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Hobbes, *Human nature* IV-VI, cf. *De Corpore* XXV.8; I.1-3
(Gaskin, 31-43, cf. 219-221, 185-88)

Over Chapters 4-6, Hobbes extended his mechanical account of the workings of the senses, memory and imagination to thought and reflection. He began by observing that, as the motions that constitute our conceptions reverberate in our brains, sometimes this one and sometimes that one will spontaneously come to our attention. This explains the random and incoherent appearance of thoughts in dreams, but by and large our waking thoughts are not random or incoherent. If I solve a mathematical problem or think about what route I will have to take on the way home in order to do all the shopping I need to do on the way, my conclusions do not just randomly and fortuitously appear before me. Instead, my thoughts occur in a certain chain or sequence, with later ones following as a consequence of earlier ones. And it seems that when we solve problems or deliberate about how best to achieve our purposes, what leads us from earlier thoughts to later ones is either the laws of logic or purposive or practical reasoning, not some chance motion of particles in the brain induced by mechanical causes. But Hobbes wanted to explain logical and practical reasoning as an effect of mechanism. He did so in stages, dealing first with the sort of concrete, imagistic reasoning that we employ when we decide what path to take when we move or decide where to look for a missing object, then with our reasoning from cause to effect and effect to cause, and finally with those forms of reasoning that employ words and mathematical symbols.

QUESTIONS ON THE READING

1. What is the chief reason why, in our deliberations we most often trace out chains of cause and effect, rather than proceed from anything to anything?
2. What leads us to suppose that certain events will occur in the future or that events that we have not witnessed have occurred in the past?
3. What is a sign?
4. Did Hobbes think that we are in control of the course of our thoughts?
5. What is a mark and what purpose does the creation of marks serve?
6. In what sense are universal names "indefinite?"

Note: "For true and false are things not incident to beasts because they adhere to propositions and language; nor have they ratiocination, whereby to multiply one untruth by another." Hobbes' pronominal references leapfrog across this sentence. The first "they" refers to "true and false." The second refers to "beasts."

7. What remedy is there for the confusion into which language has fallen by the equivocal and unthinking use of terms?
8. List the four things Hobbes identified as being necessary for knowledge.

NOTES ON THE READING

a. Memory, anticipation, deliberation, and prudence in action. Hobbes claimed that when objects press on us and communicate motions to our brains, some of these motions are very strong. This has two effects. First, it causes the motions to travel on from the brain towards the heart where they constrict or enhance its motion, thus producing pleasure or pain. Second, they tend to reverberate for a long time in the brain, and do so very strongly, which means that they

tend to occupy our memories, and return frequently to our thoughts if we ever do stop thinking of them. Whenever these strong motions are remembered, they are also remembered along with a memory of the pleasurable or painful motions of the heart that followed them. A motion that is recalled as pleasurable is a desire, as Hobbes defined the term, one that is recalled as painful an aversion. This mechanically explains why we tend to deliberate about objects that we feel a desire for or an aversion towards. We tend to deliberate about those objects that most forcefully and frequently occupy our attention because they are such strong motions. And because they are such strong motions they also produce pleasurable or painful effects on the heart, which makes them be recalled as objects of desire or aversion.

Strong motions in the brain and pleasurable or painful motions of the heart are not the only motions that are connected in our thoughts. Hobbes also noted that when our conceptions are originally received from the senses they are never received simply on their own. Instead, they occur in the midst of surrounding conceptions in space, and before or after other conceptions over time. The memories of these conceptions that are left over in the brain are likewise not single and individual, but linked to memories of the conceptions that surrounded them so that one cannot be remembered without drawing its neighbours after it in a sort of chain. This accounts for how it is that we reason temporally and geographically (Hobbes calls this "ranging" and "reminiscence"). My present sensations of a place pull after them the conception of that place's past surroundings, the surroundings of those surroundings, the surroundings of those surroundings, and so on out to the limits of my geographical experience. The same happens in time, where the experience of my present pulls after it conceptions of my immediate past, the past of that past, and so on. The conceptual map of the world and of my past positions at past times in the world locates objects of desire or aversion, like my lost keys or the bottle of milk in the supermarket, and if I appear to be "reasoning" about how to obtain these objects it is just that my current sensations of my own position are constantly pulling an expanding field of conceptions of past and surrounding positions along with them, and objects of desire appear in these fields. Once an object of desire or aversion appears, I am naturally led to pursue the route to obtain or avoid it.

