

The Representation of Life

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Part One

Introductory

1. Logic and life. Among the many scandalous features of Hegel's table, or 'system', of logical categories, we would nowadays want, I think, to accord high rank to this, that he finds a place for the concept life on it. Hegel is of course not blind to the counter-intuitive character of his teaching on this point. In the so-called 'Greater Logic', the chapter headed "Life" begins with the formulation of an objection to any specifically logical treatment of the notion. Something in the objection, at least, might still find favor today:

The idea of life is concerned with a subject matter so concrete, and if you will so real, that with it we may seem to have overstepped the domain of logic as it is commonly conceived. Certainly, if logic were to contain nothing but empty, dead forms of thought, there could be no mention in it at all of such a content as the idea of life.¹

We may set aside the lyrical opposition of life's golden branches and poor gray lifeless theory, a favorite object of Hegelian ridicule. Even if there are special 'forms of thought' allied to the concept of life, it is anyway hard to see how they would be any more or less dead than those linked to the concepts of, say, being and quantity.

If the tendentious rhetoric is dropped, the implicit objection can be expounded in a series of apparent truisms. For logic, if tradition can be trusted, relates to the form of

¹ Hegel's Science of Logic, translated by A. V. Miller (London: Allen and Unwin, 1969), p. 761. (I have omitted certain initial capitals.)

Hegel's response to his objection is unfortunately of no value. He says that logic is concerned with cognition, and that cognition is life; therefore, etc. This gets us nowhere unless the first premise means that cognition is one of the logical categories. But the premise is only uncontentious if it expresses the traditional view that the logical categories are the forms of thought or cognition.

thought — a form of inference, for example, or the 'logical form' of a judgment. 'Form' here is of course opposed to content, a distinction that begins to become explicit for us when we learn to use schematic letters of different types and to substitute other expressions for them. How the distinction is to be further elaborated, and how exactly logic is supposed to 'relate' to the associated notion of form, are admittedly matters for dispute. But let them be resolved as one likes: how can anyone pretend that thought about living things differs in any such respect from, say, thought about planets?

—After all, living things, organisms, are just some among the concrete individuals we think about, marked off from the others in quite definite ways. The word "life" is meant to capture these points of distinction. It therefore expresses one of those "particular characteristics of objects" which, according to Frege (here following tradition), logic must "disregard".² We could hardly have said the same about the ultra-abstract, bare-bones distinctions of category that Frege himself introduces, for example that between Begriff and Gegenstand. If the former sort of thing were 'marked out within a wider class' (the class of entities, as it is inevitably called) by the possession of some particular characteristic — which we express, maybe, by calling the things 'unsaturated' — then there would have been no problem about the concept horse.³

If, then, we conceive or judge or infer differently in connection with the living, it is just that we conceive and judge and infer different things. It is no use to affirm that life is an 'essential property' of whatever has it — or that maybe 'being' is a basic category of thought and vivere viventibus est esse. "Metal" and "monocotyledon" arguably express essential properties of whatever satisfies them; and if 'to be, for living things, is to live', then presumably also being, for a cockroach, is being a cockroach, or living a roach's life. If any of these concepts sets the theme for a theoretical discussion, then the discussion must fall under one of the special sciences. A properly logical discourse would have to be carried on under some more abstract heading, e.g., "individuals", "relations", "properties" — perhaps even "being" or "essential properties" — but "life" and "organism", never.

I propose to attack this sort of conception, and to make a beginning of what amounts to a logical treatment of the idea of life, and its near relatives, and their expression in language. Hegel, I think, was so far right. Thought, as thought, takes a quite special turn when it is thought of the living — a turn of the same kind as that noticed by Frege in the transition from object to concept, from Philippa is wise, to The wise are few.⁴

² Gottlob Frege, Begriffsschrift, translated by Stefan Bauer-Mengelberg, in From Frege to Godel, ed. Jean van Heijenoort (Cambridge: Harvard, 1967).

³ See especially "On Concept and Object", trans. Peter Geach, reprinted in Collected Papers, ed. Brian McGuinness (Oxford: Blackwell, 1984), pp. 182-194.

⁴ I have been advised to warn the reader that throughout this essay I take Frege's above-mentioned remarks on concept and object as a paradigmatic elucidation of a 'distinction of logical category'. It may be that this commits me to a somewhat eccentric employment of the phrase. It is one of the lessons taught by Ludwig Wittgenstein, if I understand him, that we must recognize many intuitively more determinate distinctions of the sort Frege introduced. Wittgenstein of course calls the corresponding sort of distinction among signs

2. Ethics and life. But why treat such an abstract and extra-practical topic in a work of ethical theory? The answer of course is that an appeal to notions of life and organism and life-form is implicit in all departments of ethical thought. In some recent texts this appeal has become explicit and conscious.

Such thoughts are a part, for example, of the so-called ethical naturalism of Philippa Foot, and have always formed a focus of attack on her own and similar views of Elizabeth Anscombe. We find such notions expressed for example in Professor Foot's treatment of the concepts of damage and injury;⁵ in her account of certain appearances of the word "good";⁶ —and even in her discussion of euthanasia, where the suggestion is made that

...there is a conceptual connexion between life and good in the case of human beings as in that of animals and even plants. Here, as there, however, it is not the mere state of being alive that can determine, or itself count as, a good, but rather life coming up to some standard of normality.⁷

More recently such 'naturalistic' thoughts have appeared in Foot's book Natural Goodness. It is this more recent appeal to ideas of life and organism that I find especially interesting. In that book, if I understood it, the suggestion is made that practical reason be viewed as a faculty, akin to the powers of sight and hearing and memory; it was further maintained that an individual instance of any of these latter powers is to be judged as defective or sound by reference to its bearer's species. —As for example a house cat's visual capacity is, one gathers, not to be remarked upon, if it cannot apprehend the ripening of a tomato, though that of a human being would be. This is not simply because the cat is unlikely to share its owner's interest in the ripeness of tomatoes, but because of the difference in kind or species, or because of what each of them is.

Now, in the work of practical reason we have to do with a movement in quite different categories, in some sense, from those of mere sensibility. But, then, sensibility seems to differ just as radically from the sub-psychical, merely vegetative aspects of life; and yet absolutely parallel remarks could be made about the criteria of defect in the parts and operations of individual plants. Why, then, should the novel character of rationality prevent our again according the kind or species some of the status it seemed to possess in respect of the 'lower' faculties?

And so, for example, if we care to contemplate kinds of reasoning animal other than our own, shouldn't we also imagine different shapes of practical reason, subject to

a "grammatical difference".

⁵ "Moral Beliefs", Virtues and Vices (Berkeley and Los Angeles: University of California Press, 1978), see pp. 115-8.

⁶ "Goodness and Choice", Virtues and Vices, pp. 145 - 6.

⁷ "Euthanasia", Virtues and Vices, pp. 42 - 3.

different standards of defect — that is, of irrationality, as defect may be called in this sort of case? And similarly, moving in the other direction: whatever place is to be given the picturesque customs of the world and to peoples' 'projects' and thence, won't there be some larger more generic standard of rationality the same for all who are of our same kind? And if something in the way of justice, for example, is a part of the life characteristic of human-kind, then won't its presence in a person's thinking be among the marks of a sound practical reason that are associated with our kind? It will perhaps be impossible, after all, to effect the separation required to make a great question of it, whether morality in general is rational.

3. Ethics and logic. This is all very crudely expressed, but one need not enter into details. The slightest movement in such a direction is enough to set off alarms in many quarters. Some of the likely objections are notoriously difficult to understand; for example, that when it comes to treat moral questions such a line of thought must inevitably commit the naturalistic fallacy, or pretend to supply materials for a would-be derivation of 'ought' from 'is'. Other types of resistance involve a wrong idea of the place of controversy — the tendency is thought, for example, to aim at an axiom from which particular practical principles (inevitably illiberal ones) would then be derived, and that the proponent's next step will be to prove that, say, usury and contraception are 'wrong' because 'unnatural'.

But the objection I think I understand and want to take seriously starts from the thought that in employing such notions as life and organism and species we introduce something foreign, in particular something 'biological', into ethical theory. Any such view, one thinks, must involve either a vulgar scientific dissolution of the ethical, tending maybe toward an 'evolutionary ethics', or else the substitution of an outdated metaphysics for what we know to be empirical. Each path leads to its own absurdities. Together they may be thought to betray a yearning to view our practices 'from outside' or 'from sideways on' in hope perhaps of providing them with a foundation or an external grounding.

It is, I think, to be granted that ethical theory, in all its departments, is in a certain sense conceptually fastidious, and that there is here again a sin of 'overstepping' akin to that Hegel noticed in connection with logical theory, and that the formulation of ethical principles must be contaminated by anything that comes our way through a purely scientific development. This, if it is right, is not a consequence of some more general crime of struggling to 'get beyond our practices' or 'outside our language' or what you will, but a specifically ethical truth. It is what Rousseau meant when he said that one shouldn't have to make a man a philosophe before making him a man⁸, and what Kant presupposed in shrugging off the criticism that his Groundwork proposed no new moral principle, but only a new formula.⁹ I will not defend the idea here, except to remark that, if we reject it, we will also have to reject the traditional asymmetry between ignorance of principle and

⁸ Discourse on the Origin of Inequality, Preface.

⁹ "Who would want to introduce a new principle, and as it were, be its inventor, as if the world had hitherto been ignorant of what duty is, or had been thoroughly wrong about it?", Critique of Practical Reason, Preface, trans. Beck, p. 8.

ignorance of fact.

But suppose that the concepts life, organism and life-form really are logical determinations, and that some such primitive practical concept as, say action belongs to the sphere they govern, and is not itself to be castigated as a novelty or a foreign body or 'the latest revelation of wisdom'. Then the ethical employment of such concepts would merely make articulate something already present in pensee sauvage pratique — and it would seem that Foot and Anscombe were looking at things head on, not sideways on.

Part 2

Can Life be Given a Real Definition?

1. 'Signs of life'. I want to begin by raising difficulties for one of the thoughts I took for granted in articulating Hegel's objection to his own proceeding — namely, the apparently innocent idea that living things are just some among the concrete individuals we think about, marked off from the others in quite definite ways. If this is right, then the word "life" expresses a "particular characteristic of [those] objects" in Frege's phrase, and presumably not their logical category.

The question forced upon us by this thought — what the supposed characteristic marks of the concept life might actually be — is not one that much exercises contemporary philosophers as philosophers. We may say of the problem what Frege said of investigations into the concept number — another "concept fundamental to a mighty science":

Admittedly, many people will think this not worth the trouble. Naturally, they will suppose, this concept is adequately dealt within the elementary textbooks, where the subject is settled once and for all. Who can believe that he has anything still to learn on so simple a matter?¹⁰

I want to consider just such an Elementarbuch, a typical college freshman's biology text.

In her book Biology, Professor Helena Curtis supplies us with a special illustrated section, separated off from the main text and labelled "The Signs of Life":

What do we mean when we speak of "the evolution of life", or "life on other planets" or "when life begins"? Actually, there is no simple definition. Life does not exist in the abstract; there is no "life", only living things. We recognize a system as being alive when it has certain properties that are more common among animate objects than inanimate ones. Let us take a look at some of these properties.

Here the apparently innocent thought is frankly expressed, and the associated task of expounding Merkmale is gladly shouldered. There turn out to be seven of them. "Living things," she tells us, "are highly organized". They are "homeostatic, which means simply 'staying the same'". They "grow and develop", and are "adapted". They "take energy from the environment and change it from one form to another" and they "respond to stimuli". Finally, of course, "[l]iving things reproduce themselves"¹¹

It may seem a bit odd to take casual remarks from the opening pages of a textbook

¹⁰ Frege, Foundations of Arithmetic, translated by J. L. Austin, (Oxford: Blackwell, 1980), p. iii.

¹¹ Helena Curtis, Biology, third edition (New York: Worth Publishers, 1979), pp. 20-21.

and make them the starting point for one's reflection, but consider Frege's remark quoted above, and his method throughout the Grundlagen. Professor Curtis' discussion is not really casual. A random survey of college bookstores will show that there is one of many, all of them apparently distant progeny of some Ur-list, a Q-document for which one searches in vain, but which we find repeated again and again, subject to whatever improvements occur to the immediate author.¹² A certain type of context, at once introductory and reflective, seems to attract this kind of thing. Perhaps there is no Q-document to uncover, but even if there is one, possession of it would only supply a superficial explanation of this peculiar tradition. We would still have to explain the fact that the list gets repeated, and that no one worries where the idea of such a thing came from, and that it all seems so obvious. The source of the repetition of such lists — a certain form of philosophical unconscious, I suppose — is the true original of any one of them, as also of the rare more learned account, and it is, I hope, the real focus of my remarks.¹³

But let us return to our token of this type, Professor Curtis' list. Troubles begin even before we consider the several properties adduced: what does she mean to be saying about them? She is linking an expression for life or organism with a number of predicates in unquantified propositions: "Living things are F". What form of judgment is being expressed? One of the hints she gives us is clearly mistaken — baldness, bad manners, and home ownership are all "more common among animate objects than inanimate ones", but presumably none was a candidate for inclusion. She seems to allow that the properties she retails are neither collectively sufficient nor severally necessary for the 'system' that bears them to count as alive; are they meant to illustrate a system of 'family resemblances'? — And are we doing metaphysics or epistemology? She calls the the properties "signs" of life, and speaks of how "we recognize a system as being alive"; but the inner tendency of such a list is surely toward a real definition, a metaphysical analysis, a teaching about 'what life consists in' — in any case, something on the order of criteria, not symptoms.

