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Making and Discovering

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Abstract. The classical model of knowledge is built on the distinction between making and discovering, the latter correlated to *what there is* and the former to something that is not yet there, and therefore something which the action of making brings into existence. Starting from a critique of the notion of 'given', Goodman overturns this classical model and suggests a *making model* of cognition. This gives rise to a question: if cognition is equally an action of making, what kind of an account can be given of an action that results in 'discovery'? The present paper is an attempt to give an account of the nature of discovery within the making model of cognition. The strategy is to shift the focus from that on 'doing' and 'apprehending' to that on 'routine doing' and 'thinkingly doing something'. By elaborating the notion of *thinkingly doing something* in terms of two pairs of distinctions, 'doing' and 'suffering' and 'schema' and 'actualisation' it is shown that notion of discovery can be accounted for without assuming that the cognition is a passive reception of the 'given'.

Zusammenfassung. Das klassische Modell vom Wissen enthält eine Unterscheidung zwischen Herstellung und Entdeckung — letztere wird dem zugeordnet, was da ist, ersteres dem, was noch nicht da ist. Ausgehend von einer Kritik am 'Gegebenen' kippt Goodman dieses Modell um und schlägt statt dessen ein Herstellungsmodell des Wissens vor. Dieses wirft folgende Frage auf: wenn Kognition auch eine Herstellungshandlung ist, was für eine Erläuterung kann dann zur Unterscheidung von Entdeckung und Zustandebringen eines Artefaktes gegeben werden. Dieser Aufsatz ist ein Versuch, 'Entdeckung' innerhalb eines Herstellungsmodells des Wissens zu erfassen. Die Strategie ist die folgende: Statt von der Unterscheidung 'tun' und 'begreifen' auszugehen, soll man den Kontrast zwischen Routinehandlung und denkend Etwas Tun fokussieren. Man kann die Annahme, daß Kognition ein passives Empfangen des 'Gegebenen' ist, vermeiden, indem man 'Denkend-Etwas-Tun' anhand von folgendem Paar von Unterscheidungen expliziert: 'Schema' — 'Aktualisierung' und 'Tun' — 'Leiden' bzw. 'Widerfahrnis'.

In daily life the distinction between *making*, on the one hand, and *perceiving, learning, knowing* and *investigating*, on the other, is an important one. The latter is associated with *discovering* in a way that *producing* an artefact is not: for instance, the features or *form* of a bed is said to be discovered by a person through perceiving it; in contrast, in the process of production of a bed one is said to impress the desired *gestalt* or *form* on the material, be it wood or metal. This is, in effect, an Aristotelian formulation: whereas *cognition* is a process of transference of *form* from the object to the cognising person *making* is a process of transference of the *forms* to *matter*. It is in accordance with this way of looking that Descartes classifies human mental capacities into *perception of understanding* and *will*, the one passive and the other active capacity [Descartes, 445-446]. Kant changed this by conceiving the *making* as the prototype of all human activity, within which both cognition and production of an artefact, are subspecies of 'making'. Goodman identifies his *Ways of World Making* as carrying forward this Kantian tradition.¹

¹ "I think this book as belonging to that main stream of modern philosophy that began when Kant exchanged the structure of the world to the structure of the

In this paper I want to enquire into the consequences of this latter model to our notion of 'discovery'. In the Aristotelian scheme, *discovery* is the result of *form* being out there in *nature* external to the agent of cognition. *Making*, on the other hand, is the result of *form* being located in the agent who desires and makes the object. This provides for a straight forward account: discovery is correlated to *what there is* in contrast to production, which is bringing about something that was not there earlier. If, however, all activity is of the nature of *making*, then the object of cognition too is *made*, and the distinction between *discovery* and *production* of an object cannot be drawn on the basis of *given* and *made*.

Does this mean that we have to give up the distinction between cognition and production altogether? Goodman suggests 'rightness' in place of the traditional 'true' as the criterion of knowledge [Goodman 1977, 109-110]. But this does not make any difference to our problem: both 'truth' and 'rightness' are conceived as non-arbitrary, so they are 'discovered', in the sense that we are constrained to recognise them.

In the following I want to sketch an alternative course within the *making model of cognition*. The key is a notion made use of by Ryle in his essays on *Thinking* [Ryle 1979]: *the thinkingly doing something* in contrast to doing it out of routine. An elaboration of this notion, I believe, makes it possible to derive an account of discovery from a general account of action, without thereby postulating *discovery* as related to a passive capacity in contrast to *making* as related to an active capacity. The suggestion is to look for the intellectuality of intellectual disciplines not in the fact of them involving a system of propositions about some domain but in the fact of their involving a learning how to learn along with learning something.

