

CREATION, CO-OPERATION, AND CAUSALITY: A REPLY TO GREGERSEN

by Richard T. McClelland and Robert J. Deltete

Abstract. Niels H. Gregersen seeks to illuminate the nature of continuing divine action in the world and to show that the classical theistic doctrine of continuous creation is consonant with some recent scientific theories of self-productive (“autopoietic”) systems. Central to these theories is the concept of co-operation; central to Gregersen’s theological appropriation of these theories is also the notion of structuring causality developed by philosopher Fred Dretske. While supportive of Gregersen’s overall aims and emphases, we find significant disanalogies between co-operation as a theological construct and as an evolutionary strategy. We also doubt the utility of Dretske’s notion for his project..

Keywords: autopoietic systems; causality; co-operation; creation; divine action; religion and science; structuring causes.

Niels Henrik Gregersen’s thought-provoking essay addresses the thorny question of continuing divine activity in the world. The question is surely an important one. Classical theism affirms that God created the world, and, indeed, created it from nothing (*creatio ex nihilo*, CEN). The core claim of CEN is that the world is utterly dependent on God’s action for its existence. This is needed to affirm the independence and transcendence of God, in opposition to any form of dualism. It is also needed to distinguish God from the world that God creates. The world is created *by* God, but not *out of* God; it is not (properly construed) a part of God nor is it an emanation from God; this in opposition to pantheism. Although often coupled with CEN and sometimes identified with it, *creatio originans* (original creation, in the sense of a temporal beginning) is not a central component of CEN. *Creatio continua* (continuing creation, CC), however, is. A theist may deny original creation and still uphold the central message of

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CEN, but CC *is* basic to CEN. A main task of Gregersen's relational theology of self-production is to affirm and to explain CC while steering clear of both deism and pantheism. A second main task, we think, is to remove an apparent incompatibility between these theistic affirmations and the natural sciences.

We confess some uncertainty regarding the second task, because Gregersen is not entirely clear about the exact nature of his project. But we think that, in addition to attempting to explicate the nature of divine action in the world, he is also attempting to show that CC is logically compatible with the natural sciences. For it will seem to many that the sciences understand the world to work on its own, that is, as an entirely autonomous reality owing no ontological debts to any divine agency. Given this methodological naturalism, theism and science are at least apparently at loggerheads over the central matter of CEN, the sciences seemingly denying what theism affirms. If we add (a) a robust commitment to the unity of truth, (b) a broadly realist view that takes our best scientific theories to be true, and (c) the conviction that such unity is accessible to epistemic agents of our type, then the removal of such apparent inconsistencies is a pressing reflective issue for theists.¹ The task is twofold: to explicate CC and to defend it.²

Gregersen uses two strategies to achieve his objectives. The first is an appeal to the theory of autopoietic (AP = self-productive/self-organizing) systems as that has been developed in the recent work of certain evolutionary biologists; the second is a distinction advanced by the philosopher Fred Dretske between two kinds of causal relations: structuring causes and triggering causes. Between these, Gregersen sandwiches an explication of Genesis that highlights divine and human co-operation. The appeal to biological theories seems to be intended to accomplish two purposes: to show (a) that co-operation is a pervasive evolutionary strategy attaching to both abiotic molecular systems and biotic systems; and (b) that the natural world furnishes a strong analogy to the ontological relations that classical theism posits between God and the world.³ The first of these aims dominates in the first two parts of Gregersen's paper, the second tending rather to fade from view. We think that Gregersen's main goal here is to establish co-operation as a concept in both evolutionary biology and philosophical theology, thereby demonstrating a *consonance of thought* between recent scientific work and classical theism.⁴ The second aim returns in the third part of the paper. There Gregersen seeks to show that divine action can be understood in terms of Dretske's theory of structuring causes, because this distinction enables us to understand better the double aspect of the ontological status of the world: that it is both radically dependent on its structuring cause (God) and also, despite that dependency, autonomous. The notion of a structuring cause, then, serves to explicate what is only hinted at in the first parts of Gregersen's paper, viz., the combination of depen-

dence and system-relative autonomy displayed by AP systems. There thus seem to be two main ideas in Gregersen's presentation: co-operation and structuring causality. By showing that these ideas can bear both scientific and theological weight, Gregersen hopes to demonstrate the consistency of CC with the apparent autonomy of the natural world that science, at least methodologically, presupposes. In what follows, we question Gregersen's use of both of these ideas.

