [commissar] and the [corporate] magnate," to which Chomsky was quick to add the similarity of their ideologically biased doctrines, more or less blindly derived from empiricist assumptions (cf. Section 2 above). This is one of the main points he tried to make in his very first "non-professional" book, _American power and the new mandarins_ (1969), where he attempted to show that "Bolshevism and American liberalism are basically manifestations of the same thing." A few years later he cited with approval the observation that "Lenin, in such pamphlets as _What is to be done?_, conceived of the proletariat as a _tabula rasa_ upon which the 'radical' intelligentsia must imprint a socialist consciousness . . . to the masses from the outside" and "organize and control society in order to bring 'socialist structures' into existence" (never mind what the vast majority of the people, a.k.a. the "masses," might think or want).20 And if we substitute "democratic structures" for "socialist structures," so do the traders in wares and votes of our consumption-oriented huckster societies, where the "masses" (Alexander Hamilton's "great beast") have to swim against the current of sort of preprogrammed permissible thoughts. From this perspective, the overgrown and still growing virtual Big Brother of the media (not to mention current or sought after "spy centers") makes a mockery of the much less sophisticated Bolshevik one.

In Chomsky's insightful analysis, the two systems fall together into a single tradition (profoundly at odds with the libertarian one), which finds cultural expression in "actually existing industrial democracies" and in their media and their educational institutions. Both tyrannical forms (totalitarianism and neo-liberalism) are very sharply and dramatically opposed to genuine
libertarian values, and "both were, and one of them remains, deeply authori-
tarian in fundamental commitment," as he writes in the Prologue.

At this point an intriguing series of questions arises. Where does this "modern" (read: recent) conception of private corporation, the dominant institu-
tion in contemporary industrial societies, come from? What is the intel-
lectual soil that nourishes it? What are its underlying assumptions? The answers
to these questions shed a great deal of light on our current predicament and
suggest a course of action with epoch-making potential, in Chomsky's view.

To proceed to answer them, a good place to begin is with the emergence
of the U.S.-style private corporation little more than a century ago, as a "col-
lectivist legal entity" (in legal-history terminology), a new monstrous creature
under the sun. How did it happen? How have the private companies and
institutions of an earlier era come to arrogate rights and privileges which
inhere in individual persons? On the basis of appropriate legislation? Not at
all. Largely by the sleight of hand of courts and lawyers that supported by an
elite intellectual community. Courts and lawyers introduced the vast changes
into the legal system that granted these tyrannical "collectivist legal entities"
("as they are properly called") the rights they now enjoy, a radical and
uncalled-for break with the past. In fact, the nineteenth century was charac-
terized by "an entirely different moral climate," as Chomsky often reminds
us: "wage labor was considered hardly different from slavery by such folks as
Abraham Lincoln, the Republican Party, and the New York Times—not to
speak of working people." It was only toward the end of the nineteenth cen-
tury that steps were first taken that departed radically from the enduring tra-
dition.\textsuperscript{21} As he pointed out in a 1998 interview in Citizenship Studies:

The process began from the 1880s [cf. Powers and prospects (1996), p. 74], but it
took some time for the system to be really institutionalized. It was sharply con-
demned by conservatives, already then a vanishing breed that has now virtually dis-
appeared (apart from the name, typically taken over by statist reactionaries). The
reason was that these radical innovations undermined traditional "natural rights"
doctrine as well as markets. These developments reflected very significant changes
in the economy, and were supported by an intriguing range of opinion: corporate
power, for obvious reasons, but also "progressive opinion."

Surprising as it may seem, the intellectual root of these unparalleled
innovations is the until-then-preposterous idea that "organic entities," over
and above individuals, have the rights of persons. This is of course a neo-
Hegelian doctrine, in Chomsky's view. Recall that "organic form," an ancient
metaphor ("organic unity" was first discussed by Plato and later defined by Aristotle), was a preoccupation of the German Romantics, no doubt related to their unbounded admiration for the "glory that was Greece." So, for example, Wilhelm von Humboldt's concept of the "organic form" of language (parallel to Goethe's much earlier Urform), "must be considered against the background of the intensive discussion during the Romantic period of the distinction between 'mechanical form' and 'organic form.'" But at the time, apparently, most people did not lose track of the fact that to say that a form freely created by humans was "organic" was just a way of making a point and that the expression was not to be taken literally: metaphoric "organicism" was not to be confused with biological organicism (as in the case of the biological organic form of human language). In other words, most people did not attribute a biological existence, or the characteristics of biological organisms, to non-biological "organisms" (in particular, to a state or a society).

One notable exception (not just on this) was Hegel, "a person of quite appalling ignorance" in Chomsky's considered opinion (and "an egregious racist" to boot), who, for some reason that not everyone can understand, was for some time, and in some quarters still is, greatly respected across the spectrum. For Hegel, an entity such as the state, which in his view expresses the identity of the community, is an "organic entity" or social "organism" (literally, we are to believe) with a life of its own: it logically and actually precedes the individual constituents of the community. In other words, for Hegel the whole is logically and actually prior to the parts, and "cultures, practices, institutions, and so on should be seen as products of a progressively emerging historical process." That's why he rejects even the "misleading philosophical fiction" of the "social contract" as the source of legitimacy for the (for him always absolutist) state.

It is not hard to see that this doctrine is not unlike the dogmas underlying Bolshevism and fascism/Nazism, the two generally recognized main forms of modern totalitarianism. What is perhaps less obvious is that similar neo-Hegelian dogmas underlie the conception of twentieth-century U.S.-style private corporatism, since a corporation has the "organic" status of a "person" before the law. This is no small matter if indeed a U.S.-style private corporation is, in Chomsky's words, "as totalitarian an institution as humans have managed so far to contrive": "those inside their hierarchical command structure take orders from above and send orders down below." The fact that "such terms as 'fascist' and 'totalitarian' are restricted to political entities" makes no difference. As he goes on to say, echoing Dewey, "Terminology is crafted to avoid the substance behind the shadow." What
matters is that “the similarity in character is unmistakable.” This is, in his view, one of the reasons why genuine conservatives (classical liberals among them) were strongly opposed to this attack on human (“natural”) rights principles and on markets (corporations are also a radical attack on markets, he underscores)—and, by the same token, one of the reasons why (postclassical) “liberals” and “progressives” tended to support the epoch-making legal decisions to grant corporations the rights of “immortal persons” of exorbitant power.

Revealingly, this assault on human rights is sometimes seen as a legacy of “individualism” when in fact it is a sharp attack against individualism; more precisely, an attack against the until-then taken-for-granted doctrine that rights inhere in “persons,” by which classical liberals meant, as was standard for most of historical time, persons of flesh and blood, not “collectivist legal entities.” After all, in our day a typical private corporation, let alone a megacorporation, is a kind of absolutist state-like institution, sometimes in fact bigger and more powerful and autocratic than some of the foreign states it “does business” with. Once one accepts the doctrine that a “corporate entity” is an “organic entity,” a social “organism,” their “rights” (especially their right of “freedom of speech” in marketing, advertising, and other types of deception) in practice go far beyond those of persons, both because of the huge differences of scale and because private corporations are immortal (as also stipulated by the courts), features that Chomsky has brought to the fore more than once. (See Selection 15.)

What has never been changed, fortunately for the great majority of the population, is one of the traditional restrictions generally imposed on a corporation: it has to be chartered by a state. This is a sort of Achilles’ heel whose significance should not be underestimated: since the charter can be taken away, a private American corporation “exists at the whim of the public.” Thus the private corporate structure, the major (tyrannical) power system in the West, is weak, in Chomsky’s view, appearances not withstanding. Given that “half of the population thinks that both parties should be disbanded” and “over 80 per cent regard the economic system as ‘inerently unfair’ and the government ‘run for the benefit of the few’ . . . , not the people,” once a certain level of understanding and commitment is reached, “a democratically organized public could simply take away the charter of any corporation and place it under worker control or community control.” It hasn’t been done for a long time (perhaps since the 1880s), but the mechanisms are there, ready to be triggered. If so, the fact that this system of centralized, autocratic, and unaccountable power not only has not yet succumbed, as its twin brothers, fascism/Nazism and Bolshevism,
did, but is increasing its sway and dominance all over the world does not mean that all the possibilities of historical development have already been exhausted. The latter two misshapen monstrosities were expected by their leaders to last a thousand years yet succumbed within a minute fraction of that time. The seemingly overwhelming power of the surviving current incarnations of autocracy is also "based upon social policies with particular goals that are not graven in stone or founded in law of nature or society, any more than the human institutions from which they arise."

At this point it's a short step from an illuminating analysis by a superb intellectual historian to an educational program—and, beyond that, to a suggestive and potentially effective program for action. Since "the first step is always to penetrate the clouds of deceit and distortion and learn the truth about the world," our schools and colleges have part of their work cut out for them. Their responsibility on this score is not slight: it should be abundantly clear by now that "there has rarely been a time in history when the choice carried such dramatic human consequences." No wonder education is the top political issue for the American people at the beginning of the new millennium.

The frank and open discussion in our schools, colleges, and universities (as well as in the local and national media, we may add) of truly significant questions such as the ones just illustrated—crucial not just for the advance but for the very survival of human civilization, perhaps for the survival of our species (and certainly for the survival of many other species)—is a fair measure of a decisive aspect of any program of education-for-democracy within a genuinely democratic (political and economic) order, as Chomsky understands it. Only when any truly significant question can be routinely discussed in an open and honest way in our schools and universities within a multifaceted curriculum can we begin to entertain the idea that we are out of the doldrums of our current stupor and may be on our way to at least the glimmerings of a truly advanced industrial society.

Moreover, a society that has attained at least the intellectual and moral level reached by the eighteenth-century Enlightenment would make this kind of education freely available to every one of our children and our teenagers—in fact, to everyone, at any age. (See Selection 10.) "Freedom without opportunity is a devil's gift, and the refusal to provide such opportunities is criminal," we read at the beginning of "Market democracy in a neoliberal order" (1997). This is certainly the case when what is at stake is the intellectual and moral growth of the more vulnerable among us (mostly children). Indeed, "the fate of the more vulnerable offers a sharper measure of the distance from here to something that might be called 'civilization.'"
Notes

1. Recall that John Dewey published "Progressive education and the science of education" and became honorary president of the Progressive Education Association (PEA) in 1928, the very year Chomsky was born, and published his last book on education, *Experience and education*, the centerpiece of which was an indictment of much "progressive" education (more on this later), in 1938.

2. See my introduction to N. Chomsky's *Language and politics* (1988). (Reminder: a list of references for the writings mentioned in this Introduction and in the Editor's Notes to the selections, or relevant to the discussion, appears at the end of the book.)


4. For more on the topic and a broader sample of representative testimonials, see Otero 1986/1994.

5. This conclusion, and Chomsky's epistemology more generally, is often misunderstood, perhaps because it goes so much against the grain of common sense (as the dismissal of geocentrism did—and still does for a large number of people). A relevant example in this context is the chapter "Human Learning" by D. W. Hamlyn in *The philosophy of education* (1973), ed. by R. S. Peters. Of necessity Hamlyn was unfamiliar with *Language and learning: the debate between Jean Piaget and Noam Chomsky* (1980), ed. by M. Piattelli-Palmarini, especially Chomsky's reply to Piaget, which may very well spare poorly informed and misguided critics from grossly misunderstanding what is at issue.

6. Before puberty as a rough first approximation. The "critical ages" are obviously not the same along every developmental dimension (every subclass of maturation). Even within one specific course, say, the development of language, it seems to be necessary to distinguish more than one "critical age." Cf. Strozer, *Language acquisition after puberty* (1994).

7. His terms are generally understood as pitifully inadequate ones since Chomsky's rightly celebrated 1959 review of Skinner's book on "verbal behavior," after which "Chomsky's star began to rise" and "generative grammar became the thing." The controversy was really over then and there (Skinner never attempted to defend his position), which is not to say there are no diehards left. Perhaps the latest book-length "reappraisal" is Richelle's *B. F. Skinner* (1993). Skinner's explanation for not answering Chomsky, cited at length on page 122, from which the last two quotations in the text are taken, is not without interest. See also Chomsky, "Psychology and ideology" (1972) in his *For reasons of state* (1973), reprinted in part in *The Chomsky reader*.


9. The quote is from Burrow's introduction to his (1969) edition of Humboldt's *The limits of state action* (1792), p. vii. The richer single source of information on the great classical liberal (a category not to be confused with that of contemporary "liberal," as the term is generally understood today, let alone with that of "neo-liberal") is perhaps Sweet's *Wilhelm von Humboldt: a biography* (1978–1980). Ch. 8, covering the years 1808 to 1810
(in case it helps: Darwin and Lincoln were both born in 1809), is mostly on "the reluctant educational reformer." See also Viertel, "The concept of 'diversity' in Humboldt's thought" (1973).

10. Understandably, the highly original and innovative character of his work made it hard for many to see that he is more traditional and conservative than most—as conservative as the really enduring tradition allows him to be. In fact, as has occasionally been suggested, and Chomsky is fond of showing, it is not truly revolutionary developments, but reactionary gambits, that tend to depart sharply and irresponsibly from enduring traditional values. Cf. MacIntyre, *A short history of ethics* (1966), ch. 17.


12. Cf. Chomsky, *World orders old and new* (1994, 1996), 2.1, in particular the sentence in note 4 about the articulation of these themes by Adam Smith (and other classical liberals of the Enlightenment). With respect to children's free participation, it should be kept in mind that Dewey was against not just those who still failed to "connect the subject matter of the curriculum to the interest and activities of the child," but also (something less generally known) against some advocates of "progressive" child-centered education for their failure to "connect the interests and activities of the child to the subject matter of the curriculum" (Westbrook, pp. 99; see also pp. 502f.).

13. Elsewhere he identifies those "leading elements of the Marxist mainstream" as Rosa Luxemburg, Arthur Rosenberg, Anton Pannekoek, Karl Korsch and (his late friend) Paul Mattick, and the two outstanding "libertarian socialists of various anarchist movements," as Mikhail Bakunin and Rudolf Rocker, and adds that "Russell's views were rather similar, in this regard" (*Powers and prospects* [1996], p. 76; cf., e.g., Chomsky, *American power* [1969], p. 363 [Chomsky reader, p. 413]; *Language and responsibility* [1979], p. 74; *Language and politics* [1988], pp. 167–69.) Among the important references for the "popular sectors" he may have in mind are Ware's *The industrial worker 1840–1860* (1924) and David Montgomery's *Citizen worker* (1993) and *The fall of the house of labor* (1987).

14. Although each adheres to a form of empiricism (Russell more self-consciously than Dewey), there are important differences between the two thinkers. Thus, in Chapter 30 of his history of Western philosophy (1945), after describing Dewey as "a man of the highest character, liberal in outlook, generous and kind in personal relations, indefatigable in work" with most of whose opinions he is "in almost complete agreement," Russell proceeds to refute what he considers Dewey's most important work "from a strictly philosophical point of view": "his criticism of the traditional notion of 'truth,' which is embodied in the theory of what [Dewey] calls 'instrumentalism.'" Dewey's instrumentalism, and pragmatism more generally, is as alien to Chomsky as it is to Russell—and just as alien to Chomsky is Russell's empiricism. No less significant is the fact that neither Russell nor Chomsky had a lapse in judgment comparable to Dewey's. Cf. Chomsky, *American power* (1969), pp. 6, 317 (a page included in Selection 16).

15. The quotes are from Chomsky's *Reflections on language* (1975), pp. 128ff. (see also Selection 12). No less relevant is the rest of the chapter, which cannot be discussed further here for limitations of space.

16. See Harry Bracken, *Mind and language: essays on Descartes and Chomsky* (1984), where these ideas are developed.

17. See also *Language and problems of knowledge* (1986), 171–76 and last page. For other
related references, see Corson’s “Chomsky on education” (1980) and Barsky (forthcoming), Ch. 5. Cf. Rai (1995), Ch. 8, on his view of the function of the university.