1. Four Situations

Let me first delineate four kinds of situations of doing something with the help of an example. I often prepare *dal*, an Indian lentil dish, for which the onions need to be fried till they become almost dark brown. A little more would char the onion, a little less is not tasty enough. A friend of mine does it as a matter of course that

mind, continued when C.I.Lewis exchanged the structure of the mind to the structure of the concepts, and that now proceeds to exchange the structure of the concepts for the structure of the several symbol systems of the science, philosophy, the arts, perception, and everyday discourse." [Goodman 1978, p. x].

he always succeeds in getting the onions fried to the right degree without any extra attention to it. In fact he showed me how to do it and I learnt the procedure from him. But unlike him, I need to be attentive to the frying in order to get the onions to the right degree of brownish colour. I cannot simultaneously fry the onions and talk about Goodman's theory of exemplification, for example. Let me term my friend's routine frying as 'pragmatic doing', and his showing me how to do it as 'showing', and my frying the onions as 'attentive doing'. Different from all these three is the following variety of doing: nowadays I often attend to the frying of onions not merely to get them fried to the right degree, but also with an inquisitiveness with regard to the various phases and stages of frying, the right variations of the heat, and the amount, frequency and the speed of stirring needed etc., in short, to see *what* happens *when* in the frying process. This variety of doing I will call 'explorative doing'.

I want to suggest that whereas a *pragmatic doing* can be a routine doing the *attentive* and *explorative doings* necessarily come under *thinkingly doing something*. Where the *showing* is to be placed — I leave it open. At any rate, we can distinguish between a routine doing taken by an observer as an instance of how to do something, and a demonstration of something where the contours of an action are carefully highlighted and stylised for the benefit of a learner. This latter involves both attention and exploration. But the analysis of the status of showing is not pertinent for my purpose.

2. A Scheme to Elucidate 'Thinkingly Doing Something'

As I see it, the problem of giving an account of discovery is that of a conceptual delineation of explorative doing in such a way that it brings out the special features of it in contrast to other three varieties. In doing this one has to avoid any implicit or explicit recourse to conceiving thinkingly doing something as if it is a conjunction of two separate activities, say, *doing* and *attending* to this doing, or, *doing* and *exploring* this doing etc. Such recourse is a resort to a bifurcation of the *given* and the *made*, and thus giving up the making model of cognition.

My suggestion is that a satisfactory account of discovery can be derived from a unified account of actions in terms of the following two pairs of distinctions.

(i) 'Doing' and 'suffering' or 'happening' — this is an analytic distinction between two dimensions of an action: one an active component of controlling the action-process, and another, a component of happening that the agent *suffers*. I will be elucidating the required notion of suffering in the next section.

(ii) 'Type' and 'token' — I will use sometimes the German equivalent, 'schema' and 'actualisation', so that I can talk of performing an action as a process of 'actualising a schema'.

In an *attentive doing*, a person who has a certain skill at his disposal, in order to exercise it to the maximum perfection, bestows attention on the happening correlate of the doing in the action-process. In my example, every change noticed of the onion pieces while frying attentively is followed by turning up or turning down the heat, stirring the pieces faster or slower, etc. depending upon whether the pieces get fried evenly or not. Thus here *attending to what happens* is a means of *gestalting* the action-process - of steering and regulating *what happens* through appropriate doing-inputs, so that the schema meant to be actualised is in fact actualised. Thus in attentive doing the type or schema is brought to bear on the perfection of the performance or actualisation.

In *explorative doing*, on the other hand, attending to what happens is an end and not merely a means: attending to what happens to onion pieces — its turning from whitish colour at the initial phase to different shades of yellowish, reddish and finally to dark brown at the terminal phase — is a discerning of the different aspects of the action-schema of frying. In other words, in a reverse manner to that in an *attentive doing*, here the performance or actualisation is brought to bear on discerning the features of the action-schema.

3. 'Suffering'

In the foregoing, I have deliberately used the terms, 'suffering' and 'what happens' as synonyms. But at least in one common sense usage, perhaps with some philosophical tutoring behind it, the use of these two terms are distinguished. To take an example, suppose I puncture my skin with a sharp needle; it may be said that it involves an act of myself puncturing my skin, and as a consequence of it, both an outward, i.e. inter-subjectively observable, effect of blood gushing out, and an inward, i.e. not so inter-subjectively accessible suffering of pain on my part. Accordingly one may use 'happening' as a term for inter-subjectively observable event and 'suffering' as a term to connote an individual affection. Obviously, what I need is quite different from what obtains in such a mode of description.