CO-OPERATION

Gregersen uses three applications of the theory of AP systems found in recent work on evolutionary biology to highlight the role of co-operation as one of many evolutionary strategies found in nature. All three theories, according to Gregersen, illustrate the contribution of co-operative interactions to evolutionary success. Kauffman's theory has considerably wider scope than either of the others. According to Gregersen, it generates "a full understanding of evolution through placing Darwinian theory in a broader context," namely, the context of a theory of self-organization and complexity in both prebiotic macromolecular systems and biotic systems. Central to this theory is the description of phase transitions whereby simpler systems autonomously generate more complex ones, these transitions being described in the mathematics of nonlinear chaotic functions that can be modeled on a computer. Kauffman's computer-generated simulations are able to illustrate various evolutionary strategies, including one of coevolution whereby greater complexity is shown to confer selective advantage on organisms suggestive of a natural teleology.⁵ Gregersen concludes: "It seems evident that this view of evolution is close to religious intuitions of the orderliness [and purposiveness] of the world of nature." Indeed, this seems to be Gregersen's overarching scientific conclusion: at different levels of prebiological and biological organization (genetic, phenotypical, ecological), we find evidence of evolutionary payoffs for increases in complexity that manifest co-operative strategies, this supposedly showing that the natural world has a built-in teleology that is similar to the teleology posited by theism and that one would expect to find if CC is true.

It is part of Gregersen's project to argue that classical theism should not be interpreted as claiming that God and God alone possesses the capacity to create, that human agents (and other creatures God has made) do not possess this capacity. On the contrary, he argues that the biblical tradition can be read as a guarantee that human agents, at least, do have a genuine capacity to create. We are not merely overpowered by the divine action of creation, nor are the effects of our creative capacities merely the epiphenomenal by-blows of divine action. Rather, we, at least, possess an enduring capacity to create, and the effects of our exercise of this capacity

are also durable. The upshot is that we must conceive of God as both active and reactive, as an agent who gives us our existence and causal capacities at every moment, but who also enters into genuinely two-way causal interactions with us.⁶ The divine action of creation, then, is both originative and supportive of our causal capacities, and also responsive to their exercise. Insofar as God creates a stable world within which such causal capacities can be exercised, such exercise is both theonomous and autonomous. This relation is, moreover, a reciprocal one into which God enters with other life-forms and with prebiotic systems as well. The structure of such causal relationships will concern us further below. Here we emphasize its consonance with the natural teleology Gregersen finds in contemporary evolutionary biology. “The self-consistency of divine influencing . . . is given with the steady intent to support autonomy while stimulating the qualitatively most intense interactions between self-productive systems. God is the God seeking highly patterned resonance and symbiosis.” Gregersen’s conclusion seems to be, then, that given a certain interpretation of theism and one understanding of certain biological theories, CC and contemporary science are compatible.

We endorse Gregersen’s emphasis on divine interaction with the created world, and especially with its rational agents. In the Greek Patristic tradition there is a similar emphasis on such co-operation (as a check of Lampe’s *Patristic Greek Lexicon* will show: s.v. *συνεργεῖα* and cognates). Many of these texts are explicitly Trinitarian, referring first to the co-operation between the persons of the Trinity and only secondarily to divine-human co-operation. We think the Trinity is best understood in terms of a social model.⁷ Such a view is especially congenial to a fully interactive model of divine-human relations. Moreover, such a model is almost bound to borrow analogically from what we know about interactions between human agents. Those interactions, after all, are the matrix within which our own personalities take shape and within which much of our own rational (and irrational!) intentionality finds expression. They are thoroughly causal and are also filled with novelty and creativity. We think that a nuanced analysis of human interactions, of the roles played in them by language, and of the phenomenology of human creativity might furnish useful analogies for understanding divine-human interactions and the creativity that attaches to them.⁸ Dorothy L. Sayers once remarked that “we make because we are made in the image of a maker,” echoing a theme of ancient and medieval theism.⁹ Surely if we are trying to discern the intelligibility of divine creativity, it would be well to look deeply into the character of our own creativity for models. Nevertheless, we have some reservations about this first plank in Gregersen’s platform.

First, Gregersen is in danger of arguing in a circle. Thus, co-operation as an evolutionary strategy can be given a theological interpretation, and theism can be given an interpretation that makes divine-human co-opera-

tion central, with the result that the two views are consistent. But it may be complained that the biological theories are being used as a hermeneutical guide for construing theism, and theism is being used as a hermeneutical guide for interpreting the biological theories. The resulting consistency, then, seems to be a result of circular reasoning. A second complaint has to do with some details of Gregersen's presentation of his favored theories. In particular, it is not evident that the examples he gives are all properly understood as symbiotic.¹⁰

