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## Rationality/Science

Noam Chomsky

1995

THIS DISCUSSION involves people with a large range of shared aspirations and commitments; in some cases at least, friends who have worked and struggled together for many years. I hope, then, that I can be quite frank. And personal, since to be honest, I don't see much of independent substance to discuss.

I don't want to mislead, and therefore should say, at once, that I am not all sure that I am taking part in the discussion. I think I understand some of what is said in the six papers, and agree with much of it. What I don't understand is the topic: the legitimacy of "rationality," "science," and "logic" (perhaps modified by "Western")—call the amalgam "rational inquiry," for brevity. I read the papers hoping for some enlightenment on the matter, but, to quote one contributor, "my eyes glaze over and thanks, but I just don't want to participate." When Mike Albert asked me to comment on papers advocating that we abandon or transcend rational inquiry, I refused, and probably would have been wise to keep to that decision. After a good deal of arm-twisting, I will make a few comments, but, frankly, I do not really grasp what the issue is supposed to be.

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Many interesting questions have been raised about rational inquiry. There are problems about justification of belief, the status of mathematical truth and of theoretical entities, the use to which rational inquiry is put under particular social and cultural conditions and the way such conditions influence its course, and so on. These, however, are not the kinds of topics we are to address; rather, something about the legitimacy of the entire enterprise. That I find perplexing, for several reasons.

First, to take part in a discussion, one must understand the ground rules. In this case, I don't. In particular, I don't know the answers to such elementary questions as these: Are conclusions to be consistent with premises (maybe even follow from them)? Do facts matter? Or can we string together thoughts as we like, calling it an "argument," and make facts up as we please, taking one story to be as good as another? There are certain familiar ground rules: those of rational inquiry. They are by no means entirely clear, and there have been interesting efforts to criticize and clarify them; but we have enough of a grasp to proceed over a broad range. What seems to be under discussion here is whether we should abide by these ground rules at all (trying to improve them as we proceed). If the answer is that we are to abide by them, then the discussion is over: we've implicitly accepted the legitimacy of rational inquiry. If they are to be abandoned, then we cannot proceed until we learn what replaces the commitment to consistency, responsibility to fact, and other outdated notions. Short of some instruction on this matter, we are reduced to primal screams. I see no hint in the papers here of any new procedures or ideas to replace the old, and therefore remain perplexed.

A second problem has to do with the allusions to "science," "rationality," etc., throughout these papers. These targets are sharply criticized, but they are not clearly identified. True, they are assigned certain properties. But these are either irrelevant to the issue raised or unrecognizable to me; in many cases, the properties attributed

is that there is none. What is suggested is a path that leads directly to disaster for people who need help—which means everyone, before too long.

and immoral,” not a “mistake.” Days before the U.S.-UK bombing began in the Gulf, the population, by two-to-one, favored a negotiated settlement with “linkage” rather than war. In these and numerous other cases, including domestic affairs and problems, the thoughts are individual and private; people have rarely if ever heard them publicly expressed. In part, that reflects the effectiveness of the system of cultural management; in part, the choices of left intellectuals.

Quite generally, there is a popular basis for addressing the human concerns that have long been part of “the Enlightenment project.” One element that is lacking is the participation of left intellectuals.

However meritorious motives may be, the abandonment of these endeavors, in my opinion, reflects yet another triumph for the culture of power and privilege, and contributes to it. The same abandonment makes a notable contribution to the endless project of creating a version of history that will serve the reigning institutions. During periods of popular activism, many people are able to discern truths that are concealed by the cultural managers, and to learn a good deal about the world; Indochina and Central America are two striking recent examples. When activism declines, the commissar class, which never falters in its task, regains command. As left intellectuals abandon the field, truths that were once understood fade into individual memories, history is reshaped into an instrument of power, and the ground is laid for the enterprises to come.

The critique of “science” and “rationality” has many merits, which I haven’t discussed. But as far as I can see, where valid and useful the critique is largely devoted to the perversion of the values of rational inquiry as they are “wrongly used” in a particular institutional setting. What is presented here as a deeper critique of their nature seems to me based on beliefs about the enterprise and its guiding values that have little basis. No coherent alternative is suggested, as far as I can discern; the reason, perhaps,

to rational inquiry are antithetic to it, at least as I have always understood this endeavor.

