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QUESTIONS CONCERNING SCIENCE, THEOLOGY, AND THE ENVIRONMENT

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The interaction between science and theology is usually taken to involve their claims. In this paper, I investigate how the interaction may involve their questions. Questions concerning the environment will be considered as the focal point because we are living at a time when their importance is increasing and this increase will probably continue until these questions obtain the attention they deserve. The first step in the argument will be to apply a recent aspect of philosophy of science to the current discussion about the environment. I will examine how the environment issue may be considered a real or an unreal question for scientists. The second step will be to explore the global situation what would occur if the community of scientists, and other communities, were to function and interact solely in accordance with principles of egoism. A final step will show that the distinction between real and unreal questions occurs also in theology, and that a certain interaction between real questions in science with real questions in theology may occur precisely as regards the environment.

I will introduce the first step by recalling how the philosophy of science has passed through different phases. Before about 1960, it was mainly dominated by the work of Rudolf Carnap (1928) and Karl Popper (1959). The former held that the theory of meaning and the theory of language matter very much in our search for a correct understanding of science. He also held that verification should be employed to

distinguish between science and non-science. Popper on the contrary did not think much of theory of language, and he urged falsification to distinguish between science and non-science. Although different, these two positions were similar in so far as they both assumed a universal, time-independent method of science in which observation is sharply distinguishable from theory. All this was called into question by Thomas Kuhn's work on the historical nature of the sciences which produced a view according to which observation and theory are mutually dependent (Kuhn 1969). Here a revolutionary change is not a rational change, and science cannot be said to be cumulative. The debate however drifted away then from arguments about the nature of rationality. It shifted to discussions about the status of theoretical entities, the main question being whether, say, electrons or quarks really exist or whether they are just a very convenient conceptual tool to find our way around in what we observe.

This way of engaging in the debate still has many protagonists today, but some recent work has opened up the possibility of resetting the entire issue on new ground (Jardine 1991). Instead of discussing the reality of entities, one may discuss the reality of questions for the scientific community. A range of questions are real in a given community at a given time when they are questions which the members of the community can see how they can get to grips with. Understanding questions real in my community implies that I appreciate what the community considers relevant to those questions. Understanding questions unreal in my community but real in another community involves appreciation of the considerations that would be taken in that other community to be relevant to that question. In another philosophical context, much has been said about live metaphors and dead metaphors. A similar distinction can be drawn in the field of questions constituting human inquiry. For any given community of inquirers we may have questions which used to be real but lost their relevance through the ages. Such questions, having been replaced by others, are now considered dead: they are usually taken to be totally misplaced, or the embarrassing sign of our previous ignorance.

Some brief examples may make this distinction clearer. Medieval natural philosophy held that the heavenly bodies, being immaterial and devoid of terrestrial qualities, are entirely different from terrestrial bodies. A basic explanatory presupposition of this type of natural philosophy was the Aristotelian claim that rotation is the motion natural to a sphere. Questions formulated within this framework therefore preclude many applications of reasons derived from terrestrial physics to the resolutions of questions about the heavens. For Newtonian natural philosophy, another presupposition was considered fundamental, namely the claim that a body will continue in a state of rest or of uniform motion if acted on by no forces. The separation between heavenly bodies and terrestrial bodies lost its explanatory influence. The doors were opened therefore for questions concerning the relationship between what is observed here on earth and what is observed in the heavens. Another example that has been extensively studied is the shift from eighteenth-century natural history to nineteenth-century biology. This is seen as another manifestation of a shift in type of inquiry, a shift from the ordering of things on the basis of their external and visible characteristics, to a modern inquiry concerning origins, historical formations, hidden structures and inner processes (Foucault 1970).