We may prescind from this obscurity: the reasons for it will emerge, I think, from a discussion of the individual members of the list.

2. Organization. Nothing is more common than to make life a matter of

¹² Moritz Schlick produced such a list already in lectures of 1927, attributing it to "Wilhelm Roux, the founder of so-called developmental mechanics [who] says: A body is living if it possesses the following characteristics: 1) Metabolism...; 2) Growth; 3) Active movement...; 4) Reproduction...; 5) Inheritance...", but he unfortunately supplies no reference to Roux's works. The idea of such a list must have arisen during the vitalist-mechanist debates. See Schlick's Philosophy of Nature, trans. A. von Zeppelin (New York: Philosophical Library, 1949), p. 73ff.

¹³ The idea of employing this tradition of list-making as a clue to the typical contemporary Lebensweltanschauung so to speak, is anticipated by Gareth Matthews, who rightly contrasts these lists with the familiar and seemingly similar list produced by Aristotle. See his "De Anima 2. 2-4 and the Meaning of Life", in M. Nussbaum and A. Rorty, eds. Essays on Aristotle's De Anima (Oxford: Clarendon, 1992), p. 185-193.

organization, order, structure or complexity. Professor Curtis will be no exception. She writes:

Living organisms are highly organized, as in this cross section of a pine needle. It reflects the complicated organization of many different kinds of atoms into molecules and of molecules into complex structures. Such complexity of form is never found in inanimate objects.

It is worth enquiring, though, how the intended notion of organization is supposed to work. Is it meant to cover the organization of parts in an animal, of parts in a car, of words on a page, of people in a factory, of molecules in a crystal? If the notion is so abstract, then I think we can have little reason to think that there is any one consistent measure of more-and-less in respect of it. Is the administration of the University of Pittsburgh more highly organized than, say, a Buick or the Hope diamond, or more complex than the rules of chess? Any of these would at best make an unhappy metaphor. But I suppose the lament of a 1950's auto mechanic, faced suddenly with a recent Volkswagen, would have straightforward content.

Now, Professor Curtis mentions that atoms and molecules are among the elements organized, and later on that "living things take energy from the environment" and so forth. This might suggest that we have to do with a determinate conception of organization after all, namely that sometimes said to be implicit in thermodynamical theorizing. This interpretation would perhaps supply a determinate scale; and, if it does make sense, we can happily allow that the physical contents of the regions of space occupied by terrestrial organisms tend to take on its higher values — I mean, in relation to other things we know of.

Is it perverse, though, to remind ourselves that fresh corpses are not alive, and yet have presumably lost little in the respect measured on the relevant physical scale? Suppose we freeze a bunch of camels' corpses, and arrange them for art's sake in a sort of flying wedge, hurtling toward Alpha Centauri; could the adventitious arrangement supply, for the whole, what the individuals lost with death? The thought seems perverse since, but for a camel's life, we have no camel-carcass, and anyhow the additional arrangement sprang from the allegedly awesome degree of order or organized complexity exhibited within our skulls — a part, that is, of our life. Should we say, then, that living things are sources of thermodynamically highly organized lumps of stuff? The 'living body' of an organism would be just one such highly organized precipitate of its life processes, alongside the nest or honeycomb or house it helps to build, and the dry leaves, paw-prints or corpse it leaves behind. We would be characterizing the life-process by its physicalistically intelligible and salient results.

But do we really know that nothing else can bring the results about, or that if something else can, it must be rarer, on a cosmic scale, than living things are? Even if we do know these things, or managed to find them out, it would be wrong, I think, to incorporate this knowledge into a list of the type we are hoping to construct.

To see the difficulty, it may help to consider another proposed list-occupant. Professor Ernst Mayr, in a somewhat differently motivated "tabulation" (as he calls it), puts

our present topic, "Complexity and Organization", just ahead of something he calls "Chemical Uniqueness". In explaining the latter he says:

These organic molecules [sc., those from which terrestrial organisms are composed] do not differ in principle from other molecules. They are, however, far more complex than the low molecular weight molecules that are the regular constituents of inanimate nature. These larger organic macromolecules are not normally found in inanimate matter.¹⁴

Now, it is true that if we were sending a probe to Mars to search out 'signs of life', we might have it test for the presence of 'large organic macromolecules'. But then, we might have it test for the like of DNA in particular. One supposes that "Living things contain DNA" might hold good even on a cosmic scale — perhaps we could discover that there is no other way to get this sort of thing going, given the physical constitution of 'our universe'. But no one would hope to improve on the tradition by incorporating it into one of these lists. The judgment about DNA, if it were true, would only show how resource-poor the physical world really is. It could make no contribution to the exposition of the concept of life, or to a teaching on the question, what life is — except perhaps as pointing to a few gorillas and turnips might. The ends of our sort of list, however obscure they may be, point to something more abstract and would clearly be contravened by it.

But does mention of DNA differ fundamentally from a sparer appeal to 'large organic macromolecules'? Appeal to what is, after all, a particular physical quantity thermodynamical order or organization — though it be that much more abstract — is evidently in the same boat as either of them.

The point would be easier to make if we could say that God and the angels are 'living things' if they are anything, and that physical concepts hardly have a place in the analysis of their kinds of life.¹⁵ But in the context of the present essay, and the relevant sort of list, "living thing" means organism. This narrower focus does not, however, supply a pretext for the importation of empirical physical concepts — as a further narrowing to, say, mammal, primate or gorilla might. I do not know whether the proposition, Not everything that lives is an organism, is really coherent; but on the tradition according to which it is, and is true, the specific difference of the organism was marked in a number of ways, hands left clean of the empirical. One said for example that organisms are composite, or have parts.

Let us return, then, to the thought from which we started — that the unsubscripted notion of order or organization is a very abstract or generic one, and that, left abstract, it does not make sense to think of a standard of more-and-less in respect of it. We have on the one hand the concept or idea of organization, and, on the other, a number of conceptions, determinations, types or genera of it. If a remark of the form "A is organized" is to express a definite thought, it must isolate one of these. Which do we have in view, then, if not the allegedly thermodynamical one — and if it is 'quality' and not the 'quantity' of order that matters? The obvious answer is that the relevant conception is simply

¹⁴ The Growth of Biological Thought, (Cambridge: Harvard, 1982), p.54.

¹⁵ See, e.g. Aquinas, Summa Theologiae, I, q. 18.

equivalent to the idea of life: to be alive is to be organ-ized; to be alive is to be a subject of, say, 'vital organization'. Or if, as we were just imagining, a living thing need't be an organism, then the thought should rather be that organisms are in that sense organized; or, equivalently, that if a life is a life-with-parts, then this sort of order must prevail among these parts.

The formula, "Living things have parts", which has seemed a little too obvious to merit a career as a list-occupant, is evidently closely related to the thought that living things are organized: the parts are the elements that are arranged or ordered. But if the notion of order or organization is abstract, the notion of part is as much so: we need to supply a subscript before the suggestion that living things have either of them can express a definite thought. Our language, feeling this need, sometimes permits the subscripts to be supplied non-contextually through certain uses of the words "organ" and "member" and "tissue" — though these terms are all perhaps most apt in connection with sensitive or animal life, as words for partes animalium.

I said that no one would append the like of "Living things contain DNA" to a list of the sort we are considering, even given suitable physical hypotheses. No one would add "Living things have parts, in the sense of organs" either, but for another reason. Will he or she follow the cautious Professor Mayr and remark, in the scholium, that organs are 'not normally found in inanimate matter'? My suggestion will be that every candidate list-occupant must strike the sub-metaphysical Scylla of "DNA" or else sink into the tautologous Charybdis of "organs", and that every such list may as well be replaced by the empty list.

3. Stimulus and response. Before pausing to reflect on these matters, I want to move on to some of Helena Curtis's other criteria. Two of them seem to me to belong together. First, an underwater scene:

Living things respond to stimuli. Here scallops, sensing an approaching starfish, leap to safety.

And now the forest, as an owl descends open-clawed upon a mouse:

Living things take energy from the environment and change it from one form to another. They are highly specialized at energy conversion. Here a saw-whet owl is converting chemical energy to kinetic energy, thereby procuring a new source of chemical energy, in this case a white-footed mouse.

Again there is a problem of understanding. Are we to say, for example, that the asphalt on a summer day "takes energy" from sunlight, and "converts" it into heat? And is an avalanche, on the other hand, the "response" of a snow-covered hillside to the "stimulus" of, say, excessive yodeling?

But before considering what can be made of these rhetorical questions, I want to raise a few objections to the given formulations. First, it is clear that the notion of 'response' employed in the first criterion must apply not just to the leaping of threatened scallops, but also for example to the effect of spring warming on the buds of maple trees.

Otherwise the notion will be left covering a phenomenon merely of sentient or animal life. It would thus acquire the standing of baldness and bad manners — it would be a property uncommon even among the living, but all the same 'more common among the living than the non-living'. And notice further, in connection with the second criterion, that there is nothing really special about taking energy from the 'environment' — she could as well have characterized the living as taking stuff, matter, from the environment, and converting it into other forms. Energy is after all just another physical quantity; if the considerations of the previous section are sound, then it is vulgar anyway to drag an expression for such a thing into the sort of account we are hoping to produce. Curtis' formulation of each criterion seems, then, to be defective. But what is the thought that tempts one to propound them, or anything like them?

Let us consider just the first criterion for the moment, the thought that living things 'respond to stimuli'. — The warming of an asphalt roadbed and the train of photosynthetical events in a green leaf are both of them, in some sense, the effect of sunlight. And the thawing of icy ponds and the opening of maple buds are each occasioned by rising spring temperatures. It is natural, though, to think that the two vegetative phenomena belong together as instances of a special type of causal relation, or a causal relation with special conditions, distinct from any exhibited in asphalt or water. (The corresponding phenomena of sentient life, those most aptly described in terms of 'stimulus' and 'response', belong to a subdivision of this type which need not specially concern us.) On the other hand, though, the effect of the hydrogen bomb on a rose, and on a road-bed, will be pretty much the same — at least if they are both at ground zero. I mean not only that the effects will be similar, but that the type of causality will be the same. It is in a more restricted range of cases that we seem to see a difference, if the affected individual is an organism. I mean: sunlight makes the asphalt warm; moisture and cold make it crack; the H-bomb turns it to a vapor. These things are all on a level. The asphalt is in a sense passive in the face of any of them. But, in the familiar metaphors, the rose or maple is ready for certain of these 'influences' — rising spring temperatures, for example — it is already on to them, it takes advantage of them. Green leaves are not subjected to the light, if it is not too strong; they are not in the same sense passive in respect of it; the access of photons is not to be understood on a model of bombardment — that is, as it would have to be if we were discussing the fading of a book-cover or the warming of a stone. This, I think, is the contrast one is trying to register, in placing 'responsiveness to stimuli' among the characteristic marks of the concept life.

If we attempt to put the thought less metaphorically, in terms of a notion of process, we come upon some surprising appearances. The arrival of spring, on the one hand, and of the photon, on the other — these events are meteorological and physical, and we can trace them back to their antecedents in the relation of the earth to the sun. But they are also phases of larger processes in the plant, just as the replication of yeast cells is part of a larger culinary-technical process, if it takes place in some sourdough. The rose and maple are subjects of processes of their own, which the meteorological or physical events merely complete or continue: the formation of leaves of a certain character, come spring, and the fixation of carbon in those leaves, once illuminated.

In learning of the various cellular processes unearthed and described in

biochemistry — photosynthesis, for example, or the Krebs cycle, or the replication of DNA — one is inclined to think, It's all getting boiled down to chemistry and physics, isn't it?, and in some sense of 'boiling down' this is of course true. But it is interesting that if the only categories we have to apply are those of chemistry and physics, there is an obvious sense in which none of these goings-on will add up to a single process. In a description of photosynthesis, for example, we read of one chemical process — one process-in-the-sense-of-chemistry — followed by another, and then another. Having read along a bit with mounting enthusiasm, we can ask: "And what happens next?" If we are stuck with chemical and physical categories, the only answer will be: "Well, it depends on whether an H-bomb goes off, or the temperature plummets toward absolute zero, or it all falls into a vat of sulfuric acid...". That a certain enzyme will appear, and split the latest chemical product into two, is just one among many possibilities. Physics and chemistry, adequately developed, can tell you what happens in any of these circumstances — in any circumstance — but it seems that they cannot attach any sense to a question "What happens next?", sans phrase. The biochemical treatise appears to make implicit play with a special determination of the abstract conception of a process, one distinct from any expressed in physics or in chemistry proper.

If these traditional though perhaps rather metaphysical meditations are sound, then it is not just that 'the rose and maple are subjects of processes of their own': they are also subjects of a special type or category of process — 'biological' processes, if you like, or 'life-processes'. The possibility of a biochemical discourse uniting purely physical and chemical descriptions of things and events is enough to show that the illustrated 'life-processes' are not marked off from others by their content. Whether they share a form of the sort to interest us in a logical investigation is a matter to be considered later.

The list-occupying notions of stimulus and response (which, as I have said, must be construed broadly so as to cover phenomena in the life of maple trees and blue-green algae) can be explained in terms of this type of process. The simplest explanation would involve a prior idea of events as coming respectively 'from outside' and 'from within' the thing stimulated and responding. Let us leave this common-sensical distinction momentarily unanalyzed. Then, roughly, events will add up to stimulus and response if the first comes 'from outside' and the other 'from within' the subject of the events, and they are joined as elements of this kind of process, a life-process, as I was calling it.

