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David Charles and Aristotle’s Master Craftsmen

Errol G. Katayama

In Metaphysics i 1, Aristotle sets up a wise master craftsman as a model for a wise theoretical scientist to drive home the point that wisdom is concerned with the first causes and principles. The master craftsman (ἀρχιτέκτων) illustrates a wise person through the possession of the following traits: universal knowledge, understanding of the cause, grasp of the ‘why’, and ability to teach his craft to others (981a16 and a28-b10). Whatever differences exist between craft (τέχνη) and scientific knowledge (ἐπιστήμη, 981b25-26), Aristotle is here assuming a close similarity between them, as he often does elsewhere (see, e.g., APo. 71a1-4, 77b16-24, 100a6-8, and Meta. 1025b3-7). Thus, as a general methodology Charles 2000 and 2001 has the right idea in basing the interpretation of Aristotle’s essentialism on the close analogy that is drawn between a master craftsman and a theoretical scientist; nevertheless, he is mistaken about the specific epistemological role that he assigns to Aristotle’s master craftsmen, namely, that they are our only link to realism because only they can latch onto genuine objective kinds through a unique interaction with the world in their craft.

Charles’s account of Aristotle’s essentialism is couched in ‘a broader conceptual framework’ (2000, xii), where he contrasts his interpretation of Aristotle’s view with those of contemporary philosophers (such as Saul Kripke and Hilary Putnam). We must, therefore, separate its two distinct aspects: (1) its historical accuracy and (2) its value for contemporary debates on essentialism. I am concerned exclusively with (1) and not at all with (2). Even if as I contend Charles’s account of essentialism is not the view of Aristotle himself, this will not necessarily diminish the contribution he has made to the contemporary debates on essentialism; for in that case, we can assess the merit of the account as his Aristotelian essentialism.

I cast doubt on Charles’s interpretation that all master craftsmen have the ability to latch onto objective kinds. What he failed to take into account is that there are different kinds of craftsmen with their own unique standpoint from which they encounter natural kinds. Because they achieve varying levels of success in grasping them (from complete success to failure) Aristotle’s master craftsmen do not ‘construct a realist representation of the kinds around [them]’ (2001, 71) so as to pave ‘the road to realism’ (2001, 67).

I. The View of David Charles

According to Charles, Aristotle rejects two central assumptions made by the program of modern essentialism: the ones that are concerned with (1) semantic
depth and (2) existence (2000, 9). \(^1\) Regarding (1), when ordinary pre-scientific thinkers grasp the meaning of a natural-kind term (such as ‘water’), they do so with a deep theoretical assumption (albeit often implicitly) about the scientifically discoverable properties of the internal structure of the kind signified by a name or name-like expression (such as ‘water is composed of hydrogen and oxygen’). The source of necessity, then, is located in our ‘semantically deep pre-scientific referential intentions’ (2000, 9), which is based not on any modal facts about the reality but on our a priori linguistic conventions (such as our agreement to attach the term ‘water’ only to the liquid with a certain scientifically discoverable physical feature). The problem with this assumption is that ordinary thinkers are able to use a natural-kind term without such a deep, but only with a semantically shallower, assumption (2000, 11-14); that is, ordinary thinkers are capable of understanding the term ‘water’ without even implicitly making any scientific-theoretical assumptions.\(^2\) Regarding (2), Charles’s modern essentialists make what he calls an existence assumption: that, if one understands a natural-kind term, one knows (either directly or indirectly) that the kind in question has instances. Aristotle, however, shows how it is possible to grasp a natural-kind term while denying this existence assumption (2000, 16-18).

Based on a close analysis of Posterior Analytics ii 7-10, Charles 2000, 24 argues that Aristotle distinguishes three stages of scientific inquiry:

Stage 1: This stage is achieved when one knows an account of what a name or another name-like expression signifies…

Stage 2: This stage is achieved when one knows that what is signified by a name or name like expression exists…

Stage 3: This stage is achieved when one knows the essence of the object/kind signified by a name or name-like expression…

In contrast to the modern essentialists, because Aristotle separates these three stages of inquiry, it is possible at Stage 1 for one to grasp the meaning of a kind-term without the two crucial assumptions that pertain to semantic depth and existence (2000, 25). The epistemological role of master craftsmen is precisely to obtain this kind of understanding.\(^3\) To explain how they do so, Charles examines

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\(^1\) Since there are many versions of modern essentialism and since many of the proponents remain uncommitted to the explicit formulation that Charles seeks, although the view of his modern essentialists is ‘something of an amalgam’ (2000, 6n6), Charles presents what he takes to be the essential features of their views.

