Hegel's anomalous functionalism

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The section in the *Phenomenology of Spirit* on "observing" reason is one of the least studied parts of the work, which is a pity because it contains some things very pertinent to contemporary philosophical concerns. The only passage I will treat in any detail here is the discussion concerning the observation of biological organisms (§§254–297), but I will start with a few remarks concerning the place of observing reason within the Phenomenology as a whole, and of the observation of organic life within observing reason.

"Observing Reason" is the first main section of the "Reason" chapter. In Hegel's formal scheme the chapter on Reason has a double numbering that may seem confusing at first, but on closer inspection reveals itself to be entirely logical. The preceding chapters, on Consciousness and Self-Consciousness, are called A and B, respectively. As Hegel's basic progression is always through triads, one expects the following chapter to be C, and then for the numbering to start again on a new level. In keeping with this, the two chapters following Reason, on Spirit and Religion, are numbered BB and CC, and one would expect them to be preceded by a chapter AA. Between these two series we find the chapter on Reason, and, lo and behold, it is called C AA. The only natural reading of this is that Reason has a double role in the dialectical progression: it is both the last stage of the first triad and the first stage of the second.¹

This is also reasonable with regard to the content. In the overall flow of the *Phenomenology*, the dialectical waltz is syncopated by another rhythm in two-step, moving back and forth between objectivity and subjectivity. Sense-certainty takes the world as naively given and itself as pure registration, Perception concentrates on the contribution of the subject, while the Understanding rediscovers itself in objective reality. On the next level

¹As Robert Pippin pointed out at the conference, there is a problem to reconcile this analysis with the fact that chapter CC is immediately followed by the final chapter DD, on Absolute knowing. My best answer is that this is a kind of mistake, probably reflecting a genuine uncertainty on Hegel's part about what to do with the final chapter. If absolute knowing is really the final stage of the dialectic, it should be the third stage of a triad, but religion already occupies the only available slot. As it is, I think the final chapter is best regarded as belonging with the Preface, as a comment from the outside rather than as a proper part of the development of the spirit – it is really an Epilogue.
up, Consciousness as a whole is concerned with objectivity, while Self-Consciousness is concerned with the subject – in Reason, self and world are reunited as self-consciousness rediscovers itself in the world, in the form of an object. But precisely in virtue of this, Reason is also ready to play the role of the first, objective, stage in the next large triad where Spirit represents the subjective pole and Religion combines the two in a spiritualized rendition of the world.

The same principles apply to the disposition of lower levels, within the collection of collections of chinese boxes that is the *Phenomenology of Spirit*. Sense-certainty, e.g., begins with naive objectivism, goes on to naive subjectivism and ends up with a synthetic unity that is the foundation for the first, objective, stage of Perception. According to the same pattern Reason itself has three parts, and the Observing Reason is the first one, concerned with reason as manifested in the object, as observed by reason. Put in another way, the Observing Reason is concerned with *science*, as being the most sophisticated attempt to capture reality in entirely objective terms.\(^2\) And, of course, the Observing Reason again has three main sections that relate in the same way, concerned with the observation of physical nature, with the observation of the psyche, and with the psycho-physical relation between the body and the mind, respectively.

The passage about living organisms, in turn, is situated at the end of the discussion of Nature, just before the transition to the observation of Self-Consciousness. Natural as this may seem from a modern point of view, it is not a self-evident choice as far as Hegel is concerned. Living things are intermediate between inorganic nature and consciousness. In *De anima* Aristotle treats plants and animals as having souls, in virtue of the functional organization that is their defining characteristic for Hegel as well, and the main previous discussion of living things in the *Phenomenology* is located at the beginning of Self-Consciousness rather than at the end of Consciousness. Had he been less strongly attached to his formal scheme, Hegel would, perhaps, have treated life as a separate stage between inorganic nature and self-consciousness. As it is, he hesitates about where it belongs, but he is clearly more interested in the differences between living things and inorganic nature than in their similarities.

What gives Hegel’s discussion of science its contemporary interest is largely his thorough anti-reductionism, and the fact that he opposes reductionism for conceptual rather than for metaphysical reasons. In keeping with this, the main point of his treatment of biological categories is his argument that they are not reducible to the categories of physics and chemistry. More precisely, he argues that there can be no proper scientific laws connecting the two domains – as hinted in the title of this article, his argument to that

\(^2\)Here I use the word science in an ordinary way, of course, and not as a translation of Hegel’s “Wissenschaft”, which he uses for the highest form of philosophy.
effect bears a certain resemblance to Donald Davidson’s argument for the anomalousness of the mental.