First, as I use it, the distinction between *doing* and *happening* or *suffering*, is an analytic one, and not that between two conjointly occurring activities. Second, they are specifiable as constitutive of an action type without reference to individually specific experiences of the persons performing that action. Take the example of a yoga or *taichi* exercise. You lift the arm, or bend on one side, and you feel

the stretch of a muscle at the other end of your body. The point of identifying this as an exercise is that it is *learnable* and anyone who has learnt and performs the exercise properly, does sense the stretch of the muscles as any one else. That is, 'suffering' is conceived not in the manner of an individual affection available for *inner* observation, but as a defining characteristic of an action. Following from this, third, the 'doing' and 'suffering' are not to be understood in the manner of an action and its effect, whether in a structural or a temporal sense. Sensing the stretch of the muscles is part and parcel of the exercise and it is not that you have one doing of lifting the hand and another of sensing the stretch.

That *suffering* is a correlative to the *doing*, and not a situation of doing something subsequent to which you observe or notice something, is easily granted in the case of the tactile perception of the variety in an yoga exercise. But there is a temptation to deny this when visual perception is involved, as, say, when a ball is thrown and one sees it falling down at a distance. It appears that throwing a ball and seeing the ball falling at a distance are two separate activities. My suggestion is to handle what happens visually in the same manner as what happens in a tactile realm of our yoga exercise. If there is a difference, it has to be located not at the level of separability of doing and suffering as activities, but rather at the level of distinguishing the activities in terms of the kinds of social participation possible.

This is not to preclude the possibility of conceiving perceptual skills as developing into independent activities, and indeed many autonomous varieties of perceptual skills can be developed. In fact, one determinant of the traditional notion that discovery is correlative to the notion of *given*, is the existence of highly autonomous perceptual skills, particularly in the realm of visual perception. I will later show how they can be subsumed under what I call as differentiation practices. All I need for the present is to point out the following. Perception is ingredient of many activities, and in those cases it is not necessary to conceive it as an adjunct or supplementary activity to the main doing. Rather, it can be conceived as the happening or suffering constituent of the activity in question. One need only to remind that the way we perceive is tied to interest rooted in practices of different varieties. When you are engaged in the agricultural activity, you perceive the crop as ripe for harvesting. If you are engaged in the landscape painting you perceive the wheat or paddy corns as yellowish brown.

4. Discovery as Suffering Correlate of Object Construction

My next move is to suggest to look at sciences and other intellectual disciplines as analogous to skills, and discovery as

analogous to the happening or suffering aspect of thinkingly or rather exploratively exercising a skill. This is of course programmatic, and there are some hurdles on the way before the investigation within intellectual disciplines can be seen as similar to reflection on an available skill. My main interest at the moment is to bring out the relation between what Goodman and Elgin call the *reconception* of a symbol system and the thinkingly doing something. My suggestion is that even in intellectual disciplines there is a level of skill acquaintance underlying or prior to the explicated system of propositions with their mutual connections of implications. What constitutes the reflection process is the interaction between this level of skill and the explicated system of propositions.

In the following first, I want to follow through analytically an example of exploratively exercising a skill — a process of construction of a model for something which is available only as a skill. Subsequently, I want to apply the result of that analysis to what I call the *differentiating practice*.

Let us presume that a surgeon has developed a particular knack of operating — and he wants to demonstrate it to his students in order to teach them that knack. [This example stems from Ryle 1971, 319-25]. He ponders over how best to *show* it. He may reflect either by actually performing or by seeing it performed in his 'mental eye', so to speak. Either way, whereas until then the distinction between performance and schema (i.e. actualisation and schema, or token and type) was not available to him, this reflection is aimed at a way of drawing this distinction in order to make the students to heed the schema.

Let us say that the surgeon divides up what he knows how to perform in one single step into a number of steps and a sequence of them. While performing in order to introduce the steps and the sequence, he does not yet know the concerned operating technique *as an object*; His activity of reflection is one of conceptualising what he knows at a knowing-how level into an object. This I will term as 'object-construction'.

The 'object construction' is neither an activity describing the *knowing-how* one is accustomed to, nor just setting up of a convention as to what that *knowing how* is. In the case of the former, one has a clear demarcation of the object from its situational accompaniments. In object-construction, on the other hand, every demarcation of a chunk of a performance as a step is a suggestion as to what the object is. Further, the criterion to consider it a 'right step' or 'wrong step' is not distinguishable from that of considering it a relevant or irrelevant step for exercising the knack. Thus, every suggestion as to what the object is may be adequate or inadequate,

relevant or irrelevant, or even a dangerous deviation (in case of the surgeon's technique), but *not true or false*.