However, there are more pressing difficulties. Personal experience shows that individuals suffer grave misfortune and die. Indeed, evolutionary history shows that not only do individuals die but whole species become extinct. Personal experience and evolutionary history both exhibit a lot of casualties. This mix may be consonant with theistic accounts of divine intentions for the created world, but showing that takes more work than Gregersen has done. It is not established by merely showing that co-operative evolutionary strategies are sometimes compounded with competitive ones, because, as Kauffman has emphasized, co-operation is only one among several possible evolutionary strategies. Moreover, according to his own account, coevolution appears as the result of an entirely autonomous and naturalistic process, one that can be modeled algorithmically. But it seems odd to say that such a result is at all like the teleology posited by the theist. Further, the nonlinear functions of chaos theory are commonly misunderstood as indeterministic in a metaphysical sense when they are actually only epistemologically indeterministic (Dupre 1993, 175; Polkinghorne 1991, 36). How can such mathematics describe a system exhibiting a teleology that is the result of the intentional and maximally rational action of a creator? If there is one thing an omniscient being must know through and through, it is its own intentions. God must, as a matter of necessity, be able to predict what God's own behavior will be like indefinitely far into the future.¹¹ In short, there seem to be too many disanalogies here for Gregersen's consonance of thought to hold up.

Finally, it seems that there is an equivocation in Gregersen's argument. Co-operation as an evolutionary strategy is intentional in the broad sense of being directed at some goal. Given that it can be ascribed to both biotic and abiotic systems, and to such simple organisms as viruses and bacteria, it is not necessarily deliberative or rational.¹² But co-operation as a theological concept and as applied to moral agents like ourselves is necessarily deliberative and rational, as well as intentional in the broadest and most basic sense. For such co-operation is between free and rationally intentional agents (indeed, on standard views, one of them perfectly so). It is not clear to us that comparisons of the behavior of abiotic systems, or very simple organisms, and the behavior of more sophisticated agents in their environments can be carried forward without unwarranted equivocation on the term "co-operation."

CAUSALITY

It is instructive to begin with one of Gregersen's examples. Neurons are made of atoms but are not reducible to their material constituents, because they belong to a physical system of greater complexity (a brain) and possess causal capacities that their constitutive atoms do not. Once neurons exist, they form a system that is energetically open to the lower level of organization but internally and operationally closed. That is, neurons function in the brain according to their own laws and with a degree of system-relative autonomy. Neurons, then, are an example of an AP system. The psychological life of the mind arises in a similar fashion: it is materially constituted by the brain but possesses causal capacities transcending those of the brain. Further analogues to this dual structure can be found in cells in relation to their parts, human immune systems and their parts, and so on. In all such cases, the functioning of the more complex system must be understood in its own terms by way of theories specific to that level of organization. "As soon as one leaves the level of fundamental physics," Gregersen writes, "we are confronted with a world of naturally polycentric systems, uncontrollable (and therefore unpredictable) from the constitutive level of fundamental physics—or from any other singular perspective." The epistemological plurality of the world thus "has an ontological basis."¹³ So far, so good. However, Gregersen goes further. His view is that a plurality of interacting systems also requires "multilateral and type-different causalities." Gregersen returns to this claim later in his paper and explicates it by way of Fred Dretske's distinction between structuring causes and triggering causes.

Here is an example of Dretske's (cited by Gregersen) that is supposed to illustrate the distinction. A terrorist wires up a bomb to a general's car, and the general, some days later, sets the bomb off by turning a key in the ignition. The action of the general is a triggering cause of the explosion (which is, in turn, a triggering cause of his death), but the action of the terrorist is a structuring cause of that same explosion (and of the general's death). Unlike triggering causes, structuring causes are not sufficient for their effects and can be related to them one-to-many.¹⁴ Dretske is concerned to find a way to give an explanatory role to mental events, and especially to beliefs. He argues that mental events are structuring causes and that neural events (upon which mental events supervene) are triggering causes, with causal relations being understood (apparently) in broadly Humean terms. Gregersen borrows Dretske's distinction between structuring and triggering causes to help explain the "type-different causalities" required by the theory of AP systems. He also intends to give a specifically theological interpretation of this causal dualism. In so doing, he aims to strengthen his claim that CC and science are consistent, and also to account for particular divine actions.

In the latter stage of Gregersen's project, CC is understood to include both general or uniform divine action (whereby the world and its causal capacities are sustained in existence) and particular or nonuniform divine action (whereby God acts to bring about changes within the natural world). Particular divine actions are likened to structuring causes, with special reference to their one-to-many relation to effects: "Structuring causes are thus configuring the circumstances under which the future triggering causes can work." Consider again the terrorist's bomb-wiring, which sets the conditions under which the general's action of key-turning achieves its effects. In a similar way, God acts so as to change the probability distributions, the "possibility spaces" or "possibility spectra," understood as the objective Popperian propensities that relate the parts of the natural world to one another. "The workings of nature would still be the only triggering causes," Gregersen writes; "God would rather be the underlying causality that enables the creatures to trigger themselves forth in their given setting. . . . Working as a structuring cause, God is seen as *reshaping the possibilities, as the history goes along, by acting in different ways in different contexts*, in analogy to other mental events" (ibid.). The use of Dretske's distinction to explicate this idea of altering probability distributions, *without altering causal capacities or laws*, is fundamental to Gregersen's argument. It suggests to him a way of explaining particular divine actions, and thereby a vital part of CC, and allows him to bring the theory of AP systems back into the discussion. The latter, he claims, "generalizes this fundamental idea with respect to higher-developed systems." That generalization, in turn, is supposed to show the compatibility of this component of CC with the scientific view of the world. And perhaps it does. But we are skeptical.