Perhaps my failure to recognize what is called here “science,” etc., reflects personal limitations. That could well be, but I wonder. For some 40 years, I’ve been actively engaged in what I, and others, regard as rational inquiry (science, mathematics); for almost all of those years, I’ve been at the very heart of the beast, at MIT. When I attend seminars, read technical papers in my own or other fields, and work with students and colleagues, I have no problem in recognizing what is before me as rational inquiry. In contrast, the descriptions presented here scarcely resemble anything in my experience in these areas, or understanding of them. So, there is a second problem.

With regard to the first problem, I’m afraid I see only one way to proceed: by assuming the legitimacy of rational inquiry. Suppose that such properties as consistency and responsibility to fact are old-fashioned misconceptions, to be replaced by something different—something to be grasped, perhaps, by intuition that I seem to lack. Then I can only confess my inadequacies, and inform the reader in advance of the irrelevance of what follows. I recognize that by accepting the legitimacy of rational inquiry and its canons, I am begging the question; the discussion is over before it starts. That is unfair, no doubt, but the alternative escapes me.

With regard to the second problem, since what is called “science,” etc., is largely unfamiliar to me, let me replace it by “X,” and see if I understand the argument against X. Let’s consider several kinds of properties attributed to X, then turning to the proposals for a new direction; quotes below are from the papers criticizing X.

First category. X is dominated by “the white male gender.” It is “limited by cultural, racial and gender biases,” and “establishes and perpetuates social organization [with] hidden political, social and economic purposes.” “The majority in the South has waited for the last four hundred years for compassionate humane uses of X,” which is “outside and above the democratic process.” X is

“thoroughly embedded in capitalist colonialism,” and doesn’t “end racism or disrupt the patriarchy.” X has been invoked by Soviet commissars to bring people to “embrace regimentation, murderous collectivization, and worse”; though no one mentions it, X has been used by Nazi ideologists for the same ends. X’s dominance “has gone unchallenged.” It has been “used to create new forms of control mediated through political and economic power.” Ludicrous claims about X have been made by “state systems” which “used X for astoundingly destructive purposes...to create new forms of control mediated through political and economic power as it emerged in each system.”

Conclusion: there is “something inherently wrong” with X. We must reject or transcend it, replacing it by something else; and we must instruct poor and suffering people to do so likewise. It follows that we must abandon literacy and the arts, which surely satisfy the conditions on X as well as science. More generally, we must take a vow of silence and induce the world’s victims to do so likewise since language and its use typically have all these properties, facts too well-known to discuss.

Even more obviously, the crafts and technology should be utterly abolished. It is surprising that several of these critiques appear to be lauding the “practical logical thinking” of “technologists” who concentrate on “the mechanics of things,” the “T-knowledge” that is “embedded in practice” and rooted in “experience”; that is, the kind of thinking and practice which, notoriously, have been used for millenia to construct tools of destruction and oppression, under the control of the white males who dominate them (I say “appear to be,” because the intent is not entirely clear). The inconsistency is startling, though admittedly, if consistency is to be abandoned or transcended, there is no problem.

Plainly, what I’ve reviewed can’t be the argument; these cannot be the properties of rational inquiry that lead us to abandon (or transcend) it. So let us turn to a second category of properties attributed to X.

change from the days when workers’ education was considered a means of emancipation and liberation. One recalls the days when the evangelical church taught not-dissimilar lessons to the unruly masses as part of what E. P. Thompson called “the psychic processes of counter-revolution,” as their heirs do today in peasant societies of Central America.

I’m sorry if the conclusion sounds harsh; the question we should consider is whether it is correct. I think it is.

It is particularly striking that these self-destructive tendencies should appear at a time when the overwhelming majority of the population regard the economic system as “inherently unfair” and want to change it. Through the Reagan years, the public continued its drift towards social democratic ideas, while the shreds of what existed were torn away. Furthermore, belief in the basic moral principles of traditional socialism is surprisingly high: to mention merely one example, almost half the population consider the phrase “from each according to his ability, to each according to his need” to be such an obvious truth that they attribute it to the U.S. Constitution, a text taken to be akin to Holy Writ. What is more, with Soviet tyranny finally overthrown, one long-standing impediment to the realization of these ideals is now removed. With limited contribution by left intellectuals, large segments of the population have involved themselves in urgent and pressing problems: repression, environmental concerns, and much else. The Central America solidarity movements of the 1980s are a dramatic example, with the direct involvement in the lives of the victims that was a novel and remarkable feature of protest and activism. These popular efforts have also led to a good deal of understanding of how the world works, again, with very limited contributions from left intellectuals, if we are to be honest.