\(^2\) These assumptions are as follows:

‘(1) Water has an (as yet unknown) fundamental feature, of a type grasped by scientists, which determines its features,

(2) Water has one and the same feature in all possible worlds in which it exists which fixes the identity of the kind, and

(3) The (as yet unknown) fundamental scientific feature (specified in (1) is the feature (mentioned in (2)) which fixes the identity of water in all possible worlds in which it exists’ (2000, 11).

\(^3\) ‘For Aristotle, it is the craftsman not the scientist who is the key to understanding terms for natural kinds’ (2000, 15).
in detail the account of thought and concept acquisition that is outlined in \textit{Posterior Analytics} ii 19 and \textit{Metaphysics} i 1 (2000, ch. 6), which in turn is the basis for Aristotle’s ‘account of the meaning of linguistic expressions’ (2001, 60).

In describing ‘a route to mastery of realist notions’ (2001, 60) in \textit{Metaphysics} i 1, Charles observes that Aristotle identifies three distinct types of craftsmen: Low-level artisans, Craftsmen with experience, and Master craftsmen. Low-level artisans are limited in the use of their reason; they are simply trained to implement a few techniques and lack any sort of real understanding of what they are doing.\footnote{They are ‘described as ‘like a natural force’ (\textit{Meta}. 981b2ff.) and compared to an animal (980b25ff.)’ (2001, 60).} Craftsmen with experience, in contrast, are capable of recognizing other similar phenomena and thereby are able to extend their skills to other similar cases beyond what they have encountered; however, their understanding is still limited to identifying only some cases as members of a certain kind. Master craftsmen, however, grasp the nature of the natural kind (such as a type of wood, a kind of illness, or a species of an animal) by means of the universal and as a result have acquired thoughts about it; although they are oblivious to any fundamental scientific essence of the natural kind, their grasp of its nature involves ‘what can and cannot be done with the kind’ (2001, 61n9). It is this type of understanding possessed by master craftsmen that generates thoughts about the natural kind, but without any accompanying knowledge of its existence and essence. This type of understanding arises out of their craft engagement with the world where they encounter an objective kind with ‘its own distinctive set of interlocking causal capacities’ (2001, 156) existing independently of their activities.

\textbf{II. Three Kinds of Master Craftsmen}

Although Charles uses many different kinds of master craftsmen to illustrate how they think and acquire concepts, he focuses only on what he believes to be the common feature shared by all of them. As a result, he neither classifies them nor does he take into account any significant differences among their different kinds that might undermine his analysis. There are in fact at least three crucial kinds of craftsmen: architectural (such as builders), medical (such as doctors), and agricultural (such as farmers and breeders). Their distinctive features can be seen in the light of Aristotle’s classification in \textit{Metaphysics} vii 7.1032a12-13 of three kinds of things that come to be: (1) by nature (τὰ φύσει); (2) by craft (τὰ τέχνῃ); and (3) by chance (τὰ ἀπὸ ταὐτομάτου). Builders are concerned exclusively with (2); doctors with the product that is classified as both (2) and (3); and farmers and breeders are concerned with (1), that is, animals and plants.

Aristotle draws a distinction between the products of architectural and medical crafts in \textit{Metaphysics} vii 9.1034a9-21. While \textit{health} is something that could come into existence also by chance, a \textit{house} is something that could be produced only by craft. The reason lies in the principle of movement within the matter.
Some movements originate from the nature of the matter (such as a downward movement of a stone or the heat produced by fire), while others require an external principle to produce them (1034a9-21). Thus, some crafts bring into existence a natural object (such as health) that could also come into being independently of craft; while other crafts produce an artificial object (such as a house) that could not come into being otherwise.

All craftsmen think in terms of conditional necessity as described in Physics ii 9.200a24-29 and a35-b4 (see also APo. 95b32-37). Both a doctor and a builder seek an appropriate means to achieve their respective goal, to instill health in a patient and to build a house. Both use an artificial means to attain their desired end, but because their final product differs—health is a natural product and building is an artificial product—so is the form in their mind from which they begin their thought about their final product.

This difference has an important implication for Charles’s description of the manner in which they would latch onto a natural kind. In contrast to a doctor who begins with a thought about a natural form and is at the outset capable of latching onto it, a builder who begins with a thought about an artificial form could only do so through the materials. In Physics ii 2, Aristotle draws a related distinction between two types of crafts: the craft of using (ἡ χρωμένη) and the craft that directs the making (τῆς ποιητικῆς ἡ ἀρχιτεκτονική; cf. Pol. 1282a14-23). Using involves the knowledge of the form while making involves the knowledge of the matter. For example, ‘the steersman knows and prescribes what the form for a rudder is, and the carpenter knows out of what sort of wood and by what changes it will be made’ (194b5-7, Charlton trans.). Even if both a builder and a doctor possess knowledge of both the form and the matter of their products (Ph. 194a24-25; see also DA 403b13-15), it is in virtue of one of them that they would latch onto a natural kind: a builder in virtue of the knowledge of matter and a doctor in virtue of the knowledge of form.