What social forces or motivations are acting on a community of inquirers when such a shift of questioning occurs? To answer this question, case studies are indispensable. I will briefly consider only one example here, an example not from a distant historical period, a choice which would usually render the details inaccessible to a certain extent, but one from recent events. In the US, in the first week of October, 1993, The Superconducting Super Collider (SSC) was effectively killed. It had been planned to be a proton collider that could open up a qualitatively new domain of physics and ensure the US of its lead in high-energy physics with respect to the European centres such as the large electron-positron collider (LEP) at CERN in Geneva. What was it that blocked this huge enterprise? Problems of poor management

were certainly present. But the main reason apparently was the ever-increasing costs which were drawing from resources desperately needed for the economy (Ritson 1993). Interesting insights into what arguments were used to prove that the SSC should have been considered essential to tackle questions which were then considered real can be obtained from a paper presented by C. Quigg at a Workshop in 1986. It seems that the three main *real* questions according to Quigg were the following: (1) the SSC was conceived to take the step needed for a 'thorough exploration of the 1 TeV scale'; (2) the SSC 'will clarify the structure and symmetry of the fundamental interaction and allow us to extrapolate with greater confidence back to early times', i.e. it will simulate the conditions that prevailed about 10^{-15} second after the Big Bang; (3) 'with the support of our government, hard work, and a little bit of luck, we may have, by 1995, a new instrument to explore the 1 TeV scale, and to bring us closer to the dream of an enduring understanding of all natural phenomena' (Quigg 1987). In spite of these prospects, the project was abandoned. This move could be understood simply as a confirmation of the Peircean insight that new discoveries in science are bound to become, as time goes on, more expensive and less important.[1] But it could legitimately be studied at many other levels as well. In this way one approaches as much as possible a full appreciation of all the scientific, sociological, ethical and political principles at work.[2]

But from the little I have said so far, it seems reasonable to draw the conclusion that, when a shift of inquiry is in progress, a clash of interests goes hand in hand with a choice, often implicit, of types of questions we concern ourselves with. I am not suggesting here that, to ensure genuine scientific progress, a member of a given research community must possess a *complete and explicit* understanding of the

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[1] The allusion is to Peirce's thought-provoking essay, 'The Economy of Research', where he holds that: 'when an investigation is commenced, after the initial expenses are once paid, at little cost we improve our knowledge, and improvement then is especially valuable; but as the investigation goes on, additions to our knowledge cost more and more, and at the same time, are less and less worth' (Peirce 1958, 7: 144).

[2] Some accounts of the entire issue, like Weinberg 1993, are unfortunately surprisingly narrow-minded and 'populist'.

criteria of relevance at work in the community. Such a complete grasp will effectively block the possibility of surprise discoveries, and examples of surprise discoveries abound in history.[3] All I am suggesting is that a clash of interests means a clash of criteria for relevance. Some groups will start considering some new questions as real while other groups will remain content with the previous set of questions.

It is my contention in this paper that the global, environmental consciousness which has emerged within the last few decades can be understood in terms of this type of analysis. A new question is imposing itself on humanity. A new question is becoming real.

For greater clarity, what I am calling the environment question should be distinguished from a problem in ecology. A problem in ecology is a purely scientific problem arising from the fact that scientists do not understand some particular phenomenon, like for example how DDT finds its way into the fat of Antarctic birds. The environment question, on the contrary, is here being presented as a special sort of social problem. It covers more ground than the purely scientific issues. It includes the economic, moral and philosophical dimensions of the question as it is experienced and expressed by society. The four main subdivisions of this question may be taken to concern pollution, conservation, preservation, and multiplication (Passmore 1974). From this perspective, the environment question may be expressed in terms of the following sub-questions: (1) How are we to solve the political difficulties in legislating against pollution when such legislation is usually a restriction of very powerful interests by local communities? (2) How are we to be sure that future generations will need what we are conserving and that they will not need what we are rejecting? How are individuals to be encouraged to sacrifice themselves for future

[3] A striking one is the link between diabetes and pancreatic disorders. This discovery come about through the work of O. Minkowski (1858-1931) and J. von Mering (1849-1908) who removed the pancreas from a dog in order to see whether the organ was essential to life. Such an operation was considered at the time completely irrelevant to the understanding of diabetes.

generations, given this uncertainty? (3) What should determine whether a particular area of the earth's surface should be used commercially for the benefit of many or preserved in its present state which does not yet bear the marks of human handiwork? (4) To what extent should the present generation surrender the freedom of individuals, or abandon respect for persons, in the name of control over population growth?

