

Peter McLaughlin, *What Functions Explain. Functional Explanation and Self-Reproducing Systems*, Cambridge University Press, 2001, 259 pages, ISBN 0 5217 8233 3 (hardback), GBP 35.00, USD 54.95.

The title "What Functions Explain" reflects the way in which Peter McLaughlin addresses the topic of functional explanation. The aim of his discussion is not to assess which philosophical account of functional explanation is the right one or how the concept of functional explanation should best be explicated. Instead, McLaughlin announces a study in descriptive metaphysics. He takes common uses of the term function and tries to figure out what metaphysical presumptions are made about the things to be explained. When we explain something functionally what do we presuppose about the referent? (Maybe that it is a living thing or made by a living thing, or that it is a system that has values, or perhaps that it figures in a process of heritable variation?) This is what the title of McLaughlin's book means.

The focus of the discussion is on functional ascriptions insofar as they are explanatory, i.e., they explain why an object exists and why it has the properties it has. In addition, McLaughlin is interested in common and legitimate kinds of functional explanations that might involve a rather high metaphysical cost. That is to say that types of functional explanation which, apparently, do not only make minor metaphysical presuppositions are of particular importance for the discussion. In fact, the author announces as one of his conclusions that natural selection alone is not sufficient for a naturalistic reconstruction of function. Instead, the metaphysical cost of many functional explanations involves "a bit of Aristotle" (p. 14). Another main upshot is that the things that are functionally explained are self-reproducing systems, i.e., entities that constantly rebuild or repair themselves.

The first two parts of the book give an introductory discussion of the problem of teleology and functional explanation as well as the postwar positions on these issues. For instance, McLaughlin keeps internal and external teleology apart, offers a classification of different kinds of teleological phenomena, and gives an extensive discussion of the function of artifacts. The philosophical accounts on functional explanation by Hempel and Nagel are presented and shortly discussed. The following main positions in the debate, etiological and dispositional approaches, are described together with their main features and weak points (including authors such as Ruse, Elster, Wright, Millikan, Neander, Godfrey-Smith, Cummins, Bigelow and Pargetter). McLaughlin does not only offer a good introduction to the question of teleology and a useful overview of the debate on functional explanation. His discussion also clarifies some issues that prepare the subsequent development of his own topic and will be vital for the points made in the third part.

McLaughlin claims that an analysis of functional explanation that covers all uses which actually occur involves at least the following. Saying that the function of X for system S is Y means that (1) X does Y, (2) Y is good for S, and (3) by being good for some S, Y contributes to the (re)production of X. (As the discussion of artifacts made clear, the above statements have to be replaced by corresponding statements about beliefs and intentions in this particular case.) For this reason, functional explanations commit us to the existence of causes or dispositions (item 1), of a system that has a good (item 2), and of some feedback mechanisms (item 3). In particular

the idea of a system that has a good has been largely dropped in etiological and dispositional accounts of functions.

The first chapter of the third and final part argues that the functions of artifacts and natural functions (organisms and social institutions) differ in fundamental respects. Indeed, the fact that standard accounts are based on an analogy of artificial and natural teleology creates misunderstandings. Artificial teleology is external, it presupposes an intentional agent that sets purposes. Natural teleology, by contrast, is internal, i.e., it involves systems that have a good of their own. To talk about functions in the case of artifacts is not really necessary as long as the intentional term of purpose is available. In addition, the equation of "the function of X is Y" with "there has been selection of X for Y" arises from a fallacy as to how natural selection works. For while an artisan can select the parts of an artifact for their function, nature does not select the parts of organisms for their function. Nature can only select whole organisms. As natural selection works like a breeder rather than like an artisan, McLaughlin views the analogy of artifacts and parts of organisms breaking down. As a result, functions in general should not be conceptualized on the model of artifacts. In particular, natural functions have to be considered on their own. They predate artificial functions and thus an account of natural functions is primary.

The next chapter is the core of the book. It tries to show the provocative claim that even though natural selection can explain the origin of function bearers it does not explain why they have a function. McLaughlin describes a feedback mechanism that works within generations and thus allows for examples of functional ascriptions that cannot be based on natural selection. The mechanism is an ontogenetic feedback mechanism insofar as it works within one system (token) such as an organism. A part of that system - provided it has a function - contributes to the rebuilding, repair, and maintenance of the system and thus to its own growth and maintenance. Hence, a part of a system might acquire a function within its lifetime by contributing to the good of the system. This kind of self-maintenance and reassembling is what McLaughlin means by "self-reproducing system" and he points to the fact that this understanding of an organism is historically important. In a "naturalistic fable" the origin of different kinds of functions is told in five stages. At the beginning there are self-replicating entities whose parts do not have functions. When the identity of a system over time becomes contingent upon its self-regeneration, we have self-reproducing systems that have a good and their parts may have functions. Later, intentionality and artifacts arise. Within this account, it is not determinism that is the opposite of teleology, but reductionism insofar as functional explanation involves a kind of apparent holistic causation where the whole and the parts influence each other.

Finally, McLaughlin gives some clarifications on what it means to have a good. While von Wright assumed that this is the case for living beings, McLaughlin points to the fact that what is needed is an analysis of what characterizes something that has a good. He opts for self-reproducing systems (and emphasizes that having a good or interest has to be kept apart from moral considerations). Thus the question of whether social institutions can have functions depends on whether they can be conceptualized as reassembling systems. Similarly, artifacts do not have a good, because they are not self-reproducing (the fact that they are not living is pointless).

An issue that is not well explored in "What Functions Explain" is the relationship between feedback mechanisms within and between generations. McLaughlin's account seems to rely solely on an intragenerational feedback mechanism which, in the case of parts of organisms, refers to an explanation of the morphogenetic and morphostatic processes and their relationship to the well-being of the whole organism. Thus functional ascriptions simply amount to an encompassing ontogenetic explanation. However, McLaughlin acknowledges that we attribute functions to parts of organisms that are useful for reproduction (in the sense of replication) alone. He seems to allow this usage because such an organ is useful for the progeny produced (and the progeny has a good as a self-reproducing system). As a trait used for reproduction creates progeny in the first place and does not benefit an existing system it is not clear what McLaughlin's statements are supposed to show. He wants to limit the role of natural selection as constitutive of natural functions (even though it brings forth and transforms function bearers) but does not present well enough how natural selection relates to functions and his ontogenetic feedback mechanism. In addition, the focus of the study is on the function of biological traits, a real discussion of social institutions is missing. Even though it seems plausible that a feedback mechanism similar to the proposed one might work in the case of social entities, a further exploration of this issue would have been interesting.

McLaughlin addresses the topic of functional explanation in a very fruitful manner. He does not want to come up with an explication of function that (allegedly) serves the purposes of biology or some branches of philosophy. Instead, he analyzes the ontological assumptions made by some standard uses of the term function and argues that functional explanation often involves a prize that is higher than usually acknowledged or intended by philosophical accounts. It assumes the existence of a self-reproducing system that has a good. Natural selection alone cannot do the job. McLaughlin is aware of the possibility of equating "the function of X is Y" with "X is an adaptation for Y". However, he believes that several intuitive usages of the term function (as employed by biologists as well) involve more than this. In any case, reducing functions to adaptations would amount to an elimination of functions as an independent term and recommending or rejecting such a possibility is not an issue for McLaughlin's descriptive metaphysics. By going beyond the scope of much of the literature on functional explanation, giving a provocative account and presenting a new suggestion, "What Functions Explain" offers a useful contribution to theories of teleological explanation.

Ingo Brigandt
Department of History and Philosophy of Science
University of Pittsburgh
USA