It differs from convention-setting, because to set up a convention is for the participants to decide on something which, though it may be motivated by some purpose, is a *doing* external to the object-content about which a convention is set. (What the content to be regulated by a convention one already understands.) In object-construction, in contrast, the act of construction and the object fall together, i.e., the *doing* of object-construction is not external to the object-content. It is the compulsions arising out of the nature of the operating technique itself which determines the nature of the model.

The judgement whether a suggested step is relevant or not etc., is done by relating it to one's prior action-competence. Thus the acceptability of a suggestion is not arbitrary — the action-competence does exercise a control over it — yet it is not obligatory either. That is, though there is a compulsion to consider certain aspects of a performance as belonging to the schema and certain others as not belonging, yet the choice of the aspects is not obligatory; there are many ways of construing how to do something — even though in all cases the available know-how exercises control on such construction. It is this double character of constructing the steps — the availability of choice and the compulsion exercised by the knowing-how — that makes it simultaneously a suggestion and a disclosure, an invention and a discovery.

I have taken for illustration a situation of model construction when no model is yet available; but it can be equally a thinkingly doing in order to compare an available model with the skill in order to alter the model. In either case the test which 'knowing-how' provides us with is of a corrective kind — corrective in the very conception of the object itself and not in terms of any information about the object.

5. Differentiating practice

We can think of a more complex process of object-construction than is the case in the example of the surgeon's operation technique. Instead of one action being conceived of as an object, one can carve out from different actions certain aspects of them and construe an object out of them. For instance, out of actions such as sitting-on-the-chair, kicking-the-chair, making-the-chair etc. an aspect from each of them can be carved into an object: chair. In such cases, differentiation of actions into an *accusative aspect* and an *agent aspect* can come into being. In our example, sitting, kicking, making etc. are agent-aspects and chair is the accusative of the action. If

these actions are performed to conceptualise the object chair, (analogous to the performance of our surgeon's operation technique to construct that technique as an object), then, in that case, I will term sitting, kicking, making etc., as the 'forms of access' to the object and the chair as the object. That is, the agent-aspect of the action gets separated from the object-aspect and thereby the former gets a status of separate level of sign-actions separable from the object. In the case of techniques or ways of doing, as elaborated in the previous paragraph, the elements and the sequences introduced in conceptualising the technique constitute the parts of the technique both in a pragmatic sense and in a semiotic sense, i.e. pragmatic and sign-aspects of an action are not separately available. In the case of object-constitution such as the chair, on the other hand, we have a separation of the sign-actions from the object such that the performance of sitting etc. are not considered as *part* of the chair, but only one's *form of access* to the chair. I will refer to the result of this latter sort of object construction by the term 'differentiating practice'.

Different intellectual disciplines are different types of *differentiating practices* and investigations are exploratively exercising those differentiating skills.

There are two evident obstacles for this programmatic suggestion. The first obstacle is that the intellectual disciplines involve not merely exploration, but also certain standards and scruples associated with the exploration. A fuller account of discovery needs to integrate in it the roles such standards play. My present effort is a limited one, and doesn't yet intend to accomplish this. The second obstacle is that my account implies that discovery is a correlative to reflectively doing something. This may be understood as a process of revising or reconceiving an existing practice, and that may account for some kinds of discoveries. But we are habituated to take the sudden unsought for type, such as Columbus discovering America for Europeans as the paradigm case of discovery. Perhaps this instance can be looked at as related to many practices such as mapping, navigation, inter-continental missionary and trading activities, and the corresponding orientations. 'Discovery of America' is certainly not a label for Columbus seeing a particular landscape, but rather for the supplanting of an old differentiating practice of the surface of the earth by a new one, and the whole lot of other things it implies. But still here the discovery appears more an initiator of a revision of practices rather than a correlative to some revision.

I think this second obstacle is not a serious one. Experience of failure of an available *know-how* in a situation where it is thought to

be applicable is common enough. Equally common are attempts to experimentally vary the available *know how* in order to arrive at new knacks of mastering such situations. Instances like discovery initiating revision can be easily compared with experiencing failure with an available way of doing things and attempts to improvise and finally overhaul those old ways completely. But the very identification of a situation as a failure-situation is within the context of exercising some skill or the other.

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