As is to be expected, Chomsky’s view is totally at odds with current trends, in particular the current attempt to privatize the educational system, that is, the attempt of the corporations to take over the educational system as they took over most of the health system and part of the prison system in order to make them sources of large profits. In other words, the educational analog of HMOs will be EMOs, Chomsky suspects. This is “the direction that financial capital wants to move in. . . . The next big target of public money that [investors] can go after in the parasitic fashion of the rich is the education system” (“U.S. to world: get out of the way,” 1999). In his view, it is just part of the general assault of the last quarter century on solidarity, democracy, social welfare, and anything that interferes with private power and profit making. For a recent special report on the trend, see the ranking of “the top U.S. universities in their quest for intellectual property, commercial partners and profits” in Rebecca Zacks, “The TR university research scorecard,” in the July–August 2000 issue of the Technology Review, “MIT’s Magazine of Innovation” (not surprisingly, the University of California emerges as undisputed number one in both “campus patenting” and “tech transfer riches,” with MIT a distant second in the first category and tenth in the second category); see also Buder, “From the ivory tower to the bottom line,” in the same issue. Cf. R. Solomon and J. Solomon, Up the university: re-creating higher education in America (1993), Soley, Leasing the ivory tower: the corporate takeover of academia (1995), Masao, “Ivory tower in escrow” (2000), for critiques of higher education as big business, with bloated university administrations vying for research grants and lucrative profits, having lost sight of teaching as the university’s mission; also, Hewlett, Child neglect in rich societies (1993) and Hewlett and West, The war against parents (1998), for a related aspect of the general issue.

18. There’s no reason to be any less rational in the study of human affairs than in any other study: if a rational approach is essentially not allowed to run its course, institutional structure is likely to be blocking the way. On the other hand, since the high point of the scientific revolution in the seventeenth century, most knowledgeable people agree that there is no such thing as indubitable knowledge or absolute certainty about empirical matters. See Popkin, The history of scepticism from Erasmus to Spinoza (1979).

19. The term corporatism is first documented in English in 1890 (the date is significant). The qualification “private” is necessary to distinguish it from public corporatism. Both types can be found in both fascist regimes and “liberal” democracies.

Interestingly, current studies of corporatism usually pay no attention to private corporatism of the U.S. variety (“big business”). The object of their attention is public or communal corporatism, particularly in fascist or formerly fascist states (see, e.g., The corporate state: corporatism and the state tradition in Western Europe [1988], ed. Cox and O’Sullivan). So when an American specialist on the topic writes in a comparative overview that

In fact, we do not like to talk about corporatism very much in the United States. It is not mentioned in polite company, in part because of its association with fascism. . . . We like to think of ourselves as a free and democratic country. We do not like to think that we are like . . .

he, in sharp contrast with Chomsky’s analysis, is not thinking of the private corporation (which the fascist regimes tried to rein in somewhat), but rather of public measures, as the following passage makes clear:
Nevertheless, whenever we talk about private groups (such as business, labor, teachers) being incorporated into the political system; whenever we have government-sponsored group entitlements, set-asides, quotas, or group favoritism; whenever we discuss health care reform, industrial policy, reforming Medicare or Medicaid, welfare or Social Security reform—then corporatism, or elements of corporatism, are almost always involved. (Wiarda, *Corporatism and comparative politics*, 1997, pp. 129, 130)

An explicit lame justification offered for a usage quite different from Chomsky's usage (or from the one attributed to the "New Left" below) is the following:

The "New Left" has used the term "corporate state" to signify a state in which business corporations have important or decisive influence. If this usage were generally adopted, we would be at a loss to have an English equivalent for the German *Ständestaat* ["corporate state in the old sense"]. The French and Italian, of course, speak of *ordre corporatif* or *stato corporativo* in the same sense in which we use the term here. (Landauer, *Corporate state ideologies: historical roots and philosophical origins*, 1983, p. 1)


22. Chomsky, *Cartesian linguistics* (1966), p. 22f. He also suggests that the emphasis on language as "un système où tout se tient" and "un tout organique" of Saussurean structuralism "is, conceptually at least, a direct outgrowth" of Humboldt's concept.


24. For some telling examples from his most mature work (his lectures on philosophy of history), see the "outlandish and astonishingly ignorant racist ravings, shocking even by the (not particularly lovely) standards of the day" (Znet Forum) quoted in Chomsky, *Year SOI* (1993), pp. 4–5, 119–20, 226, 230.


26. As Chomsky has pointed out, the neo-Hegelian doctrines and their place in the intellectual history of Bolshevism, fascism, and private corporatism, an extremely interesting topic, which should be illuminating as well, have not been studied in any depth (it's not a favorite topic anywhere on the political spectrum), although there are intimations here and there. Some, perhaps among the earliest, can be found in an outstanding study (Business as a system of power, 1943) by Robert Brady, "a very important Veblenite political economist" whom Chomsky has quoted now and then. The major source on legal history appears to be *The transformation of American law, 1870–1960* (1992) by Morton Horwitz, a Harvard law professor and a leading legal historian, who gives a detailed and
interesting history of relevant judicial decisions at the root of contemporary corporate law. As he writes, such a “judicial personification of the corporation . . . radically enhanced the position of the business corporation in American law” (p. 67). In the preface he points out that “historical thinkers as varied as Hegel and Marx, or Whig historians like McCauley, or conservatives like Sir Henry Maine, sought to find the general laws of history, change and social progress,” mimicking the natural sciences, we may add, and more or less consciously assuming that some cultural entities are no less “organic” than a human organism. See also pp. 52, 222, and “The natural entity theory,” pp. 106f.


28. As Chomsky points out, in the mislabeled “free trade agreements” (NAFTA, WTO, etc.) corporations are granted rights far beyond persons: for example, NAFTA’s Chapter 11 grant of the right to bring suit against sovereign states for actions “tantamount to expropriation” (e.g., regulations that might interfere with future profits), or “national treatment,” which can be demanded by General Motors in Mexico but not by a Mexican of flesh and blood in New York.

29. See Robert W. Benson, Challenging corporate rule: the petition to revoke Unocal’s charter as a guide to citizen action (1999), a very good account of an effort (proceeding through the courts at the time of writing) to compel the attorney general of California to rescind the charter of Unocal, for crimes committed in Burma and in California. This book also provides good background and a guide to citizen action elsewhere. See also Dean Ritz (ed.), Defying corporations, defining democracy: A book of history and strategy (2001).


31. Chomsky, Powers and prospects (1996), Ch. 4; see also “Rollback III” (April 1995); “Propaganda and control of the public mind” (Feb. 1997), of which Selection 20 is an excerpt; and “Market democracy in a neoliberal order: doctrine and reality” (1997), excerpted in Profits over people (1999), among other writings.


33. For a wide range of comments on a variety of aspects of Chomsky’s work, see Noam Chomsky: critical assessments (1994), ed. by C. P. Otero, and references there, in particular those in the introduction to each of the four volumes; for overviews of his work, see the monographs by Lyons (1970, 1991), Leiber (1975), Salkie (1990), Haley and Lundsford (1994), Wilkin (1997), Barsky (1997, forthcoming), McGilvray (1999), Smith (1999), and Otero (forthcoming a, b). There is also a Chomsky for beginners (1996) by Cogswell and, in the same vein, Introducing Chomsky (1997) by Maher and Groves.
The topic that was suggested, which I'm very happy to talk about, is "Democracy and Education." The phrase *democracy and education* immediately brings to mind the life and work and thought of one of the outstanding thinkers of the past century, John Dewey, who devoted the greater part of his life and his thought to this array of issues. I guess I should confess a special interest. It just happened that his thought was, for various reasons, a strong influence on me in my formative years—in fact, from about age two on, for a variety of reasons that I won't go into but are real. For much of his life (later he was more skeptical) Dewey seems to have felt that reforms in early education could be in themselves a major lever of social change. They could lead the way to a more just and free society, a society in which, in his words, "The ultimate aim of production is not production of goods, but the production of free human beings associated with one another on terms of equality."

This basic commitment, which runs through all of Dewey's work and thought, is profoundly at odds with the two leading currents of modern social intellectual life: one, strong in his day (he was writing in the 1920s and 1930s about these things), is associated with the command economies in Eastern Europe in that day, the systems created by Lenin and Trotsky and turned into an even greater monstrosity by Stalin; the other, the state capitalist industrial society being constructed in the U.S. and much of the West, with the effective rule of private power. These two systems are actually similar in fundamental ways, including ideologically. Both were, and one of them remains, deeply authoritarian in fundamental commitment, and both were very sharply and dramatically opposed to another tradition, the left libertarian tradition, with roots in Enlightenment values, a tradition that included progressive liberals of the John Dewey variety, independent socialists like Bertrand Russell, the leading elements of the Marxist mainstream (mostly
anti-Bolshevik), and of course libertarian socialists of various anarchist movements, not to speak of major parts of the labor movement and other popular sectors. (Dewey and Russell were perhaps the two leading thinkers of the twentieth century in the West, in my opinion.)

This independent left, of which Dewey was a part, has strong roots in classical liberalism. It grows right out of it, in my opinion, and it stands in sharp opposition to the absolutist currents of state capitalist and state socialist institutions and thought, including the rather extreme form of absolutism that's now called conservative in the U.S., a terminology that would have amused Orwell and would have caused any genuine conservative to turn over in his grave—if you could find one.

I need not stress that this picture is not the conventional one, to put it rather mildly, but I think it does have one merit, at least, namely the merit of accuracy. I'll try to explain why.

Let me return to one of Dewey's central themes, that the ultimate aim of production is not production of goods but the production of free human beings associated with one another on terms of equality. That includes, of course, education, which was a prime concern of his. The goal of education, to shift over to Bertrand Russell, is "to give a sense of the value of things other than domination, to help create wise citizens of a free community, to encourage a combination of citizenship with liberty, individual creativeness, which means that we regard a child as a gardener regards a young tree, as something with an intrinsic nature which will develop into an admirable form given proper soil and air and light."

In fact, much as they disagreed on many other things, as they did, they did agree on what Russell called the humanistic conception, with its roots in the Enlightenment: the idea that education is not to be viewed as something like filling a vessel with water, but rather assisting a flower to grow in its own way (in other words, providing the circumstances in which the normal creative patterns will flourish). It's an eighteenth-century view which they revived.

Dewey and Russell also shared the understanding that these leading ideas of the Enlightenment and classical liberalism had a revolutionary character, and they retained it right at the time they were writing, in the early half of this century. If implemented, these ideas could produce free human beings whose values were not accumulation and domination but rather free association on terms of equality and sharing and cooperation, participating on equal terms to achieve common goals which were democratically conceived. There was only contempt for what Adam Smith called the "vile maxim of the mas-
ters of mankind, all for ourselves, and nothing for other people." The guiding principle that nowadays we're taught to admire and revere as traditional values have eroded under unremitting attack, the so-called conservatives leading the onslaught in recent decades.

It's worth taking time to notice how sharp and dramatic is the clash of values between, on the one hand, the humanistic conception that runs from the Enlightenment up to leading twentieth century figures like Russell and Dewey and, on the other hand, the prevailing doctrines of today, the doctrines that were denounced by Adam Smith as the "vile maxim" and also denounced by the lively and vibrant working-class press of a century ago, which condemned what it called the "new spirit of the age, gain wealth, forgetting all but self" (Smith's vile maxim). The quote is from 1850 or so, from the working class press in the U.S.

It's quite remarkable to trace the evolution of values from a pre-capitalist thinker like Adam Smith, with his stress on sympathy and the goal of perfect equality and the basic human right to creative work, to contrast that and move on to the present, to those who laud the new spirit of the age, sometimes rather shamelessly invoking Adam Smith's name. For example, Nobel prize-winning economist James Buchanan, who writes that "what each person seeks in an ideal situation is mastery over a world of slaves." That's what you seek, in case you hadn't noticed—something that an Adam Smith would have regarded as simply pathological. The best book I know of on Adam Smith's actual thought (Adam Smith and his legacy for modern capitalism [1991]) is written by a professor here at Loyola, Patricia Werhane. That's Adam Smith's actual views. Of course, it's always best to read the original.

One of the most dramatic illustrations of this new spirit of the age and its values is the commentary that's now in the press on the difficulties we face in uplifting the people of Eastern Europe. As you know, we're now extending to them, our new beneficiaries, the loving care that we've lavished on our wards elsewhere in Latin America and the Philippines and so on; with the consequences that are dramatically clear and consistent in these horror chambers, but also are miraculously free of any lessons about who we are and what we do. One might ask why. In any event, we are now proceeding to uplift the people liberated from communism as we've in the past liberated Haitians and Brazilians and Guatemalans and Filipinos and Native Americans and African slaves and so on.

The New York Times is currently running an interesting series of articles on these different problems. They give some interesting insight into the prevailing values. There was an article on East Germany, for example, written by
Steven Kinzer. It opens by quoting a priest who was one of the leaders of the popular protests against the communist regime in East Germany. He describes the growing concerns there about what's happening to the society. He says: "Brutal competition and the lust for money are destroying our sense of community, and almost everyone feels a level of fear or depression or insecurity" (as they master the new spirit of the age in which we instruct the backward peoples of the world).

The next article, written by Jane Perlez, turned to what we regard as the showplace, the real success story, Poland. The headline reads "Fast and Slow Lanes on the Capitalist Road." The structure of the story is that some are getting the point, but there are also some who are still backwards. She gives one example of a good student and one example of a slow learner. The good student is the owner of a small factory which is a "thriving example of the best in modern capitalist Poland." "It produces intricately designed wedding gowns sold mostly to rich Germans and to that tiny sector of super-rich Poles." This is in a country where poverty has more than doubled since the reforms were instituted, according to a World Bank study last July, and incomes have dropped about 30 percent. However, the people who are hungry and jobless can look at the intricately designed wedding gowns in the store windows, appreciating the new spirit of the age, so it's understandable that Poland is hailed as the great success story for our achievements. This good student explains that "people have to be taught to understand they must fight for themselves and can't rely on others." She is describing a training course she's running that's trying to instill American values among people who are still brainwashed with slogans like, "I'm a miner. Who else is better?" They have got to get that out of their heads. A lot of people are better, namely people who can design wedding gowns for rich Germans.

That's the chosen illustration of the success story of American values. Then there are the failures, still on the slow lane on the capitalist road. Here she picks one as her example, a forty-year-old coal miner who "sits in his wood-paneled living room admiring the fruits of his labor under communism: a TV set, comfortable furniture, a shiny, modern kitchen, and he wonders why he's at home, jobless and dependent on welfare payments," having not yet absorbed the new spirit of the age (gain wealth, forgetting all but self, and not "I'm a miner. Who else is better?"). The series goes on like that. It's interesting to read and to see what's taken for granted.

What's happening in Eastern Europe recapitulates what's gone on in our Third World domains for a long time and falls into place in a much longer story. It's very familiar from our own history and the history of England
before us. There's a recent book, by a distinguished Yale University labor historian, David Montgomery, in which he points out that modern America was created over the protests of its working people. He's quite right. Those protests were vigorous and outspoken, particularly in the working class and community press that flourished in the U.S. from the early nineteenth century up until the 1930s, when it was finally destroyed by private power, as its counterpart in England was about thirty years later. The first major study of this topic was in 1924 by Norman Ware. It stills makes very illuminating reading. It was published here in Chicago and reprinted very recently by Ivan Dee, a local publisher. It's very much worth reading. It's a work that set off a very substantial study in social history.

What Ware describes, looking mostly at the labor press, is how the value system that was advocated by private power had to be beaten into the heads of ordinary people, who had to be taught to abandon normal human sentiments and to replace them with the new spirit of the age, as they called it. He reviews the mainly mid-nineteenth-century working class press, often, incidentally, run by working class women. The themes that run through it are very constant for a long period. They are concerned with what they call "degradation" and "loss of dignity and independence, loss of self-respect, the decline of the worker as a person, the sharp decline in cultural level and cultural attainments as workers were subjected to" what they called "wage slavery," which they regarded as not very different from chattel slavery, which they had fought to uproot during the Civil War. Particularly dramatic and quite relevant to today's problems was the sharp decline in what we call "high culture," reading of classics and contemporary literature by the people who were called the factory girls in Lowell and by craftsmen and other workers. Craftsmen would hire somebody to read to them while they were working because they were interested and had libraries. All that had to go.