Particularly noteworthy is the divergence of popular attitudes from mainstream ideology. After 25 years of unremitting propaganda, including ten years of Reaganism, over 70 percent of the population still regard the Vietnam war as “fundamentally wrong

because of their “culture or gender and race.” I suspect that “surprise” would not be quite the proper word for their reaction.

I find it depressing, frankly, to read learned left discourse on science and technology as a white male preserve, and then to walk through the corridors at MIT and see the significant results of the efforts to change that traditional pattern on the part of scientists and engineers, many of them very remote from the understanding of “positive social outcomes” that we largely share. They have dedicated serious and often successful efforts to overcome traditional exclusiveness and privilege because they tend to agree with Descartes (as I do) that the capacity for understanding in the “profoundest sciences” and “high feeling” are a common human attribute, and that those who lack the opportunity to exercise the capacity to inquire, create, and understand are missing out on some of life’s most wonderful experiences. One contributor condemns this humane belief for labelling others as “defective.” By the same logic, we should condemn the idea that the capacity to walk is a common human possession over a very broad range.

Acting on the same belief, many scientists, not too long ago, took an active part in the lively working class culture of the day, seeking to compensate for the class character of the cultural institutions through programs of workers’ education, or by writing books on mathematics, science, and other topics for the general public. Nor have left intellectuals been alone in such work, by any means. It strikes me as remarkable that their left counterparts today should seek to deprive oppressed people not only of the joys of understanding and insight, but also of tools of emancipation, informing us that the “project of the Enlightenment” is dead, that we must abandon the “illusions” of science and rationality—a message that will gladden the hearts of the powerful, delighted to monopolize these instruments for their own use. They will be no less delighted to hear that science (E-knowledge) is intrinsically a “knowledge system that legitimates the authority of the boss,” so that any challenge to such authority is a violation of rationality itself—a radical

X is “E-knowledge,” “obtained by logical deduction from firmly established first principles.” The statements in X must be “provable”; X demands “absolute proofs.” The “most distinctive component of Western E-knowledge” may be its “elaborate procedures for arriving at acceptable first principles.” These are among the few attempts here to define or identify the villain.

Furthermore, X “claims to a monopoly of knowledge.” It thus denies, say, that I know how to tie my shoes, or know that the sky is dark at night or that walking in the woods is enjoyable, or know the names of my children and something about their concerns, etc.; all such aspects of my (intuitive) knowledge are far beyond what can be “obtained by logical deduction from firmly established first principles,” indeed well beyond the reach of rational inquiry now and perhaps ever, and is therefore mere “superstition, belief, prejudice,” according to advocates of X. Or if not denying such knowledge outright, X “marginalizes and denigrates” it. X postulates dogmatically that “a predictable end point can be known in advance as an expression of X-achieved truth,” and insists upon “grounding values in [this] objective truth.” It denies the “provisional and subjective foundations” of agreement in human life and action, and considers itself “the ultimate organizing principle and source of legitimacy in the modern society,” a doctrine to which X assigns “axiomatic status.” X is “arrogant” and “absolutist.” What doesn’t fall “within the terms of its hegemony...—anger, desire, pleasure, and pain, for example—becomes a site for disciplinary action.” The varieties of X are presented as “charms to get us through the dark of a complex world,” providing a “resting place” that offers a “sure way of ‘knowing’ the world or one’s position in it.” The practitioner of X “screens out feeling, recreating the Other as object to be manipulated,” a procedure “made easier because the subjective is described as irrelevant or un-X.” “To feel was to be anti-X.” “By mid twentieth century the phrase ‘it works’ came to be enough for X-ists,” who no longer care “why it worked,” and lost interest in “what its implications” are. And so on.

I quite agree that X should be consigned to the flames. But what that has to do with our topic escapes me, given that these attributions scarcely rise to the level of a caricature of rational inquiry (science, etc.), at least as I'm familiar with it.

Take the notion of "E-knowledge," the sole definition of science presented here. Not even set theory (hence conventional mathematics) satisfies the definition offered. Nothing in the sciences even resembles it. As for "provability," or "absolute proofs," the notions are foreign to the natural sciences. They appear in the study of abstract models, which are part of pure mathematics until they are applied in the empirical sciences, at which point we no longer have "proof." If "elaborate procedures," or any general procedures, exist "for arriving at acceptable first principles," they have been kept a dark mystery.

