tree (if there is no impediment, as Aristotle used to say); if it were not an acorn, it would not develop into an oak tree. Where is an explanation here? We have not left the realm of trivial description as yet. I would like to add that everything is perfectly all right with the statement "acorns develop into oak trees". This a useful commonsensical **descriptive** statement which belongs to science as a starting point.

Let us try the 'capacity' talk. Acorns have the capacity to develop into oak trees. Aspirins have the capacity to relieve headaches. Nancy Cartwright says that this is not a report of regularities: it does not say that aspirins "relieve headaches most of the time, or more often than not". A capacity can reveal a regularity, but one good single case is enough: "[t]he best sign that aspirins can relieve headaches is that on occasion some of them do" [6: 3]. Have we won anything? Unlikely. Can we proceed without regularities? Unlikely. Let us note first that Cartwright speaks about "a relatively enduring and stable capacity" [6: 3]. What would we do if only 3% of aspirin or acorns revealed the capacities mentioned above? We would look for regularities by means of controlled experiments: maybe aspirin is not pure or acorns are too dry, etc. I readily agree that "one good single case" may be enough, but, notice, enough to see a regularity. This is because we have a lot of commonsensical experience about orderly things in our pre-scientific days. The introduction of the 'capacity' talk does not help us circumvent regularities. Acorns develop and aspirins relieve – they just do that. We have perfectly good descriptive statements. There is no need for a metaphysical paraphrase to do the descriptions. The next interesting question would be why they do that. Maybe they have certain special constituent parts?

But let us follow Nussbaum in her reasoning. She says that organic systems are self-maintaining: "[t]his capacity – to maintain functional states through self nutrition and to propagate them through reproduction – is the mark that sets off the living from the lifeless" [17: 76]. A good description. Problems cripple in when we try to get a teleological explanation out of it. Icicles also grow, as Nussbaum says, but icicles cannot vary their behavior with changing circumstances. The rooting and branching change in plants, depending on the location of the sources of light and water. The material account cannot do the explanation. Nussbaum's Aristotle claims that the teleological law can help – the law that the behavior is whatever will promote the flourishing of the mature organism [17: 79].

First of all, it is premature to rule out the explanation through the efficient-causal chain. Nussbaum is not against it: in C_1, plant O does x_1, etc. But she insists that we have a simpler teleological law in terms of the flourishing of the mature organism or bringing about a component of its λογος [17: 80]. I am very dubious about the flourishing as an end-result. The trivial counterargument is that living organisms decay – there is no long flourishing in our world. Putting this aside, let us look at the rooting. Roots absorb water; suppose it is contaminated water; roots would absorb it and will not flourish. The point is that roots just do their own **regular** job and λογος is not realized in the end. The law of flourishing just will not do. Besides, all I have said earlier about the vacuity of the explanation through form is applicable to λογος as the end-state "which provides a unified account of adaptive behavior" [17: 80]. Adaptive behavior really deserves explanation, and I will come back to this later.

Another troublesome point for neo-Aristotelians is that their objective teleological account hardly distinguishes between living and non-living creatures. This is the famous characteristic of natural things from Aristotle's *Physics* (199b 15–18): "Things exist by nature if, starting from some internal starting-point, they arrive by a continuous process of change at some end-state. Each starting-point gives rise, not to the same thing in all cases, nor to just any chance thing, but always to something proceeding towards the same thing, if there is no impediment" (Nussbaum's translation) [17: 80]; [1]. This is a general description applicable to all natural processes including growing icicles and massive objects attracting each other. I suppose this is not what modern neo-Aristotelians intended to achieve by introducing the teleological account.

Permit me another digression. The teleological discourse can be found in highly unexpected places. Roger Jones argues that poor realists do not know what to be realists about even in the Newtonian world. Why? There are different formulations of Newtonian mechanics with different ontological and explanatory commitments. One of the version is based on minimum principles which says that the motion of a massive body "is determined by a property associated only with a complete path between two points in space". According to Jones, this approach "seems to have no connotations of causality" [13: 190]. In later discussions, Alan Musgrave seems to ascribe the teleological character to Jones' minimum example: the approach has "a teleological rather than a causal flavor" [16: 692].