Nature

The Observing Reason as a whole is concerned with the nature of scientific concepts and their relation to scientific laws. The beginning of the scientific attitude is the naïve conviction that the world itself is reasonable and that you can find reason in the world by just paying attention – i.e., by observation. In a way, we seem to be back at the level of sense-certainty, where consciousness appears to itself as doing no more in knowledge than register the way things are. But in truth, we are at a higher level where reason is in charge and controls what it shall experience.

The active role of reason in the epistemic process is deepened as we go along. At the first, taxonomic, stage it goes no further than to classify particular phenomena in general terms. The desire for knowledge is expressed through the labour to describe everything there is, to extend what we know, through voyages of discovery and ever more powerful instruments of observation. Soon, however, the spontaneous will to chart the unknown and describe what one finds in nature starts to run into problems. It is easy enough, says Hegel, to see that there is something special about the elephant, the oak or the substance of gold, but when we push further and try to distinguish genera and species in what soon threatens to become a chaos of animals, plants and natural substances, we loose our foothold and find it increasingly difficult to draw the line between what are really separate species and what is mere individual variation. The solution is to create systematic taxonomies, built on unified criteria, but this already implies that reason abandons its passivity and increases its own command:

Through this distinction between what is essential and what is unessential, the Notion rises above the dispersion of the sensuous, and cognition thus makes it clear that it is just as essentially concerned with its own self as with things. (§246)

Are the kinds that we discern, and the criteria we employ, grounded in the nature of things or are they just tools manufactured by us? As usual, Hegel distinguishes different grades and levels in this respect, before he connects the classifications most worthy of being taken as both real and reasonable to the concept of law.

Easiest of natural things to demarcate by essential characteristics are, according to Hegel, the kinds of animals, and the reason for this is that animals demarcate themselves. The individual animal upholds and defends its own identity against external attack – by a somewhat dubious argument, Hegel draws the conclusion that they are best classified by the tools they
use for this purpose, i.e., by the shape of teeth and claws. Plants are lower on the ladder of conceptuality and do not sustain their individuality in the same active way – they stand, says Hegel, “on the boundary-line of individuality”. But in the interest of reproduction they uphold at least one essential distinction, namely according to sex, and so we classify them by their reproductive organs.

While the details of this account are decidedly passé, the underlying point is important. There are no real individuals in inorganic nature, new things can be fashioned at will by composition or partition, and in many cases the actual demarcation between different things is obviously artificial and imposed by the observer. And the higher degree of individuality of animals and plants is connected to their more intimate relation to conceptuality – the animal does not need to wait for an observer to be classified, it incorporates its concept and itself recognizes its kin. In inorganic nature, to the contrary, not even the boundaries between different substances are absolute: in chemical reactions given substances are transformed into new ones with unpredictable features.

Reason looks for what is constant in experience but cannot find it on the level of observable properties, because the nature of things is to change. What first appears as an essential property of an abiding thing reveals itself as a fleeting stage of a process. What is constant must be sought on another level, in the laws that govern change, but the search for natural laws will force a decisive change in the formation of scientific concepts.

At the outset, the observing reason takes it for granted that laws shall be accessible to direct observation, that they shall be given as correlations between observable properties. But it soon runs into two sorts of trouble with this approach. First, purely empirical correlations are never truly universal, they always admit of exceptions and special cases, that we in turn want to understand and submit to strict laws. Second, even if an empirical correlation should happen to be universally valid, it lacks the necessity of a true law. The necessity of a true law stems from its conceptual form rather than from empirical observation, that by itself can reach no further than to contingent probabilities.

So what is it, according to Hegel, that confers necessity on a true law? It has to do with the relation that reason instinctively seeks to establish between what is given in experience and the conceptual structures it applies to it.

That a stone falls, is true for consciousness because in its heaviness the stone has in and for itself that essential relation to the earth which is expressed in falling. Consciousness thus has in experience the being of the law, but it has, too, the law in the form of a Notion [Begriff]; and it is only because of the two aspects together that the law is true for consciousness. The law is valid
as a law because it is manifested in the world of appearance, and is also in its own self a Notion. (§250)

The stone falls because it is heavy, but heaviness is nothing but a disposition to fall. It sounds as if Hegel thinks of natural laws as analytic, as conceptual truths of a kind, and so he does, to some extent. The terms of a scientific theory are defined in relation to each other, and the laws of the theory express the relevant relations. Take the concept of mass, to stay close to the example in the quote. Mass is measured by weighing, which in itself is a relational procedure – as demonstrated by the use of scales to establish sameness of mass – and its role in Newton’s mechanics is defined by the laws of inertia and gravitation. Would something that did not obey these laws really be mass?³

(The concept of mass is also a good example of the important phenomenon that Hegel calls “reflection”. The mass of a thing is essentially a relation that it has to other things, but it appears to us as a property of the thing itself: the relation is “reflected” back into it. Unpacking such reflected relations is one of the main tasks of the Phenomenology.)