What they described, quoting from the labor press, is "when you sell your product, you retain your person. But when you sell your labor, you sell yourself, losing the rights of free men and becoming vassals of mammoth establishments of a monied aristocracy that threatens annihilation to anyone who questions their right to enslave and oppress. Those who work in the mills ought to own them, not have the status of machines ruled by private despots who are entrenching monarchical principles on democratic soil as they drive downwards freedom and rights, civilization, health, morals and intellectual- ity in the new commercial feudalism." Just in case you're confused, this is long before Marxism. This is American workers talking about their experiences in the 1840s.
The labor press also condemned what they called the "bought priesthood," referring to the media and the universities and the intellectual class, that is, the apologists who sought to justify the absolute despotism that was the new spirit of the age and to instill its sordid and demeaning values. One of the early leaders of the AFL (American Federation of Labor), about a century ago, late nineteenth century, expressed the standard view when he described the mission of the labor movement as "to overcome the sins of the market and to defend democracy by extending it to control over industry by working people."

All of this would have been completely intelligible to the founders of classical liberalism, people like Wilhelm von Humboldt, for example, who inspired John Stuart Mill, and who, very much like his contemporary Adam Smith, regarded creative work freely undertaken in association with others as the core value of a human life. So if a person produces an object on command, Humboldt wrote, "we may admire what he did but we will despite what he is" (not a true human being who acts on his own impulses and desires).

The bought priesthood have the task of undermining these values and destroying them among people who sell themselves on the labor market. For similar reasons, Adam Smith warned that in any civilized society governments would have to intervene to prevent the division of labor from turning people into "creatures as stupid and ignorant as it's possible for a human being to be." He based his rather nuanced advocacy of markets on the thesis that if conditions were truly free, markets would lead to perfect equality (that was their moral justification). All of this has been forgotten by the bought priesthood, who have a rather different tale to tell.

Dewey and Russell are two of the leading twentieth-century inheritors of this tradition, with its roots in the Enlightenment and classical liberalism. Even more interesting is the inspiring record of struggle and organization and protest by working men and women since the early nineteenth century, as they sought to win freedom and justice and to retain the rights that they had once had as the new despotism of state-supported private power extended its sway.

The basic issue was formulated with a good deal of clarity by Thomas Jefferson around 1816. This was before the Industrial Revolution had really taken root in the former colonies, but you could begin to see the developments. In his later years, observing what was happening, Jefferson had rather serious concerns about the fate of the democratic experiment. He feared the rise of a new form of absolutism that was more ominous than what had been overthrown in the American Revolution, in which he was of course a leader.
Jefferson distinguished in his later years between what he called “aristocrats” and “democrats.” The aristocrats are “those who fear and distrust the people, and wish to draw all powers from them into the hands of the higher classes.” The democrats, in contrast, “identify with the people, have confidence in them, cherish and consider them as the honest and safe depository of the public interest, if not always the most wise.” The aristocrats of his day were the advocates of the rising capitalist state, which Jefferson regarded with much disdain, clearly recognizing the quite obvious contradiction between democracy and capitalism, or more accurately what we might call really existing capitalism, that is, guided and subsidized by powerful developmental states, as it was in England and the U.S. and indeed everywhere else.

This fundamental contradiction is enhanced as new corporate structures were granted increasing powers, not by democratic procedures but mainly by courts and lawyers who converted what Jefferson called the “banking institutions and monied incorporations,” which he said would destroy freedom, and which he could barely see the beginnings of in his day. They were converted, mainly through courts and lawyers, into “immortal persons” with powers and rights beyond the worst nightmares of pre-capitalist thinkers like Adam Smith or Thomas Jefferson. Half a century earlier, Adam Smith already warned against this, though he could barely see the beginnings of it.

Jefferson’s distinction between aristocrats and democrats was developed about a half a century later by Bakunin, the anarchist thinker and activist (actually one of the few predictions of the social sciences ever to have come true; it ought to have a place of honor in any serious academic curriculum in the social sciences and the humanities for this reason alone). Back in the nineteenth century, Bakunin predicted that the rising intelligentsia of the nineteenth century would follow one of two parallel paths. One path would be to exploit popular struggles to take state power, becoming what he called a “Red bureaucracy that will impose the most cruel and vicious regime in history.” That’s one strain. The other strain, he said, will be those who discover that real power lies elsewhere, and they will become its “bought priesthood” (in the words of the labor press), serving the real masters in the state-supported private system of power, either as managers or apologists who “beat the people with the people’s stick” (as he put it) in the state capitalist democracies.

The similarities are pretty striking, and they run right up to the present. They help account for the rapid transitions that people make from one to the other position. It looks like a funny transition, but in fact it’s a common ideology. We’re seeing it right now in Eastern Europe with the group that’s
sometimes called the nomenclatura capitalists (the old communist ruling class), now the biggest enthusiasts for the market enriching themselves as the societies become standard Third World societies. The move is very easy, because it's basically the same ideology. A similar move from Stalinist commissar to "celebration of America" is quite standard in modern history, and it doesn't require much of a shift in values, just a shift in judgment as to where power lies.

Independently of Jefferson and Bakunin, others were coming to the same understanding in the nineteenth century. One of the leading American intellectuals was Charles Francis Adams, who in 1880 described the rise of what is now called the "post-industrial society" by Daniel Bell and Robert Reich and John Kenneth Galbraith and others (this is 1880, remember), a society in which, Adams says, "the future is in the hands of our universities, our schools, our specialists, our scientific men and our writers and those who do the actual work of management in the ideological and economic institutions." Nowadays they're called the "technocratic elite" and the "action intellectuals" or the "new class" or some other similar term. Adams, back in 1880, concluded that "the first object of thinking citizens, therefore, should be not to keep one or another political party in power, but to insist on order and submission to law"—meaning that the elites should be permitted to function in what's called "technocratic isolation" by the World Bank (I'm being a little anachronistic here, that's modern lingo), or, as the London Economist puts the ideal today, "policy should be insulated from politics." That's the case in free Poland, they assure their readers, so they don't have to be concerned about the fact that people are calling for something quite different in free elections. They can do what they like in the elections, but since policy is insulated from politics and technocratic insulation proceeds, it really doesn't matter. That's democracy.

A decade earlier, in 1870, Adams had warned (they were worried then about universal suffrage, people were fighting for the right to vote), he warned that universal suffrage would "bring the government of ignorance and vice, with power in the hands of the European and especially Celtic proletariat on the Atlantic coast," those horrible Irish people, "an African proletariat on the shores of the Gulf and a Chinese proletariat on the Pacific." Adams didn't foresee the sophisticated techniques that would be developed in the twentieth century to ensure that policy remains insulated from politics as the franchise was extended through popular struggle and to guarantee that the general public would remain marginalized and disaffected, subdued by the new spirit of the age and coming to see themselves not as free people who
have a right to dignity and independence but as atoms of consumption who sell themselves on the labor market, at least when they’re lucky.

Adams was in fact expressing an old idea. Eighty years earlier Alexander Hamilton had put it clearly. He said there was the idea that your people are a “great beast” and that the real disease is democracy. That’s Hamilton. These ideas have become ever more entrenched in educated circles, as Jefferson’s fears and Bakunin’s predictions were increasingly realized. The basic attitudes coming into this century were expressed very clearly by Woodrow Wilson’s secretary of state, Robert Lansing, attitudes that led to Wilson’s “Red scare,” as it was called, which destroyed labor and independent thought for a decade. Lansing warned of the danger of allowing the “ignorant and incapable mass of humanity” to become “dominant in the earth,” or even influential, as he believed the Bolsheviks intended. That’s the hysterical and utterly erroneous reaction that’s pretty standard among people who feel that their power is threatened. Those concerns were articulated very clearly by progressive intellectuals of the period, maybe the leading one being Walter Lippman in his essays on democracy, mainly in the 1920s. (Lippmann was also the dean of American journalism and one of the most distinguished commentators on public affairs for many years.)

He advised that “the public must be put in its place so that the responsible men may live free of the trampling and the roar of a bewildered herd” (Hamilton’s “beast”). In a democracy, Lippman held, these “ignorant and meddlesome outsiders” do have a “function.” Their function is to be “interested spectators of action,” but not participants. They are to lend their weight periodically to some member of the leadership class (that’s called elections), and then they are supposed to return to their private concerns.

In fact, similar notions became part of mainstream academic theory at about the same time. In the presidential address to the American Political Science Association in 1934, William Shepard argued that government should be in the hands of “an aristocracy of intellect and power,” while the “ignorant, the uninformed and the anti-social elements” must not be permitted to control elections, as he mistakenly believed they had done in the past. One of the founders of modern political science, Harold Lasswell (one of the founders of the field of communications, in fact), wrote in the Encyclopedia of Social Sciences in 1933 or 1934 that modern techniques of propaganda, which had been impressively refined by Wilsonian liberals, provided the way to keep the public in line. Lasswell described Wilson as “the great generalissimo on the propaganda front.” Wilson’s World War I achievements in propaganda impressed others, including Adolf Hitler (you can read about it in Mein
Kampf), but crucially they impressed the American business community. That led to a huge expansion of the public relations industry, which was dedicated to "controlling the public mind," as advocates used to put it in more honest days, just as, writing in the *Encyclopedia of Social Sciences* in 1934, Lasswell described what he was talking about as propaganda. We don't use that term. We're more sophisticated.

As a political scientist, Lasswell advocated more sophisticated use of this new technique of control of the general public that was provided by modern propaganda. That would, he said, enable the intelligent men of the community, the natural rulers, to overcome the threat of the great "beast," who may undermine order because of, in Lasswell's terms, "the ignorance and superstition of the masses." We should not succumb to "democratic dogmatisms about men being the best judges of their own interests." The best judges are the elites (Jefferson's aristocrats, in other words), who must be ensured the means to impose their will for the common good.

Lippmann and Lasswell represent the more liberal, progressive fringe of opinion, which grants the "beast" at least a spectator role. At the reactionary end you get those who are mislabeled conservatives in contemporary newspeak. So the Reaganite statist reactionaries thought that the public, the "beast," shouldn't even have the spectator role. That explains their fascination with clandestine terror operations, which were not secret to anybody except the American public, certainly not to their victims. Clandestine terror operations were designed to leave the domestic population ignorant. They also advocated absolutely unprecedented measures of censorship and agitprop and other measures to ensure that the powerful and interventionist state that they fostered would serve as a welfare state for the rich and not troubled by the rabble.

The huge increase in business propaganda in recent years, the recent assault on the universities by right-wing foundations, and other tendencies of the current period, are other manifestations of the same concerns. These concerns were awakened by what liberal elites had called the "crisis of democracy" that developed in the 1960s, when previously marginalized and apathetic sectors of the population, like women and young people and old people and working people and so on, when they sought to enter the public arena, where they have no right to be, as all right-thinking aristocrats understand.

John Dewey was one of the relics of the Enlightenment classical liberal tradition who opposed the rule of the wise, the onslaught of the Jeffersonian aristocrats, whether they found their place on the reactionary or the liberal
part of this very narrow ideological spectrum. Dewey understood clearly that “politics is the shadow cast on society by big business,” and as long as this is so, “attenuation of the shadow will not change the substance”—meaning, reforms are of limited utility: democracy requires that the source of the shadow be removed, not only because of its domination of the political arena, but because the very institutions of private power undermine democracy and freedom. Dewey was very explicit about the anti-democratic power that he had in mind. To quote him: “Power today” (this is the 1920s) “resides in control of the means of production, exchange, publicity, transportation and communication. Whoever owns them rules the life of the country,” even if democratic forms remain: “business for private profit through private control of banking, land, industry, reinforced by command of the press, press agents and other means of publicity and propaganda”—that is the system of actual power, the source of coercion and control, and until it’s unraveled we can’t talk seriously about democracy and freedom. Education, he hoped, of the kind he was talking about (“the production of free human beings”), would be one of the means of undermining this absolutist monstrosity.

In a free and democratic society, Dewey held, workers should be “the masters of their own industrial fate,” not tools rented by employers. He agreed on fundamental issues with the founders of classical liberalism and with the democratic and libertarian sentiments that animated the popular working-class movements from the early Industrial Revolution until they were finally beaten down by a combination of violence and propaganda. In the field of education, therefore, Dewey held that it is “illiberal and immoral” to train children to work “not freely and intelligently, but for the sake of the wage earned,” in which case their activity “is not free because not freely participated in” (again the conception of classical liberalism and the workers’ movements). Therefore, Dewey held, industry must also change “from a feudalistic to a democratic social order” based on control by working people and free association (again, traditional anarchist ideals with their source in classical liberalism and the Enlightenment).

As the doctrinal system has narrowed under the assault of private power, particularly in the past few decades, these fundamental libertarian values and principles now sound exotic and extreme, perhaps even anti-American, to borrow one of the terms of contemporary totalitarian thought in the West. Given these changes, it’s useful to remember that the kinds of ideas that Dewey was expressing are as American as apple pie. They have origins in straight American traditions, right in the mainstream (not influenced by any dangerous foreign ideologies), in a worthy tradition that’s ritually lauded,
though it's commonly distorted and forgotten. And all of that is part of the
deterioration of functioning democracy in the current age, both at the institu-
tional and at the ideological level, in my opinion.

Education is, of course, in part a matter of schools and colleges and the
formal information systems. That's true whether the goal of education is edu-
cation for freedom and democracy, as Dewey advocated, or education for
obedience and subordination and marginalization, as the dominant institu-
tions require. The University of Chicago sociologist James Coleman, one of
the main students of education and effects of experience on children's lives,
concludes from many studies that "the total effect of home background is
considerably greater than the total effect of school variables in determining
student achievement." Actually, about twice as powerful in effect, he con-
cludes from a lot of studies. So it's therefore important to have a look at how
social policy and the dominant culture are shaping these factors (home influ-
ences and so on).

That's a very interesting topic. The inquiry is much facilitated by a
UNICEF study published a year ago called Child Neglect in Rich Nations,
written by a well-known American economist, Sylvia Ann Hewlett. She
studies the preceding fifteen years, the late 1970s up through the early 1990s,
in the rich nations. She's not talking about the Third World but about the
rich countries. She finds a sharp split between the Anglo-American societies,
on the one hand, and continental Europe and Japan, on the other hand. The
Anglo-American model, spearheaded by the Reaganites and Thatcher, has
been a disaster for children and families, she says. The European model, in
contrast, has improved their situation considerably, from a starting point that
was already considerably higher—despite the fact that the European societies
lack the huge advantages of the Anglo-American societies. The U.S. has
unparalleled wealth and advantages, and while the United Kingdom, Britain,
has severely declined, particularly under Thatcher, it has the economic advan-
tage, at least, of being a U.S. client as well as being a major oil exporter in the
Thatcher years. That's something that makes the economic failure of
Thatcherism even more dramatic, as authentic British conservatives like
Lord Ian Gilmour have shown.

Hewlett describes the Anglo-American disaster for children and families
as attributable "to the ideological preference for free markets." Here she's only
half right, in my opinion. Reaganite conservatism opposed free markets. It
did advocate markets for the poor, but it went well beyond even its statist
predecessors in demanding and winning a very high level of public subsidy
and state protection for the rich. Whatever you choose to call this guiding
ideology, it's unfair to tarnish the good name of conservatism by applying it to this particular form of violent and lawless and reactionary statism. Call it what you like, but it's not conservatism, it's not the free market.

However, Hewlett is quite right in identifying the free market for the poor as the source of the disaster for families and children. And there isn't much doubt of the effects of what Hewlett calls the "anti-child and anti-family spirit that's loose in these lands" (in the Anglo-American lands, most dramatically in the U.S., but also Britain), this "neglect-filled Anglo-American model based on market discipline for the poor has largely privatized child rearing while making it effectively impossible for most of the population to rear children." That's been the combined goal and policy of Reaganite conservatism and the Thatcherite analogue. The result is, of course, a disaster for children and families.

Continuing, Hewlett points out, "in the much more supportive European model, social policy has strengthened rather than weakened support systems for families and children." It's no secret, except of course as usual to readers of the press. As far as I'm aware, this 1993 study, rather critically relevant to our current concerns, has yet to be reviewed anywhere. It's not been, say, featured in the New York Times, although the Times did devote last Sunday's book review section largely to this topic, with somber forebodings about the fall of IQ, the decline of SAT scores, and so on, and what might be causing it, say, in the city of New York, where the social policies that have been pursued and backed by the Times have driven about 40 percent of the children below the poverty level, so that they're suffering malnutrition, disease, and so on.