The agricultural craft, on the other hand, involves breeding, nurturing, and raising animals and crops by a number of artificial means (such as artificial breeding methods (HA 577b15-18), irrigation, fertilization and other farming methods, etc.—some are more artificial than others). It yields living products for the purpose of human use and consumption. Thus, although both a medical and an agricultural craftsman produce a natural product by an artificial means, in contrast to a doctor, whose primary concern is with a specific attribute (that is, health) of a human being, a farmer is concerned with a wide range of activities that involve the whole animal or the whole plant. As a result, if he were to latch onto a natural kind, he would do so insofar as he is encountering a composite of form and matter.

The distinction, then, among the three kinds of master craftsmen in terms of how they would latch onto a natural kind (if they could) is this: a builder would

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latch on in terms of the product \textit{qua} matter; a doctor in terms of the product \textit{qua} form; and a farmer in terms of the product \textit{qua} composite of form and matter. Thus, contrary to Charles’s uniform description of master craftsmen, they will each encounter an objective kind from their own unique standpoint.

III. An Architectural Master Craftsman

Charles 2001, 68 provides us with the following example of a builder who is said to grasp the nature of the wood with which he is working:

Here we are working with the grain…here we have to be very careful because the stress is close to what the wood can take…we must find a different way because I can feel the strength of the resistance in the wood to this way of doing things…if we go on we will break or damage the wood.

What the craftsman is examining here, however, is not really a natural kind, because when the builder is examining the grain of wood, he is working with lumber or a plank of wood. The real raw material is a living tree and not a piece of lumber that has been made \textit{artificially}. But perhaps what Charles is getting at here is that even if a plank of wood is sliced artificially, a craftsman is encountering a set of interlocking causal capacities that are not affected by a human intervention; as Aristotle points out even if an artifact, such as a bed, does not have any innate tendency to change, it does possess such a tendency to the extent that it is made of material, such as stone or earth (\textit{Ph}. 192b16-23). So after all, a craftsman seems to confront with a natural kind even when he is examining an artificial product, at least, \textit{qua} matter or raw material.

However, the problem with such an artificial material (such as a plank of wood), with which a builder is concerned, is that the set of interlocking causal capacities that it possesses is taken out of a unified context, that is, such an artificial material is not a genuine unified natural kind about which the master craftsmen is supposed to have a thought. Since the plank is no longer functioning as a part of a tree, the nature of the ‘grain’ of the wood that the craftsman is examining is not the true nature of a natural kind; for, unless one comes to know how it promotes the overall function of a tree, its true nature will escape the examiner. A botanist, perhaps, may attain such knowledge, but not a builder.

Any set of interlocking causal capacities in nature of the sort that Charles speaks of are unified by a determinate kind. In the case of wood, prior to being cut down it was the form of a tree that unified the set of interlocking causal capacities that existed in the wood. What such craftsmen as builders do, by very nature of their activities, is to examine such capacities \textit{outside} of a naturally unifying context, which implies that the set of interlocking causal capacities were removed from their natural setting to an artificial setting. The question, then, is

\footnote{In the domain of craft, matter is something that is \textit{made} (\textit{Ph}. 194a33-34 and 194b7-8). Bricks are baked, lumber and planks of wood are cut down and sliced and stones are quarried (\textit{APo}. 95b32-33) and shaped; thus, if a master craftsman were to latch onto a natural kind term, he must do so when he is confronted with the \textit{raw natural} material rather than with the \textit{artificial proximate} matter.}
this: To what extent will such an out-of-context examination lead to a thought about a natural kind?

One possible reply is that there is a path that one can trace from the artificial context back to the natural one. So suppose we grant that, although a builder’s knowledge of his material is limited ‘up to a point (μέχρι του)’ (Ph. 194a23; see also DA 403b12-13), this is determined by what is needed for building a house, a part of his knowledge requires that he be familiar with the origin of the materials with which he is working. For example, he has knowledge about the variety of planks, which includes the kinds of trees as well as the regions from which they were taken, etc. The problem with this response, however, is that because of the builder’s artificial orientation towards his materials, he will inevitably classify them based on their utilities. In other words, a builder uses an artificial, and not a natural, classification.