The urge to transform empirical correlations into conceptually grounded laws is, according to Hegel, built into the praxis of science, for example in the use of controlled experiments, with the aim of purifying proposed laws from accidental circumstances and reach the really essential factors.

The inner significance of this investigation is to find the pure conditions of the law, and this means nothing else /.../ than to raise the law into the form of Notion, and to free its moments completely from being tied to a specific being. (§251)

This is a first point where Hegel’s view bears a striking relation to Davidson’s. The idea of a reciprocal relation between laws and the concepts used to formulate them plays a key role in Davidson’s argument for the non-reducibility of the mental, which relies on a specific account of conceptual holism, according to which the physical and the mental constitute separate conceptual totalities, held together by separate unifying principles. In the case of the mental domain, the relevant unity is constituted by the principles of rationality, as reflected in the principle of charity, while the physical domain is held together by “constitutive laws” for which one should not “force the decision” whether they are analytic or synthetic – Davidson even uses the term “synthetic apriori” for such laws.⁴

³Thomas Kuhn, who views the relation between concepts and theories in science in a similar way, has famously argued that there is no contradiction between the theories of Newton and Einstein, because they do not use the same concept of mass: for Newton gravitational and inertial mass are the very same thing, while they are different quantities in relativity theory.

Living things

The next step is to go from inorganic to organic nature. As we saw, non-living things, according to Hegel, have no real individuality – for a stone, there are no immanent criteria of identity that define the border between transformation and annihilation. A living thing, to the contrary, incorporates the law of its own development, it exists in the form of a law-governed process and preserves itself through change.

One has to remember, of course, that Hegel writes before Darwin and at the beginning of modern science, before the softening of the borders between physics, chemistry and biology. His world-view is dominated by the ontological hierarchy that he has, by and large, inherited from Aristotle. There are distinct levels in nature, that differ not only in conceptual complexity but also in value: the living is more valuable than inorganic nature, conscious life has more value than organisms without consciousness, and so on. The relations between different levels is always at the center of Hegel’s attention but there is no reduction: each level has emergent properties that could not be predicted on the basis of lower levels – this goes for chemistry as well as for biology.

The essential characteristic of biological organisms is their finality, i.e., that they are susceptible to functional or teleological explanation. The focus of Hegel’s discussion is the nature of functional laws and the relation of functional organization to inorganic nature, to the body and to the physical environment of the organism.

He starts out with a discussion of correlations between features of organisms and general characteristics of their milieu – examples are the thick fur expected of animals in cold climates, and the typical shapes of fish and birds that seem adapted to life in water and air, respectively. Lacking the darwinian framework, Hegel has no theoretical way to treat such associations, and he brushes them aside as mere empirical correlations, susceptible to exceptions and lacking the inner necessity of true laws.

A teleological explanation explains why something is or happens in a certain way by invoking a goal, something that it achieves or contributes to realize. In the usual case, the goal is is beyond the phenomenon to be explained, something external to the process whose goal it is – I take the bus to the airport in order to be in Paris later in the day. But the basic biological functionality is different, according to Hegel. A biological organism is its own telos and creates itself only in the sense that it preserves itself, recreating what it already is. Hegel associates this kind of self-relation to self-consciousness, and from a philosophical perspective we can see the living thing as an incarnated concept. But this conception is beyond the observing reason which is bound to treat the relation between the function and the organism as a connection between two things, a correlation to be observed.
In this way, the organism appears to the observing consciousness as a relation of two *fixed* moments in the form of immediate being – of an antithesis whose two sides, on the one hand, appear to be given to it in observation, and on the other hand, as regards their content, express the antithesis of the organic *Notion of End* (Zweckbegriff) and *actuality* (Wirklichkeit); but as the Notion as such is effaced therein, the antithesis is expressed in an obscure and superficial way, in which thought has sunk to the level of picture-thinking (Vorstellen). Thus we see the Notion taken to mean roughly the *inner*, and actuality the *outer* and their relation produces the law that the outer is the expression of the inner. (§262)

It is worth to note the word ”roughly” in this passage. The opposition between the inner and the outer is invoked many times in the *Phenomenology*, but always accompanied by critical reflections. We first meet it, in the section on Force and the Understanding, as a way of thinking about the relation between the super-sensible world and the world of appearance, and it recurs as a way of viewing the relation between consciousness and the body. In each case, Hegel argues that the idea of a relation between two independent entities is ultimately untenable.