Science is tentative, exploratory, questioning, largely learned by doing. One of the world's leading physicists was famous for opening his introductory classes by saying that it doesn't matter what we cover, but what we discover, maybe something that will challenge prevailing beliefs if we are fortunate. More advanced work is to a large extent a common enterprise in which students are expected to come up with new ideas, to question and often undermine what they read and are taught, and to somehow pick up, by experience and cooperative inquiry, the trick (which no one begins to comprehend) of discerning important problems and possible solutions to them. Furthermore, even in the simplest cases, proposed solutions (theories, large or small) "outrun empiricism," if by "empiricism" we mean what can be derived from experience by some procedure; one hardly has to move to Einstein to exhibit that universal trait of rational inquiry.

As for the cited properties of X, they do hold of some aspects of human thought and action: elements of organized religion, areas of the humanities and "social sciences" where understanding and insight are thin and it is therefore easier to get away with dogmatism and falsification, perhaps others. But the sciences, at least

than astrology, but is otherwise on a par. That suggestion does in fact help solve my problems. If I can just tell stories about the questions that I've been struggling with for many years, life will indeed be easier; the proposal "has all the advantages of theft over honest toil," as Bertrand Russell once said in a similar connection.

I should also "favor particular directions in scientific and social inquiry because of their likely positive social outcomes," thus joining the overwhelming mass of scientists and engineers—though we commonly differ on what are "positive social outcomes," and no hints are given here as to how that issue is to be resolved. The implication also seems to be that we should abandon "theories or experiments" favored "because of their supposed beauty and elegance," which amounts to saying that we should abandon the effort to understand the mysteries of the world; and by the same logic, presumably, should no longer be deluded by literature, music, and the visual arts.

I'm afraid I didn't learn much from these injunctions. And it is hard for me to see how friends and colleagues in the "non white world" will learn more from the advice given by "a handful of scientists" who inform them that they should not "move on the tracks of western science and technology," but should prefer other "stories" and "myths"—which ones, we are not told, though astrology is mentioned. They'll find that advice a great help with their problems, and those of the "non white world" generally. I confess that my personal sympathies lie with the volunteers of Tecnica.

In fact, the entire idea of "white male science" reminds me, I'm afraid, of "Jewish physics." Perhaps it is another inadequacy of mine, but when I read a scientific paper, I can't tell whether the author is white or is male. The same is true of discussion of work in class, the office, or somewhere else. I rather doubt that the non-white, non-male students, friends, and colleagues with whom I work would be much impressed with the doctrine that their thinking and understanding differ from "white male science"

not be “transferring God into knowable nature” (thanks). Since “it is now obvious” that its “very narrow and surface idea of rationality and rationalism” has undermined “the canon of Western thought,” I should adopt “a new notation system which laid out moral and historical propositions” in a “rationality [that is] deepened” (thanks again). I should keep to “rebuttable axioms,” which means, I take it, hypotheses that are taken to be open to question—the practice adopted without a second thought in all scientific work, unless the intent is that I should drop Modus Ponens and the axioms of arithmetic; apparently so, since I am also to abandon “absolutism or absolute proofs,” which are unknown in science but, admittedly, sometimes assumed with regard to the most elementary parts of logic and arithmetic (a matter also subject to much internal controversy in foundational inquiries).

I should also follow the lead of those who “assert that there is a common consciousness of all thought and matter,” from human to “vegetable or mineral,” a proposal that should impinge directly on my own attempts for many years to understand what Hume called “the secret springs and origins, by which the human mind is actuated in its operations”—or might, if I had the slightest idea what it means. I am also enjoined to reject the idea that “numbers are outside of human history” and to regard Goedel’s incompleteness theorem as “a situation of inability” of the 20<sup>th</sup> century, which to my old-fashioned ear, sounds like saying that the irrationality of the square root of two—a disturbing discovery at the time—was “a situation of inability” of classical Greece. How human history or the way rationality “is presently defined” impinge on these truths (or so I thought them to be), I again fail to see.

I should regard “Truth” not “as an essence” but “as a social heuristic,” one “predicated on intersubjective trust and story telling whether through narrative or numbers and signs.” I should recognize that “scientific endeavor is also in the world of story and myth creation,” no better or worse than other “stories and myths”; modern physics may “have more funding and better PR”

as I am familiar with them, are as remote from these descriptions as anything in human life. It is not that scientists are inherently more honest, open, or questioning. It is simply that nature and logic impose a harsh discipline: in many domains, one can spin fanciful tales with impunity or keep to the most boring clerical work (sometimes called “scholarship”); in the sciences, your tales will be refuted and you will be left behind by students who want to understand something about the world, not satisfied to let such matters be “someone else’s concern.” Furthermore, all of this seems to be the merest truism.