Given this starting point about the nature of the environment issue, I will now move to the second step of my argument. If we take this complex environment issue as a question which is invading, as it were, the interests of the scientific community, a question which is becoming real for that community, then it is important to examine what forces are at work in this particular process of realisation. It may be argued that what is behind such a process is the exercise of a certain kind of universal goodwill inherent in human beings. According to this view, the scientific community is becoming aware that people are suffering, and such an awareness is in the process of pushing those members responsible for the administration of that community to exercise their altruism and start directing research in a direction that will benefit the multitudes. In my opinion, such a process may in fact be happening, and we have no reason to believe that genuine altruism plays no part in the shifts of interests we are examining. However, one can hardly believe that this explains the entire process. What goodwill means is often considered culturally and geographically local. On a planetary scale, we are still living in a system of coexisting communities dominated, to a certain extent, by the principle of survival of the richest. It is true that homogeneous, and perhaps even universal, ethical visions are being formulated so as to be binding to all communities, but this should not make us underestimate the role the principle of egoism plays in international affairs. What I want to examine now is the worst case — the case when the different communities on the planet are not

motivated by altruism but solely by egoism.[4] What will make a question real for the scientific community in *that* case?

In such a context, the reality of questions may perhaps be best understood as depending on Darwinian principle of survival of the fittest, understood here in a specific sense. Survival of real questions for the scientific community depends on what cash value they are producing to that community. New questions become real when the community is constrained to accept the relevance of those questions as a matter of gaining more power, as a matter of raising the members' standard of living, understood in a specific sense, and, *a fortiori*, as a matter of survival in the literal sense. For example, the questions which were meant to be examined through the Superconducting Super Collider have lost their battle for importance against other questions which the US administration deemed more important. Questions concerning particle-physics may still be considered relevant by some members of the scientific community, but a sustained inability to tackle them will inevitably end up in their losing their reality for that community. If this analysis of the mechanism behind the reality of questions is accepted, then we may ask: as regards the environment question, what is the struggle that has to be engaged in, or is already being engaged in, until this particular question becomes real?

For this particular case, the element of survival is trivially obvious. The environment question becomes real by its very nature, because it concerns the survival of life on the planet.[5] It will inevitably become real, therefore, when the relevance to our well-being of pollution, conservation, preservation, and

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[4] This distinction is sometimes expressed by describing how one person may play different roles in society: sometimes as a 'citizen', concerned with public interest and sometimes as a 'consumer', concerned with personal, or self-regarding, wants and interests. Mark Sagoff (1988, 7-8) argues that social regulation should reflect the community-regarding values that we express through political processes, and not simply, or primarily, our self-regarding preferences.

[5] Neil Everndon makes a similar prognosis. He argues that we will inevitably become more and more aware that there is no sharp distinction between us, as human inquirers, and the natural world we scrutinise (Evernden 1992).

multiplication will outrun the importance of other questions which dominate the scientific community at present. To obtain a deeper understanding of what is at stake in this kind of shift of interests we should take into consideration the way the global human population is made up of different communities: some rich, others poor; some having one set of real questions, and others having other sets of real questions. It is a fact that the scientific community is, perhaps necessarily, a rich community — the one which is therefore in the best position to protect itself from the harmful effects of the four dimensional, environment issue mentioned above. Other communities will be more vulnerable to the threat to survival than the scientific community.

This state of affairs entails the following conclusion. What will push the members of the scientific community into considering the environment issue as a real question are threats to survival which are, from their point of view, only the tip of the iceberg. Other more vulnerable communities will have had a much higher share of suffering before the scientific community becomes convinced that the entire issue deserves to be considered a real question.