But it turns out that is irrelevant to the decline in IQ as is anything that Hewlett discusses in this Anglo-American neglect-filled model. What's relevant, it turns out, is bad genes. Somehow people are getting bad genes, and then there are various speculations about why this is. For example, maybe it's because black mothers don't nurture their children, and the reason is maybe they evolved in Africa, where the climate was hostile. So those are maybe the reasons, and this is really serious, hardheaded science, and a democratic society will ignore all this at its peril, the reviewer says. Well-disciplined commissars know well enough to steer away from the obvious factors, the ones rooted in very plain and clear social policy. They are perfectly evident to anybody with their head screwed on, and happen to be discussed in considerable detail by a well-known economist in a UNICEF study that's not likely to see the light of day around here.

The facts are no secret. A blue-ribbon commission of the state boards of
education and the American Medical Association reported: “Never before has one generation of children been less healthy, less cared for, and less prepared for life than their parents were at the same age.” That’s a big shift in an industrial society. It’s only in the Anglo-American societies where this anti-child, anti-family spirit has reigned for fifteen years under the guise of conservatism and family values. That’s a real triumph for propaganda. It’s one that would very much have impressed even “generalissimo” Woodrow Wilson, or probably Stalin and Hitler.

A symbolic expression of this disaster is that when Hewlett wrote her book, a year ago, 146 countries had ratified the international convention on the rights of the child, but one had not: the U.S. That’s a standard pattern for international conventions on human rights. However, just for fairness, it’s only proper to add that Reaganite conservatism is catholic in its anti-child, anti-family spirit, so the World Health Organization voted to condemn the Nestlé Corporation for aggressive marketing of infant formula, which kills plenty of children. The vote was 118 to 1. I’ll leave you to guess the one. However, this is quite minor compared with what the World Health Organization calls the “silent genocide” that’s killing millions of children every year as a result of the free-market policies for the poor and the refusal of the rich to give any aid. Again, the U.S. has one of the worst and most miserly records among the rich societies.

Another symbolic expression of this disaster is a new line of greeting cards by the Hallmark Corporation. One of them says: “Have a super day at school.” That one, they tell you, is to be put under a box of cereal in the morning, so that when the children go off to school it says: “Have a super day at school.” Another one says, “I wish I had more time to tuck you in.” That’s one that you stick under the pillow at night when the kid goes to sleep alone. There are other such examples.

In part, this disaster for children and families is the result simply of falling wages. State corporate policy has been designed for the last years, especially under the Reaganites and Thatcher, to enrich small sectors and to impoverish the majority, and it succeeded. It’s had exactly the intended effect. That means that people have to work much longer hours to survive. For much of the population both parents have to work maybe fifty to sixty hours merely to provide necessities. Meanwhile, incidentally, corporate profits are zooming. Fortune magazine talks about the “dazzling” profits reaching new heights for the Fortune 500 even though sales are stagnating.

Another factor is job insecurity, what economists like to call “flexibility in the labor markets,” which is a good thing under the reigning academic the-
ology, but a pretty rotten thing for human beings, whose fate doesn't enter into the calculations of sober thinking. Flexibility means you better work extra hours or else. There are no contracts and no rights. That's flexibility. We've got to get rid of market rigidities. Economists can explain it. When both parents are working extra hours, and for most on falling incomes, it doesn't take a great genius to predict the outcome. The statistics show them. You can read them in Hewlett's UNICEF study if you like. It's perfectly obvious, without reading them, what's going to happen. Contact time, that is, actual time spent by parents with children, has declined 40 percent in the last twenty-five years in the Anglo-American societies, mostly in recent years. That's actually ten to twelve hours a week of eliminating contact time, and what they call "high-quality time," when you're not just doing something else, is virtually disappearing. Of course that leads to the destruction of family identity and values. It leads to sharply increased reliance on television for child supervision. It leads to what are called "latchkey children," kids who are alone, a factor in rising child alcoholism and drug use and in criminal violence against children by children and other obvious effects in health, education, ability to participate in a democratic society, even survival, of course decline in SATs and IQs, but you're not supposed to notice that. That's bad genes, remember.

None of these things are laws of nature. These are consciously selected social policies designed for particular goals, namely enrich the Fortune 500 but impoverish others. In Europe, where conditions are more stringent but policy is not guided by the same anti-family, anti-child spirit, the tendencies are in the opposite direction, and the standards for children and families are much better.

It's worth mentioning, and let me stress, that this is not just true in the Anglo-American societies themselves. We're a big, powerful state. We have influence. It's very striking to notice what happens when other countries within the range of our influence try to undertake policies that benefit families and children. There are several striking examples.

The region that we control most completely is the Caribbean and Central America. There are two countries there that did undertake such policies: Cuba and Nicaragua, and with considerable success, in fact. Something which should surprise no one is that those are the two countries that were primarily targeted for U.S. assault. And it succeeded. So in Nicaragua, the rising health standards and the improvement in literacy and the reduction in child malnutrition have been reversed thanks to the terrorist war that we fought in Nicaragua, and now it's proceeding to the level of Haiti.
In the case of Cuba, of course, the terrorist war has been going on a lot longer. It was launched by John F. Kennedy. It had nothing to do with communism. There weren't any Russians around. It had to do with things like the fact that these people were devoting resources to the wrong sectors of the population. They were improving health standards. They were concerned with children, with malnutrition. Therefore we launched a huge terrorist war. A bunch of CIA documents were just released recently, filling in some of the details of the Kennedy period, which was bad enough. It continues up to the present. Actually, there was another assault just a couple of days ago. On top of that, there’s an embargo to try to ensure that they’ll really suffer. For years the pretext was that this had to do with the Russians, which is completely fraudulent, as you can see by what was going on when the policies were instituted and as is demonstrated conclusively by what happened after the Russians disappeared. Here was a real job for the “bought priesthood.” They have to not notice that after the Russians disappeared we harshened the attack against Cuba. Kind of odd if the reason for the attack was that they were an outpost of communism and the Russian empire. But we can handle that.

So after the Russians disappeared from the scene and it really became possible to strangle them, the conditions got harsher. A proposal was sent through Congress by liberal Democrats, led by Representative Torricelli, calling for a cutoff of any trade with Cuba by any subsidiary of any American corporation or any foreign corporation that used any parts produced in the U.S. That is so obviously in violation of international law that George Bush vetoed it. However, he was forced to accept it when he was outflanked from the right by the Clintonites in the last election, so he did then allow it to go through. That went right to the United Nations, where the U.S. position was denounced by just about everybody. In the final vote, the U.S. could pick up only Israel, which is automatic, and they got Romania for some reason. Everyone else voted against it. The U.S. position was defended by no one. It is an obvious violation of international law, as even Britain and others pointed out. But it doesn’t matter. It’s extremely important to carry out our anti-child, anti-family spirit and our insistence on highly polarized societies everywhere we can go. If any foreign country under our control tries to go that way, we’ll take care of them, too.

That’s now continuing. It’s the kind of thing you can actually do something about if you like. In Chicago there is the Pastors for Peace, and the Chicago-Cuba Coalition has another caravan going to Cuba to try to undermine the embargo and bring humanitarian aid, medicines, medical books, powdered milk for infants, and other assistance. They’re in the phone book
under Chicago-Cuba Coalition. You can look them up. Anyone who is interested in countering the anti-child, anti-family spirit that reigns here and that we're exporting by violence elsewhere can do that, just as they can do plenty of things at home.

I should say that the effects of this latest Democratic proposal, which went through, to strangle Cuba have recently been reviewed in this month's issues, October, of two leading American medical journals, *Neurology* and the *Florida Journal of Medicine*, which simply review the effects. They point out the obvious thing. It turns out that about 90 percent of the trade that was cut off by the Clinton-Torricelli bill was food and humanitarian aid—food, medicine, and things like that. For example, one Swedish company which was trying to export a water filtration device to create vaccines was blocked by the U.S. because there's some part in it that's American-made. We really have to strangle them badly. We have to make sure that plenty of children die. One effect is a very sharp rise in infant mortality and child malnutrition. Another is a rare neurological disease that's spread over Cuba that everyone pretended they didn't know the reasons for (but of course they did, and now it's conceded: it's malnutrition), a disease which hasn't been seen since Japanese prison camps during the Second World War. So we're succeeding in that one. The anti-child, anti-family spirit is not just directed against kids in New York, but much more broadly.

I stress again that the difference in Europe (it is different in Europe, and there are reasons for it), one of the differences, is the existence of a strong trade union movement. That's one aspect of a more fundamental difference, namely, the U.S. is a business-run society to quite an unparalleled degree and, as a result, the vile maxim of the masters prevails to an unprecedented extent, pretty much as you'd expect. These are among the means that allow democracy to function formally, although by now most of the population is consumed by what the press calls "anti-politics," meaning hatred of government, disdain for political parties and the whole democratic process. That, too, is a great victory for the aristocrats in Jefferson's sense, that is, those who fear and distrust the people and wish to draw all power from them into the hands of the higher classes—by now that means into the hands of transnational corporations and the states and quasi-governmental institutions that serve their interests.

Another victory is the fact that the disillusionment, which is rampant, is anti-politics. A *New York Times* headline on this reads: "Anger and Cynicism Well Up in Voters as Hope Gives Way. Mood Turns Ugly as More People Become Disillusioned with Politics." Last Sunday's magazine section was
devoted to anti-politics (notice: *not* devoted to opposition to power and
authority, to the easily identifiable forces that have their hands on the lever
of decision-making and that cast their shadow on society as politics, as
Dewey put it; they have to be invisible). The *Times* has a story today again
about this topic where they quote some uneducated person who doesn’t get
the point. He says, “Yeah, Congress is rotten, but that’s because Congress is
big business, so of course it’s rotten.” That’s the story you’re *not* supposed to
see. You’re supposed to be anti-politics. The reason is that whatever you think
about the government, it’s the one part of the system of institutions that you
*can* participate in and modify and do something about (by law and principle,
you can’t do anything about investment firms or transnational corporations).
Therefore nobody better see that. You’ve got to be anti-politics. That’s
another victory.

Dewey’s observation that politics is the shadow cast on society by big
business, which was incidentally also a truism to Adam Smith, has now
become invisible. The force that casts the shadow has been pretty much
removed by the ideological institutions and is so remote from consciousness
that we’re left with anti-politics. That’s another severe blow to democracy
and a grand gift to the absolutist and unaccountable systems of power that
have reached levels that a Thomas Jefferson or a John Dewey could scarcely
imagine.

We have the usual choices. We can choose to be democrats in Thomas
Jefferson’s sense or we can choose to be aristocrats. The latter path is the easy
one. That’s the one that the institutions are designed to reward. It can bring
rich rewards, given the locus of wealth and privilege and power and the ends
that they very naturally seek. The other path, the path of the Jeffersonian
democrats, is one of struggle, often defeat, but also rewards of a kind that
can’t even be imagined by those who succumb to “the new spirit of the age,
gain wealth, forgetting all but self.” It’s the same now as it was 150 years ago,
when there was an attempt first to drive it into the heads of the factory girls
in Lowell and the craftsmen in Lawrence and so on. Today’s world is very far
from Thomas Jefferson’s. The choices it offers, however, have not changed in
any fundamental way.
Part I

Science: the genetic endowment
Why do you believe that language behavior critically depends on the existence of a genetically preprogrammed language organ in the brain?

There's a lot of linguistic evidence to support this contention. But even in advance of detailed linguistic research, we should expect heredity to play a major role in language because there is really no other way to account for the fact that children learn to speak in the first place.

What do you mean?

Consider something that everyone agrees to is due to heredity—the fact that humans develop arms rather than wings. Why do we believe this? Well, since nothing in the fetal environments of the human or bird embryo can account for the differences between birds and men, we assume that heredity must be responsible. In fact, if someone came along and said that a bird embryo is somehow "trained" to grow wings, people would just laugh, even though embryologists lack anything like detailed understanding of how genes regulate embryological development.

[A close parallel to embryology]

Is the role of heredity as important for language as it is for embryology?

I think so. You have to laugh at claims that heredity plays no significant role in language learning, because exactly the same kinds of genetic arguments hold for language learning as hold for embryological development.

I'm very much interested in embryology, but I've got just a layman's knowledge of it. I think that recent work, primarily in molecular biology, however, is seeking to discover the ways that genes regulate embryological development. The gene-control problem is conceptually similar to the problem of accounting for language growth. In fact, language development really ought to be called language growth, because the language organ grows like any other body organ.
Is there a special place in the brain and a particular kind of neurological structure that comprises the language organ?

Little enough is known about cognitive systems and their neurological basis, so caution is necessary in making any direct claims. But it does seem that the representation and use of language involve specific neural structures, though their nature is not well understood.

But clearly, environment plays some role in language development. What’s the relationship between heredity and environment for human language?

The language organ interacts with early experience and matures into the grammar of the language that the child speaks. If a human being with this fixed endowment grows up in Philadelphia, as I did, his brain will encode knowledge of the Philadelphia dialect of English. If that brain had grown up in Tokyo, it would have encoded the Tokyo dialect of Japanese. The brain’s different linguistic experience—English versus Japanese—would modify the language organ’s structure.

Roughly the same thing goes on in animal experiments, showing that different kinds of early visual experience can modify the part of the brain that processes visual information. As you may know, cats, monkeys, and humans have hierarchically organized brain-cell networks connected to the retina in such a way that certain cells fire only when there is a horizontal line in the visual field; other hierarchies respond only to vertical lines. But early experience can apparently change the relative numbers of horizontal– and vertical-line detectors. MIT psychologists Richard Held and Alan Hein showed some time ago, for example, that a kitten raised in a cage with walls covered by bold, black vertical lines will display good sensitivity to vertical lines as an adult but poor horizontal–line sensitivity. Lack of stimulation apparently causes the horizontal–line detectors to atrophy.

An even closer analogy exists between language growth and the growth that occurs in human beings after birth—for example, the onset of puberty. If someone came along and said, “Kids are trained to undergo puberty because they see other people,” once again everybody would laugh. Would we laugh because we know in great detail the gene mechanisms that determine puberty? As far as I can tell, no one knows much of anything about that. Yet we all assume that puberty is genetically determined.

Still, as your own example shows, environmental factors do play a major role in physiological growth.

And it goes without saying that the onset of puberty may well vary over quite a range depending on childhood diet and all kinds of other environmental
influences. Nonetheless, everyone takes for granted that the fundamental processes controlling puberty are genetically programmed. This is probably true of death as well. You may be genetically programmed to die at roughly a certain point; it's a reasonable theory.

Look, all through an organism's existence, from birth to death, it passes through a series of genetically programmed changes. Plainly language growth is simply one of these predetermined changes. Language depends upon genetic endowment that's on a par with the ones that specify the structure of our visual or circulatory systems, or determine that we have arms instead of wings.

*What about the linguistic evidence? What have you learned from studying human languages to corroborate your biological viewpoint?*

The best evidence involves those aspects of a language's grammar that are so obvious, so intuitively self-evident to everyone, that they are quite rightly never mentioned in traditional grammars.

*You mean that school grammars fill in the gaps left by heredity? They teach everything about French or Russian, for example, that can't be taken for granted by virtue of the fact that you're human?*

That's right. It is precisely what seems self-evident that is most likely to be part of our hereditary baggage. Some of the oddities of English pronoun behavior illustrate what I mean. Take the sentence, "John believes he is intelligent." Okay, we all know that he can refer either to John or to someone else, so the sentence is ambiguous. It can mean either that John thinks he, John, is intelligent, or that someone else is intelligent. In contrast, consider the sentence, "John believes him to be intelligent." Here the pronoun *him* can't refer to John; it can refer only to someone else.

Now, did anyone teach us this peculiarity about English pronouns when we were children? It would be hard to even imagine a training procedure that would convey such information to a person. Nevertheless, everybody knows it—knows it without experience, without training, and at quite an early age. There are any number of other examples that show that we humans have explicit and highly articulate linguistic knowledge that simply has no basis in linguistic experience.

*There's just no way that children can pick up this kind of information by listening to the grown-ups around them?*

Precisely. But let me give you another example. English contains grammatical constructions that are called parasitic gaps. In these constructions, you can
drop a pronoun and still understand the sentence in the same way as when the sentence contains a pronoun. Consider the sentence, “Which article did you file without reading it?” Notice that you can drop the pronoun it without changing meaning or grammaticality. You can say, “Which article did you file without reading?” But you can’t say, “John was killed by a rock falling on,” when you mean, “John was killed by a rock falling on him.” This time omitting the pronoun destroys both meaning and grammaticality.