The receipt of photons and the formation of glucose, the rising temperature and the unfolding leaves, the apprehension of a starfish and the leaping away are all of them bound together in this sort of nexus — though the lattermost pair of events is also caught up in certain more determinate (psychical) categories. But the radiation cast off by the detonated H-bomb and the evaporation of a thing, whether it be asphalt or an organism, will not be so joined or united. This particular type of process or nexus, this form of unity of events — which by the way need not be sorted into those 'from without' and those 'from within': the phases of, say, the Krebs cycle are not — this is, I think, what is really at issue when 'stimulus and response' make it onto our kind of list. But, again, it is clear that a philosophical account of this form of unity, and a philosophical account of life, are at bottom the same: such processes are after all what goes on as life goes on.

4. Vital operation The same thought will perhaps be supposed to underlie that other list-occupying formula, "Living things take energy from the environment and convert it into other forms". For it is in the nature of our sort of enterprise, I said, to recoil from words for particular physical quantities. If we cleave to this principle and delete the reference to energy, we are left with a general schema of 'taking and converting'. And this, it might be argued, is itself only worth mentioning as an illustration of events as bound together in a life-process.

But perhaps everything that follows the word "energy" depends on it and should fall with it. The remaining thought would then simply be that Living things take. This is more a thought-fragment than a thought, but it suggests what is at least prima facie a different account of the idea that underlies the criterion we are mutilating: it is not that living things are the subjects of events falling into a certain form of process, but that they are subjects of a certain form of agency. —We have to do, that is, not with a special nexus of events, but with a special nexus of thing and event.

The topics are obviously closely related, and another of Curtis' criteria, "Living things grow and develop," would seem to split itself between them. "Development" is another word for process, and it can only be a life-process that is intended. Growth involves a notion of increase in size, which, given certain very general but philosophically unmentionable facts of physical nature, would seem to be entailed by the demands of reproduction (a matter to be discussed later). The rational kernel of such a criterion is just the difference between the growth of a chipmunk or a pine tree and the growth of, say, a trash heap — which difference has of course nothing to do with growth. The relevant nexus of thing and event is the one we intended above in speaking of an event as 'coming from within' a thing.

Now, the tactic of marking off a class of things by the special relation they may bear to some of the things they do — which doings are ipso facto 'doings' in some restricted and italicizable sense — is a familiar one. Suppose, for example, that a certain thing can be said to will or intend some of what happens to it or some of what it does (in some broad sense), or that some of these happenings can be said to be 'caused by' its intention, desire or judgment. Then presumably we can call the thing a person or an agent, and dignify the event too with a title of "intentional action" or even "action" simply.

The notion of an animal and the notion of 'behavior' or 'animal movement' — motus animalium — might be given a parallel treatment. How does a bird's progress out of the stadium, where it has been mistaken for a fast ball, differ from a progress out in search of better food? It is usual to say that, in the one case, the bat moves the bird, and that, in the other, the bird moves itself. If this account of the difference is sound then we may perhaps go on in good conscience to introduce some new expressions, granting a title of "animal" or "self-mover" to whatever is 'such a source of things', and applying the words "behavior" or "animal movement" to any event with that sort of source.

If, arguably, person = subject of intentional action and animal = subject of animal movement, then perhaps what the fragment "Living things take" really means to tell us is that living thing = subject of (say) 'vital operation'; this is our 'deeper reading' of Curtis's intentions, or rather those of the tradition she represents.¹⁶ And as persons and animals are

¹⁶ Gareth Matthews quotes a list of so-called basic characteristics of living things which

forms of living thing, so presumably also intentional action and animal movement are forms of vital operation. The traditional hierarchy of forms of life appears to correspond to a hierarchy of forms of agency.

I don't want to object to any of these identities. The question, once again, is whether anything like the third of them can rightly contribute to a real definition of its subject. As I have formulated them, the second and third would give an appearance of circularity if advanced as definitions, a fact which maybe put down to my tendentious nomenclature. After all, we have an explanation of 'animal movement' as self-movement. But is the explanation any good?

There is no question that a misunderstanding about which of the two sorts of stadium-and-bird case one had intended can be cleared up with the words, "No, no, it moved itself". If, however, we ask in philosophy what the difference is between the cases, then we mean to find the difference between such cases generally, and an appeal to 'self-movement' is not illuminating.¹⁷ The reflexive is simply one of the means our language gives us for marking the different relation posited between subject and predicate, thing and event. It does not by itself tell us what this relation is.

It will perhaps help to see this if we remember that the relation of the bird to its movement was supposed to be somehow higher or more sublime in the no-bat case than in the other, and that, of course, the same sublime creature-event nexus can bind a bird and the movement of something else, a piece of straw, for example.¹⁸ And, more obviously, the sublime relation between a bird and the movement of its own parts need not be severed if the movement can be said in some sense to spring from something other than the bird, suitable prey up yonder, for example. And in general if A moves B, then the mereological sum of A and B in some sense moves itself, or some of itself. Some 'self-movement', then, is other-movement; some 'self-movement' is movement-by-another; and some non-'self-movement' is self-movement after all.

We are considering the special case of animals and animal movement for purposes of analogy, but in truth, I think, any attempt to mark the character of organisms in general

includes the responsiveness we have already discussed, but also — and at first glance completely mysteriously — movement (ib., p. 185). That the quoted author must have heard of the laws of falling bodies, on the one hand, and of deep-rooted trees, on the other, suggests the necessity of such a deeper reading; it is only the present broad form of 'agency' that can be intended. In the list Schlick quotes from Wilhelm Roux, the place of movement is thus taken by something called 'active movement' (see fn. 14 above).

¹⁷ See a parallel remark in Elizabeth Anscombe, Intention, (Ithaca: Cornell U. P., 1963), p. 3.

¹⁸ It may be objected that a bird never moves straw, except by moving itself — that is to say, parts of itself. But if we refuse to take the idea of the limits of an animal's body for granted, and ask how it is settled what is a part of it, and what is just stuck to it or what it is just holding or what, come to think of it, is really on the other side of the room, then we will, I think, be forced to import the notion of 'animal movement' as something already understood.

by an employment of such prefixes as "self-" or "auto-" — as in, say, "self-reproduction", "self-organization" or "auto-regulation" — is for the same reason completely empty. The phrase to which the prefix is attached is always a distraction, and the whole problem is already contained in the reflexive; it should be replaced in each case with some such transparently circle-making expression as "bio-", "biological" or "vital". The emptiness of a philosophical appeal to this reflexive is already shown by the fact that we incline to it in so many places — to distinguish the two types of growth, the two types of bird-flight, and even, in Kantian moral philosophy, two types of rational agency. At each link in the great chain of agency, activity, autonomy or spontaneity we employ the reflexive to introduce another 'higher' link; it is a finger pointing upward, yes, but we want to know what's up there.

If we must drop the special emphasis on the reflexive then it is natural to explain the special nexus of animal and event by appeal to sensation or appetite. Our account of the concept motus animalium would then mirror the sort of account of the category of willed, voluntary or intentional action which takes such notions as desire, intention and judgment for granted, along with some abstract conception of cause.¹⁹ Something must fall between the would-be agent and what it does — something which, as 'cause' of the latter happening, gives the whole ensemble the special character of rational agency or intentionalness in the one case, and of animal movement in the other.

Elizabeth Anscombe has attacked this doctrine of intentional action²⁰, and one would want to reproduce her thinking in a more extended discussion of the broader category of animal movement. But we need not produce any analogous counter-argument in the case of our present quarry, the still wider category of 'vital operation', or 'life-functioning'. The materials for constructing a Cartesian-Davidsonian account are simply unavailable in this more general case. What individual happenings will 'fall between' a tree and its getting larger, thereby potentially distinguishing this nexus from that involved in a crystal's or flame's or trash-heap's getting larger? Well, no sap runs in a crystal, you might say, and there is no photosynthesis in a flame; but then no sap runs in an amoeba, and there is no photosynthesis in a human being. Nothing has the position in respect of organisms generally that sensation and appetite have among animals, and judgment, intention, and desire have among persons. There is no general type of event, X, of which we will be tempted to say: whenever an individual event is to be brought back to the 'vital operation' of an organism, there must be some other event of type X which predates the attributed event and causes it — unless of course it be simply more vital operation. An account of this type of 'agency', 'activity', 'substance-causality' or 'spontaneity' in terms of a prior abstract notion of cause and a particular kind of state or event is thus I think impossible.

5. Summary of results reached so far. A number of abstract categories — that of a concrete individual; of a thing's being a part of something; of order or organization; of

¹⁹ See especially the first five essays reprinted in Donald Davidson, Essays on Action and Events (Oxford: Oxford, 1981).

²⁰ See, for example, Intention, 5-15.

one thing's following another in a process; of a thing's doing something — are all together determined or specified, or thrown into a higher gear, to yield the concepts: organism; organ, 'part' or 'member'; vital order or organ-ization; life-process; and vital operation. The abstract notion of existence, in the sense of actuality (Frege's *Wirklichkeit*) evidently bears the same relation to that of life: 'to be, for a living thing, is to live'²¹ I will later suggest that this same shift of gear will turn the abstract notion of a kind or of a 'natural kind' into that of a life-form — the notion, that is, of a living kind, or of a species (on one reading of that expression).

These concepts, the vital categories, together form a sort of solid block, and we run into a kind of circle in attempting to elucidate any of them, a circle much like the one Anscombe found at a higher stratum of things:

Why is giving a start or gasp not an 'action', while sending for a taxi, or crossing a road, is one? The answer cannot be "Because the answer to the question 'why?' may give a reason in the latter cases", for the answer may 'give a reason' in the former cases too [e.g. where the 'reason why' you gasped is that you misheard "It's satin" as "It's Satan"]; and we cannot say, "Ah, but not a reason for acting"; we should be going round in circles. We need to find the difference between the two kinds of 'reason' without talking about 'acting'; and if we do, perhaps we shall discover what is meant by 'acting' when it is said with this special emphasis.²²

Our circle may of course be larger: 'Why is a taxi not an 'organism' while a tarantula is one? The answer cannot be, "Because a tarantula has members", for a taxi has parts as well....' We might go on to explain the intended notion of part in terms of vital organization, say, but in the end the fly paper will have to stick somewhere. It is of course useless to attempt a 'holistic' account, seeking to elucidate the several categories together by describing their interrelations: the relations that hold among the vital categories are presumably the same as those holding among the more abstract ones.

Anscombe escapes her circle by fixing on the relevant sort of reason, and then rejecting what may be called a purely metaphysical approach to it. It is the hope of giving a real definition which sends us reaching back into the circle and then from pillar to post. She takes refuge instead in the representation of 'reasons', 'explanations' or 'accounts' in general, in the asking and answering of questions "Why?" If, now, she can isolate a certain particular 'sense of the question "Why?"', she will have exposed the more determinate kind of reason, and with it a whole ensemble of practical categories: action, intention, end, means, will, motive, etc.

Our method is meant to be the same. To apply it, though, we must first expand our circle to include the concept of a life-form or a species; this, I think, is the weak link. A species or life-form is just a certain kind of kind — the sort of thing to be the subject of a general judgment or a general statement; the sort of thing that is said of something and

²¹ Aristotle, De Anima, II, 5 (415b13).

²² Intention, 5, p. 10.

about which something can be said. Our problem will then reduce to one of isolating a particular form of general judgment or statement — a natural-historical judgment, as I will call it, or an aristotelian categorical. What is fit to be the subject of such a thing we may call a species-conceptor a life-form-word. A species or life-form, then, will be whatever can be conceived through such a concept or expressed by such a word — not a real definition, alas, but not a circular one, I think, and not egregious organicistic metaphysics either. It is because in the end we have to do with a special form of judgment, a distinct mode of joining subject and predicate in thought or speech, that I am emboldened to say that the vital categories are logical categories.

Part 3

The Representation of the Living Individual

1. Sameness in the sphere of the living. This discussion has so far focussed on the metaphysical ambition of the list-making approach to the question, "What is life?". But there is another hope evinced by that tradition, a hope bound up with a certain extreme individualism, as I think it can rightly be called. An acceptable answer to the great question is implicitly required to tell us how things must be in a given region of space if we are to say, "A living thing is there" — or, perhaps better: what a region of space-time needs to be like, if it is to be the 'time-worm' of an individual organism.

That Professor Curtis is not managing to pull the trick off becomes painfully clear in the text for her final "Sign of Life", which she illustrates with a photograph of a mature pair of ostriches and twenty head of little ones. It is a traditional favorite:

Living things reproduce themselves. They make more of themselves, copy after copy after copy, with astonishing fidelity (and yet, as we shall see, with just enough variation to provide the raw material for evolution).

Problems of understanding again arise, this time from the apparent accident that she has put her definiendum in the plural. It is not just that living things generally 'take energy from the environment' — I, Thompson, do this as well; and I, Thompson, 'react to stimuli', I suppose. What would it be, though, for me, Thompson, to make more of myself? We are not envisaging an increase in portliness.

Let us say that it means: to make a copy, indeed "copy after copy". We might forestall mention of it that I have not done this in all these years of seeming life, if we adopt a backward-looking formulation of the criterion, as say "Living things are made by more of themselves", or "Living things are copies of what they are made by." This raises the problem of a beginning, but, putting that aside, the question must still arise: in just what respects am I supposed to be copied, or to be a copy? Or again: more of what? It is of course no use to say that the formula means simply that living things come from living things, so that the words "living thing" themselves express the respect of sameness. This need not be circular; it might be an implicit definition, requiring us to solve the equation in order to arrive at the content of "living thing". But again material object will make as good a solution as living thing will.