Other properties are attributed to X, including some that are presumably intended as caricature: e.g., that practitioners of X claim “that seventeenth-century Europe answered all the basic questions of humankind for all times to come...” I’ve tried to select a fair sample, and apologize if I’ve failed. As far as I can see, the properties assigned to rational inquiry by the critics fall into two categories. Some hold of human endeavor rather generally and are thus irrelevant to the issue (unless we mean to abandon language, the arts, etc., as well); they clearly reflect the social and cultural conditions that lead to the outcome that is properly deplored. Others do not hold of rational inquiry, indeed are flatly rejected by it; where detected, they would elicit internal critique.

Several writers appear to regard Leninist-Stalinist tyranny as an embodiment of science and rationality. Thus “the belief in a universal narrative grounded in truth has been undermined by the collapse of political systems that were supposed to [have] produced the New Socialist Man and the New Postcolonial Man.” And the “state systems” that “used positive rationality for astoundingly destructive purposes” were guided by “socialist and capitalist ideologies”—a reference, it appears, to radically anti-socialist (Leninist) and anti-capitalist (state-capitalist) ideologies. Since “scientific and technological progress were the watchword of socialist and capitalist ideologies,” we see that their error and perversity is deep, and we must abandon them, along with any

concern for freedom, justice, human rights, democracy, and other “watchwords” of the secular priesthood who have perverted Enlightenment ideals in the interests of the masters.

Some of the commentary is more familiar to me. One contributor calls for “plural involvement and clear integration in which everyone sits at the table sharing a common consciousness,” inspired by “a moral concept which is linked to social trust and affection in which people tell what they think they see and do and allow the basic data and conclusions to be cross examined by peers and non-peers alike”—not a bad description of many seminars and working groups that I’ve been fortunate enough to be part of over the years. In these, furthermore, it is taken for granted that “knowledge is produced, not found, fought for—not given,” a sentiment that will be applauded by anyone who has been engaged in the struggle to understand hard questions, as much as to the activists to whom it is addressed.

There is also at least an element of truth in the statement that the natural sciences are “disembedded from the body, from metaphorical thought, from ethical thought and from the world”—to their credit. Though rational inquiry is rife with metaphor and (uncontroversially) embedded in the world, its intent is to understand, not to construct doctrine that accords with some ethical or other preferences, or that is confused by metaphor. Though scientists are human, and cannot get out of their skins, they certainly, if honest, try to overcome the distortions imposed by “body” (in particular, human cognitive structures, with their specific properties) as much as possible. Surface appearances and “natural categories,” however central to human life, can mislead, again uncontroversially; we “see” the sun set and the moon illusion, but we have learned that there is more to it than that.

It is also true that “Reason separates the ‘real’ or knowable...and the ‘not real’,” or at least tries to (without identifying “real” with “knowable”)—again, to its credit. At least, I know that I try to make this distinction, whether studying questions that are hard, like the

origins of human knowledge, or relatively easy, like the sources and character of U.S. foreign policy. In the latter case, for example, I would try, and urge others to try, to separate the real operative factors from the various tales that are spun in the interests of power and privilege. If that is a fault, I plead guilty, and will compound my guilt by urging others to err in the same way.

Keeping to the personal level, I have spent a lot of my life working on questions such as these, using the only methods I know of—those condemned here as “science,” “rationality,” “logic,” and so on. I therefore read the papers with some hope that they would help me “transcend” these limitations, or perhaps suggest an entirely different course. I’m afraid I was disappointed. Admittedly, that may be my own limitation. Quite regularly, “my eyes glaze over” when I read polysyllabic discourse on the themes of poststructuralism and postmodernism; what I understand is largely truism or error, but that is only a fraction of the total word count. True, there are lots of other things I don’t understand: the articles in the current issues of math and physics journals, for example. But there is a difference. In the latter case, I know how to get to understand them, and have done so, in cases of particular interest to me; and I also know that people in these fields can explain the contents to me at my level, so that I can gain what (partial) understanding I may want. In contrast, no one seems to be able to explain to me why the latest post-this-and-that is (for the most part) other than truism, error, or gibberish, and I do not know how to proceed. Perhaps the explanation lies in some personal inadequacy, like tone-deafness. Or there may be other reasons. The question is not strictly relevant here, and I won’t pursue it.

Continuing with my personal quest for help in dealing with problems to which I have devoted a large part of my life, I read here that I should recognize that “there are limits to what we know” (something I’ve been arguing, in accord with an ancient rationalist tradition, for many years). I should advance beyond “panopticed rationality” (which I might happily do, if I knew what it was), and should