Constructions of this type—where you can or cannot drop the pronoun—are very rare. In fact, they are so rare that it is quite likely that during the period a child masters his native language (the first five or six years of life), he never hears any of these constructions, or he hears them very sporadically. Nonetheless, every native speaker of English knows flawlessly when you can and can’t drop pronouns in these kinds of sentences.

So we’re faced with a mystery. How could anyone possibly learn enough about the English language to possess the rich and exotic grammatical knowledge that we all seem to possess by the time we are five or six years old?

There’s an obvious answer to that: the knowledge is built in. You and I can learn English, as well as any other language, with all its richness because we are designed to learn languages based upon a common set of principles, which we may call universal grammar.

What is universal grammar?
It is the sum total of all the immutable principles that heredity builds into the language organ. These principles cover grammar, speech sounds, and meaning. Put differently, universal grammar is the inherited genetic endowment that makes it possible for us to speak and learn human languages.

Suppose that somewhere else in the universe intelligent life has evolved. Could we, with our specialized language organ, learn the aliens’ language if we made contact with them?
Not if their language violated the principles of our universal grammar, which, given the myriad ways that languages can be organized, strikes me as highly likely.

Maybe we shouldn’t call it universal, then. But please explain what you mean.
The same structures that make it possible to learn a human language make it impossible for us to learn a language that violates the principles of universal grammar. If a Martian landed from outer space and spoke a language that violated universal grammar, we simply would not be able to learn that language the way that we learn a human language like English or Swahili. We
should have to approach the alien’s language slowly and laboriously—the way that scientists study physics, where it takes generation after generation of labor to gain new understanding and to make significant progress. We’re designed by nature for English, Chinese, and every other possible human language, but we’re not designed to learn perfectly usable languages that violate universal grammar. These languages would simply not be within our range of abilities.

How would you assess current research about universal grammar?

In the last three or four years there’s been a major conceptual change in the underlying theory. We now assume that universal grammar consists of a collection of preprogrammed subsystems that include, for example, one responsible for meaning, another responsible for stringing together phrases in a sentence, a third one that deals, among other things, with the kinds of relationships between nouns and pronouns that I discussed earlier. And there are a number of others.

These subsystems are not genetically preprogrammed down to the last detail. If they were, there would be only one human language. But heredity does set rather narrow limits on the possible ways that the rules governing each subsystem’s function can vary. Languages like English and Italian, for example, differ in their choice of genetically permitted variations that exist as options in the universal grammar. You can think of these options as a kind of linguistic menu containing mutually exclusive grammatical possibilities.

For example, languages like Italian have chosen the “null subject” option from the universal-grammar menu: In Italian you can say left when you mean “He left” or “She left.” English and French have passed up this option and chosen instead the rule that requires explicit mention of the subject.

What are some other grammatical options on the universal-grammar menu?

In English the most important element in every major grammatical category comes first in its phrase. In simple sentences, for example, we say “John hit Bill,” not “Bill hit John.” With adjectives we say “proud of John” not “John of proud”; with nouns we say “habit of drinking wine,” not “drinking wine of habit”; and with prepositions we say “to John,” not “John to.” Because heads of grammatical categories always come first, English is what is called a head-initial language.

Japanese is a head-final language. In Japanese you say “John Bill hit.” And instead of prepositions, there are postpositions that follow nouns: “John to,” rather than “to John.” So here’s another parameter the child’s got to learn from experience: Is the language head-initial or head-final?
These grammatical parameters are interconnected. You can't pick them any more freely than, say, a wine fanatic who insists on white wine with fish and red wine with meat is free to choose any main dish once he's decided on his wine. But grammars are even more sensitive than this culinary example might suggest. A slight change in just one of the universal grammar's parameters can have enormous repercussions throughout the language. It can produce an entirely different language.

Again, there's a close parallel to embryology, where a slight shift in the gene mechanisms regulating growth may be all that separates a fertilized egg from developing into a lion rather than a whale.

So what exactly would you say is the grammar of English?
The grammar of English is the collection of choices—head-initial rather than head-final, and null subject forbidden, for example—that define one of a limited number of genetically permitted selections from the universal-grammar menu of grammatical options. And of course there are all the lexical facts. You just have to learn your language's vocabulary. The universal grammar doesn't tell you that tree means "tree" in English.

But once you've learned the vocabulary items and fixed the grammatical parameters for English, the whole system is in place. And the general principles genetically programmed into the language organ just churn away to yield all the particular facts about English grammar.

It sounds as if your present research goal is to reach the point where you can define every human language's grammar simply by specifying its choices from the universal grammar's menu of options.

That's the kind of work you would hope would soon be done: to take a theory of universal grammar, fix the parameters one way or another, and then deduce from these parameters the grammar of a real human language—Japanese, Swahili, English, or whatnot.

This goal is only on the horizon. But I think that it is within our conceptual grasp. Undoubtedly the principles of universal grammar that we currently theorize are wrong. It would be a miracle if we were right this early along. But the principles are of the right type, and we can now begin to test our present system with complex examples to see what is wrong and to make changes that will improve our theory.

Judging from what you've said about language and heredity, it sounds as if you must be sympathetic to the aims of sociobiology. Is that a fair assumption?

Well, I think that in some respects the sociobiologists are on the right track.
I think it's true that a good deal of our personal behavior, social behavior, reactions, and so on are the reflection of genetic programs, and I think that it's a worthwhile enterprise to discover what these programs are. But while I think the general idea behind sociobiology is right, I also think that sociobiologists should be extremely cautious about the specific conclusions they draw from their research. Unfortunately, they often draw conclusions that are remote from evidence or theory.

*Many sociobiologists would dispute your note of caution. They claim that science has already gained enough information about the relationships between genes and behavior to permit some shrewd guesses about some of the ways heredity influences human social behavior. What do you say to these claims?*

I'm very skeptical. I haven't really studied the newer research in enough detail to make any informed judgment. But as for the earlier work—for example, E. O. Wilson's *Sociobiology*—well, about 90 percent of the book was on non-primates, and that looked interesting. There was a little bit on primates, which was more questionable. And there was a final chapter on humans that was completely empty. I don't think Wilson understood what he was talking about in that final chapter. There were real errors in what he did describe in any detail. I don't even understand why the chapter on humans was tacked onto the book. It didn't seem to belong.

*What do you think about the claim made by Wilson and others that there's an innate incest taboo in human beings?*

Sorting out what is and what is not genetically preprogrammed in human behavior is a very difficult task. As I said, I agree with the general approach of sociobiology. I think it's a reasonable approach. But it's important to be very cautious in making any claims about the role of heredity in human affairs—especially claims that would have social consequences if they were true. Science is held in such awe in our culture that every scientist has a special responsibility to make clear to the lay audience where his expert knowledge actually yields scientifically verifiable results and where he is guessing, indulging in sheer speculation, or expressing his own personal hopes about the success of his research. This is an important task because the lay audience is in no position to make these distinctions.

**[Piaget versus Skinner]**

Moving on to another controversial area in the behavioral sciences, how do you think your views differ from B. F. Skinner's behaviorist theory of language, learning, and mind?
Skinner used to take a relatively extreme position. At one point he held that, apart from the most rudimentary functions, essentially nothing of importance was genetically programmed in the human brain. Skinner agreed that humans were genetically programmed to see and hear, but that's about all. Accordingly he argued that all human behavior was simply a reflection of training and experience. This view can't possibly be correct. And, in fact, Skinner's approach has led absolutely nowhere in this area. It has yielded no theoretical knowledge, no non-trivial principles as far as I am aware—thus far, at any rate.

*Why is that?*

Because Skinnerian behaviorism is off the wall. It's as hopeless a project as trying to explain that the onset of puberty results from social training. But I really don't know whether Skinner still maintains this extreme position.

*What about the late Jean Piaget? Where do you stand on his theories of the child's mental development?*

Piaget's position is different: it's more complex than Skinner's. Piaget held that the child passes through cognitive states. According to my understanding of the Piagetian literature, Piaget and his supporters were never really clear about what produced a new stage of cognitive development. What they could have said—though they seemed to shy away from it—is that cognitive development is a genetically determined maturational process like puberty, for example. That's what the Piagetians ought to say. They don't like this formulation, but it seems right to me.

*In other words, Piagetians place much more emphasis on the role of experience in cognitive development than you do. Are there other differences as well?*

Yes. Piagetians maintain that the mind develops as a whole rather than as a modular structure with specific capacities developing in their own ways. This is a possible hypothesis, but in fact it seems to be extremely wrong.

*How do you mean?*

Well, consider the properties that determine the reference of pronouns that we talked about earlier. Once you ferret out these rules for pronouns, they seem to have nothing in common with the logical operations that Piagetians single out as being typical of the early stages of the child's mental development.

*In other words, a four-year-old who may not realize that the amount of water stays the same when you pour the contents of a low, wide glass into a tall, thin container nevertheless displays sophisticated logical abilities in his grasp of the complex rules of English grammar?*
Yes. And these abilities are independent of the logical capacities measured by tests. There's just no resemblance between what a child does with blocks and the kind of knowledge that he displays of English grammar at the same age. In fact, I think it's sort of quixotic to expect tight interconnections between language development and growth in other mental domains. By and large, body systems develop in their own ways at their own rates. They interact, but the circulatory system doesn't wait until the visual system reaches a certain stage of organization before proceeding to imitate the visual system's organizational complexity. Cognitive growth shouldn't be different in this respect either. As far as we know, it isn't.

[A riddle: free will]

What about the problem of free will? If genes play a crucial role in structuring the mind's abilities, is free will an illusion?

Well, that's interesting. Here, I think I would tend to agree with Descartes. Free will is simply an obvious aspect of human experience. I know—as much as I know that you're in front of me right now—that I can take my watch and throw it out the window if I feel like it. I also know that I'm not going to do that, because I want the watch. But I could do it if I felt like it. I just know this.

Now, I don't think that there's any scientific grasp, any hint of an idea, as to how to explain free will. Suppose somebody argues that free will is an illusion. Okay. This could be the case, but I don't believe that it's the case. It could be. You have to be open-minded about the possibility. But you're going to need a very powerful argument to convince me that something as evident as free will is an illusion. Nobody's offered such an argument or even pretended to offer such an argument.

So where does that leave us? We're faced with an overwhelmingly self-evident phenomenon that could be an illusion even though there's no reason to believe that it is an illusion. And we have a body of scientific knowledge that simply doesn't appear to connect with the problem of free will in any way.

Do you think that science will ever solve the problem of free will? Personally, I don't think so. People have been trying to solve the problem of free will for thousands of years, and they've made zero progress. They don't even have bad ideas about how to answer the question. My hunch—and it's no more than a guess—is that the answer to the riddle of free will lies in the domain of potential science that the human mind can never master because of the limitations of its genetic structure.
Can you spell out what you mean?
We can laugh at a rat that always fails a complicated maze. We can say, "The rat is always going to fail because it can't look at the maze in the right way. It's doomed to fail this test forever."

Similarly, some other intelligence, organized along hereditary lines different from our own, could look at the human race and say, "Those humans are always formulating the problem of free will in the wrong way. And the reason they don't understand the problem has something to do with their biological nature."

It could well turn out that free will is one maze that we humans will never solve. We may be like the rat that simply is not designed to solve a certain type of maze and will never do so even if it works on it for ten million years. Look, in principle, there are almost certainly true scientific theories that our genetically determined brain structures will prevent us from ever understanding. Some of these theories may well be ones that we would like to know about.

That's a discouraging prospect.
I don't see it as much of a reason to despair. In fact, I kind of like the conclusion. I'm not sure that I want free will to be understood.

[The new work in art and science: a crisis of modernism?]
Do you think that any other human abilities fall into the same mysterious category as free will?
In my opinion all of them do.

All of them?
Take, for example, the aesthetic sense. We like and understand Beethoven because we are humans, with a particular, genetically determined mental constitution. But that same human nature also means there are other conceivable forms of aesthetic expression that will be totally meaningless to us. The same thing is as true for art as it is for science: the fact that we can understand and appreciate certain kinds of art has a flip side. There must be all kinds of domains of artistic achievement that are beyond our mind's capacities to understand.

Do you think genetic barriers to further progress are becoming obvious in some areas of art and science?
You could give an argument that something like this has happened in quite a few fields. It was possible in the late nineteenth century for an intelligent per-
son of much leisure and wealth to be about as much at home as he wanted to be in the arts and sciences. But forty years later that goal had become hopeless. Much of the new work in art and science since then is meaningless to the ordinary person.

Take modern music—post-Schoenbergian music. Many artists say that if you don’t understand modern music it’s because you just haven’t listened enough. But modern music wouldn’t be accessible to me if I listened to it forever. Modern music is accessible to professionals and maybe to people with a special bent, but it’s not accessible to the ordinary person who doesn’t have a particular quirk of mind that enables him to grasp modern music, let alone make him want to deal with it.

*And you think that something similar has happened in some scientific fields?*

I think it has happened in physics and mathematics, for example. There’s this idea, which goes back to the French mathematicians known collectively as Bourbaki, that the development of mathematics was originally the exploration of everyday intuitions of space and number. That is probably somewhat true through the end of the nineteenth century. But I don’t think it’s true now. As for physics, in talking to students at MIT, I notice that many of the very brightest ones, who would have gone into physics twenty years ago, are now going into biology. I think part of the reason for this shift is that there are discoveries to be made in biology that are within the range of an intelligent human being. This may not be true in other areas.

*You seem to be saying two things. First, that whatever defines our common human nature will turn out to be a shared set of intuitions that we owe much of their strength and character to our common genetic heritage—our species genotype. Second, that the exhaustion of these intuitions in many areas is producing a peculiar kind of artistic and scientific specialization. Further progress in music or mathematics, for example, requires a scientist or artist with an unusual heredity.*

Well, it’s a different mental constitution—something like being a chess freak or a runner who can do a three-and-one-half-minute mile. It’s almost a matter of logic that this change is going to occur sooner or later. Has it happened already? That’s a matter of judgment. It’s a matter of looking at, say, the twentieth century and seeing whether there are signs of this change. Is it the case, for example, that contemporary work in the arts and sciences is no longer part of our common aesthetic and intellectual experience? Well, there are signs. But whether the signs are realistic or whether we are just going through a sort of sea change, and something will develop, who knows? Maybe a thousand years from now we’ll know.
Do these possibilities ever make you feel that you’re living in a time of creative stagnation?

I don’t really feel that. I think that there are too many possibilities. There’s too much human potential that hasn’t as yet been realized. And don’t forget that the vast majority of the human race hasn’t even entered into the world that we’re claiming may be finished. Who knows what the Third World will contribute to mankind’s store of science and art when it does catch up with the industrialized nations? We are well short of real stagnation or termination, but that doesn’t rule out the possibility that one might be able to perceive signs of such a change, or even be able to gain some insight into the ultimate limits to our intelligence by examining these signs.

How do these ideas fit into your choice of linguistics as a career?

My choice of linguistics was like most people’s choice of work. It was an accident that depended on whom I met, where I was, and that sort of thing. Linguistics, however, was a fortunate choice for me because I think that linguistics is an area where it is possible to construct a very rich science.

[One major scientific revolution with a lot of outgrowths]

How would you assess your own contributions to linguistics?

They seem sort of pre-Galilean.

Like physics before the scientific revolution in the seventeenth century?

Yes. In the pre-Galilean period, people were beginning to formulate problems in physics in the right way. The answers weren’t there, but the problems were finally being framed in a way that in retrospect we can see was right.

How “pre-” do you mean? Are you saying that linguistics is about where physics was in the sixteenth century? Or are we going back still further, to Aristotle and to other Greek ideas about physics?

We don’t know. It depends, you see, on when the breakthrough comes. But my feeling is that someday someone is going to come along and say, “Look, you guys, you’re on the right track, but you went wrong here. It should have been done this way.” Well, that will be it. Suddenly things will fall into place.

And then we’ll have a scientific revolution in linguistics?

I would think so, although to speak of scientific revolutions occurring outside a small core of the natural sciences is rather misleading. In fact, there was one major scientific revolution in the seventeenth century, and there have been a lot of outgrowths from it since then, including biochemistry and molecular
biology. But that's it. Nothing remotely resembling a scientific revolution has ever occurred in the social sciences.