The approach involving the idea of real or unreal questions, which has resulted in this alarming conclusion, finds an echo in some recent theological works. To examine in great detail on what grounds a question may become real in a theological context is outside the scope of this paper, even though it is of crucial importance. However, to arrive at some conclusions regarding one possible interaction between science and theology, it will be useful to mention briefly three examples of theologians who expressed some aspects of their work in terms which approach this idea of the emergence of real questions.

Edward Schillebeeckx has produced, among other works, the precious little books on the Eucharist, on clerical celibacy, and on ministry. It is arguable that the views expressed in these books arose from his reflections on the observation that

people's experiences seemed, at that time, to be contradicting church teaching and discipline. Concrete experiences in his own surroundings made him concentrate his attention on some questions rather than on others. His commitment to the concretness of history, therefore, may be said to have been an important criterion for him. In the vocabulary employed in this paper, one may understand Schillebeeckx as working on the assumption that some criterion defines the reality of questions in theology: real questions for him would be those arising from concrete experience. He was well aware however that the process of a theological question's becoming real is a complex one. Experience cannot push us towards a new theological question without us having recourse to previous theological understanding of that same experience: 'In faith and theology, the situation is not very different from what we find in the sciences and in everyday human experiences: articulated experiences are already conditioned by a theory (though this theory may not have been developed explicitly). In our time it has become clear from the controversy as to whether experience influences theory or theory experience that to be dogmatic about experience is as unjustified as to be dogmatic about theory' (Schillebeeckx 1985, 87).

Concrete experience may therefore determine a new set of real questions. In another context, that of the history of science, a set of real questions has been called, by T. Kuhn, a paradigm. Hans Küng, at one point, has made an interesting attempt to apply the Kuhnian analysis of paradigm changes, and the Kuhnian analysis of the problems associated with such changes, to the realm of theology. According to him, in theology as in science, while some people continue to defend an old paradigm, others live and work already in a different one. Küng however makes it clear that it would be a mistake to think that every new paradigm necessarily means progress just because it is new and different. For the context of theology, he marks some specific constraints which do not exist within the Kuhnian understanding of science: 'A paradigmatic upheaval can take place in Christian theology — if it is to be and remain Christian — always and only on *basis* of the Gospel, and ultimately *on account of* the

Gospel, but never *against* the Gospel' (Küng 1991, 159). Although he never seems to express his thoughts in terms of real and unreal questions, it seems legitimate here to hold that his investigations concerning paradigm shifts in theology were a move towards this.

As a third example, I will take a theologian from a different theological setting. Jon Sobrino starts his christological investigations by distinguishing what questions and what contexts are being presupposed by existing Christologies. He points out that the questions usually inherited from the European context may not be real for Latin Americans. A real question for people living in Latin America will not be related to the Heideggerian question 'Why is there something rather than nothing?', but related to the more context-dependent, and consequently less abstract, question: 'Why is there suffering and oppression?' His method highlights the fact that a theological question often becomes real, in the sense used above, because of the type of dialogue it makes us enter into: 'Unlike European brands of theology, liberation theology does not see itself situated in a broader history of Latin American theology since the latter is of very recent vintage. So rather than engaging in dialogue with other theologies, philosophies or cultural movements, liberation theology has faced up to the basic Latin American reality of underdevelopment and oppression' (Sobrino 1978, 33). This leads him to remark that, for the context of Latin America, some questions should receive priority-attention, or, in other words, some questions rather than others should considered real : 'We are hiding from real problems and serving the interests of ideology if we focus on the traditional theological problems of transubstantiation and the hypostatic union while such issues as underdevelopment and its implications go unexplained' (Sobrino 1978, 34).