The same difficulties must beset another of Professor Curtis' properties, the last will mention. "Living things," she tells us, "are homeostatic, which means simply 'staying the same.'" Now, of course, on one way of taking these words, they would formulate a fairly sound criterion of death. What, then, do we have to 'stay', if we are to 'stay the same'?

in the sense intended?²³ One is familiar, after all, with fairly radical phenomenal and physical alterations, 'metamorphoses' as they call them, in the typical life of various sorts of animal. It is clear that the concept of life is plastic enough to allow such 'changes of form' to be as thoroughgoing and frequent as one likes, consistently with the thing's being alive. What happens once in a typical butterfly's life might happen a hundred times in the typical life of some yet-to-evolve quasi-butterfly.

I want to say that in neither the case of reproduction nor that of so-called homeostasis is the requisite sort of sameness fixed or determined by anything in the individual itself: whatever else may come from a thing, and whatever becomes of the thing itself, the upshot will be in some respects the same and in other ways different from what we had before. If we call the relevant sameness sameness of form, then that a thing has a given such form will not be an 'individualistically' determinable fact about the thing; it will not, for example, be equivalent to any collection of physical or phenomenal facts about the thing. The imagined example of a sort of poly-metamorphic butterfly makes this obvious in the second sort of case: the superficial, changing morphe may be taken in by the eye, or registered by a physical apparatus — each of which trades in what is present here and now; the shape of things that must be maintained, according to the criterion, is realized differently at different times, or maybe. But the case of reproduction bears some further discussion.

Since a thing needn't actually reproduce itself to count as alive, one wants to say that it must at least be able to, or have it in it to do so. Even this is not quite right, given any ordinary understanding of the words "able to"; but let this pass. Our thought would seem to be that if a thing is to count as alive, it must fall under some universal U where, (a), an individual's falling under U is an individualistically ascertainable fact about the thing, and, (b), some general truth approximately formulable as "From a given U, another U can come to be" holds. I have already remarked that this proposition will come out true if we substitute "material object" for "U"; but let us suppose we have a principle for ruling out such trivial readings.

Now, "Another can come from it" doesn't mean: another can come from it, whatever the circumstances. We can at most require that we get 'another' in some circumstances. The necessary weakening must bring the whole naive picture to ruin. — One is acquainted, after all, with the astonishing works of some of the 'large organic macro-molecules' that characterize terrestrial life, enzymes for example. Now there must be many chemical substances C, such that for some appropriate stew of other chemical stuffs, S (some of them no doubt 'large organic macro-molecules'), the following holds good: if a bit of C is introduced into a vat of S, then a bit more C will be produced, and so later on a lot more C will have been produced, until in the end we face a parody of 'environmental collapse'. Perhaps this is true of every chemical substance. And why shouldn't it be true of anything, whether it be held together by chemical bonds or not, and

²³ I take it that the word "homeostasis" has been supplied with a rather extended sense in this context, so that it does not cover mere maintenance of body temperature or the ratios of things dissolved in cells, but the whole 'reproduction of the individual'. Her criterion is a form of the traditional slogan that substance has a tendency to keep itself in being.

under any of its physical descriptions, partial or complete?— there is some 'environment', also physically describable, in which, if there be one of that description, another will come to be. If it isn't so, then this is just another empirical fact about this vale of dross and tears, the 'physical universe'. From the point of view of physics, after all, a text in a scrivener's shop is like an amoeba in the sea, or a bacterium in my bloodstream. And so perhaps everything has 'reproductive fitness', and under any description, and all things are full of souls. It is just that most of them are starved for the circumstances that would express the trait.

What we miss, or miss most obviously, in the flat physicalist picture of reproduction, is any conception of the unity of a thing and its circumstances as potentially non-accidental. An organism's coming to be in such circumstances as tend to its reproduction is itself typically a vital operation, a phase in a life-process, and therefore, in a certain sense, 'no accident'. A dandelion-seed falling on reproductively apt soil may seem fortuitous, but its parent, by a kind of ruse of vegetation, makes such an accident no accident, most obviously by producing so much seed. The reproduction and staying-the-same that are put down as "Signs of Life" are really just self-reproduction and keeping oneself the same, where the reflexive expresses, not an abstract relation to the subject, but vital operation. And so in the last analysis these criteria might be thought to take us nowhere we haven't been. It is enough that the thing should exhibit any vital process or operation — why should reproduction and 'homeostasis' in particular be among them? But though the conception of the relevant sort of 'form'-transmission or 'form'-maintenance is a notion of vital operation, it may yet be that a grasp of the category of vital operation, or of any conception of a particular vital operation, must presuppose a grasp of the appropriate category of form. And this, I think, is what really gets registered in criteria of 'homeostasis' and reproduction — that is, of the 'reproduction of the individual' and the 'reproduction of its kind'.

2. The mediate character of vital description: the 'wider context' Rather dark, that, but let us make a fresh start, in hope of explaining it, with some quotations from Anscombe's discussion of contraception:

Acts that are pretty clearly defined biological events, like eating and copulation, may be said to be by nature acts of a certain kind. Eating is a useful example to illustrate further the concepts I am using; it is a biological example like copulation, but on the other hand we shall not here be confused by controverted moral judgments. Eating is intrinsically a nutritive act, the sort of act to be nutritive; this would be an essential mark of eating if we wished to identify it in an animal species differing very much from us in structure.

And she also says:

In the same way, we may say that ... the eye is as such an organ of sight: consider how we would identify eating and the eye from one species to another. And it is in this sense that copulation is intrinsically generative — though there are very many copulations which in fact do not generate.

And best of all she says:

When we call something an acorn, we look to a wider context than can be seen in the acorn itself. Oaks come from acorns, acorns come from oaks; an acorn is thus as such generative (of an oak) whether or not it does generate an oak.²⁴

Anscombe is mostly interested in the idea of an action's bearing an 'intrinsic nature'; having attained the conception, she puts it to work in a classification of sexual acts. But I am interested in the matter of a 'wider context', a matter she promptly drops: When we call something an acorn, we look to a wider context than can be seen in the acorn itself.

"Acorn", I suppose, means "oak-corn" or "oak-seed", and this might seem to make the point about the look to a wider context pretty trivial. In thinking of something as an acorn, we tie it up specifically with oaks, none of which need be present here, and so of course we 'look beyond' the individual lump of stuff. But the remarks about eating and the eye show that the point is not trivial: the 'look to a wider context' occurs already in thinking of the acorn as seed.

But that materially different things can add up to the same — be it seed, or eating, or eye — is not enough to vindicate an 'anti-individualistic' account of the thing that is the same; thus, for example, copper and iron and silver are all equally metal. That the reverse is also true in our sort of case may however be seen if we expand on Anscombe's example of eating.

We can readily enough imagine the genesis of a novel kind of shark — one nourished, not by the flesh of smaller fish, but by plankton and the like. Certain elaborate structures have developed on their sides: these continuously filter the water and extract the nutritious elements. All the same, we may suppose, these newly developed sharks or quasi-sharks can sometimes be seen to chase after smaller fish and incorporate them. No part of this flesh ever enters the bloodstream, rather it makes a hideous brew and is spewn out occasionally to frighten predators. The operation looks very much like the hunting, munching and swallowing that actually existing sharks go in for, and no doubt some of the genetic basis of the latter will have carried over to the former. Someone might take the movement for the same sort of thing, and call it eating; but it is clear that it isn't eating. When we call something eating, then, we appeal to something more than is available in the mere spectacle of the thing here and now. 'Philosophers can arrange', as Professor Foot would say, that the spectacle should be there with or without the eating.

Another example may be constructed from the familiar text-book facts about 'mitosis' — the doubling, sorting out, and splitting up of chromosomal material. It may be happening here, under the microscope, in an amoeba; and there in a human being. In the first case, an event of this type will of course be a phase in a process of reproduction — one of the forms of generation available to that kind of thing. But in the case of the human it will rather be a part of growth or self-maintenance; reproduction is and has another matter among them. The distinction between the two cases of mitosis is not to be

²⁴ All of these quotations are from pp. 85-7 of "You Can have Sex without Children", Collected Philosophical Papers volume III.

discovered by a more careful scrutiny of the particular cells at issue — any more than, as Frege said, the closest chemical and microscopical investigation of certain ink-markings will teach us whether the arithmetical formulae they realize are true.

It is pointless to say that, after all, the DNA will have a different structure in the different cases — as pointless as it would be to say that the quasi-shark's quasi-eating will not really look like that of a proper shark, what with the repulsive apparatus the quasi-shark carries about with it. Philosophers can arrange that the apparatus should have fallen off moments before in a lover's quarrel. The 'look to a wider context', then, is not a look to the left and right.

This will perhaps be more obvious if we consider another sort of case involving DNA. Lab technicians keep lines of human cells of certain types multiplying in vats for ages; suppose then a lake in South America, one maintained by nature in such a character as the lab solution is by art, and shaken perhaps by frequent earthquakes; and now — it does not matter whether it be by a process of evolution from something else, or a quantum-mechanical accident, or an act of God — something as like as you like to a human cell of the appropriate type appears in that sinister fluid. At some point we will have a race of one-celled vegetative creatures, to be given a Latin binomial name and investigated like any other. This kind is evidently not human-kind, and its mode of reproduction is not the human sort. The division that takes place in the lake has a characteristic, reproduction of the species, not exhibited in the vat or flask. Moreover, in the one case we have a collection of individual substances and organisms, and in the other case nothing of the sort. Yet if we ladle up a bit of the lake and take it back to the lab in New York, no test, however subtle, will ever disclose the difference. The example is maybe a bit wild, but it shows, I think, that the same sort of DNA can 'control' the operations of merely vegetative and of rational life. It follows that a proposition running "This DNA contains in itself all the information ...", while perhaps sound enough in its place, cannot bear a metaphysical emphasis — and that the Human Genome Project will no more uncover the 'real essence' of the human than will a study of the anatomy of the hand.²⁵

3. The 'wider context' is the life form. If a thing is alive, if it is an organism, then some particular vital operations and processes must go on in it from time to time —

²⁵ A tamer example may be of some use in exposing 'the fetishism of DNA and the secret thereof'. Different individual plants falling under the same species and with the same parents will often present quite dissimilar appearances if grown in different soils and climates, especially if these are in either case intuitively deficient in some respect. Let us then suppose two species to have evolved independently, one in the Arctic and one in Brazil. One has red flowers and one has white; one is compact and creeping and one is tall and upright; one is pollinated by bees and one by a special sort of moth; etc. The various segments of genetic material will thus carry widely different bits of 'information' in either case. It is of course consistent with this, and with every physicalistic slogan, that the seeds they form, and thus their genetic material, should be alike in every physical detail. The 'phenotypical' differences would then arise solely from the differences in soil and climate. Though physically identical, the seeds and the genes will necessarily attract quite different descriptions.

eating, budding out, breathing, walking, growing, thinking, reproducing, photosynthesizing; and it must have certain particular organs or 'parts' — leaves, legs, cells, kidneys, a heart, a root, a spine. But we have suggested, following up Anscombe's clue, that if any of these things is there, or is happening, then this is not something fixed or determined by anything in the organism considered in its particularity or as occupying a certain region of space. That they are there or happening, and thus that we have an organism at all, presupposes the existence of a certain 'wider context'; it is this that stamps these several characters onto things.

This is a purely metaphysical formulation of the thought; let us move on to the matter of representation. It is obvious that a language cannot contain any representation of objects, in the thin Fregean sense, unless it also contains predicative expressions. And, perhaps more generally, an intellect cannot have a power of apprehending objects unless it has a power of thinking something of them — that is, if you like, of apprehending Fregean concepts.

We may also say that a language cannot contain any representation of things in the narrower but richer class of concrete particulars unless it also contains some of a narrower but richer class of predicates — for example, verbs expressing special causal concepts possibly applicable to such particulars. "A small selection: scrape, push, wet, carry, eat, burn, knock over, keep off, squash, make (e.g. noises, paper boats), hurt."²⁶ And, again, an intellect cannot receive a power to judge of concrete particulars, unless it also receives, inter alia, some such special causal concepts.

Perhaps this last will not be accepted, but it is in any case only a model for what I want to say, namely this: if a language contains any representation of members of the yet narrower class of organisms, it must also include a battery of what we may call "life-descriptions". Such would be, for example: representations of parts as organs or 'members'; representations of particular sorts of going-on as vital operation — a subclass of that of which we had a "small selection", just as organisms are a subclass of concrete particulars; and so forth. And, again, an intellectual capacity to think of individual organisms will have to involve possession of some of the corresponding concepts.

But, of course, what falls under such descriptions and such concepts will be different in different 'wider contexts'. And so, if there is to be thinking of organisms or a representation of life at all, then the thinking and speaking subject must have some means of apprehending the various sorts of 'wider context' — the various 'life-forms', as I will call them. Even the most pedestrian case of life-description, say, that the cat is drinking the milk, must make an implicit claim about the relevant 'form' or 'context' — that for it, or in it, the events before us add up to drinking; or that what the creature is doing is drinking, for such as it is.

