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Social vs. Natural Science?

I LARGELY AGREE WITH CLIFFORD GEERTZ (*Science*'s Compass, Books *et al.*, 6 Jul., p. 53) and the main point of the work he discusses, *Making Social Science Matter* (*1*)—that social research can make good use of a "phronetic" approach, that is, qualitative and judgmental, as distinct from mere imitation of the "hard" sciences. This argument has been a major theme of European philosophy for the better part of the last century, its most powerful modern exponent being H. G. Gadamer (*2*). I have, however, one objection: the pervasive use of the phrase "view from nowhere" in characterizing natural science. To advance or correct the social sciences, we need not diminish or distort, even subtly, the approach of the natural sciences, and that is what this catchy phrase often does. But when Thomas Nagel introduced it in his thoughtful book of that title, he was speaking mainly about objectivity and subjectivity in philosophy, and the phrase was intended as purely descriptive (*3*).

Yet it seems to me that, in science, even as description the phrase is surely misleading. If catchy phrases we must have, then I suggest an alternative: let it be the "view from everywhere," reflecting more nearly what the natural sciences do. There is a big difference between "no reference frame" and "invariance" under specified transformations of reference frames or standpoints. I am pointing here not only to the well-known invariances of physics under coordinate transformations but, far more generally, to "transformations" or interchanges of investigators, cultures, and experimental equipment, and to the practice of acquiring many "profiles" of the same phenomenon. David Bohm, among others, has expounded this idea, including the role of dialectics or hermeneutics in it (*4*). And I have tried to apply it in some detail to the history of solar neutrino research (*5*).

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UNSCEAR on the Health Effects from Chornobyl

IN THE NEWS FOCUS ARTICLE "LIVING IN THE shadow of Chornobyl" (20 Apr., p. 420), in which Richard Stone examines the effects on human health of the nuclear accident at Chornobyl 15 years ago, the latest report from the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) (*1*) is not mentioned.

The report, published last year, assessed the radiological situation in the highly contaminated regions of Belarus, Russia, and

Ukraine. At the time of the accident, 134 employees of the Chornobyl nuclear power plant and emergency workers received short-term whole-body doses ranging from 800 to 16,000 milligrays of radiation, 28 of whom, as Stone mentions, died within the first 4 months of the accident, due to acute radiation sickness. The fate of the 106 survivors who received doses of 1300 to 5300 milligrays has been monitored up to the present. There have been 11 deaths among them between 1987 and 1998. Only in three cases (one of myeloid leukemia and two of meylodysplastic syndrome) could the death be probably related to radiation. The average yearly dose received by about 5 million inhabitants of the contaminated regions and by 336,000 evacuated persons was about 1 millisievert (mSv), and about 381,000 recovery workers received an average total dose of 100 mSv. For comparison, the dose rate from natural radiation ranges between 1 and 20 mSv/year in most countries, and up to 150 mSv/year in some inhabited regions. No radiation-induced increase of cancers and hereditary diseases has ever been observed in these high natural radiation regions. Also, no hereditary effects were detected after the atomic explosions in Japan.

Apart from an increased incidence of thyroid cancer in children, which Stone discusses, in the general population of contaminated areas, there is no evidence of a major health impact induced by radiation. "No increases in overall cancer (and leukemia) incidence or mortality have been observed that could be attributed to ionizing radiation." And contrary to Stone's article, in which he says that "rates of some noncancer diseases—endocrine disorders and stroke, for instance—appear to be rising disproportionately among [those] who cleaned up the heaviest contamination...," the UNSCEAR committee reported no proof of such disorders that could be attributed to ionizing radiation. However, they did find that "there were widespread psychological reactions to the accident, which were due to fear of the radiation, not to the actual radiation doses."

Regarding the search for genetic effects associated with Chornobyl exposures in Belarus or Ukraine, which had the highest contamination, and in a number of European countries, UNSCEAR's 2001 report states that no unambiguous evidence was found for an increase in the frequencies of, for example, Down's syndrome, congenital anomalies, miscarriages, or perinatal mortality (*2*). According to UNSCEAR, generally positive prospects for the future health of people in contaminated regions should prevail.

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Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted by e-mail (science_letters@aaas.org), the Web (www.letter2science.org), or regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.