These three examples of modern theologians give a preliminary idea on how the notion of real and unreal questions finds a place, and also can be fruitful, in theology. The full development of such a preliminary idea deserves a much longer

treatment that these brief remarks here. It should moreover be recalled that valuable, previous work in this area has already been done (Newman 1891). The foundational insight is probably best captured by the Second Vatican Council expression: ‘At all times the Church carries the responsibility of reading the signs of the time and of interpreting them in the light of the Gospel’ (*Gaudium et Spes* § 4). Given this basic insight, the third example starts taking a global significance because underdevelopment and poverty are now known to be the result of injustice inscribed within economic and social structures pervading not only some Latin American countries but our international community. I will venture the suggestion therefore that one of the ways theological questions become real in today’s world is in virtue of their expressing the fact that the reconciliation of people among themselves, which their reconciliation with God demands, must be based on justice.

Now, if this criterion for real questions in theology is accepted, one can see that a close link is becoming evident between real questions in theology and real questions in science. It was shown previously how vulnerable communities will probably have a much higher share of adversity before the scientific community becomes convinced that the environment question deserves to be considered a real question. There is here an element of injustice of a subtle kind. The environment question, and the process it takes to become real for rich communities, thus become an important part of one of the major real questions in theology. A link is thus established between a real question in one discipline and a real question in another. From this analysis, one may understand better how theologians carry a part of the responsibility for making the scientific community more and more aware of the fact that environment problems hit hardest not at the scientific community itself but at other more vulnerable communities.

One of the merits of such a linkage between theology and science through the idea of real questions is the following. It shows that theology is neither necessarily

indifferent nor necessarily against the cause of the environmentalists. There is always a real danger that Christianity is understood as somehow contributing to the cause of the environment problem. Some have argued that Christianity is inherently inimical to the care of the environment to such an extent that no degree of revision or interpretation can redeem it. For example, John Passmore mentions two points. First, Christianity insists on the essential difference between human beings and the rest of the universe; secondly, it insists as well that human beings gain a kind of salvation that does not depend on the natural environment (Passmore 1974, 184). This makes him have strong doubts whether Christianity will ever be capable of having a healthy attitude towards nature. Another danger related to these two points is to consider the non-human, created order so corrupted by original sin as to be unredeemable through Christ. This tendency in theology presupposes that Christ, in a sense, just managed to save humankind from damnation but left the rest of creation in a state of corruption.[6] If we are to reply to Passmore's criticism and moreover develop a theology whose concept of salvation covers the entire creation, then one possible way is to re-examine the type of theological questions we start with, and to examine their links with the reality of the environment question in science.

By way of summary and conclusion then: recent philosophy of science has emphasised the importance of seeing how questions become real for the scientific community. The environment issue may be considered a question of this sort which is on the process of becoming real. This process may be analysed in terms which emphasise altruism or in terms which emphasise egoism. Only the latter case was considered. Hence it was assumed that questions become real when they concern issues dealing directly with survival. If, moreover, one assumes that the scientific community is one among many, and that this scientific community is also the one which is the least vulnerable to environmental problems, it follows that, for the

6 The origin of such theological tendencies can be traced back to the early Protestant-Catholic debates (Faricy 1994).

environment issue to become a real question, the scientific community should not wait until the detrimental effects are on its own doorstep. If such waiting is indulged in, it will be at the expense of considerable suffering undergone by other communities whose cry was never deciphered. This possibility of injustice links the scientific issue to one of the major real questions for theology today. It was argued that, since questions concerning global justice are real for theology, science and theology may be said to converge and interact at this point.

The overall conclusion is that interaction between science and theology can occur not only on the conceptual level. Interaction does not occur only because of the fact that the two disciplines share the same concepts, as they apparently do, for example, in the case of the concept of time or of creation. It also occurs, and maybe more significantly, through an understanding of real and unreal questions in both disciplines.[7]

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[7] An original version of this paper was presented at the Fourth European Jesuit Scientists Meeting at Antonianum Collegio Universitario, Padua, 13 - 17 September, 1995.

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