But still, what is this supposed 'wider context', this 'life-form', as I am calling it? The doctrine into which these ciphers enter has a structure in common with other more familiar ones: it is to be compared, for example, with that expressed by Professor Rawls in the decisive passage of "Two Concepts of Rules" (which is itself, of course, intended as an application of certain thoughts of Wittgenstein's):

²⁶ Anscombe, "Causality and Determination", Collected Philosophical Papers, volume II, p. 137.

Many of the actions one performs in a game of baseball one can do by oneself or with others whether there is a game or not. For example, one can throw a ball, run, or swing a peculiarly shaped piece of wood. ... [But no] matter what a person did he could not be described as stealing a base or striking out or drawing a walk unless he could also be described as playing baseball, and for him to be doing this presupposes the rule-like practice which constitutes the game. The practice is prior to particular cases: unless there is the practice, the terms referring to actions specified by it lack sense.²⁷

Rawls claims that the sort of 'wider context' intended in the description of an individual action as one of stealing a base or striking out is a practice; and we may say that Anscombe, by contrast, in her remarks on "eating" and "eye", implicitly claims that the 'wider context' at stake in particular applications of those words is species.

This suggests, though, that we know what practices and species are before we come to advance such claims. Do we take the concepts over, maybe, from sociology in the one case, and biology in the other?²⁸ But we are practicing philosophy, or mean to be, and so if we accept the equation, the 'wider context' of vital description is the species, then we must, in Professor McDowell's phrase, 'enter on the left side'. Vital description of individual organisms is itself the primitive expression of a conception of things in terms of 'life-form' or 'species', and if we want to understand these categories in philosophy we must bring them back to that form of description.

If this is right, then, of course, we are wrong to think of the concepts of the various life-forms as reached through abstraction from features of their particular bearers. That notion takes for granted a picture of the terrestrial biosphere as offering us a magazine of living individuals, which we then carve up in accordance with certain principles. The error is not overcome, but only complicated, by the Realist notion that, after all, we 'carve at the joints'. What is wrongly called carving is already a part of thinking of things as alive, as organisms available for 'classification'.

This is not to say that the category we reach in the explanation of "species" or "life-form" as 'wider context of vital description' cannot be further specified or schematized with a view to empirical terrestrial employment. The thin category that is accessible to philosophy must for example leave many questions of sameness and difference of life-form unsettled, questions which might be decided by a 'definition' in terms of interbreeding

²⁷ "Two Concepts of Rules", reprinted in Philippa Foot, Theories of Ethics, p. 164.

²⁸ On practices see, for example, Max Weber's classification of 'empirical uniformities of action' in The Theory of Social and Economic Organization, Henderson and Parsons, trans. (New York: Free Press, 1964), pp. 120-3. On species, see Mayr, for example, op. cit., pp. 270-5.

It is remarkable that contemporary moralists, many of whom uncritically employ notions of 'practice', 'social practice', 'custom' and the like, yet view any notion of species or life-form with suspicion, as a sort of foreign scientific intruder. But each concept can seem to spring from empirical science; and where either emphatically does not, it can seem to involve a screwy metaphysics of 'innermisus' and so forth.

populations. It may be that the word "species" is best left to express this more determinate conception, but I will not so leave it. The resolution of these fine points of course presupposes an accretion of empirical content —so that, for example, the formula "It is a merely empirical fact that organisms fall into species" will come out true on the empirically schematized reading and false on our own. But even this, I think, does not entail that in the central range of cases a sentence containing a word associated with the definition in terms of interbreeding populations must express a thought different from one expressed with a term that has been given a sparer, philosophical exposition. (The thought that it must entail that is perhaps just a Fregean prejudice: "Different concepts touch here and coincide over a stretch. But you need not think all lines are circles."²⁹) I think, then, that Anscombe was not wrong to import the word "species" into this context, but at most a bit uncritical.

A species or life-form of course determines a class of individuals, its bearers. But if the only possible account of the concept of a species or life-form were in terms of ensembles of individuals bound together by certain relations, then our remarks about the 'wider context', read accordingly, would be completely absurd. We may see this if we consider a more radical illustration of those remarks.

What should we say about a creature who comes to be from sand or swamp-muck by the agency of lightning or by quantum-mechanical accident —a creature part for part the same as I am, standing nearby, and just considered physically? One wonders whether the limits of philosophical imagination have not been transgressed in such a fable, but let us waive the suspicion. Philosophers have doubted whether such a thing could have thoughts, or whether its thoughts would have content.³⁰ If you shout the name "Thompson!", each will turn his head, it is supposed, but while I am wondering "What's N.N. doing here?", the new-comer will not be.

We must accept this skepticism and carry it further: the thing has no ears to hear with and no head to turn; it has no brain-states, no brain to bear them, and no skull to close them in; prick it, and it does not bleed; tickle it, and it does not laugh; and so forth. It is a mere congeries of physical particles and not so much as alive.

In the other cases we considered, physically or phenomenally similar events took place in different 'wider contexts'. The opposing life-forms put divergent interpretations on these events, or sent them in different directions; and so different vital descriptions applied. Here we have no determinate form at all, and so the ground of all vital description

²⁹ Ludwig Wittgenstein, Philosophical Investigations, third edition (New York: Macmillan, 1963), II, x, p. 192. So also, if Wittgenstein is right, and I understand him, his favorite signs, "non" and "ne" (where "non non p = p" and "ne ne p = ne p"), may each express the category of negation involved in, say, philosophical difficulties about not-being; here, and in the central cases of affirmation and denial, the thoughts expressed in either vocabulary will be the same, though of course the thoughts expressed by the doubling of the signs will differ. (See Investigations, 547-57 and Remarks on the Foundations of Mathematics 2nd ed., (Cambridge: MIT, 1978), pp. 102-10.)

³⁰ Donald Davidson, "Knowing One's Own Mind", Proceedings and Addresses of the American Philosophical Association 1987, pp. 441-58.

is removed. We can say, in the light of my form, that these are arms — a bit weak maybe, but fairly together. Are those, which 'he' 'has', maybe legs, after all — only horribly deformed and not much good for crawling with? Or are they mutilated wings? Is his tail missing? It may be thought that these matters are settled by a look to 'his genes'. But suppose he has genes: are they defective? Or, again, suppose we are each now turned to jelly by a land-mine left from the last war: those micro-events, happening just before the blast, were the opening stages of (say) glycolysis in me — a process unfortunately left hanging, glucose unsplit. But in him? That the conditions were there for 'the next stage', considered chemically, is by hypothesis accident, in every sense, just as 'his' origination was; they have no more bearing on the description of what has happened than the bomb itself does.³¹

What is missing, the 'wider context' that would bring these things into focus, I have called a life-form. I have also called it a species, with some reservations, and would be happy to call it soul.³² But each of these latter expressions carries a baggage of associated imagery — a picture to hold us captive, if you like. I mean: what do I have that 'he' lacks, and by which I am alive? Friends and countrymen? Or a ghost? — Or perhaps, if we stress the "form" in our preferred "life-form", the will even be sought in a platonic heaven, or in the mind of God. I think our question should not be: What is a life-form, a species, a psuche?, but: How is such a thing described?

³¹ Compare Wittgenstein, Remarks on the Foundations of Mathematics, p. 336. Wittgenstein is, alas, merely ambivalent about the description of denizens of his two-minute model of a part of England as, say, adding or subtracting. But it is important that he imagines a God in this connection, so that the case is like that of Adam in the Garden, and not sheer accident. Where the act of addition presupposes a practice — and it is hard to see how such a category can gain a foothold in two minutes — breathing and glycolysis presuppose a life-form (as of course any so-called practice does). Reflection on some of our earlier examples, especially the poly-metamorphic form of butterfly, will I think show that two or even twenty years will fail to hook my Doppelgänger up with any determinate form.

³² Aristotle, De Anima, Bk. 2, ch. 1.

Part 4
The Representation of the Life-form Itself

1. Natural historical judgment. Everyone is familiar with the characteristic mood of what was formerly called 'natural history' — the supposed content of Aristotle's Historia animalium, for example, and of dusty books bearing such titles as Conifers of the Central Rockies or Winged Creatures of Western Pennsylvania. The voice-overs on public television nature programs are characterized by propositions in the sort of 'mood' I am intending. — We will see film footage depicting some particular bobcats, taken perhaps in the spring of 1977; the voice-over will include verbs and other predicates which were verified, as the film shows, in the activities, parts, and environment of the featured, or starring, individual bobcats. But the verbs and predicates we hear will not generally be combined with proper names or demonstrative expressions — words that, as we say, 'make singular reference'. It sounds like this: "When springtime comes, and the snow begins to melt, the female bobcat gives birth to two to four cubs. The mother nurses them for several weeks." (Here perhaps we see and hear violent mountain streams, rioting birds, blossoming alpine flora, and, say, three predictably adorable cubs piled up against a perplexed but stoical mother — not just 'two to four' of them, but exactly three.) "...As the heat of summer approaches, the cubs will learn to hunt." (And here the viewer might witness a thankfully inept attempt on a half-fledged California condor.) The filmed individuals themselves are rarely mentioned. Or if they are, it will be for example to give a sort of personal touch to the broadcast: "Ah, this little one seems to have awakened the neighborhood rattlesnake..." — that sort of thing.

It is evidently irrelevant to the ends of this sort of employment of film, that it might sometimes be a different bobcat family that is filmed later on in the summer. Why should the film-maker wait until next year if the original crop of cubs falls to distemper? There would be no dishonesty in the substitution, given what is going on, and even though what is going on is documentary-production. It would be quite different, though, if she were attempting to film a biography — a sort of bobcat version of 28 Up; and someone might mistake the nature program for such a thing. The sameness presupposed is not that given

by the words "same individual animal". Someone who does not grasp the other sort of sameness of animal will of course not understand the broadcast.

The peculiarity of this sort of employment of verbs and predicates comes out even better in the telegraphic style of a certain sort of field guide. Here we find a Latin binomial name, a common noun, and then some such text as "Four legs. Black fur. Nocturnal. Lives among rocks near rivers and streams. Eats worms and fish. See plate 162." It is important to see that these very predicates can as easily be attached to designations of individuals and to individual variables. Again, someone might mistake the grammar of our field guide for such predication, viewing it as something on the order of the FBI's Most Wanted List: "Blond hair. Six feet tall. Lives in cheap hotels. Partial to Italian cuisine. Armed and dangerous. See photo opposite."⁶³

Let us call the thoughts expressed in the field guide and in the nature documentary natural historical judgments. We may take as their canonical expression sentences of the form "The S is (or has, or does) F" — "The domestic cat has four legs, two eyes, two ears, and guts in its belly", "The Texas blue-bonnet harbors nitrogen-fixing microbes in certain nodes on its roots", "The yellow finch breeds in spring, attracting its mate with such and such song", whatever. Such sentences I will call "aristotelian categoricals". But our language of course permits the same judgments to be expressed in a number of other ways, for example, by "S's are/have/do F", or "It belongs to an S to be/have/do F", or "S's characteristically (or typically) are/have/do F", and a hundred others. The mere form of words, however, is in no case enough to show that the thought expressed is of our type. It is necessary that a common noun ("S") and some other predicative expression ("F") be present or in the offing; the other linking expressions — the definite article, the unquantified plural — are part of the context which may or may not show the nexus of signs to be of the sort that interests us. That I am making voice-overs for a nature documentary is just another part of the context, tending to force our sort of construction onto my remarks. But background knowledge, my alarmed tone of voice, and the predicate I use in saying "The domestic cat has three legs" will show that here I am not making an attempt at natural history, that it is poor Tibbles that I am talking about, and that my statement has the 'logical form' of "The cat is on the mat".

Natural historical judgments tend to be formulated in some type of present tense. If temporal designations enter into their expression, it is typically a matter of before and after — "in the spring", "in the fall", "in infancy", "in adolescence" — and not of now and then and next spring and when I was young and so forth. The temporal indicators thus express a B series, in McTaggart's sense, and not an A series.³⁴ It is of Elsa, hic et nunc, that we say: she bore three cubs last spring. Of her kind we say: the mature female bears

³³ The field guide and the FBI list of course aim at supplying materials for identification. But the proposition employed in the FBI list records plain facts about the suspect persons; the further purpose they are meant to serve does not affect the kind of predication involved. Similarly we should not suppose that the type of predication we find in the field guide or nature documentary must limit itself to the attribution of differentiae or 'species-specific' traits.

³⁴ McTaggart, The Nature of Existence, (Cambridge: Cambridge, 19XX).

two to four cubs in the spring — employing a form of present tense even if we pass the information on in winter.