To begin with, it is far from clear that anything in the theory of AP systems warrants talk of type-different causalities. As described, this theory seems to refer only to ordinary event causation, or what Dretske would call triggering causes. Second, Dretske's distinction itself is not secure. It seems conceptually more economical to say that Dretske's examples merely describe one kind of cause (triggering causes) of various different effects, including distinct events like the explosion of the bomb and the standing conditions, made up of the bomb and its wiring, which are the conditions in which the explosion occurs. There is insufficient reason, and perhaps no need, to posit two different kinds of causation.¹⁵ Third, it is not clear that Dretske's distinction will serve Gregersen's purpose. Altering the probability distribution of a Popperian propensity looks to us like either the operation of an ordinary triggering cause (to use Dretske's terms) or some third kind of causality, perhaps a restructuring cause. If it is the former, then Dretske's distinction does not work, and if it is the second, then Gregersen owes us some account of this new type of causality. However, he seems to despair of giving any account of how God structures (or restructures) possibility spaces: "'How? By which means?' the skeptic will

ask. My answer is bluntly that no one who knows what he or she is asking about can expect an answer to this question.” But an answer is what a reflective theist would like to have and what Gregersen’s project leads us to expect. How, then, to proceed? Why not take advantage of the rich philosophical literature on causation that has appeared in the last decade or so, approaching the problem of divine action in the light of a more explicit analysis of causal relations, especially because much of that literature emphasizes a plurality of types of causation? Counter-factual theories, which are well developed, offer an appealing option.¹⁶ Without such analysis, Gregersen’s claim to have made divine action (whether uniform or particular) intelligible is unconvincing. And without an intelligible account of divine action, it is not clear how one can show that CC is logically compatible with a scientific view of the world.

NOTES

1. Advocates of anti-realism about scientific theories will find this less pressing. See Cartwright 1983 and Hacking 1983 for such theoretical anti-realism (as opposed to anti-realism about entities). Clayton 1998 provides a useful short discussion of methodological naturalism.
2. This is in keeping, perhaps, with the meaning of the original German title of Gregersen’s paper, with “*verstehen und verantworten*” understood as “to comprehend and defend.”
3. Gregersen makes no use of the standard terminology of inductive logic, so we are uncertain about the last point. We are also uncertain how much of the world is supposed to be an AP system or composed of AP systems, though of course CC applies everywhere and all the time.
4. “Consonance of thought” is vague. Sometimes Gregersen seems to mean (1) only that AP theory and CC are logically consistent, sometimes (2) that AP theory illuminates CC, and sometimes (3) that AP theory gives inductive support for CC.
5. Kauffman has only computer models to use as evidence, with no other empirical support for his theory. Moreover, it is unclear to us that Kauffman’s theory, as Gregersen presents it, is consistent with the theories of Eigen-Schuster and Balmer-Weizsaecker, but Gregersen’s argument requires that they be so. See, however, Peacocke 1979, 101–3.
6. We think it is better to talk in terms of causal capacities rather than causal laws. See Van Inwagen 1988 and Cartwright 1994.
7. Layman 1988. Van Inwagen 1995 defends the more traditional “substance” theory of the Trinity. We use the social model in McClelland and Deltete (forthcoming).
8. The phenomenology of creativity is treated in McClelland 1993.
9. Human agents as co-creators with God is the topic of Peacocke 1979, 304–11, and Hefner 1989.
10. Not all of the relationships Gregersen describes as “symbiotic” are clearly such; and can we bring the adaptive behavior of both viruses and wolves under the rubric of “learning” without risk of equivocation?
11. Like Gregersen, we think that God is an omnitemporal being. Indeed, we think that interaction between God and creatures requires this.
12. The distinction is discussed in detail by Pettit 1996, chaps. 1–2.
13. Such pluralism has powerful allies in Dupre (1993) and in Galison and Stump (1996).
14. Dretske 1995, 121–36. The theory is briefly recapitulated in Dretske 1997, 159–62.
15. Dretske himself entertains this objection, but his rejection of it (1995, 124–25) is unconvincing. Lynn Rudder Baker has criticized Dretske’s general approach to beliefs on the grounds that it is circular (1995, 56–62).
16. There is a good review of counter-factual causation in Ramachandran 1997. Clarke 1993 uses this approach effectively to analyze agent causation, which is especially relevant to Gregersen’s concerns. See further: McClelland and Deltete (forthcoming).

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