*How should a scientist exercise responsibility for the uses of his research?*

The same way that any human does in any area of life.

*Do you think that there are areas in science so potentially vulnerable to social misuse that they should not be pursued?*

I think there are. For example, research on how to build more effective nuclear weapons. I don't think that should be pursued.

*What about fundamental research—say, basic research in molecular biology that might conceivably give the weapons makers of the next generation a new set of destructive tools?*

There's no simple answer to that question. Human beings are responsible for the predictable consequences of their actions. I would stop doing what I was doing if I discovered that I was engaged in an area of scientific research that I thought, under existing social conditions, would lead to, say, oppression, destruction, and pain.

*An anachronistic question, then: if you were a physicist in 1929, would you have done basic work in nuclear physics even though there was already speculation about the possibility of someday building an atom bomb?*

It's not an easy question. It's tempting to say, "Yes, because we have to understand the world." On the other hand, it could be that basic research in nuclear physics will lead to the extinction of the human race or to something close to that. So I don't think a glib answer is possible. Still, if you ask me specifically, I'm sure that my answer would have been yes. I would have done the work just out of interest and curiosity and with the hope that things would somehow work out. But whether that would have been the morally responsible path is not clear.
You represent an anthropological approach to linguistics. Do you think that linguistics can contribute to the understanding of philosophical problems of human nature and culture?

My feeling is that a human being or any complex organism has a system of cognitive structures which develop much in the way the physical organs of the body develop. That is, in their fundamental character they are innate; their basic form is determined by the genetic nature of the organism. Of course, they grow under particular environmental conditions, assuming a specific form that admits of some variation. Much of what is distinctive among human beings is a specific manner in which a variety of shared cognitive structures develop.

Perhaps the most intricate of these structures is language. In studying language we can discover many basic properties of this cognitive structure, its organization, and also the genetic predispositions which provide the foundation for its development.

So in this respect, linguistics, first of all, tries to characterize a major feature of human cognitive organization. And secondly, I think it may provide a suggestive model for the study of other cognitive systems. And the collection of these systems is one aspect of human nature.

[Is anything really "learned"?]

Language, then, is a key to human nature?
In Western scientific thought of the last several centuries there has been a tendency to assume that human nature is limited to the immediate observable physical structure of the organism. And that for other aspects of human nature, specifically for behavior, there are no genetically determined structures of comparable complexity to the directly observable physical organiza-
tion of the body. So human physical structures and intellectual structures are generally studied in different ways. The assumption is that physical structures are genetically inherited and intellectual structures are learned.

I think that this assumption is wrong. None of these structures is learned. They all grow, they grow in comparable ways; their ultimate forms are heavily dependent on genetic predispositions. If we understood, as we do not, the physical bases for these structures, I have little doubt that we would find structures in the brain for social interaction, or language, or analysis of personality—a whole variety of systems developed on the basis of specific biological endowment.

*Do you mean that all behavior is innate, genetically determined?*

No. But the basic structures for our behavior are innate. The specific details of how they grow would depend on interaction with the environment.

[**Thought without language**]

_Supposing that linguistics could describe one of such structures, would the findings apply to all our intellectual activity? Do we think only in language, or do there exist non-linguistic forms of thinking too?_

The analysis of linguistic structures could help in understanding other intellectual structures. Now, I don't think that there is any scientific evidence about the question whether we think only in language or not. But introspection indicates pretty clearly that we don't think in language necessarily. We also think in terms of visual images, we think in terms of situations and events, and so on, and many times we can't even begin to express in words what the content of our thinking is. And even if we are able to express it in words, it is a common experience to say something and then to recognize that it is not what we meant, that it is something else.

What does this mean? That there is a kind of non-linguistic thought going on which we then are trying to represent in language. And that we know that sometimes we fail.

_I've read several times that we think in language but "feel" in a non-linguistic way._

I know that it is false of me, at least if "language" refers (in my case) to English, and I assume that it is false of everyone else. I don't think that you would have any trouble at all in deciding that you are thinking of some event and then visualizing it happening with its consequences, and constructing a rational analysis of it without being able to verbalize adequately anything like its full complexity.
You used the expression "rational analysis." Do you believe that all our thinking is rational and linear?

I don't think that all thinking is a kind of rational structure. But I don't think that it is correct to identify the rational/non-rational dichotomy with the linguistic/non-linguistic dichotomy.

Can language be non-rational?

Yes. So those are two dimensions that do not correlate. It's true that language is in a sense linear, but that is as obvious as that perceptual space is three-dimensional.

[Language without communication]

As I understand it, language has an innate biological basis. Its use, however, is social. What do you think of the social functions of language? Is it primarily an instrument of communication?

I think that a very important aspect of language has to do with the establishment of social relations and interactions. Often, this is described as communication. But that is very misleading, I think. There is a narrow class of uses of language where you intend to communicate. Communication refers to an effort to get people to understand what one means. And that, certainly, is one use of language and a social use of it. But I don't think that is the only social use of language. Nor are social uses the only uses of language. For example, language can be used to express or clarify one's thoughts with little regard for the social context, if any.

I think that the use of language is a very important means by which this species, because of its biological nature, creates a kind of a social space, to place itself in interaction with other people. It doesn't have much to do with communication in a narrow sense, that is, it doesn't involve transmission of information. There is much information transmitted, but it is not the content of what is said that is transmitted. There is undoubtedly much to learn about the social use of language, for communication or for other purposes that are important. But at present there is not much in the way of a theory of sociolinguistics, of social uses of language, as far as I am aware.

What, then, in the field of linguistics are the greatest achievements?

I think that the most important work that is going on has to do with the search for very general abstract features of what is sometimes called universal grammar: general properties of language which reflect a kind of biological necessity rather than logical necessity, that is, properties of language
which are not logically necessary for such a system but which are essential invariant properties of human language and are known without learning. We know these properties but we don’t learn them. We simply use our knowledge of these properties as the basis for learning.

*Do we genetically inherit this knowledge?*

Yes, we must. In fact, by universal grammar I mean just that system of principles and structures which are the prerequisite for acquisition of language, and to which every language necessarily conforms.

*Does it mean that this genetic basis of language is universal?*

Yes, that’s right. But we are only one species. You can imagine a different world in which a number of species developed with different genetically determined linguistic systems. It hasn’t happened in evolution. What has happened is that one species has developed, and the genetic structure of this species happens to involve a variety of intricate abstract principles of linguistic organization which, therefore, necessarily constrain every language, and, in fact, create the basis for learning language as a way of organizing experience rather than constituting something learned from experience.

*Would such knowledge also be helpful in understanding human nature?*

It would, in two respects. For one thing, it is by itself a part of a study of human intelligence which is, perhaps, the central aspect of human nature. And, secondly, I think, it is a good model for studying other human properties, which ought to be studied by psychologists in the same way.

*Do you mean that psychology could benefit from linguistics? Could you explain how?*

One thing that you and I know is language. Another thing that you and I know is how objects behave in perceptual space. We have a whole mass of complex ways of understanding what is the nature of visual space. A proper part of psychology ought to be, and in recent years has been, an effort to try to discover the principles of how we organize the visual space. I would say that the same is true of every domain of psychology, of human studies. To understand, for example, how people organize social systems, we have to discover the principles that we create to make some societies intelligible.

*I understand that we could have a kind of “universal grammar” of non-linguistic forms of human behavior as well. But if, as you say, our behavior and language are*
heavily guided by universal principles, why, then, do they differ so much all around the world?

I don't think they differ so much. I think that as human beings we quite naturally take for granted what is similar among human beings and then pay attention to what differentiates us. That makes perfect sense for us as human beings. I suppose that frogs pay no attention to being a frog. They take it for granted. What interests a frog are differences among frogs. From our point of view they are all more or less the same, from their point of view they are all radically different.

Similarly with us. For us, we all are very different, our languages are very different, and our societies are very different. But if we could extract ourselves from our point of view and sort of look down at human life the way a biologist looks at other organisms, I think we could see it a different way. Imagine an extra-human observer looking at us. Such an extra-human observer would be struck precisely by the uniformity of human languages, by the very slight variation from one language to another, and by the remarkable respects in which all languages are the same. And then he would notice, observing us, that we do not pay attention to that because for the purpose of human life it is quite natural and appropriate just to take for granted everything that is common. We don't concern ourselves with that, all we worry about are differences.

[Limited scientific capacity]

Would this extra-human observer think the same way about our symbols, ideas, needs, and values?

Absolutely. I think he would be struck with the uniformity of human societies in every aspect. And there is more than that. Let's imagine again an observer looking at us without any preconceptions. I think he would be struck by the fact that although human beings have the capacity to develop scientific knowledge, it must be a very limited capacity because it is done only in very narrow and specific domains. There are huge areas where the human mind is apparently incapable of forming sciences or at least has not done so. There are other areas—so far, in fact, one area only—in which we have demonstrated the capacity for true scientific progress.

Physics?

Physics and those parts of other fields that grow out of physics: chemistry, the structure of big molecules—in those domains there is a lot of progress. In many other domains there is very little progress in developing real scientific understanding.
Isn't because humans want to exercise control over the physical world?
I don't think so. I think that probably reflects something very special about
the nature of our minds. There is no evolutionary pressure to create minds
capable of forming sciences; it just has happened. Evolutionary pressure has
not led to higher rates of reproduction for people capable of solving scientific
problems or creating new scientific ideas. So if, in fact, the science-forming
capacities evolved for other reasons, it would not be too surprising if those
particular structures that have developed proved to be rather special in their
nature, reflecting the contingencies of their evolution or the working of physi-
cal law.

Do you mean that we may, by virtue of this accidental origin of science, be capable
of development of some disciplines of science and incapable of others, and that we
are not conscious of that?
Yes. As human beings, we are not too conscious of that because we naturally
assume that our mental structures are universal. But I suppose an outside
biologist looking at us would see something very different. He would see
that, like other organisms, we have a narrow sphere within which we are very
good, but that sphere is very limited. And that, in fact, the very achievements
that we can have within that sphere are related to lack of achievements in
other spheres.

To construct a scientific theory from the data and to be able to recognize
that it is a reasonable theory is possible only if there are some very sharp
restrictive principles that lead you to go in one direction and not in another
direction. Otherwise you wouldn't have science at all, merely randomly chosen
hypotheses. Then human genius may have limitless opportunities to
develop in one direction, but at the same time this genius will not go in other
directions. And those two considerations are related. The very properties of
the human mind that provide an enormous scope for human genius in some
domains will serve as barriers to progress in other domains, just as the prop-
erties that enable each child to acquire a complex and highly articulated
human language block the acquisition of other imaginable linguistic systems.

[A condition of (temporary) ignorance?]
What domains do you consider the most backward and neglected?
I think that we have basically nothing in the field of human behavior. Maybe
that is just a condition of temporary ignorance. But it may be that we are sim-
ply not intellectually equipped to develop such a theory.
Do you mean that not only do we not have tools to develop such a theory but we are not capable of creating the necessary tools?

Yes. Intellectual tools. Our minds are specifically adapted to developing certain theories, and we have a science if the theories which are available to our minds happen to be close to true. Well, there is no particular reason to suppose that the intersection of true theories and theories that are accessible to the mind is very large. It may not be very large.

Can we know at least how large it is?

It is a question of biology how large that intersection is. And if humans are organisms like every other organism, which they are, then we would expect precisely that if there are some domains where real scientific progress is possible, then there are others where it is not.
Chapter 3

A really new way of looking at language (November 1987)

Dr. Chomsky, many of our teachers are unfamiliar with your work, because the study of linguistics is not required in their professional training. It would be helpful and would arouse some interest in this field if you answered the following questions.

[Four central questions: innate knowledge and its creative use]

Your 1957 publication entitled Syntactic structures presented a completely new way of looking at language. What was it that started you on this exploration? One may be interested in language for many different reasons and from many different points of view. My own interest has been dominated by several central questions: (1) What is it that we know when we know a language? (2) How is this knowledge acquired? (3) How is this knowledge put to use? (4) What is the physical basis, in neural mechanisms, for systems of knowledge and use of language? The fourth question remains on the horizons of research. Let us keep, then, to the first three.

In the early 1950s, typical answers to these questions would have been something like this. (1) A language is a certain system of habits and skills; to know a language is to have mastered these skills. (2) Knowledge of language is acquired by such mechanisms as conditioning, association, practice in exercising skills, et cetera. (3) Use of language is exercise of the skills that have been mastered. Within psychology, the dominant framework of thinking was one or another variety of behaviorism. Within linguistics, the dominant assumptions were structuralist. As a theoretical discipline, linguistics was devoted to devising principles of analysis that could be used to provide an organized and systematic account of the elements of a language, their relations, the orders in which they appear, the way they are grouped into larger elements, and so on.
It seemed to me clear that these approaches were entirely inadequate—in fact, that the entire conception was completely wrong. Normal use of language is not an exercise of any habit or skill. Typically, use of language is creative in the sense that it constantly involves the production and interpretation of new forms—new in the experience of the language user or even in the history of language. This is not an exotic phenomenon, but rather the norm. Thus readers of these sentences may not have seen any of them before, or anything like them, yet they have no difficulty recognizing them as sentences of their language and assigning to them a specific meaning. They do this in the same way as other speakers of (similar varieties of) English. If these sentences were modified in some arbitrary way—say, in reverse order—they would be equally novel for the reader, but they would be gibberish. It is easy to show that speakers of a language, even young children, assign specific and precise meanings to very simple sentences that are entirely new in their experience.

Consider, for example, the following sentences to illustrate what is in fact the norm in language use:

(1) We expect to like each other
(2) John wonders who [we expect to like each other]
(3) John is too clever to catch Bill
(4) John is too clever to expect anyone to catch Bill
(5) John is too clever to catch
(6) John is too clever to expect anyone to catch
(7) John is too clever to meet anyone who caught

In case 1, we know that the sentence means, roughly, that each of us expects that we will like the others of us. In case 2, the very same sentence is embedded in the context “John wonders who—,” yet we interpret it quite differently. The reciprocal phrase “each other” does not relate to we, but rather to the more remote phrase who. The meaning is something like “John wonders which people are such that we expect that each of those people will like the others of those people.” In example 3, we understand that John is to do the catching; in 4, John is to do the expecting. But in 5 and 6, which differ from 3 and 4 only by the deletion of the final noun, the meaning is quite different: it is not John who is to do the catching and expecting, but someone else, maybe us; John is the person to be caught. (To understand sentence 6 often takes a moment’s reflection, whatever that means exactly.) Sentence 7 appears to be of the same complexity and roughly the same form as 6, but it is complete gibberish unless we understand catch quite differently, as in “he catches for the Yankees.”
These are very short and simple sentences. We understand them in a precise and explicit way even though they may be novel in our experience and unlike others that we have heard (in fact, we typically have no idea what sentences we have heard, apart from conventional greetings and the like). Children are not instructed to interpret these sentences in the ways they do, nor are foreigners learning English. Examples such as these do not appear in grammar books or teaching texts, and would only confuse people if they did appear; in fact, the properties of these sentences were not even noticed until recently. The sentences seem familiar, but that is not because we have come across others resembling them.

In fact, inspection of actual texts would show that such constructions are quite rare. Plainly, we cannot be carrying out these accomplishments by habit, and there is no mere skill involved. Our inability to associate “each other” with “we” in 2 is not a lack of ability; it is not that we haven’t practiced enough, or that we are too weak, or that we should try harder. Furthermore, such examples show that no notion of “analogy” or “similarity” will be of any help at all in explaining the core properties of language. Thus the phrase given within brackets in 2 is identical with 1, and thus is surely analogous to it in any reasonable sense of analogy, but it is interpreted quite differently. Such examples also show that the entire framework of behaviorist psychology is simply irrelevant to normal linguistic behavior, though to demonstrate this point, much simpler observations suffice, as they suffice to demonstrate the irrelevance of behaviorist doctrine to behavior generally, apart from its peripheral aspects.