Of course, we ourselves do have means of throwing these propositions into an intelligible past tense, as when we describe life-forms now extinct — and so we are also able to describe changes in the characteristics natural-historically attributable to particular kinds of living thing. But it is clearly possible to enjoy a capacity for this type of sentence formation, and yet lack any past- or future-tense employment of the propositions so formed. By contrast, I think, we could not suppose a language to contain any description of concrete particulars if it did not contain a past and perhaps a future tense employment of them, in addition to the present. I mean: to know what it is for a person to walk or a raindrop to fall, one must know what it is for the walking or falling to be over; but to know what it is for a form, kind or 'species' of bird to be crested one need not attach any significance to a notion of its ceasing to be crested.³⁵

It may seem a bit absurd that a form of predication suggestive of field guides, dusty compendia, and nature shows should be supposed to be the ticket for a philosophy of organism. But I think we can see that many of the specifically 'biological' propositions falling under such headings as anatomy, physiology, ethology, bio-chemistry and so forth are themselves such statements or else, and more commonly generalizations on the common-noun position in such statements. That is, in a properly begriffsschriftliche formulation of these more abstract propositions of terrestrial biology, the verbs and other predicates would be attached to a variable; substitution instances of the corresponding open sentences would be simple aristotelian categoricals. — When Aristotle says that some animals are viviparous, he does not give Helen and Penelope as examples, his examples are: man, the horse, the camel.³⁶ His thought may thus be canonically expressed as "For some terrestrial life forms S, the S is viviparous". And when he says that some animals shed their front teeth, but there is no instance of an animal that loses its molars,³⁷ he will not give up the sentence when faced with a denture wearer; denture wearers aren't the 'animals' he was talking about. Similarly — I want to say — when an introductory botany book says that photosynthesis, a process it will spend many pages of chemical formulae describing, is characteristic of flowering plants, among others, the exceptions it mentions will be, e.g., field dodder and Indian pipe, and not this pitiful albino marigold seedling. Our mode of sentence-formation must thus, I think, lurk at the bottom of even these abstract pages.

It might be suggested that a natural historical judgment should be able to take some higher genus as its immediate subject — a judgment to be canonically formulated as, say, "The flowering plant is F", or "Flowering plants are F", rather than as, say, "For every

³⁵ Thus I think problems about the re-identification of species across geological expanses of time and through more or less massive alterations in aristotelianly-attributable traits — problems about 'cladism' and so forth — must fall outside our subject, as attaching to an empirically warranted specification of the concept of a life-form and of the form of judgment in which we represent it.

³⁶ Historia animalium, 489b1.

³⁷ Historia animalium, 501b1.

terrestrial life form S, if S is a form of flowering plant, then the S is F" (as I would write it). It is a possible theory. My purposes do not I think require that I refute it. But we should remember that it is a merely empirical truth, an artifact of their evolution from earlier forms, that terrestrial life-forms admit of any interesting classification into higher genera. But if the thoughts advanced in 11 are true, then it is not a merely empirical fact, given that there are any organisms, that they fall under the particular items we were calling 'life-forms'. The received taxonomical hierarchy is a record either of history or of the similarities that this history explains; but the simple 'classification' of individual organisms in terms of life-form precedes any possible judgment of similarity or of shared historical genesis. The real subject of a natural historical judgment and of an aristotelian categorical is I think inevitably a representation of the thing that must be there— that is, of what was formerly called an infima species. But even this description is impure and not properly philosophical: it retains the suggestion of higher 'species', and thus of collateral infimae species, which, as I have said, need not be there.

2. The irreducibility of this form of thought. We have to do with a special nexus of concepts in a judgment, or of general terms in a proposition, however it may be formulated — "The S does F", "S's do F", "This is how things go with an S: it does F". One's first inclination, though, is to attempt to reduce the connection to something more familiar.

So, for example, we might attempt to assimilate "Man sheds his teeth" to "Each man sheds his teeth", or, equivalently, to "For every man x, x sheds his teeth." On such an account the predicate "sheds his teeth" is caught up in the same sort of combination (but with an individual variable) as it is in, say, "When little Arthur sheds his teeth,...." The account is of course worthless: 'man' sheds all of 'his' deciduous teeth, but some of us keep a few, and in any case it isn't shedding if they are kicked out in a street-fight.

Does the sentence then rather amount to something on the order of "Most men shed their teeth"? At first sight even Aristotle appears to have made the identification. Something akin to our mode of combination of terms is explicitly mentioned in his account of accident, for example. He characterizes the propositions so formed as holding hos epi to polu, a phrase typically rendered "for the most part".³⁸ But, again obviously, although 'the mayfly' breeds shortly before dying, most mayflies die long before breeding. And if the description of the 'life-cycle' of the monarch butterfly told us 'what mostly happens', then it would soon be unnecessary to visit that strange Mexican valley in order to wade knee-deep among them. A natural historical judgment may be true though individuals falling under both the subject- and predicate-concepts are as rare as one likes, statistically speaking.³⁹

Perhaps then our sort of proposition should be brought under the linguists' rubric: generic sentence, and we should follow them in their attempt to supply a 'semantic'

³⁸ Physics, book II, chapter 5, 196b10ff; see also Posterior Analytics, book A, chapter 30, 87b20.

³⁹ See the remarks on the number of teeth 'man' has, in Elizabeth Anscombe, "Modern Moral Philosophy", Collected Philosophical Papers volume III, p. 38.

analysis.⁴⁰ Here, though, we meet with a different sort of problem. It is not that the suggestion is simply false. If the class of generic sentences is marked off by possession of some such outward form as the unquantified 'bare plural "S's are F"', then there is no question that a natural historical judgment can be expressed in a 'generic' sentence. But is there any reason to think that the class of generic sentences, so understood, is not a rag-bag covering many forms of conjunction of subject and predicate—our own type just one among them? We have already seen that a similarly identified class of 'statements with a definite description as subject' would have to constitute a merely surface-grammatical category: it is clear that the words "The domestic cat has four legs" contain a syntactical ambiguity, and that the natural reading is not the one Russell attempted to explain.

It is implicit in Aristotle's remarks that inferences involving judgments hos epi to polu should mirror those involving universal judgments.⁴¹ And it does seem true that, just as "All A's are F" and "All A's are G" together entail "All A's are both F and G", so also "The S is F" (or "S's are F") and "The S is G" (or "S's are G") together entail "The S is both F and G" (or "S's are both F and G")—if it is our sort of combination that is expressed. The inference would obviously be invalid for any sort of statistical generalization. And it would be too bold to claim that it holds for generic statements or bare plurals generally, if only because the bare plural can presumably express a form of statistical generalization. The validity of such inferences is I think one of the reasons why we incline to express natural historical judgments by means of a definite article—after all, inferences involving proper names and definite descriptions mirror those involving universal generalizations in a number of ways, as was traditionally noticed. A typical page of biochemical exposition exhibits none of the inferential anxiety that would be called for if the propositions it contains expressed mere statistical generalizations or if they were to admit only the inferences holding generally among so-called generic propositions.

A similar recommendation would be that our propositions be taken as Fregean universal propositions after all, but qualified by something one calls ceteris paribus clause. "The bobcat breeds in spring" will thus I suppose amount to something of the form, "For all x, if x is a bobcat, and spring is approaching, and ...x..., then x will soon be breeding". How one completes the ellipsis will depend on one's understanding of these ceteris paribus clauses. The added condition will either be 'normative' or not; if it is, I will come to it later; if it is not, then the suggestion will be either that conditions are normal or standard or ordinary in some (non-'normative') sense, or else that nothing intervenes that might prevent the breeding.

Let us consider the case of intervention first. I object: the question what counts as that is surely to be answered, in any given case, by appeal to the system of natural historical judgments with the relevant kind as subject. And so we cannot simply take such a category for granted and then employ it in an account of our form of thinking.—If the mother bobcat leaves her young alone, then they will wither and rot; if she nurses them they will develop thus and so. In which case, though, do we find 'intervention', and in

⁴⁰ A standard treatment is Gregory N. Carlson, Reference to Kinds in English, (New York: Garland, 1980).

⁴¹ Posterior Analytics, 87b23.

which rather 'what happens, ceteris paribus'? No one will insist that the mother's nursing be viewed as the intervention of something alien, from without, into an otherwise inviolate cub-system set to evolve in its own direction. But to deny it is just a more stilted way of expressing the thought that bobcats are not to be compared with caterpillars — they do not strike out alone and set themselves straightaway to munching. No, 'the mother nurses them for several weeks'; I heard about it on a nature documentary.

The same sort of objection may of course be raised against any appeal to 'normal', 'ordinary' or 'standard' conditions. Let us take the simplest sort of judgment to which such an account might reasonably be applied. If I say "Water is a liquid" or "Oxygen is a gas" — and who will not? — I do seem to presuppose what are sensibly called 'normal conditions'. And so, "In normal conditions, water is a liquid" is a more precise and strict formulation of my thought. If, now, I go on to spell these conditions out, I will mention, e.g., room temperature. What is 'normal' or 'standard' is here evidently judged by reference to myself. The 'normal conditions' presupposed in such a statement as "Water is a liquid" are not normal conditions for water — continuous bits of it will indifferently occupy any of the three states of matter — and to articulate them is not to articulate any truth about water.

Now suppose I say, "Bobcats breed in spring": it is again obvious that this isn't going to happen in any particular case unless certain conditions are satisfied. Perhaps a special hormone must be released in late winter. And perhaps the hormone will not be released if the bobcat is too close to sea-level, or if it fails to pass through the shade of a certain sort of tall pine. But, now, to articulate these conditions is to advance one's teaching about bobcats. It is not a reflection on the limited significance of one's teaching. The thought that certain hormones are released or that they live at such and such altitudes and amid such and such vegetation, is a thought of the same kind as the thought that they breed in spring. The field guide and the nature documentary assign an external environment to the intended life-form, after all, and in the same 'voice' they elsewhere employ in describing its bearers' inner structure and operations. These conditions are thus 'presupposed' by the life-form itself, and not by the poor observing subject with his low-resolution lens. If Q is simply true, then "P on condition that Q" does not supply a more 'precise' or 'strict' formulation of anything that P might 'loosely' formulate — though it may of course be an interesting truth in its own right. All of this must, I think, distinguish our natural historical judgments from the so-called hedged generalities or ceteris paribus laws said to be employed in certain of the 'special sciences'⁴²

It is worth noticing that by repeated application of our apparently unexciting rule of inference — "S's are F", "S's are G", ergo "S's are both F and G" — we will presumably always be able to produce a true statement of our form involving a complex conjunctive

⁴² See, for example, the exchange between Stephen Schiffer and Jerry Fodor in Mind, volume 100, 1991, pp. 1 - 34. This particular dispute is in any case over judgments linking event-types with event-types, and not judgments like our own, which link individual-substance-types with all manner of things. It is clear, by the way, that on Fodor's account of his super-abstract category, ceteris paribus statements, the things will not support the Aristotelian form of inference I mentioned — see especially the diagram on p. 139 of his "Special Sciences", reprinted in Representations (Cambridge: MIT, 1981).

predicate that is not true of any member of the kind denoted by its subject, living or dead. I mean: nobody's perfect. (Will anyone say, by the way, that anything is, ceteris paribus, what it never is?)

This may seem to cut our propositions entirely free of 'the facts'. But consider the ensemble of true natural historical judgments with a given kind, S, as subject; call it the natural history of S's. I do not doubt that many of the features attributed to S itself in this imagined 'history' will also have to be attributable to many of the individual S's (attributable, that is, in the more familiar "When little Arthur sheds his teeth..." sort of way). To deny it would in any case make for a bold expression of Platonism. But the affirmation alone tells us nothing about the relation that any particular judgment in the 'history' must have to the class of individual S's and the facts about them.

The unity of subject and predicate realized in an aristotelian categorical, "The S is F", and the act of mind expressed in it, are thus not to be compared with those realized and expressed in the English forms "Some S is F", "All S's are F" and "Most S's are F". The latter, we may say, relate directly to features of the class of individuals covered by the subject term. The former rather express one's interpretation or understanding of the life-form shared by the members of that class. This understanding may of course be shallow or deep, extensive or narrow, mostly true or largely mistaken. It is itself the 'look to a wider context' which we said governs the description of the individual organism hic et nunc: what is implicit in the tensed description of an individual organism is explicit in an aristotelian categorical. But in truth the lyrical opposition, 'an understanding of the life-form' versus 'a mere survey of the class', is itself just a more abstract re-write of the concrete opposition of natural historical judgment and, say, statistical or Fregeanly-universal thinking.

3. Is natural-historical judgment 'normative' judgment? But perhaps I have overlooked a possibility of reduction. Frege himself, in his dispute with Kerry, considers the sentence "The horse is a four-legged animal", clearly intending it to be taken in our sense. He says that it "is probably best regarded as expressing a universal judgement, say 'all horses are four-legged animals' or 'all properly constituted horses are four-legged animals'...."⁴³ The first alternative is obviously wrong; the second raises the possibility of what we may call a normative analysis.

I should say that I do believe that our natural historical judgments are closely related to a range of judgments that one would want to call 'normative'. I will object rather to the idea that we can give anything to be called an analysis or elucidation in terms of them; the reverse is closer to the truth. As for sentences of the form "A properly constituted S is F", my own view is that, in them, the words "properly constituted" do not restrict the common noun, S. Rather, the words "A properly constituted ___ is ___" move together and are just another sign that the judgment expressed is a natural historical judgment.

But Frege wants to construe the original sentence as expressing a 'universal judgment' in his sense. This presupposes that in his substitute sentence the words "properly constituted horse" act as a unit, and designate or express the concept properly constituted

⁴³ "On Concept and Object", p. 185.

horse. How is this concept supposed to be explained? If it is a veterinarian's or horse-breeder's notion, so to speak, then presumably a horse will fall under it if it meets a certain limited range of conditions. But many of the features we would want to attribute to 'horses' or 'the horse' in a natural historical judgment will have to fall outside this range; there is no reason to think that all 'properly constituted horses' have them.

We might instead try to explain the concept in something like the following terms: a properly constituted horse is a horse that is as a horse should be (or 'ought to be', or 'is supposed to be') in every respect. Here, though, we should notice, first, that there is every reason to think that we now have an empty concept, and thus that our proposition would come out true whatever we put in the predicate place. Moreover, such an analysis forces us to believe that the quotidian sentences printed in the field guide and voiced over the nature-documentary involve an implicit second order quantification over 'respects', which is absurd.