The biological functions that Hegel uses as examples are “sensibility”, “irritability” and “reproduction”. The choice of these three goes back to Aristotle’s discussion of the basic functions of the soul in *De anima*. Aristotle identifies the mental with the biologically functional, and ascribes “souls” to plants and animals, not in the sense of having consciousness, but, precisely, in the sense of having certain types of functional organization. The “reproductive soul” is common to plants and animals, and amounts to the capacity to reproduce, i.e., to grow and procreate. What sets animals apart from plants is that they also have the capacities of perception and movement – it is the latter faculty that Hegel refers to as “irritability”.5

Hegel’s first question is about the relation between the function and the biological structure that we take to be its organ or carrier – for example the relation between sensibility and the sensory nervous system or between irritability and the motor system. How can we observe such a relation? The metaphor of an outer and an inner already seems to imply that the game is lost, for what does it mean to be “inner” in this connection except to be inaccessible to observation? To be empirically correlated with the outer, the inner must already be observable, it must, in Hegel’s terms, itself have an external shape (Gestalt):

> We have now to see what *shape* the being of inner and outer each

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5As Hegel himself points out, the ensuing discussion is primarily relevant to animals, rather than to living things in general.
The inner itself must have an outer being and a shape, just as much as the outer as such; for it is an object, or is itself posited in the form of being, and as present for observation. (§264)

So what is the outer aspect of a function, its observable *Gestalt*? It is, of course, the functional behavior, what Hegel calls a “doing” (Tun). A law that connects function and structure ultimately regards the relation between the activity of the organism and its “ruhendes sein”, but the conception of such a law gives rise to new problems, akin to those that Davidson points out with regard to the possibility of strict psycho-physical laws.

The functional capacities belong to the organism as a whole, ultimately serving its self-reproduction, and they also form an integrated totality. Particular capacities, like sensibility or irritability, are dependent moments of this totality: there can be no sensibility without irritability, says Hegel, or the reverse, and there is even a necessary correspondence between the two, implying that an organism cannot have “more” of one capacity without having more of the other. Why would that be so?

Sensibility is the capacity to register differences in the environment, while irritability is the capacity to react to them. To have a high degree of sensibility is to be able to discriminate subtle differences between stimuli. But what does it mean to say that an organism itself recognizes a difference, that two stimuli are different not only for us but for the organism itself? It is obviously not sufficient that its sensory apparatus reacts differently to them, i.e., occupies states that we, as external observers, can discriminate – in that sense a stone, for example, would have a subtle capacity to register temperature differences in its environment, but there is presumably no temptation for us to ascribe the capacity to discriminate hot and cold to the stone itself.\(^6\)

The natural suggestion is that the organism discriminates between different stimuli by reacting differently to them, or at least by being able to react differently – there is a conceptual connection between its sensory repertoire and its behavioral repertoire. The same thing can be argued from the opposite direction: if we ascribe a complex repertoire of behaviors to an organism we implicitly ascribe to it representational capacities of corresponding subtlety – the difference between goal-directed behavior and just being moved around, like a stone, implies the capacity to recognize when to a start and when to end.

But is this not just to postpone the problem – what makes two reactions different, apart from the possibility of an external observer to tell them apart? Presumably it has to do with some difference that they make

\(^6\)A parallel point can be made about behavior. If we ascribe a complex repertoire of behaviors to an organism we implicitly ascribe to it representational capacities of corresponding subtlety – the difference between goal-directed behavior and just being moved around, like a stone, implies the capacity to recognize when to a start and when to end.
with regard to the self-preservation of the organism, with its capacity for reproduction. When the organism correlates differences in stimulations with differences in behavior in a way that furthers its survival and reproduction, we have grounds to say that these are differences for the organism, and not just for us. With this, we have arrived at Hegel’s conclusion: that the different functional capacities are abstract moments of a conceptually intertwined totality.

The important contrast is between being an abstract moment of a totality, in this sense, and being a concrete part of something, in the way that the sensory nervous system is a part of the body. While the sensory function is conceptually intertwined with the other life-functions, the different parts of the body are conceptually independent of each other. One can illustrate the point with the help of Aristotle’s famous example of the eye: there are no anatomical properties that in themselves make something an eye, something is an eye only as a functioning part of a living body. But to view something as a living body, in this sense, is to make a conceptual jump from the anatomical description to the functional, to see what the organism does in the light of its end, self-preservation.

And this also completes the analogy with Davidson’s argument for the anomalousness of the mental. It is the fact that functional capacities constitute as conceptually linked totality of a specific kind that makes them irreducible to phenomena that do not belong to the relevant circle.