Attention to the facts shows that the answers to the three questions posed must be entirely different from those that were conventional at the time. Recognition of such facts as these in various domains, and ideas as to how to account for them, led to the “cognitive turn” in psychology in the mid-1950s and to the development of generative grammar within linguistics, one primary factor in this “cognitive revolution,” as it is sometimes called. It seems that the right answers to the three questions are something like this: (1) to know a language is to have mastered a system of rules and principles; (2) the child acquires this knowledge on the basis of a very rich biological endowment that determines, quite precisely, the kinds of systems that can develop in language growth; (3) use of language is rule-governed behavior. At the heart of language, and much of human action and thought, is a system of mental representations and computations. The goal of linguistics, then, is to discover these systems, and more deeply, to discover the fixed, invariant biological endowment that enables each child to develop a very rich and highly
articulated system of knowledge on the basis of quite fragmentary and limited evidence.

These ideas were by no means entirely novel. In fact, they recall a rich tradition that had long been forgotten by the mid-1950s and is still little known.

[A system of mental computations]

For those of us who are not linguists, how would you state the basic idea of your generative transformational theory?

The basic idea is that knowledge of language involves a system of rules and representations, of mental computation, linked to the motor and perceptual apparatus; and that much of this system is fixed and invariant, just as the essential form and organization of the human body is fixed and invariant, determined by our biological endowment. To develop these ideas further would lead us to the principles that determine the form and meaning of sentences. Phenomena such as those illustrated above are common to the languages of the world, so far as we know. Notice that in all of these examples certain elements are missing in the physical form, but understood. Thus in 1 and 2 the subject of like is not expressed but is understood; it is understood differently in the two cases. The same is true in the other examples. The principles of language determine where these missing elements must appear, and how they must be understood. They are missing only in the sense that they are not pronounced: the mind "sees" them and uses them in its mental computations, and they are just as real as the elements John, we, et cetera, which happen to be linked to the vocal apparatus in the system of mental computation.

Languages of course differ; English is not Japanese. But it seems that languages differ only in their lexical choices and in selection of certain options that are not fully determined by the fixed principles of our biological endowment. Thus in every language, verbs take objects; but the object may follow the verb, as in English, or precede it, as in Japanese. This option holds not only for verb phrases, but for all phrases. Thus English has prepositions, while Japanese has postpositions. Japanese in many ways seems a mirror image of English, and seems superficially to differ in many other respects as well. But the systems are cast from the same mold. The same is true of other languages, so far as we know, however different they may seem superficially. Indeed, we know that this must be the case, or children would never be able to learn any of these languages. A language can be acquired, in all of its richness and complexity, because the child basically already knows it as part of its
biological endowment. The same is true much more broadly, in every domain of human achievement.

[The most complex and intricate biological system]
You have written that a major contribution of the study of language is in understanding of the character of mental processes, i.e., "Language is a mirror of the mind." At the present point in your work, what important reflections are in this mirror?

The idea that language is a mirror of mind is a traditional one which has received expression in various ways over the centuries. I have never felt that this metaphor should be taken too literally. Rather, it seems that language is one essential component of the human mind. The human brain is the most complex and intricate biological system we know. When we study its properties and manifestations, we are studying what we call "mind." The human mind appears to consist of different systems, each intricate and highly specialized, with interactions of a kind that are largely fixed by our biological endowment; in these respects it is like all other known biological systems—the physical organs of the body below the neck, for example.

One of these systems is the human language faculty. It is particularly interesting because it is a common property of humans, with little if any variation apart from quite serious impairment, and it appears to be unique to the human species; contrary to much mythology, other organisms appear to lack even the most rudimentary features of the human language faculty, a fact that has been shown quite dramatically in recent studies of apes. Thus human language appears to be a true "species property," and one that enters in a central way into thought and understanding. But it is not, in my view, a "mirror of mind"; rather, an essential component of the human mind, a crucial element of the human essence.

[A very radical departure from the tradition]
In Language and mind, you wrote in essence that as research in grammar continues, we may expect boundaries that seem clear today to shift for a new basis for organization of grammar. Now, in 1987, which, if any, have shifted?

There have been many changes in our conception of the nature of language over the past thirty years. Early work in generative grammar, as in Syntactic structures, was in some respects similar to traditional grammar. Specifically, it involved rules that were specific to particular constructions and to particular languages. Thus the rule for forming questions in English, or passives in English, was language-particular and construction-particular, just as in a tra-
ditional grammar there will be a chapter on passives, one on questions, and so on. The so-called rules of traditional grammars are really only hints, understandable to an intelligent reader who already knows the language, just as the rules in a teaching grammar presuppose that the learner already knows the basic structure of language. Generative grammar, in contrast, attempted to make explicit what is presupposed—indeed, what was not even recognized to exist—in traditional and pedagogic grammar. But apart from this crucial distinction, the rule systems of early generative grammar had a rather familiar look to them.

More recent work has led to the conclusion that the rules of traditional and early generative grammar are an artifact, not real elements of the mind/brain. There appear to be no construction-particular rules, but rather very general principles, such as the principles for interpreting missing elements, that are common to all languages and all constructions. Languages differ in the manner indicated earlier, but not by selection of different rules. There is thus, in recent work, a very radical departure from the tradition of study of language over the past several thousand years.

*Reading teachers are concerned with language acquisition, since oral language provides a basis for reading. In your writings, you state that at birth, children are genetically programmed to acquire language and that it is innate. Is then the heavy emphasis placed on language development by nursery schools and kindergartens justified?*

There is little doubt that the basic structure of language and the principles that determine the form and interpretation of sentences in any human language are in large part innate. But it does not follow that emphasis on language development is misplaced. If a child is placed in an impoverished environment, innate abilities simply will not develop, mature, and flourish. To take an extreme case, a child who wears a cast on its legs for too long will never learn to walk, and a child deprived of appropriate nutrition may undergo puberty only after a long delay, or never, though there is no doubt that walking and sexual maturation are innately determined biological properties. Similarly, a child brought up in an institution may have ample experience and nutrition but still may not develop normally, either physically or mentally, if normal human interaction is lacking.

It is a traditional insight that teaching is not like filling a cup with water, but more like enabling a flower to grow in its own way; but it will not grow and flourish without proper care. Language development, like all human development, will be heavily determined by the nature of the environment,
and may be severely limited unless the environment is appropriate. A stimulating environment is required to enable natural curiosity, intelligence, and creativity to develop, and to enable our biological capacities to unfold. The fact that the course of development is largely internally determined does not mean that it will proceed without care, stimulation, and opportunity.

*We realize that linguistics is the scientific study of language and not a recipe for language instruction. But if teachers in primary grades were familiar with your work, what kind of changes or even emphasis might they make in reading instruction? What general suggestions would help them?*

I'm hesitant even to suggest an answer to this question. Practitioners have to decide for themselves what is useful in the sciences and what is not. As a linguist, I have no particular qualifications or knowledge that enables or entitles me to prescribe methods of language instruction. As a person, I have my own ideas on the topic, based on my own experience (in part as a teacher of language to children), introspection, and personal judgment, but these should not be confused with some kind of professional expertise, presented from on high. My own feeling, for what it is worth, is that at any level, from the nursery to graduate school, teaching is largely a matter of encouraging natural development. The best “method” of teaching is to make it clear that the subject is worth learning, and to allow the child's—or adult's—natural curiosity and interest in truth and understanding to mature and develop. That is about 90 percent of the problem, if not more. Methods of instruction may influence the residue.

**[Problems of the society at large]**

*Many of the early beliefs concerning the nature of language of “disadvantaged children” have been disproven by research, i.e., that Black English is deficient or inferior; that it fails to provide an adequate basis for abstract thinking. Yet speakers of Black English want their children to learn standard English. Is this best done by direct instruction or by osmosis?*

Anyone who was familiar with language took for granted, or should have taken for granted, that so-called Black English is simply a language on a par with my urban Philadelphia dialect of English, the English of [the] high table at Oxford, Japanese, Greek, et cetera. If race, class, and other power relations were to change, Black English might emerge as the standard language, and what I speak would be regarded as defective. None of this has anything to do with the nature of the languages. The idea that Black English, or my urban dialect, or any other language fails to provide an adequate basis for
abstract thinking is utterly implausible, and I think one should be extremely skeptical about claims to the contrary. Typically, they are based on gross misunderstanding.

Questions nevertheless arise about what should be taught in the schools. If speakers of Black English came to dominate and control American society, so that my speech would be regarded as nonstandard and defective, then it might be argued that my children should be taught the language of the dominant culture, Black English, not the particular variety of English that I speak. The decision would not be based on characteristics of the language, or on some ludicrous beliefs about how certain languages stand in the way of abstract thought, but rather on other considerations. Thus one would have to ask whether my children would suffer in the real world of power, authority, inequality, and coercion if they were not to acquire relevant features of the dominant culture. Surely this consideration would have to be given weight if the welfare of my children were to be taken into account. On the other hand, if my children were to be instructed in what amounts to a foreign language, their intellectual development might be inhibited; there is little doubt, for example, that it would be harder for them to learn to read if the language of instruction were Black English, which is not the language that they acquired in their pre-school environment. The same questions would arise if I had moved to Italy when my children were young. Exactly how these factors should be balanced is not a simple question, and there is no reason to believe that there is any uniform answer to them; too many factors vary.

My own personal judgment, for what it is worth, is that speakers of a language that is not that of groups that dominate some society should probably be taught in their own languages at least at very early stages, until basic skills are acquired, and should be taught in the dominant language at later stages, so that they can enter the society without suffering disadvantages that are rooted in prevailing power, privilege, and domination. One might hope to modify these features of the dominant society, but that is another question. Children have to be helped to function in the world that exists, which does not mean, of course, that they—or others—should not try to change it to a better world.

I am not presuming to express any firm judgments or to offer general proposals. There are a great many factors to consider, and the answers will surely not be the same for every person or every circumstance. We have to do here not with the problems of language but of the society at large, and they have to be confronted in these terms.
Chapter 4

Perspectives on language and mind (October 1999)

It would only be appropriate to begin with some of the thoughts of the master, who does not disappoint us, even though the topics I want to discuss are remote from his primary concerns. Galileo may have been the first to recognize clearly the significance of the core property of human language, and one of its most distinctive: the use of finite means to express an unlimited array of thoughts. In his *Dialogo*, he describes with wonder the discovery of a means to communicate one's “most secret thoughts to any other person . . . with no greater difficulty than the various collocations of 24 little characters upon a paper.” This is the greatest of all human inventions, he writes, comparable to the creations of a Michelangelo—of whom Galileo himself was a virtual reincarnation, according to the mythology constructed by his student and biographer Viviani, memorialized in Kant's image of the reincarnation of Michelangelo in Newton through the intermediary of Galileo.

*A product of biological evolution: discrete infinity*

Galileo was referring to alphabetic writing, but the invention succeeds because it reflects the nature of the language that the little characters are used to represent. Shortly after his death, the philosopher-grammarians of Port Royal took that further step, referring to the “marvellous invention” of a means to construct “from 25 or 30 sounds that infinity of expressions, which bear no resemblance to what takes place in our minds, yet enable us to reveal [to others] everything that we think, and all the various movements of our soul.” The “infinity of expressions” is a form of discrete infinity, similar to that of the natural numbers. The Port Royal theorists recognized that “the marvellous invention” should be the central topic of the study of language, and pursued the insight in original ways, developing and applying ideas that became leading topics of inquiry only much later. Some were revived and
reshaped in Frege's concept of *Sinn* and *Bedeutung*, others in the phrase structure and transformational grammars of the latter part of this century.

From a contemporary point of view, the term *invention* is of course out of place, but the core property of language that Galileo and his successors identified is no less marvelous as a product of biological evolution, proceeding in ways that lie well beyond current understanding.

The same property of human language, and its apparent biological isolation, also intrigued Charles Darwin when he turned his attention to human evolution. In his *Descent of man*, Darwin wrote that with regard to understanding of language, dogs appear to be “at the same stage of development” as one-year-old infants, “who understand many words and short sentences but cannot yet utter a word.” There is only one difference between humans and other animals in this regard, Darwin held: “man differs solely in his almost infinitely larger power of associating together the most diversified sounds and ideas.” This “association of sounds and ideas” is the “marvellous invention” of seventeenth-century commentators, which Darwin hoped would somehow be incorporated within the theory of evolution.

The theory of evolution, not necessarily the workings of natural selection; and surely not these alone, since, trivially, they operate within a physical channel, the effects of which are to be discovered, not stipulated. It is also worth recalling that Darwin firmly rejected the hyperselectionism of his close associate Alfred Russell Wallace, which has been revived in some contemporary popular versions of so-called neo-Darwinism. Darwin repeatedly emphasized his conviction “that natural selection has been the main but not the exclusive means of modification,” taking explicit note of a range of possibilities, including non-adaptive modifications and unselected functions determined from structure—all topics that are alive in contemporary theory of evolution.

[The faculty of language as a “language organ”]

An interest in the nature and origins of the “marvellous invention” leads to investigation of the component of the human brain that is responsible for these unique and indeed wondrous achievements. This language organ or faculty of language, as we may call it, is a common human possession, varying little across the species as far as we know, apart from very serious pathology. Through maturation and interaction with the environment, the common language faculty assumes one or another state, apparently stabilizing in several stages, finally at about puberty. A state attained by this faculty resembles what is called a language in ordinary usage, but only partially: we are no longer sur-
prised when notions of common sense find no place in the effort to understand and explain the phenomena they deal with in their own ways, another achievement of the Galilean revolution, now taken for granted in the hard sciences but still considered controversial beyond—inappropriately, I think.

The internal language, in the technical sense, is a state of the faculty of language. Each internal language has the means to construct the mental objects that we use to express our thoughts and to interpret the limitless array of overt expressions that we encounter. Each of these mental objects relates sound and meaning in a particular structured form. A clear understanding of how a finite mechanism can construct an infinity of objects of this kind was reached only in this century, in work in the formal sciences. These discoveries made it possible to address in explicit ways the task that was identified by Galileo, the Port Royal theorists, Darwin, and some others—a scattering of others, as far as I have been able to discover. For the past half century, a good part of the study of language has been devoted to the investigation of such mechanisms—called “generative grammars” in the study of language—an important innovation in the long and rich history of linguistics, though, as always, there are precedents, in this case tracing back to ancient India.

Darwin’s formulation is misleading in several respects. It is now understood that the linguistic achievements of infants go far beyond what Darwin attributed to them, and that non-human organisms have nothing like the linguistic capacities he assumed. Furthermore, association is not the appropriate concept. And his phrase “differs solely” is surely inappropriate, though “primarily” might be defensible: the property of discrete infinity is only one of many essential differences between human language and animal systems of communication or expression—for that matter, other biological systems rather generally. And of course the phrase “almost infinite” must be understood to mean “unbounded,” that is, “infinite” in the relevant sense.

Nonetheless, Darwin’s point is basically correct. Essential characteristics of human language, such as the discrete-infinite use of finite means that intrigued him and his distinguished predecessors, appear to be biologically isolated and a very recent development in human evolution, millions of years after the separation from the nearest surviving relatives. Furthermore, the “marvellous invention” must be present in Darwin’s one-year-old, indeed in the embryo, even if not yet manifested, just as the capacity for binocular vision or undergoing puberty is part of the genetic endowment, even if manifested only at a particular stage of maturation and under appropriate environmental conditions. Similar conclusions seem highly plausible in the case of other aspects of our mental nature as well.
The concept of mental nature underwent an important revision in the Galilean era. It was formulated in a novel way, in fairly clear terms—and, I think it can be argued, for the last time: the concept soon collapsed, and nothing has replaced it since. The concept of mind was framed in terms of what was called “the mechanical philosophy,” the idea that the natural world is a complex machine that could in principle be constructed by a skilled artisan. “The world was merely a set of Archimedean simple machines hooked together,” Galileo scholar Peter Machamer observes, “or a set of colliding corpuscles that obeyed the laws of mechanical collision.” The world is something like the intricate clocks and other automata that excited the scientific imagination of that era, much as computers do today—and the shift is, in an important sense, not fundamental, as Alan Turing showed sixty years ago.

Within the framework of the mechanical philosophy, Descartes developed his theory of mind and mind-body dualism, still the locus classicus of much discussion of our mental nature—a serious misunderstanding, I believe. Descartes himself pursued a reasonable course. He sought to demonstrate that the inorganic and organic world could be explained in terms of the mechanical philosophy. But he argued that fundamental aspects of human nature escape these bounds and cannot be accommodated in these terms. His primary example was human language: in particular, that “marvellous invention” of a means to express our thoughts in novel and limitless ways that are constrained by our bodily state but not determined by it; that are appropriate to situations but not caused by them, a crucial distinction; and that evoke in others thoughts that they could have expressed in similar ways—a collection of properties that we may call the creative use of language.