Where is anything at least close to teleology in the minimum approach? I think that the approach should be seen as a regularity description: particles move in a way described in mathematical terms. If one insists that every law-like account is an explanation, let it be an explanation. Does the end-state direct (or precause) the path of a particle? This

torturing problem arises only if we use an anthropological picture of causal agents as acting in an intentional-like manner. No problem of this kind arises if we think about the natural world in terms of natural regularities occurring "always or for the most part", to use one of Aristotle's favorite phrases. Besides, *contra* Jones, the minimum description is compatible with other descriptions: natural systems might well have different things going on in a regular fashion inside.

Let us get back, however, to Nussbaum's Aristotle. He turns to functions which are said to be another way to describe the objective teleological order, for instance, "the function of eyes in lions is seeing" [17: 75]. Functional account is given with reference to the nature of a thing; in biology functions of parts are given with regard to organism's self-maintaining activity. She emphasizes that this is not a genetic account, that is, the main question is **not** how certain parts got there. The main thing is how systems and parts enable organisms to maintain themselves, which is related to the λογος of an organism. So the function of the heart in higher animals is to pump blood. Other things that the heart can do (a thumping noise, etc.) do not enter the animal's λογος [17: 83].

The heart both makes a thumping noise and pumps blood. These two things are related in a causal chain (*i. e*. regularity chain). It is true that animals need the blood (not the sound) to survive and it is the heart that forces the blood to circulate. Why then not to say simply "the heart just pumps the blood"? Or as a typical textbook puts it, "[t]he heart is a pump that forces the fluid blood from one part of the body to another" [9: 207]. We are in the natural world: hearts pump, massive bodies attract, etc. Our Aristotle would probably point out that I am not careful enough: the function is given with the reference to the λογος of each living thing and its self-maintaining activity. But we must bear in mind that the heart stops naturally at some point and the self-maintenance fails. Besides, the self-maintenance of a lion requires the destruction of a zebra. So we are brought back to simple descriptions of the natural world. Then we could ask a straightforward non-teleological question: what leads to the survival of organisms? Could the term 'function' without any teleological flavor show up in answers to this question? Let us discuss the question from the post-Darwinian perspective.

4. One might think that my criticism of internal teleology is a suspect in the light of modern evolutionary biology. Really, philosophers of science defend functional account [14]. "Design language reigns triumphant in evolutionary biology", as Michael Ruse puts it [18: 16]. Geneticist and evolutionist Francisco J. Ayala claims that teleological explanations are essential in biology [3]. Others disagree: for instance, botanist Paul J. Kramer claims that the design language is not appropriate in the post-Darwinian age [15]. Let us look at the most straightforward Ayala's account.

Man-made objects are usually teleological. Ayala points out that features of organisms are also teleological: "bird's wings are *for* flying", etc. [3: 187]. What about the gravitational interaction being for keeping the solar system together? Hold on, the reader might say, don't you see the difference? I see the difference and the temptation, but from evolutionary biology we learn that organisms evolved without any design and purpose. Therefore I resist the temptation. Ayala's answer is obvious: the gravitational interaction contributes to the stability of the solar system, but the solar system is not the reason why the gravitational interaction is there. According to Ayala, the essential component of teleological explanations is that a feature's contribution "*must be the reason why the feature or behavior exists at all*" [3: 188]. Now we crucially depend on the term 'reason'. Does anyone reason the reason?

At this point the familiar distinction between external (intentional, artificial) teleology and internal (natural) teleology comes in. Ayala argues that teleology in biology is not purposeful (intentional), no need for "the conscious design of any agent". Then two types of internal teleology are distinguished: determinate and indeterminate. In the case of determinate teleology an end-state is reached in spite of environmental fluctuations, *e. g.* the development of an egg into a chicken. Indeterminate teleology means that the end-state is the outcome of selection from generally non-predictable alternatives, *e. g*. the adaptation of wings for flying [3: 190].

I do not have to say anything new about the determinate teleology. All the critical remarks concerning the Aristotelian teleology are relevant here. Specific end-states (meaning final-states) are reached in both the organic and the inorganic world. The end-states are not goal-states, though. One can speak metaphorically about the design in the development of the solar system or a chicken. Since there is no conscious goal, the simplest general description of the developments is that nature follows its regular causal routes. The end-states are not **the reason** why the development occurs.

The case of indeterminate teleology is more interesting. It is different from older versions of teleology because natural selection is behind it. It looks like we come up with a special teleological mechanism at last. In Kitcher's functionalism this is also crucial: functional attribution rests on certain presuppositions about "a pertinent source of design [14: