A Critique of Critical Realism

History has known periods – the High Middle Ages, for instance – during which human intellectual pursuits were united by an overarching consensus. Ours is not one of them. Today science, philosophy, theology and the arts usually tend their own gardens with little penetration of the fences between them. In several countries "science" and "religion" have been embroidered on the banners of contending political factions. A popular perception has arisen that the spirit of science is inimical to religion and, if not inimical, more or less indifferent to the arts.

Yet among those who remember history, some hanker for a new reunion, a new basis for intercommunication. It is now almost respectable for scientists to publish treatises dealing with theological questions. Theologians are no longer excommunicated, although some (like Hans Küng) are severely disciplined, for allowing scientific insights to affect their theology.

Humans being what they are, institutions now arise to cultivate these interrelationships. On the science and religion front, one example is the Center for Theology and the Natural Sciences (CTNS) in Berkeley, Calif., which is associated with the Graduate Theological Union, a consortium of theological schools there. In the domain of science and the arts is the recently formed Society for Literature and Science, most of whose present officers are at Worcester (Mass.) Polytechnic Institute.

Into this context came the conference on Critical Realism in Science and Religion, in which this reporter was invited to participate. Convened recently in Berkeley by the CTNS, the meeting was something of a *Fest*, a celebration, for Arthur Peacocke of Oxford University, a biologist and theologian who is a prominent proponent of the philosophical stance known as critical realism.

Critical realism proposes that science is saying something real about the nature of things. This statement is not as tautological as it may appear. As philosopher Ernan McMullin of the University of Notre Dame (Ind.) pointed out at the conference, the age-old debate over the nature of scientific theories is whether they are saying something about the nature of things or whether they are concerned mainly with "saving the appearances," with calculating how the phenomena appear and change from time to time.

The trial of Galileo Galilei, physicist and astronomer of Florence, Italy, is a case in point. Members of the Inquisition dearly wanted Galileo to admit that his Copernican theory of the solar system was a matter of saving the appearances, a new and more accurate way of calculating the positions of the planets in the sky without necessarily saying anything real about the configuration of the solar system itself. Galileo at first insisted that the Copernican view was saying something real about the arrangement of the solar system. Then he caved in. Finally – in a whisper – he supposedly retracted his retraction.

According to McMullin and to Peacocke, critical realism stands opposed to those who regard scientific development as conditioned by sociology. Specifically they mention the "Edinburgh school" of sociologists of science and the followers of philosopher and physicist Thomas Kuhn of Massachusetts Institute of Technology. In the Kuhnian view, scientific activity is governed by paradigms, generally accepted ways of looking at a given problem or set of problems. What people seek to find experimentally, what they do find and how they relate new findings to old knowledge are all highly conditioned by the particular paradigm they follow. The Ptolemaic picture of the solar system, to which the Inquisition was wedded, and Galileo's Copernican view are rival paradigms in the Kuhnian view. Observers believing in either one would arrange observations according to the presuppositions of that paradigm.

Critical realists will have none of this conditioning. They insist that, by correcting errors and rejecting false starts, science "converges" to real answers to given questions, answers that are not paradigmatically conditioned. To this Ian G. Barbour, professor of science, technology and society and professor of religion at Carleton College in Ottawa, objected in his response to Peacocke's opening lecture of the conference that "the theories you hold influence the data you get."

This principle of convergence is one of the elements of critical realism that allow Peacocke to use it as a common philosophical approach to both science and religion. Peacocke sees a similar kind of convergence in Christian theology. Others, however, citing serious interdenominational disagreements, don't see it. Peacocke himself admits difficulties in finding any such convergence between Christian and non-Christian religions. Here, too, Barbour objects that in religion things are even more model-dependent than they are in science. "In religion the influence of theory on data is more problematic," he told conferees. Particularly one needs to take into account the difference between Eastern and Western religions, he said, the Eastern tending toward mystical experience of divine immanence, the Western toward numinous experience of divine

transcendence.

At the conference and in his written works Peacocke has stressed the intersubjective nature of science: It emerges from the common experience of a number of persons; it is what they can all agree on. He sees a similar intersubjective quality to Christian theology, citing the traditional "Vincentian canon," the ancient rule that Christian doctrine is what is believed everywhere always by everybody, the consensus of the faithful. This is a doctrine that is likely to be very attractive to Anglicans – Peacocke is an Anglican priest – but others in other denominations and other religions may object. While Peacocke seems to see theology emerging from this intersubjective consensus of the faithful, there are those who like to deduce their theology from first principles such as Plato's definition of god or from axioms taken from scripture or other religious tradition. For them, the function of the consensus of the faithful is merely to ratify what has been properly derived from proper principles.

Peacocke sees the sciences as a "nested set," each dealing with reality at a particular level of complexity. In his view, the levels of greater complexity are not completely reducible to levels of lower complexity: Biology, for example, is not reducible to physics and chemistry. Peacocke does not believe in anything like an *élan vital,* some special principle of life. He acknowledges that the processes occurring in biology are those of physics and chemistry but insists nevertheless that biology is not reducible to chemistry and physics. In this nonreductionist scheme, theology takes its place as dealing with reality on the most complex level of all, and it is not reducible to the natural sciences. One of the serious problems in the past has been that science has explained on natural grounds things that theologians considered inexplicable.

In theology Peacocke chooses panentheism. Panentheism proposes that God is present in all things, but in contrast to pantheism, it does not stop there. It affirms that God is also an independent being above and beyond all things. Such a theology is an attractive choice for the scientific minded, as it can have God acting in nature from within, in an "emergent" way, to use Peacocke's word. This gets around another serious difficulty: If one accepts scientific findings at their face value, they leave little room for God to act on nature in an external way. Panentheism is also a choice traditionally available to Christians, though it is more often adopted by Eastern Orthodox thinkers than by Western ones. Some theologians might object that it does not pay enough attention to divine transcendence.

Using scientific insights in theology can raise serious problems. One of those cited at the meeting by Robert John Russell, a physicist and theologian who is director of the CTNS, concerns Peacocke's use of insights from thermodynamics in theodicy. Western religions at least (Christianity, Judaism, Islam) have to deal with the question: If God is both good and omnipotent, why is there evil in the world? Theodicy is how one answers this question. Using thermodynamical language Peacocke finds evil inherent in nature and has God suffering in nature along with His creatures. As Russell pointed out, this may be difficult to square with traditional Christian views. Peacocke's statement provoked McMullin, reverting perhaps to Platonic notions of divine impassivity, to remark that he does not want God to suffer too much.

Physics makes scientific problems for critical realism. Antirealists, McMullin remarked, will draw their examples from mechanics. At the time I was unwilling to be called an antirealist – who wants to be in favor of unreality? – but now I think I probably am one, from the critical realists' point of view. I asked whether science needs to converge to one answer to every question. Quantum mechanics tends to give at least two answers to every question, and it tells you you can't choose between them; it deals with a reality that is complex and often paradoxical. McMullin brushed this aside. To him there are no paradoxes in quantum mechanics – a conclusion, I think, that will amaze most physicists. To most physicists the conjunction of particle and wave natures in a single being is as close to an antithesis as you are likely to get.

Peacocke insists that critical realism teaches us that electrons are real. I believe it; now tell me what an electron is. What does "real" mean in the context of an electron's existence? Indeed, for physicists the interesting question nowadays is whether quarks and gluons are real, but critical realism's exclusion of mechanics from its purview seems to preclude it from dealing with that question.

The critical realists concentrate on what they call the structural sciences, by which they mostly mean biology. They get geology into their program by leaving dynamics out of it. They also try to annex astrophysics by leaving mechanics out of it. Most astrophysicists would be hard put to find much left of their discipline if you took mechanics out of it. I got the feeling that I was attending a celebration by biologists who had found a philosophy that fits biology rather well, as the Kuhnian analysis fits physics rather well, and who were not going to let objections mar their festivities, even when the objections came from another biologist.

That biologist is Gunther Stent of the University of California at Berkeley. He takes issue with the doctrine of nonreducibility. In genetics, he told conferees, one explains what goes on in terms of chemistry and physics. That's how he teaches it, he said. Peacocke responded that you have to use the concept of information in genetics. Stent said that information is a metaphor that geneticists used years ago when they didn't know the details of what was going on; now they have dropped it.

The confrontation was a standoff, and it provoked from paleontologist Dawn Adams of UC-Berkeley the protest: "You have two prominent biologists [Stent and Robert Schimke of Stanford University] telling you that biology doesn't work the way you say it works, and you sweep it aside."

It may be that there *is* no hope of providing any common ground for the different areas of intellectual endeavor. They may indeed be too inimical to each other for that. However, discussing the issues will certainly clarify things, and it may show some commonalities that people hadn't suspected before. I believe Russell as he told me in a private conversation that "in this business we are all groping." We need dialogue, and the kind of dialogue that alters people's opinions, not mere throwing of snowballs from previously frozen positions.

– D.E. Thomsen