It is an artificial kind that originates in the mind of a craftsman that eventually unifies the fragmented remains of interlocking causal capacities that were once unified by nature. The realization of the possibility of such an artificial unity is externally imposed by a craftsman. According to Charles 2000, 358, the understanding of the master craftsman essentially involves ‘a modality rich grasp on reality’ and such an understanding allows us to latch onto ‘the modal properties we need to grasp the fundamental nature of things’ (360; see also 2001, 71); but the modal properties in question cannot be the ones that exist in the natural setting for a natural kind. To think by art (τὸ τεχνάζειν) is to examine how to bring into existence something that may or may not exist (EN 1140a11-13); that is, the modal properties of raw materials are investigated in the context of bringing into existence a contingent product.

Regardless of whether (or how) necessity without qualification exists within the destructible natural things (see, e.g., Lennox 2001, 127-128), a craftsman does not study such a modality in its appropriate context, since craft is not concerned with the things that exist, nor with the things that come-to-be, of necessity (ἐξ ἀνάγκης, EN 1140a14-15). The only relevant kind of necessity that a craftsman investigates, therefore, is the conditional necessity that is concerned with the production of a contingent artifact; and not the other kinds of necessities that are concerned with nature (such as necessity without qualification—however it exists in nature—or the conditional necessity that explains the coming into being of natural kinds). In other words, a builder is oblivious to the necessities that flow from nature, he is aware only of the necessities that artificially flow from what is needed for his products.

How a builder sees the modalities of his materials is affected by the fact that matter is relative to form (Ph. 194b8-9). The form that a builder is considering, the form of house, is an artificial kind; thus, a craftsman will think of the raw

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7 See, e.g., Meta. 1032b1. Charles 2000, 41 points out that the unity of both Iliad and ‘goatstag’ do not depend ‘on the natural unity of a genuine kind but on a man-made unity which we create’. But so are all artifacts; their unity is derived from being ‘tied together by us’ (42) or ‘“stitched together” by us’ (78).
material as matter that is relative to an artificial form. In *Generations of Animals* iii 5, Aristotle points out that many, including fishermen, are deceived in believing that fish are conceived by swallowing the milt because they copulate quickly. The reason for this failure of observation on the part of fishermen is that they are not concerned about such thing for the sake of knowledge (τοῦ γνῶναι χάριν, 756a33-34). In contrast to other rational capacities in the soul, which include scientific knowledge and craft, Aristotle defines craft in terms of a unique disposition (ἕξις) that exists in the soul (*EN* 1139b31, b34, 1140a1-5). A craftsman is, not only, not interested in examining nature for the sake of knowledge, but is also biased and driven by other interests; his orientation to the natural world is very different from the person who is interested in studying it for its own sake.

Despite the difference in their orientations, however, Charles 2000, 70 makes the following claim:

> Although the master craftsman’s interests arise out of practical questions about how things can best be made or what can be done with wood of this type, he is forced in seeking to answer these to look for the truth about the nature of the kinds around him.

In contrast to ‘the truth about the nature of the kinds’ at which the architectural master craftsman is supposedly looking, a distortion caused by his orientation will lead him to fail to classify his materials based on natural kinds. In fact, Charles himself admits that a craftsman could make a mistake about natural kinds (such as between elm and beach wood) by lumping them together; but he insists that even in this case, ‘the idea of there being an objective kind with its own distinctive nature plays a central role in his thinking’ (2000, 160).

A note of clarification about Charles’s view is helpful, before we proceed further. Because Charles admits that it is possible for a craftsman to make a mistake, he is not arguing for the case that a craftsman guarantees the path to realism but rather for the case that the master craftsman is a reliable source. If he is to be reliable, then we should expect him to be more likely to be correct then wrong. Thus, in examining how a builder classifies his material, we need to take into account the nature and the frequency of his mistakes.

The central question is this: Why would he ‘lump together’ elm and beech wood? The obvious answer is that it does not matter for his purposes which wood to use. Unless a natural kind possesses the only distinctive property that is not shared by any other kind and that property is the only useful characteristic needed for the purpose of an artifact being produced, there is no reason why a craftsman will latch onto a natural kind. The distinctive property he needs could be found among many natural kinds.

A person who has the knowledge of the essential properties of elm and beach wood would never lump them together. A lack of such knowledge stems from two possible reasons: either (1) from ignorance of various natural kinds stemming from operating at the level above the natural kind or (2) from very fine knowledge that operates at the level below it. In (1), a person is incapable of
identifying any given wood as either elm or beach; and in (2), a person is drawing a distinction between various sub-species of elm and beach wood but is incapable of identifying any of their sub-species as either elm or beach. In other words, a classification of natural objects could take place at two basic levels other than at the level of the natural kind: either above or below it. An ignorant and inexperienced person, who operates at the level above the natural kind, would fail to draw an obvious distinction between elm and beach wood. But since we are dealing with a master craftsman who supposedly has very sophisticated and fine knowledge of woods, the most likely source of the mistake stems from operating at the level below it.

According to Charles 2000, 359 the master craftsman’s understanding of a given material is not simply of the form, ‘If I do this, that will happen’, but instead it allows him to respond creatively to new situations (see also 2001, 63). In other words, the architectural master craftsman has knowledge of how a given type of wood will react in a variety of circumstances: when it is dry; when it is wet; when it is tarred; when it is treated in a variety of ways; and etc. So the architectural master craftsman’s knowledge is concerned with a kind as such and not with a kind in certain conditions. Would this knowledge of a type of wood in a variety of situations lead the architectural master craftsmen to the discrimination of the type that cuts at just the right degree of specificity to mark out natural kinds?

Unfortunately, it is more likely that the master craftsman will lump together different kinds of trees because the factors (such as the age of the trees, the season when they are cut down, the location not only of the countries but regions, climate, the manner in which they were planted, whether they are cultivated or wild, etc.) that affect the qualities of wood are all accidental properties of natural kinds.8 An illustration is in order. For the sake of simplicity, let us take two natural kinds of wood A and B from three distinct regions (1, 2, and 3) resulting in 6 different types of wood: A1, A2, A3, B1, B2 and B3. An architectural master craftsman will have knowledge of how each of these 6 types of wood will behave in a variety of conditions and as a consequent will know about many features of each type of wood relative to cutting, staining, hardness, durability, etc. But how these types of wood are to be classified would depend on a specific task. For example, if a certain hardness of wood is needed for a job, and if wood taken from types A2 and B3 are of equal quality of appropriate hardness, a master craftsman would ‘lump together’ two different natural kinds of wood. Of course, if we take into account of all the factors that affect the quality of wood in conjunction with many different features relevant to building materials, the numbers of the types of wood that the master craftsman are acquainted with are increased exponentially. Consequently, more likely than not he will lump many different natural kinds of wood together (in many different situations and depending on

8 Aristotle was well aware of how different regions affect the same kind of plants: see, e.g., HA 543b24-27 and GA 738b34-36 and 783a29-33. Cf. also a spurious work, On Plants 820a7-10. For the other factors, see Theophrastus De historia plantarum v.
the task at hand) because it is in virtue of accidental, and not essential, properties of natural kinds that a master craftsman will classify various kinds of wood taken from various ‘kinds’ of trees for the purpose of constructing an artificial kind.

I have so far exclusively focused on animate materials (such as woods); but what about inanimate ones (such as metals and rocks)? To take an example provided by Charles 2000, 169:

…it is not enough that one thinks of gold as something yellow and malleable, if one lacks the idea of the distinctive, interconnected nature of gold as a kind of metal. For, in that case, one’s term ‘gold’ would signify not gold, but whatever is yellow-looking and malleable by us.

What is required, according to Charles, is for the master craftsman to locate the signification of the name in question in an appropriate genus and to latch onto some of its non-accidental properties such that he can make an indefinite number of claims ‘about how the metal will react in different situations, and what he can and cannot do to it’ so that he can ‘track gold through a variety of actual and possible situations’ (2000, 170). So, just as in the case of wood example we looked at, what we have here is a master craftsman’s extensive and sophisticated knowledge of how these materials react in a number of both actual and possible situations.

To see whether Charles has a correct view (at least) as regards inanimate materials, let us highlight two different but interrelated distinctions we find between animate and inanimate materials as regards the set of their interlocking causal capacities: (1) the nature of the internal principle of change and rest; and (2) the unifying principle of interlocking causal capacities. In contrast to animals and plants, there is a controversy as to what extent Aristotle maintained the view that inanimate things possess an active capacity. For example, in Physics ii 1.192b10-15 he seems to affirm such an active principle to the ultimate inanimate matter, the so called the four elements (earth, water, air, and fire), but in Physics viii 4.255b30-31 he recognizes that they possess only a passive capacity. And as far as their unity is concerned, in Metaphysics vii 16.1040b8-10 the elements are likened to heaps that require an external unifying principle.

So the question is this: To what extent are the raw inanimate materials heap- or lump-like passive capacities? It seems that if they are more lump like than a unified kind, there is really no determinate kind to latch onto. In that case, a unified natural or artificial kind will only come to exist when the set of these interlocking causal passive capacities are subsumed as parts of the natural function of a living organism or the artificial function of an artifact. Thus, a master craftsman will see these passive capacities unified only when they are not in a lump like condition. However, they could be easily regarded as being more like a unified kind in the sense that there are varieties of interlocking causal passive capacities such that one could come to distinguish and classify them as natural determinate

9 See, e.g., Graham 1999, 87-89. For my view on this controversy, see Katayama 2011.
kinds.

As we pointed out, however, there are two ways in which we can understand the artificial context in which an architectural master craftsman operates: (1) an examination of building materials taken out of natural context; and (2) a classification of these materials based on their utilities. Even if there seems to be no problem with (1), there is still a problem with (2), that is, the problem of an artificial classification of inanimate materials in terms of his very fine knowledge of such materials that operates at the level below the natural kind.

‘Marble’, for example, comes with a wide variety of qualities depending on where it was quarried. Builders and masons in fact use it as a general term to refer not only to limestone and other carbonate rocks that have been metamorphosed (which is how geologists use the term), but also to some variety of unmetamorphosed limestone. A geologist who has the knowledge of the essential attributes of marble as a metamorphic rock (either qua limestone or qua other carbonate rock) in contrast to an un-metamorphosed limestone, of course, could tell the essential difference among them. In contrast, a builder, who has knowledge only of the essential attributes of marble qua construction material (whose knowledge is equivalent to the knowledge of the accidental attributes of marble, whether or not metamorphosed), does not possess the criterion to draw a distinction between essential and accidental properties of any given piece. Therefore, the same sort of ‘lumping together’ of different types of animate materials (like wood) at the level below the natural kind will also occur with different types of inanimate materials (like marble).

Thus, although an architectural master craftsman may have more success at latching onto inanimate than animate natural kinds because inanimate materials lack internally active principles, his artificial classification of inanimate materials is based on the very fine knowledge of their accidental properties and thus would render him far from being a ‘reliable’ guide to realism. Contrary then to Charles’s likening the master craftsman to someone who has ‘a properly functioning visual system’ (2000, 360) he is like a person who is wearing a pair of shaded glasses that distorts the world around him.

IV. A Medical Master Craftsman

A medical master craftsman, however, does not seem to be looking through distorted lenses that would prevent her from seeing a natural kind, because her product is the natural condition of a body. So it would seem that a doctor begins by latching onto a natural kind. But let us examine whether the problem of artificial context that vexed the architectural master craftsman also exists for the medical master craftsman.

The first thing to note is that a medical master craftsman does not see a set of interlocking causal capacities in a natural condition as such, but in a context

where her task is to bring about the natural state from an unnatural condition, that
is, from illness to health. What is striking about the discussion of various things
that come to be in *Metaphysics* vii 9, as we saw, is that Aristotle does not list
health as something that comes to be by nature, but rather by chance or by craft.
So when Aristotle is thinking about the coming to be of health, he is focusing
exclusively on the transition from sickness to health. That means that, although
health is the natural condition of a living body (what Aristotle refers to as ‘uni-
formity’ or ‘an equable state’ [όμαλλοτητα, 1032b7-8]) that is maintained by an
organism itself, a doctor is not concerned with how the health is originated from
an organism, but what external cause is needed to restore health when her patient
fails to maintain it. Thus the health in question comes to be by external condi-
tion—such as, the presence of heat (1034a26-30)—which may occur either by
chance or deliberately produced externally by the craft of medicine. A medical
master craftsman, then, would be able to formulate universally what is the effec-
tive method to instill warmth in a body so as to restore its uniformity.

The set of interlocking causal capacities that is unified by the internal principle
that exists in her patient, then, is again examined outside of its natural context. A
doctor’s task is to produce health by means of an artificial external principle. It is
this principle that temporarily unifies the interlocking causal capacities until the
patient’s body is capable of unifying them itself. A doctor qua doctor does not
examine how health is unified by an organism. Perhaps this is a task of a biolo-
gist. The doctor’s main concern is to restore health to a body by an artificial
means such that once the restoration is obtained she allows the body to take over
its own maintenance of health. However, even if a medical master craftsman’s
method is artificial and her knowledge about health *per se* is examined outside of
it natural context, the perspective from which she operates is not artificial, for
disease that she encounters is *defined* negatively as a privation (*Meta*. 1032b3-4)
of the natural condition of a body. Her perspective is, thus, natural albeit indi-
rectly.

A doctor, therefore, seems to be capable of latching onto some of ‘genuine,
non-accidental, features’ of a disease she is examining, whose features are
enough ‘to go on to search…for answers and questions about its existence and
essence’. She then has (at least indirectly) ‘a point of access to an epistemic trail
which culminates (if all goes well) in knowledge of the existence and nature of
the kind with which she is interacting’ (Charles 2000, 159).

Yet what about her classification of the diseases that she encounters? Would it
be artificial or natural? What is unique about a doctor is that she is concerned
only with the health of one species, human being.\(^\text{11}\) Thus, she is ignorant of
whether her understanding of health is unique to human being or is shared by
other species of animals and, if so, shared by what sort of animals. Charles details
an account of a doctor who is examining a medical condition that she calls

\(^{11}\) A veterinarian may have a better understanding of health from the cross-species standpoint,
since she deals with many animals, although not about human health.
‘dropsy’ with a certain set of symptoms and who believes that she is interacting with one disease. He asks us to imagine that her hypothesis was correct. In that case, without her knowing, she has latched onto a kind: for her ‘interactions with the kind, although not sufficient (by her light) to generate knowledge of its existence, are sufficient to give her thoughts about it’ (2000, 158); that is, ‘she has a thought about dropsy without knowing that there is, in fact, such a kind’ (2000, 159).

‘Dropsy’ or ‘edema’ is a disease that affects not only various parts of the human body but also occurs in plants and fish. A doctor who is treating a set of symptoms and labels the disease as ‘dropsy’ then has at best latched onto a small portion of a determinant kind. Thus, although a doctor may not be wearing a pair of shaded glasses, she is myopic: her field of vision is too narrow and therefore she cannot be a reliable source of a determinant kind per se. Nevertheless, she seems to have latched onto something objective that could lead to a determinant kind. Thus, a doctor is partially successful in leading us to realism. A medical master craftsman, then, is a much more reliable link to realism than an architectural master craftsman.

V. An Agricultural Master Craftsman

Charles 2000, 157n26 describes this third kind of master craftsman when he is contrasting Aristotle’s master craftsmen with what he calls the conceptualist option:

One account of this process runs as follows: Given his general understanding of (e.g.) ‘animal’, and his skilled interaction with particular animals, specific kinds will become visible to him. If so, it is not merely that he groups certain animals together for his own purpose (e.g. guarding the house, plough-

12 See http://www.merriam-webster.com/dictionary/edema and ‘Viruses of Fish’ by Russell and Dixon in Encyclopedia of Life Sciences at http://www.els.net. Aristotle seems to be also aware of the cross-species nature of dropsy (HA 553a16 and 638b17). In fact, the cross-species nature of disease as such is not something that would surprise Aristotle; he would rather expect it, since he identifies the four elements in terms of ‘hot and cold, wet and dry’ that make up all species as practically the causes of (among other things) disease (PA 648b2-11; cf. Lloyd 1996, 45 and 45n18), or an excessive useless residue that occurs in living things as a cause of disease (GA 725a3-10; cf. Lloyd 1996, 86 and 88-89).

13 The aim of Charles 2000, 147-149 in the doctor story is to illustrate how it is possible for one to arrive at ‘Stage 1 without as yet achieving Stage 2’ so as to acquit Aristotle of the charge of inconsistency. The problem is to explain how it is possible for one to grasp an account of what a simple name signifies without knowing of its existence when the content of such a thought ‘is determined by the kinds in the world which imprint themselves on our psychological states’ (147). But because Charles believes that the master craftsman will frequently get it right about latching onto a genuine kind as such, the master craftsman will not only have a grasp of the kind but also its existence, that is, she will have achieved both Stages 1 and 2 (191). If my criticism about the doctor being myopic is on target here, then Charles’s imagined doctor is the norm and if so, the medical master craftsman will frequently err in latching onto a genuine kind as such, that is, she will normally attain only Stage 1 and if lucky attains Stages 1 and 2.
ing the field, etc.). Rather, he will distinguish separate kinds, with distinctive natures, when in the course of his activity he finds that some (e.g.) eat, move, breathe in one way, others in another. His kind concepts will not be merely the pragmatic one (recommended by conceptualist writers), designed simply to serve his needs and purposes.

There is something quite accurate about what Charles is saying here about a farmer. Since, in the course of raising animals and crops, a farmer is ‘dealing with an objective kind with its own “internal principle of change and rest”’, he is indeed confronting and skillfully engaging with a set of interlocking causal capacities that are unified in their natural context. Thus, as far as the problem of artificial context is concerned, a farmer does not interact with a set of interlocking causal capacities outside of their natural context.