But the best objection to this last account is that it ends up attaching the 'normative' expression to the predicate, or rather to a variable for which predicates are to be substituted. Why not try that with the original? Let "The horse is a four-legged animal" amount to: "It holds good of every horse that it ought to have four legs". But, now, what are we to make of the sub-sentence "it ought to have four legs"? Here the norm-word falls between a predicative expression and a variable ranging over individuals, which is what Frege really wants. But this norm-word is so far left too abstract to supply us with a complete account of the original proposition. There is, after all, a way of hearing the word "ought" which might have us assent, in certain moods, to something like "It holds good of every cockroach that it ought to be killed." This "ought" evidently pertains to 'human ends and projects' and is thus out of the question. What we want is a so-to-speak intrinsic, or non-relative, oughtness — we want, e.g., "It ought, as far as its merely being a horse goes to be four-legged", or "It is supposed, by its mere horse-nature, to be four-legged," or "It ought, considering just what it is, to be four-legged". There are no doubt other ways of bringing off this specification of the "ought". Some may be more elegant, but each must bring the common noun back into the expression for the relation between the individual and the property. Or, if it does not re-introduce the common noun directly, then, as in the lattermost case, it must inevitably employ a pronominal expression — in this case "what it is". But this pronoun is one for which the common noun can be substituted; it is as it were a pro-common-noun.

In order to control the shapeless "ought", then, we are forced to join the predicate and the common noun (or its pronominal representative) together immediately — though in the presence of a 'normative' expression and an individual variable. But what a given horse is 'supposed by its mere horse-nature to be' must presumably be the same for every horse. The individual variable, and the quantifier that binds it, are thus wheels turning idly in such a formula as "For every x, if x is a horse, then x is supposed by its mere horse-nature to be four-legged". (It is as if one were to replace the proposition "Two and two make four" with "For all times t, two and two make four at t" with a view to rendering the philosophical problems about the former more tractable.) What we are really saying, then, is "Horses are supposed to be four-legged". All we are really working with is a common noun, a predicate, and 'something normative'. We are thus no further on than we were with

"A properly constituted horse is four-legged".

But, finally, it was only a hope of reducing our kind of generality to a Fregeanly respectable sort that had us reaching for anything 'normative' in the first place. On reflection, the move was a desperate one, and did violence to the transparently 'factual' or 'positive' character of the teaching of the field guide, the nature documentary and the biochemical treatise. In the end, I think, all we are really working with is a predicate and certain sort of common noun; the appearances are bene fundata.

4. Conclusion: Goodness and life In natural-historical description, we meet, I think, with a logically special form of appearance of predicative expressions, one to be distinguished from the essentially tensed connection they may have with representations of individuals, including individual variables. We may say that a common noun has the 'grammar' of a life-form-word if it is suited to be the subject of such predication — that is, if this is among the powers of combination with other words that go to fix its sense. Or, equivalently, a word is a life-form-word if the capacity to express natural historical judgments in terms of it is a part of the mastery of its employment. It is here, I think, as it was with Frege's 'concept-words', which may be said to supply the apt predicates for the more familiar form of predication. An expression, "F", or "is F", has the 'grammar' of a concept-word if it can enter into the combinations "a is F" and "a is not F" with some singular term; the capacity to form such combinations is evidently a part of the mastery of its employment. This last is not I think something we could say of a statistical quantifier, for example. "99% of ___ are ___" is something we can add to a language with the apparatus of common nouns and other predicative expressions; it does not enter into the constitution of this apparatus, though it may help to define some of its more particular terms. The terms united are themselves indifferent to this form of combination. To affirm that the situation is the same with our form of combination is I think to deny that 'when we call something an acorn we look to a wider context than can be seen in the acorn itself.'

We may say that a concept is a species-concept if it is a possible subject of the corresponding form of judgment. A life-form or 'species' (in the broad sense) is anything that is, or could be, immediately designated by a species-concept or a life-form-word. To this sort of 'genus', then, there corresponds that sort of generality. An organism or individual living thing, finally, is whatever falls under a species or 'has' a life-form. It is whatever might justly be designated by a phrase of the form "this S" for some reading of the common noun S as a life-form word. Or, equivalently, an organism is the object of any possible judgment, this S is F, to which some natural-historical judgments, the S is G, might correspond. If an intellect loses the capacity for the latter sort of 'synthesis' it must also lose the former, and with it, I think, the capacity to experience things as alive. It can no longer 'look to a wider context'.

In saying all of this I of course presuppose that enough has been said to isolate this alleged form of judgment and its expression in speech. Perhaps there are other types of generality which satisfy the various features registered so far. Perhaps my occasional appeal to the notion of a life-form in attempting to impart the idea of such a form of judgment has begged some question and left the essay to fall short of the standard raised by Anscombe's Intention. But the answer to the question, when we can say "Enough said",

will of course depend on who we are saying it to, and what else there is in our language and thought with which the intended form may be confused. For someone, I suppose, it might be 'enough' to point out a few peculiarities of the nature documentary.

Let it be thought, though, that we have at best isolated some class of what we may call 'non-Fregean generalities'. The dispiriting suggestion will be that the intended natural-historical judgments form a subclass marked off from the others by content and not by form. It may be helpful then to notice, briefly, that our enterprise can be carried further. For example, we might go on to remark that natural historical judgments themselves possess certain further possibilities of combination — in particular, of 'teleological' combination with others of their same form. Their linguistic expressions, that is, are fit to enter into certain sorts of 'final clause'. "They have blossoms of such and such type in order that such and such insects should be attracted and spread their pollen about". Here the propositions joined — "They have blossoms of such and such form" and "They attract certain insects which spread their pollen about" — are of the intended type. Now, any attempt to employ this fact as an instrument of 'grammatical' isolation may of course be thought to raise new difficulties: perhaps the whole idea is just a theological survival. But the insistence on an independent, 'conscious' subject who sets up the things thus teleologically expressed presupposes that the relevant 'sense of the question "Why?"' is the one about which Anscombe and Davidson disputed. It presupposes, that is, that the intended order is the order of intention.

But, of course, it is among the marks of that sense of the question "Why?" that it attaches to datable descriptions of goings-on, — of 'events in a man's history', as Anscombe says.⁴⁴ If someone moves behind a pillar and I ask, "What's going on? What's the point? Why?", and am satisfied with the response, "He's trying to avoid the Griffin Professor; he owes her a paper", then it is the movements hic et nunc and not elsewhere that form the object of my query. But suppose we are dissecting a living frog and — scalpel aimed at the repulsive contractions of the heart — I ask, "What's going on? What's the point? Why?" If I am satisfied with the response, "It's the heart, of course, and by so beating it circulates the blood", then, after all, I think, it was not the individual movements that interested me. I was not so much pointing into the individual, as pointing into its form. I do not anticipate a different reply at a different lab-bench, as I would at a different pillar. The alarming truth I apprehend and query, the 'that' for which I seek the 'because', is to be formulated in a natural historical judgment.

We are thus, I think, very far from the category of intention or psychical teleology — a fact which is also shown in this, that if the complex thought about, e.g., the blossoms is true, then the judgments joined in it are also true. Here, that is, "P in order that Q" entails both P and Q. In making out this sort of connection one links a fact, not with a possibly unrealized end, but with another fact. Natural teleological judgments may thus be said to organize the elements of a natural history; they articulate the relations of dependence among the various elements and aspects and phases of a given kind of life.

And so, I think, even if the Divine Mind were to bring a certain life-form into being 'with a view to' securing an abundance of pink fur along the shores of the Monongahela, this would have no effect on the natural teleological description of that form

⁴⁴ Intention, p. 24.

of life. The description of this sort of order has nothing to do with natural selection either; these propositions are in no sense hypotheses about the past. The elements registered in natural historical judgments and the interconnections registered in the natural teleological judgments all alike belong to that peculiar 'present' which we saw contains both 'spring' and 'fall' in winter, and 'the seventh year of the cicada's life-cycle' even during the second.

This can of worms having briefly been opened, perhaps new doubts will be raised. One may wonder whether even the monstrous phrase "teleologically-articulable non-Fregean generality" can isolate our sort of judgment. Don't certain sorts of general proposition enter into a final-causal nexus in the description, for example, of techniques, technical processes, technai — and also into the description of the artifacts and bits of technology that are among their means and ends? "The point of the lye-bath is to harden the leather." "The point of the carburetor is to mix the air and fuel." It would be wrong to insist that the relevant teleology is the one Anscombe and Davidson discussed.⁴⁵ For here too we will find, I think, that "P in order that Q" entails both P and Q.

But the distinction can be marked in other ways. For example, a kind of 'partial idealism', in Professor Anscombe's sense, seems to hold in the technical sort of case.⁴⁶ The truth of a proposition of the form "First one does this, then one does this", where it belongs to the general description of a particular technique of, say, bread-baking or aspirin-synthesis, presupposes that someone makes or has made the corresponding judgment, or at least some others belonging to the same system of judgments — though of course it presupposes more than this. An unrecognized technique is after all a merely possible one. Nothing of the sort would hold of a natural historical judgment expressed in the form, "First this happens, then that happens" — which might expound the phases of the embryological development of cranes, or of the synthesis of glucose in redwoods. Natural historical judgments are in no sense presupposed by what they are about, and unrecognized life-forms are common.

I will end with a few unguarded remarks on concepts of good. I have rejected any account of natural historical judgment in normative terms, suggesting that the order of explanation must run the other way. If, though, we want to apply 'normative' categories to sub-rational nature, and apart from any relation to 'our interests', then the question inevitably arises, and not so unreasonably: Where does the standard come from? What supplies the measure? The system of natural historical propositions with a given kind as subject supplies such a standard for members of that kind. We may implicitly define a certain very abstract category of 'natural defect' with the following simple-minded principle of inference: From: "The S is F", and: "This S is not F", to infer: "This S is defective in that it is not F". It is in this sense that natural historical judgments are 'normative', and not by each proposition's bearing some sort of normative infrastructure. The first application of concepts of good, bad, defect and pathology is to the individual, and it consists in a certain sort of reference of the thing to its form or kind. Once formed,

⁴⁵ See Sarah Waterlow Broadie, "Nature, Craft and Phronesis in Aristotle", (Philosophical Topics, vol. 15, no. 2, 1987, pp. 35-50), and Andrew Hsu, "Artifacts" (unpublished manuscript).

⁴⁶ "The Question of Linguistic Idealism", reprinted in Collected Philosophical Papers, volume 1.

though, these concepts may of course be employed in general thoughts of various types.

It is true that the judgment of natural defect, so explained, must in a sense reach beyond the 'facts' about an individual. It reaches beyond them, though, to what appear equally to be 'facts' — namely, facts about its kind or species or life-form. What merely 'ought to be' in the individual we may say really 'is' its form. In another sense, though, the picture of a 'reach beyond' is absurd: when we call something an acorn we look to a wider context than can be seen in the acorn itself. A reference to the life-form is already contained in the thought of the individual and its vicissitudes. We go no farther for critique than we went for interpretation. — Consider that we might attempt to explain a conception of, say, oddness, with some such rule as follows: From: "Most A's are F", and: "This A is not F", to infer: "This A is odd in that it is not F". If someone then asks, "But what does 'what most of them do' have to do with what it does?", the answer will have to be, "Not much, really." But if, in the other case, someone asks, "What bearing does 'what they do' have on what it does?", the answer will have to be, "Everything." A true judgment of natural defect supplies an 'immanent critique' of its subject.

But in truth the abstract category of natural defect is an artificial one. One tends to employ more concrete concepts: sickness, need, lack, deformity — or, still more concretely: lameness, blindness, color-blindness, etiolation, and so forth. Such concepts may be said to express forms of natural defect. Whether and when any of them is applicable to a given individual organism will of course depend on the character of its life-form, on the particular content of its form's 'natural history'. They are all, as we might say, 'species-relative.'

In Philippa Foot's Natural Goodness we have a striking exposition of the content and the advantages of the ancient notion that, as we may now put it, irrationality and vice are forms of natural defect. The sort of life in which such concepts gain a foothold is a life caught up in categories of thought and action and passion, of custom and 'culture', and of much else besides. All of these matters raise philosophical problems of their own. It is clear that the relation between the stupidity of an individual human action, say, and the character of its agent's life-form is something far more complex and mediated than is the relation, for example, of the etiolation of a given geranium to the character of its form. The real problem is to grasp this complexity and the distinctions that are introduced with the categories of intellect and will. But no special difficulty arises from a moralist's appeal to the life-form, named "human", that all of us share: we make such appeal already in everything we think of ourselves and one another.

Appendix:
Three Degrees of Natural Goodness

Philippa Foot's Natural Goodness is the most beautiful and moving work of moral philosophy yet produced in the analytic tradition. It is so much an integral whole that it will seem barbaric to do as I propose briefly to do, and put it to the scalpel. But Natural Goodness propounds a complex theory with many levels or strata, some of which even the author fails completely to distinguish. I will distinguish three strata, each depending logically on the one that comes before. I will call them respectively logical Footianism, local Footianism and substantive Footianism. My purpose in making these distinctions is simply to advance discussion: I believe that objections to Natural Goodness generally confuse these different dimensions of the doctrine, and that the author to some extent aids this confusion.

Logical Footianism

The most abstract and fundamental stratum of the theory, logical Footianism, as I am calling it, itself has a number of components.