More generally, Descartes held, “free will is in itself the noblest thing we can have” and all that “truly belongs” to us. As his followers expressed the thesis, humans are only “incited and inclined” to act in certain ways, not “compelled” (or random). In this respect they are unlike machines—a category that includes the entire non-human world, they held.

For the Cartesians generally, the creative aspect of ordinary use of language was the most striking illustration of our noblest gift. It relies crucially on the “marvellous invention,” the mechanisms responsible for providing the infinity of expressions for expressing our thoughts and for understanding other people, though it relies on far more than that.

That we ourselves have these noble qualities of mind we know by reflection; we attribute them to others, in the Cartesian model, by best-theory arguments, as they are now called: only in this way can we deal with the problem of “other minds.” Body and mind are two substances, one an extended
substance, the other a thinking substance, res cogitans. The former falls within the mechanical philosophy, the latter not.

Adopting the mechanical philosophy, "Galileo forged a new model of intelligibility for human understanding," Machamer argues plausibly, with "new criteria for coherent explanations of natural phenomena" based on the picture of the world as an elaborate machine. For Galileo, and leading figures in the early modern scientific revolution generally, true understanding requires a mechanical model, a device that an artisan could construct. Thus he rejected traditional theories of tides because we cannot "duplicate [them] by means of appropriate artificial devices."

[Incomprehensibility of the natural world]
The Galilean model of intelligibility has a corollary: when mechanism fails, understanding fails. The apparent inadequacies of mechanical explanation for cohesion, attraction, and other phenomena led Galileo finally to reject "the vain presumption of understanding everything." Worse yet, "there is not a single effect in nature . . . such that the most ingenious theorist can arrive at a complete understanding of it." For mind, the Galilean model plainly fails, as Descartes convincingly showed. Though much more optimistic than Galileo about the prospects for mechanical explanation, Descartes nevertheless speculated that the workings of res cogitans may lie beyond human understanding. He thought that we may not "have intelligence enough" to understand the creative aspect of language use and other manifestations of mind, though "there is nothing that we comprehend more clearly and perfectly" than our possession of these capacities, and "it would be absurd to doubt that of which we inwardly experience and perceive as existing within ourselves, just because we do not comprehend a matter which from its nature we know to be incomprehensible." He goes too far in saying that we "know" the matter to be incomprehensible, but anyone committed to the belief that humans are biological organisms, not angels, will recognize that human intelligence has specific scope and limits, and that much of what we seek to understand might lie beyond these limits.

The fact that res cogitans escapes the model of intelligibility that animated the modern scientific revolution is interesting, but in a way not important. The reason is that the entire model quickly collapsed, confirming Galileo's worst fears. Newton demonstrated, to his dismay, that nothing in nature falls within the mechanical model of intelligibility that seemed to be the merest common sense to the creators of modern science. Newton regarded his discovery of action at a distance, in violation of the basic princi-
amples of the mechanical philosophy, as "so great an Absurdity that I believe no Man who has in philosophical matters a competent Faculty of thinking, can ever fall into it." Nonetheless, he was forced to conclude that the absurdity "does really exist." "Newton had no physical explanation of it at all," two contemporary scholars observe, a deep problem for him and eminent contemporaries who "accused him of reintroducing occult qualities" with no "physical, material substrate" that "human beings can understand" (Betty Dobbs and Margaret Jacob). In the words of one of the founders of modern Galilean studies, Alexander Koyré, Newton demonstrated that "a purely materialistic or mechanistic physics" is "impossible."

To the end of his life, Newton sought to escape the absurdity, as did Euler, D'Alembert, and many since, but in vain. Nothing has lessened the force of David Hume's judgment that by refuting the self-evident mechanical philosophy, Newton "restored [nature's] ultimate secrets to that obscurity in which they ever did and ever will remain." Later discoveries, introducing still more extreme absurdities, only entrenched more deeply the realization that the natural world is not comprehensible to human intelligence, at least in the sense anticipated by the founders of modern science.

While recognizing the absurdity, Newton defended himself vigorously against the criticism of continental scientists—Huygens, Leibniz, and others—who charged him with reintroducing the "occult qualities" of the despised Scholastic philosophers. The occult qualities of the Aristotelians were vacuous, Newton wrote, but his new principles, while unfortunately occult, nevertheless had substantive content. "To derive two or three general Principles of motion from Phaenomena, and afterwards to tell us how the properties and Actions of all corporal Things follow from those manifest Principles, would be a very great step in Philosophy," Newton wrote, "though the Causes of those Principles be not yet discover'd." Newton was formulating a new and weaker model of intelligibility, one with roots in what has been called the "mitigated skepticism" of the British scientific tradition, which had abandoned as hopeless the search for the "first springs of natural motions" and other natural phenomena, keeping to the much more modest effort to develop the best theoretical account we can.

The implications for the theory of mind were immediate, and immediately recognized. Mind-body dualism is no longer tenable, because there is no notion of body. It is common in recent years to ridicule Descartes's "ghost in the machine" and to speak of "Descartes's error" in postulating a second substance: mind, distinct from body. It is true that Descartes was proven wrong, but not for those reasons. Newton exorcised the machine; he left the ghost
intact. It was the first substance, extended matter, that dissolved into mysteries. We can speak intelligibly of physical phenomena (processes, etc.), as we speak of the real truth or the real world, but without supposing that there is some other truth or world. For the natural sciences, there are mental aspects of the world, along with optical, chemical, organic, and others. The categories need not be firm or distinct, or conform to commonsense intuition, a standard for science that was finally abandoned with Newton's discoveries along with the demand for intelligibility as conceived by Galileo and early modern science rather generally.

In this view, mental aspects of the world fall together with the rest of nature. Galileo had argued that "at present we need only . . . investigate and demonstrate certain of the properties of motion which is accelerated," putting aside the question of "the cause of the acceleration of natural motion." After Newton, the guiding principle was extended to all of science. The eighteenth-century English chemist Joseph Black recommended that "chemical affinity be received as a first principle, which we cannot explain any more than Newton could explain gravitation, and let us defer accounting for the laws of affinity, till we have established such a body of doctrine as [Newton] has established concerning the laws of gravitation." Chemistry proceeded along that course. It established a rich body of doctrine, achieving its "triumphs . . . in isolation from the newly emerging science of physics," a leading historian of chemistry points out (Arnold Thackray). Well into this century, prominent scientists regarded molecules and chemical properties as basically calculating devices; understanding of these matters was then vastly beyond anything known about mental reality. Unification was finally achieved sixty-five years ago, but only after physics had undergone radical revision, departing even more from commonsense intuitions.

Notice that it was unification, not reduction. Chemistry not only seemed irreducible to the physics of the day, but indeed was.

[Important lessons for the cognitive sciences]
All of this conveys important lessons for the study of mind. Though they should be far more obvious to us today, they were already clear after Newton's demolition of the mechanical philosophy. And they were drawn at once, pursuing John Locke's suggestion that God might have chosen to "superadd to matter a faculty of thinking" just as he "annexed effects to motion which we can in no way conceive motion able to produce." In Newton's words, defending his postulation of innate active principles in matter, "God, who gave animals self-motion beyond our understanding, is, without doubt, able to
implant other principles of motion in bodies, which we may understand as little.” Motion of the limbs, thinking, acts of will—all are “beyond our understanding,” though we can seek to find “general principles” and “bodies of doctrine” that give us a limited grasp of their fundamental nature. Such ideas led naturally to the conclusion that properties of mind arise from “the organization of the nervous system itself,” that those properties “termed mental” are the result of the “organical structure” of the brain just as matter “is possessed of powers of attraction and repulsion” that act at a distance (La Mettrie, Joseph Priestley). It is not clear what might be a coherent alternative.

A century later, Darwin expressed his agreement. He asked, rhetorically, “Why is thought, being a secretion of the brain, more wonderful than gravity, a property of matter?” Essentially Locke’s suggestion, as elaborated by Priestley and others. It is well to remember, however, that the problems raised by the Cartesians were never addressed. There is no substantial “body of doctrine” about the ordinary creative use of language or other manifestations of our “noblest” quality. And lacking that, questions of unification cannot be seriously raised.

The modern cognitive sciences, linguistics included, face problems much like those of chemistry from the collapse of the mechanical philosophy until the 1930s, when the bodies of doctrine that chemists had developed were unified with a radically revised physics. Contemporary neuroscience commonly puts forth, as its guiding idea, the thesis that “things mental, indeed minds, are emergent properties of brains,” while recognizing that “these emergences are not regarded as irreducible but are produced by principles that control the interactions between lower level events—principles we do not yet understand” (Vernon Mountcastle). The thesis is often presented as an “astonishing hypothesis,” “the bold assertion that mental phenomena are entirely natural and caused by the neurophysiological activities of the brain,” a “radical new idea” in the philosophy of mind that may at last put to rest Cartesian dualism, some believe, while others express doubt that the apparent chasm between body and mind can really be bridged.

These are not, however, the proper ways to look at the matter. The thesis is old, not new; it closely paraphrases Priestley and others two centuries ago. It is, furthermore, a virtual corollary of the collapse of mind-body dualism as Newton undermined the concept of matter, in any intelligible sense and left science with the problems of constructing “bodies of doctrine” in various domains of inquiry and seeking unification.

How unification might take place, or whether it can be achieved by human intelligence or even in principle, we will not know until we know.
Speculation is as idle as it was in chemistry early in this century. And chemistry is hard science, just beyond physics in the misleading hierarchy of reductionism. Integration of mental aspects of the world with others appears to be a distant goal. Even for insects—the so-called language of the bees, for example—problems of neural realization and evolution are barely at the horizon. It is perhaps surprising to find that such problems are lively topics of speculation for the vastly more complex and obscure systems of human higher mental faculties, language and others, and that we regularly hear confident pronouncements about the mechanisms and evolution of such faculties—for humans, not for bees; for bees the problems are understood to be too hard. Commonly the speculations are offered as solutions to the mind-body problem, but that can hardly be, since the problem has had no coherent formulation for three hundred years.

For the present, the study of language and other higher human mental faculties is proceeding much as chemistry did, seeking to “establish a rich body of doctrine,” with an eye to eventual unification, but without any clear idea of how this might take place.

[An idea surprising in its implications]

Some of the bodies of doctrine that are under investigation are rather surprising in their implications. Thus it now seems possible to take seriously an idea that a few years ago would have seemed outlandish: that the language organ of the brain approaches a kind of optimal design. For simple organic systems, conclusions of this sort seem very reasonable, and even partially understood. If a very recent emergent organ that is central to human existence in fact does approach optimal design, that would suggest that in some unknown way it may be the result of the functioning of physical and chemical laws for a brain that has reached a certain level of complexity. And further questions arise for general evolution that are by no means novel, but that have been somewhat at the margins of inquiry until fairly recently. I am thinking of the work of D'Arcy Thompson and Alan Turing, to mention two of the most prominent modern figures.

Similar conceptions, now emerging in a certain form in the study of language, also had a central place in Galileo's thought. In studying acceleration, he wrote, "we have been guided . . . by our insight into the character and properties of nature's other works, in which nature generally employs only the least elaborate, the simplest and easiest of means. For I do not believe that anybody could imagine that swimming or flying could be accomplished in a simpler or easier way than that which fish and birds actually use by natural
instinct." In a more theological vein, he held that God "always complies with the easiest and simplest rules, so that His power could be all the more revealed through his most difficult ways." Galileo was guided by the ontological principle that "nature is perfect and simple and creates nothing in vain," historian of science Pietro Redondi observes.

The theory of evolution adopts a more complex picture. Evolution is a "tinkerer," in François Jacob's often-quoted phrase. It does the best it can with the materials at hand, but the best may be convoluted, a result of path-dependent evolution, and under physical constraints and often conflicting adaptive demands. Nonetheless, the conception of the perfection of nature remains a vital component of contemporary inquiry into organic nature, at least in its simpler aspects: the polyhedral shells of viruses, cell division into spheres, the appearance of the Fibonacci series in many phenomena of nature, and other aspects of the biological world. How far this goes is a matter of speculation and debate.

Very recently, the issues have come to the fore in the study of language. It has become possible to pose in a productive way the question of "perfection of language": specifically, to ask how closely human language approaches an optimal solution to design conditions that the system must meet to be usable at all. To the extent that the question receives a positive answer, we will have found that nature has—in Galileo's words—"employed the least elaborate, the simplest and easiest of means," but in a domain where this would hardly be expected: a very recent and apparently isolated product of evolution, a central component of the most complex organic object known, a component that is surely at the core of our mental nature, cultural achievement, and curious history.

Perhaps I might add one final remark about the limits of understanding. Many of the questions that inspired the modern scientific revolution are not even on the agenda. These include issues of will and choice, which were taken to be at the heart of the mind-body problem before it was undermined by Newton. There has been very valuable work about how an organism executes a plan for integrated motor action—how a cockroach walks, or a person reaches for a cup on the table. But no one even raises the question of why this plan is executed rather than some other one, apart from the very simplest organisms. Much the same is true even for visual perception, sometimes considered to be a passive or reflexive operation. Recently two cognitive neuroscientists published a review of progress in solving a problem posed in 1850 by Helmholtz: "even without moving our eyes, we can focus our attention on different objects at will, resulting in very different perceptual experiences of
the same visual field." The phrase "at will" points to an area beyond serious empirical inquiry. It remains as much of a mystery as it was for Newton at the end of his life, when he was still seeking some "subtle spirit" that lies hidden in all bodies and that might, without absurdity, account for their properties of attraction and repulsion, the nature and effects of light, sensation, and the way "members of animal bodies move at the command of the will"—all comparable mysteries for Newton, perhaps even "beyond our understanding," like the "principles of motion."

It has become standard practice in the last few years to describe the problem of consciousness as the "hard problem," others being within our grasp, now or imminently. I think there are good reasons to treat such pronouncements with at least mitigated skepticism, particularly when we recognize how sharply understanding declines beyond the simplest systems of nature. History also suggests caution. In the Galilean era, the nature of motion was the "hard problem." "Springing or Elastic Motions" are the "hard rock in Philosophy," Sir William Petty observed, proposing ideas that resemble those soon developed much more richly by Newton. The "hard problem" was that bodies that seem to our senses to be at rest are in a "violent" state, with "a strong endeavor to fly off or recede from one another," in Robert Boyle's words. The problem, he felt, is as obscure as "the Cause and Nature" of gravity, thus supporting his belief in "an intelligent Author or Disposer of Things." Even the skeptical Newtonian Voltaire argued that the ability of humans to "produce a movement" where there was none shows that "there is a God who gave movement" to matter. To Henry More, the transfer of motion from one body to another was an ultimate mystery: if a blue ball hits a red ball, the motion is transferred, but not the color, though both are qualities of the moving blue ball.

These "hard problems" were not solved; rather, abandoned as science turned to its more modest post-Newtonian course. That has been recognized by leading historians of science. Friedrich Lange, in his classic scholarly history of materialism a century ago, observed that we have simply "acquainted ourselves to the abstract notion of forces, or rather to a notion hovering in a mystic obscurity between abstraction and concrete comprehension," a "turning-point" in the history of materialism that removes the doctrine far from the "genuine Materialists" of the seventeenth century and deprives it of much significance. Their "hard problems" disappeared, and there has been little noticeable progress in addressing the other "hard problems" that seemed no less mysterious to Descartes, Newton, Locke, and other leading figures, including the "free will" that is "the noblest thing" we have, manifested most
strikingly in normal language use, they believed, for reasons that we should not lightly dismiss.

For some of these mysteries, extraordinary bodies of doctrine have been developed in the past several hundred years, some of the greatest achievements of the human intellect. And there have been remarkable feats of unification as well. How remote the remaining mountain peaks may be, and even just where they are, one can only guess. Within the range of feasible inquiry, there is plenty of work to be done in understanding mental aspects of the world, including human language. And the prospects are surely exciting. We would do well, however, to keep in some corner of our minds Hume's conclusion about "nature's ultimate secrets" and the "obscenity in which they ever did and ever will remain," and particularly the reasoning that led him to that judgment, and its confirmation in the subsequent history of the hard sciences. These are matters that are sometimes too easily forgotten, I suspect, and that merit serious reflection—possibly, someday, even constructive scientific inquiry.
Part II

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