But what about the nature of his classification, is it natural or artificial? The souls of animals and plants are the internal principles of change that unify their bodies, and thus when the whole living organisms are materials that a craftsman needs for his purpose, in the course of his skillful interaction with them, he will inevitably have thoughts about not only the different species, but also the sub-species, of animals. Would the agricultural master craftsmen’s very fine and sophisticated knowledge of animals lead him to classify them at the level below the natural kind and, therefore, as in the case of the architectural master craftsman, fail to latch onto a natural kind?

The answer is no, for according to Aristotle one of the most natural functions of living organisms is to generate its own species (DA 415a26-29). Farmers, as well as breeders, will inevitably be well acquainted with the reproductive capacities of animals they take care of. They will know whether they are dealing with a given sub-species or different species by whether or not they are capable of reproducing the same kind. To the extent that the reproductive capacity of animals to generate the same species defines the determinate natural kind, then, farmers and breeders will be very reliable guides to realism: for they have a reliable criterion.

Conclusion

Based on the interpretation of Metaphysics i 1 that he relies on, we find Charles

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14 He does not name any craftsman here; though he does mention farmer and breeder elsewhere (see, e.g., 2000, 367).

15 According to Aristotle, the offspring resulting from cross-breeding of two different species will eventually, with subsequent generations, revert back to the species to which mother belongs (GA 738b27-36).

16 I argued for this view in Katayama 1999 and 2008.

17 From the standpoint of clearly separating the stages 1 and 2, however, this result may not be a too happy one for Charles, since the example of ‘dropsy’ was to illustrate how clearly the two stages can be separated (see n13). In contrast, in the case of ‘man’ or ‘horse’, although Charles 2000, 171-172 does draw certain logical distinctions between the two stages, the grasp of their existence seems to be simultaneous with the grasp of the signification of their name.
Thus, the master craftsman’s practical engagement with objects is indispensable in our acquisition of thoughts about kinds. It is not merely one possible route, or even the one we happen to follow. Our definitional and explanatory practices are grounded, in the ways indicated, in the master craftsman’s understanding of kinds.

On the contrary, in the light of our analyses about the nature of different kinds of craftsmen, our road to realism via Aristotle’s master craftsmen is a bumpy one. Builders (whose visions are distorted by the lenses they wear) cannot be trusted with their thoughts about both natural animate and inanimate kind terms (although their thoughts about natural-inanimate-kind terms may be slightly more reliable); doctors (who are myopic) are only partially reliable in leading us to natural kinds; and it is only farmers and breeders (who seem to have relatively healthy eyesight) are most reliable in latching onto natural kinds. Thus, our reliance on Aristotle’s master craftsmen’s understanding of kinds as the basis for our ability to see what is really there should be rather a guarded one.

What options are left for Charles now? Is he compelled to abandon his thesis altogether or is it possible for him to qualify it? Could he, for example, defend the view that in *Metaphysics* i 1, Aristotle is outlining his view that not all but some master craftsmen are a reliable link to realism? Charles could point out that Aristotle chose a doctor as the only example of a master craftsman for a specific reason. He did not choose a builder because he is not a reliable master craftsman; nor did he choose a farmer (although he is the most reliable master craftsman) because, in contrast to the craft of agriculture, the craft of medicine is regarded by Aristotle as closely connected to one of the theoretical sciences: that is, biology (*De sensu*. 436a27-b1). Perhaps what Charles could claim is that Aristotle was looking for was a specific master craftsman who was a sufficiently reliable link to realism and whose craft has a close affinity with a theoretical science so that Aristotle could use him as a reliable model for a wise theoretical scientist.

Ultimately, though, I do not think that it is possible to qualify Charles’s thesis from all to some, for two reasons. First, a doctor is an example Aristotle frequently uses in many other passages. In fact, a doctor and a mathematician are two standard examples that he uses together when he is discussing both craft and scientific knowledge (see, e.g., *APo*. 71a1-4, 77b16-24, and *Meta*. 1025b3-7), just as we find in *Metaphysics* i 1.981b23-24 where Aristotle describes mathematics as τέχναι. There is, therefore, nothing significant about his selection of a doctor as an example of a master craftsman. Second, although Aristotle gives only one example throughout the chapter, there is no indication that his view on the master craftsman is exclusively about doctors; on the contrary, he applies it generally to all of them (981a30-31 and b13-23).

Of course, even if Charles is mistaken about what Aristotle himself believed, he may have yet offered us a promising Aristotelian account of essentialism that relies on a unique epistemological role played by the master craftsmen. The dis-
cussion of its merit within the contemporary debates on essentialism, however, is for another occasion; and I leave that task for others who are qualified to comment on it.18

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