Foot's theory presupposes, in the first instance a certain conception of life and of the grammar of the representation of life⁴⁷. The representation of an individual living organism as living is everywhere mediated by an implicit representation of the species or life form under which the individual is thought to fall. Consider a concrete case in which you would say or think of an

⁴⁷ Foot's account of these matters is in some respects derived from my paper "The Representation of Life" in Reasons and Virtues, ed. Hursthouse, Quinn and Lawrence, (Oxford: Oxford University Press, 1995).

individual living being that it is flying, or that it has leaves, or that it has eyes, or that it is blossoming, or that it is reproducing. It is clear that the same phenomenon, eye or leaf or flight, might be constituted very differently in a form of life very different from the one you have imagined.

Similarly, the same materials might constitute quite different phenomena of life in sufficiently different species. Consider, to take a very simple example, cell division or "mitosis", a process described at length in elementary textbooks. It is the process of reproduction in bacteria, the coming-to-be of new bacteria from old; but it is a part of growth and self-maintenance in a California condor or in a human being. What phenomena count as reproduction thus depends on the life form in question. And the representation of given phenomena as amounting to a process of reproduction depends implicitly on a conception of how things stand in individual's species or life form. This species-dependence extends to every ordinary tensed description of an individual organism as alive: for example as eating or drinking or leafing out, or as having teeth or lungs or leaves, etc.

What can we say about the representation of the life form or species that is implicit in these ordinary tensed judgments about living individuals? It is made articulate in a connected system of tenseless judgments. A collection of true thoughts which completely develop this system we may call a "natural history" of the life form in question. The components of this system, the "natural history judgments," attribute to the life form, in a logically distinctive way, predicates which can also intelligibly be attributed to individual organisms. "They have four legs," we say of cats or of cat-form; "They bloom in spring," we say of cherries or of cherry-form. "It has four legs", we say of this cat hic et nunc; "It bloomed last spring" we say of the cherry tree in the garden. The properties expressed by these predicates may be said to "characterize" the life forms cat and cherry respectively; we may say, by contrast, that they "hold of" the individual cat or cherry tree in question. The predicates may of course fail to hold of many individual bearers of the life forms they characterize; it may even, in suitable cases, fail to be true of most of them. Where the characterizing predicates do fail to hold -- where a cat has three legs or a cherry does not bloom -- we have natural defect, a failure of elementary "natural goodness." Thus judgments of goodness and defect make implicit reference to the species or life form that the individual bears. Such "evaluative" judgments are no more suspicious, metaphysically, than are the "positive" descriptions: the materials on which we base the evaluative judgments are implicitly present in positive description.

In these logico-metaphysical thoughts we find nothing specifically practical or moral. A more important feature of "logical Footianism" is the claim that the following idea is coherent: a natural life form -- an item falling into the same logical category as domestic cat, cherry, California condor -- might be characterized by practical reason as a power or capacity. That is, practical reason is just as much a "characteristic" of certain (possible) life forms or species as vision or the capacity to feel pleasure or pain are. In order for such a claim to hold of a given life form, it is not necessary (to repeat) that each single one of its bearers develops the power to reason practically. No more than it need be that every bearer of a sighted species develops sight. Some individual cats, for example, are born blind.

This aspect of logical Footianism may of course seem to be a platitude. Why shouldn't such a "practically reasoning form of life" be possible? It may, after all, also seem to be a platitude that the human species in particular -- the particular terrestrial life form that you and I

together bear -- is in this sense a practically reasoning one. But surprisingly many philosophers are explicitly or implicitly committed to accounts of intellect and reason generally which entail that the self-same animal species might in one epoch, A, be devoid of concepts and reasoning and the making of practical connections between what is understood and what is to be done, and then in a later epoch, B, develop these powers or "practices," perhaps again losing them in a still later historical period C. Practical thought and calculation are, on such views, to be compared with money and banking, or with a certain style of clothing. They do not characterize the life form as such; mention of them will not enter into its natural history. (It will be an open question whether the "intellectual interlude," epoch B, in such an imaginary history should be viewed as a period of sickness and psychic deformation-- as I suppose it is a sort of forcible deformation of chimpanzee-life, akin to the binding of Chinese women's feet, to remove them from their characteristic environments, hold them in zoos, and "teach" them rudiments of American Sign Language.)

Logical Footianism need not deny that some or even all developed manifestations of practical reason depend on historically formed and contingent "social practices." It may be that they do and must. For example, it may be that individual, concrete phenomena of practical reason are everywhere internally related to language, that is, to "practices" of discursive interaction. I suspect that Professor Foot would argue that phenomena of practical reason are essentially bound up with language, at least in the human case. But it is one thing to say that human languages rise and fall in the course of human history, as they evidently do; it is quite another to say that human language has arisen in the course of human history. The more reasonable view is surely that our human linguistic power is a product not of history proper, but of Darwinian evolution; discursive interaction is thus a part of our natural history, a phenomenon characteristic of our peculiar life form. It is the particular language in which this natural capacity is exercised, for example Finnish or Old Irish, which is contingent in relation to that natural history and a product of genuine human history. Thus the two claims that phenomena of practical rationality are always dependent somehow on the agent's possession of language and that all languages are historically developed practices, are perfectly consistent with the aspect of logical Footianism I am describing. Namely this: that it is possible for practical reason to be a capacity "characteristic" of an animal as a bearer of a specific natural life form, just as wings are characteristic of doves. It would be a defect in an individual bearer of such a life form if it never develops this power.

But, now, what does it mean to speak of an agent as possessing developed practical reason? It means that the agent applies conceptual thought-- thought that is bound up inferentially with other thought -- to action. It operates on the strength of calculation. It does things "because it thinks that P", where its "thinking that P" falls into a "space of reasons," in the language of Wilfrid Sellars. Or, put more formally, a practical reasoner is the subject of attributions of the form: X does A because it thinks (conceptually) that... doing A..... A practical reasoner is something that does A on the strength of a consideration about doing A.

The ellipses in our formula might be filled in a variety of ways. What can we say, a priori, about the routes or forms that this practical application of conceptual thought can take in a practically reasoning animal?

It seems clear that wherever we find phenomena of practical reason we must potentially find the agent applying elementary "instrumental" thoughts to action. Suppose that our agent is engaged in doing C, or is trying to do C, or wants to do C. Given this, the agent might do B

because it thinks something about the connection between doing B and doing C; that is, it is doing B because it thinks ...doing B...doing C.... Here the “instrumental” connection between doing B and doing C might be that doing B will supply a condition for doing C or that doing B will make it easier to do C, or that doing B is part of doing C or that doing B constitutes doing C. Suppose then that, on these grounds, our agent is now doing B, or is trying to do B, or intends to do B. The agent might then do A because it thinks that doing A will supply a condition for doing B, or that doing A is a part of doing B – and so on. It seems practical reason could not gain a foothold in an animal's operation unless this “instrumental” structure had a foothold.

Now, can we intelligibly suppose that the practical application of thoughts might take only this form in a given kind of practically reasoning organism? I don't see why not. In that case, we would have to do with a merely Humean form of rational life. Appetite supplies certain objectives, without thought or calculation, and practical calculation moves from there to action.

It is important to see that Foot can accept the coherence of this idea, though her method of presentation does not make this clear. What Foot must and does claim, as a component of "logical Footianism," is that there are other possibilities. What forms of application of thought to action are possible and sound will depend on the particular form of practically intelligent life in question

Logical Humeanism, as we might call it, is the claim that applications of instrumental thought to action are the only possible phenomena of practical reason in any life form whatsoever. From a Footian perspective this is an extraordinarily strong claim, and it must indeed be rejected. It is quite as strong as the Kantian claim that wherever there is practical reasoning of any sort, there are non-instrumental sorts of practical reasoning. Kant evidently believes that if the application of conceptual thought to action occurs anywhere in the whole of Nature, then there is the possibility and necessity of application of the "formula of universal law" or the "formula of humanity" to action.

Logical Footianism rejects each of these aprioristic extremes. Different forms of animals have different forms of visual capacity. The incapacity to make a certain color discrimination will count as a defect in one type of animal, but not in another. As it is with vision, so it is with practical reason. There might be merely Humean forms of practical intelligence. That is, in imputing practical reason to a form of life as "characteristic", we might impute to it only application of instrumental thought. But equally, in imputing practical reason to a form of life we might also impute the application of other, non-instrumental forms of thought. It might be possible, in some forms of life, for an agent to do A because he thinks that he promised Jones he would do A, or because he thinks that this previous action will injure Smith unless he does A, etc., where these explanations of action are not to be given an instrumental construction.

Local Footianism

By local Footianism, I mean the claim that certain of the possibilities articulated by logical Footianism are realized in the specifically human, terrestrial, case. For one thing, it belongs to human beings characteristically to reason practically, just as it belongs to them to learn a language. But more particularly it belongs to human beings to reason practically in certain specific ways. In particular, it belongs to them to act on the strength of non-instrumental thoughts of certain types.

Consider again the linguistic parallel. It might be argued that it belongs to human beings to learn, not just language, but a language containing the first person. It is perhaps characteristic

of the developed human being to be able to use a first person indiscursive interaction: if a human language does not contain a first person employment of verbs, it is a defective human language; or if it does, but one of its speakers cannot learn this use, then that speaker is a linguistically defective human being. I don't know whether this is true. But it does not seem to be something that is contained analytically in the idea of language in general. By contrast, subject-predicate structure and the use of singular terms do seem to be contained analytically in the idea of language.

Similarly, the ideas of action on grounds of considerations of long-term prudence or action on grounds of considerations of justice or action on the ground of a thought about what would be most pleasant are not contained analytically in the idea of practical reason in general. By contrast, a capacity for action based on instrumental considerations does seem to be contained analytically in the idea of reasoned practice.

Note that someone might accept logical Footianism as a claim about the abstract possibilities, but reject local Footianism as a claim about human beings. He might argue that, as a matter of fact, human life is a Humean form of life, even if we can imagine or describe other forms of practical intelligence. On Mars, he grants, it might be otherwise.

Against this "local, non-logical Humeanism" Foot is in a position to argue from appearances. We humans describe certain choices as good or bad, reasonable or unreasonable, irrespective of the agent's further objectives. We advise for and against certain courses of action without a close study of the agent's ends. Indeed, it seems clearly to belong to the well-developed human intelligence to think of the actions of other human beings in such terms. In accepting logical Footianism, we accept that such thoughts could be true in some possible form of life. We make room for them in logical space, so to speak. We see that there would be nothing mysterious about them if they were true.

But we do think such things about ourselves and our fellow human beings. What reason, then, have we to think that some such thoughts are not true, and thus that our form of life is not a Humean form of life? I will come back to this point.

Substantive Footianism

By substantive Footianism, I mean Foot's belief that something like the traditional table of virtues provides an apt characterization of the specifically human form of practical rationality. In particular, she believes that considerations of justice, benevolence and prudence are among those a well-reasoning human being will act upon, even where they conflict with other objectives. Foot's chapters on happiness and on the traditional immoralists belong to this level of her theory. Figures like Callicles, Thrasymachus, Hobbes, Gide and, to some extent, even Nietzsche may be characterized as accepting both logical and local Footianism. They reject logical and local Humeanism and see the soundly operating human practical understanding as applying non-instrumental thoughts to action. But they reject the validity in the specifically human case of either benevolence or prudence or justice. They have different conceptions of human life.

Once again, we misunderstand Foot if we suppose that her critique of such thinkers is purely a priori, or that she means it to follow immediately from the more abstract strata of her theory. Perhaps another form of intelligent life would be one in which Hobbesianism is true: the

forms of practical reason that are "characteristic" of such life would be instrumental and long-term prudential. Or perhaps the idea of a Calliclean form of practical intelligence is coherent. Again, I think that Foot does not make this clear, though it must be her position. She is, as it were, a substantive Hobbesian about other possible forms of life; but about human life, she is a substantive Footian.

But faced with the idea of, say, a Hobbesian form of practical intelligence, Foot's more abstract theory has positioned her to pose the question "But is it so with us?" and to argue from appearances. What can seem to exclude these appearances is the thought that something else must be the case. But logical Footianism ought to convince us that, though such immoralisms might be true in given types of life, they needn't be true of every such form. Once the thought is posed clearly, we see that other, non-Hobbesian, or non-Calliclean, forms are possible – if indeed the Hobbesian and Calliclean forms really are coherent.

In the end, substantive Footianism rests on something structurally akin to Kant's "fact of reason". Again, Foot's form of presentation covers this up: she often seems to be justifying certain claims about human practical rationality where she might have emphasized the extent to which these thoughts are self-validating. The human form of life is one in which considerations of justice, for example, characterize a sound practical reason. But this is not something we properly discover from a close study of human life. It must be given to us from inside, so to speak. For our taking such thoughts as reason-giving, considered as a general characteristic phenomenon of human intelligence, is part of what makes our species to be the sort that it is. It is part of the constitution of this peculiar structuring of a kind of animal life. That we operate with these thoughts is thus a part of what makes these thoughts true. The situation would be structurally the same in a Hobbesian or Calliclean species, if the idea of such a life form makes sense. Thus Foot's view, properly understood, is not one in which "ethics" can be justified "from outside," as John McDowell seems to suppose.⁴⁸ If her teaching were like that, she would have to rule a priori against the "immoralist" possibilities I have just mentioned.

For Foot, as for McDowell, our confidence in the validity of considerations of justice and other fundamental forms of practical thought must, at a certain level, be groundless.

⁴⁸ "Two Kinds of Naturalism," Reasons and Virtues