Admittedly, deliberative action and problem-solving typically occur in the reverse direction. It is often the case that a conception of the object of desire or aversion comes first and leads us to deliberate about how to obtain or avoid it. Hobbes had an account to offer for this second type of deliberation as well, but it is more complicated. He began by claiming that when an object has been constantly or regularly connected with another object in the past it becomes more likely that whenever a conception of the one occurs, it will be followed by a conception of the other. (This is because our brains contain more left-over instances of motions where the two were connected than instances where the one occurred without the other, so the chances are greater that they will come to mind in sequence.) The one that regularly precedes is called the cause whereas the one that regularly follows it is called its effect, and the act of conceiving the one upon conceiving the other is what we call "reasoning" from cause to effect or effect to cause. Hobbes noted that this sort of "reasoning" leads us to populate the world with unperceived objects. Seeing certain causes occur, we anticipate that their usual effects will soon follow, even though we do not plan on hanging around to be there when they do. Coming upon certain effects, we suppose that their causes must have preceded them, even though we were not there to see them at the time. And having certain desires or aversions, we think of the causes of those desires or the means of avoiding those aversions, the causes of those causes, the causes of those causes and so on. Each

more remote member of the chain of conceived causes becomes an object of desire or aversion in its own right until we reach one in our immediate vicinity and act on it. It may look like were are deliberating, but really desire and aversion are simply being mechanically transmitted along a chain of associated conceptions up to a proximate conception that motivates action.

Hobbes observed that all animals deliberate in this way about what things have tended to precede the objects of their fear or aversion in the past, and so come to fix on those precedent objects as things to be obtained or avoided now, in the present. However, he thought it to be a peculiar characteristic of human beings that they not only deliberate about what causes are requisite to bring about their ends, but also about what effects will follow from achieving those ends. (Perhaps he thought that this requires greater powers of memory, attention, and imagination than animals are capable of.) He referred to this additional activity as prudence or foresight. It is what keeps us from doing such things as achieving our ends through criminal means. As he colourfully put it, the crime, the officer, the prison, the judge, and the gallows are connected in our imaginations.

Regardless of whether one considers deliberation or prudence, however, it is important to appreciate that the chain of thought we pursue is purely mechanical and not rational. When we think that the best way to start the car is to find the key and put it in the ignition, we do not do so because we have any insight into what it is in this action that makes that effect come about. Our thoughts follow in this chain simply because we have regularly experienced events to follow upon one another in this way in the past. This past experience creates a mechanical connection between the thoughts, so that they follow one another in the imagination in the same sequence that they followed one another in experience.

It is for this reason that Hobbes was at pains to stress that deliberation and prudence can lead us astray. Simply because one thing has frequently been observed after another, that does not mean that the one is the cause of the other. Nonetheless, the mechanical way in which our minds or brains work leads us to employ this fallible method of inference, and depending on the extent of our experience, our suppositions are more or less reliable.

b. Language and universals. The next task Hobbes set himself was to account for the process of rational thought. He approached the issue in a round-about way, by first talking about speech and words in Chapter V. Reasoning is then accounted for in Chapter VI as an operation performed through the use of words. This is so much the case, in his opinion, that it led him to maintain that those deaf and mute since birth could have not very extensive reasoning abilities (*Leviathan*, IV.9).

Speech originates from the operation of making signs. Signs in turn are explained by Hobbes' previous account of deliberation and inference from effect to cause and cause to effect. Hobbes claimed that when two things have been constantly or regularly observed to go together, as is the case with causes and effects, an experience of either one of them can lead us to think of the other, due to the fact that the motions induced by these two objects in our minds have been so strongly connected together. In effect, therefore, either object serves as a sign inducing us to recollect the other.

If you think that our thoughts are not within our own control, and that we cannot remember anything simply by desiring to do so, but only insofar as some motion occurs in our brains that pulls the motion corresponding to the thing we want to remember after it, then you can see that signs would be very useful things. An appropriately placed sign can induce us to remember something we would otherwise not be able to remember (like where the treasure is buried).

Hobbes illustrated this point with a story about dogs who bury their bones but then are unable to find them again because, he claimed, they have nothing to jog their memories about the place where the bone was buried. More radically, he talks about ewes who don't miss one or two of their lambs because they have no signs to remind them of exactly how many lambs they have. Ultimately, we human beings are no better off than these animals. We cannot remember at will any more than they. But we can do something that makes up in some measure for the defect: we can set up signs at certain spots, that is, things that we have learned to associate with the things we want to remember, so that when we go back to those spots, seeing the signs will cause us to remember.

These signs can be anything: a string around the finger that we tell ourselves is a sign not to forget to buy more milk; a mark in a tree or a cross in the ground, or an x on a map that tells us where something is buried; and so on. But the most versatile vehicle we have for making signs is our voices and our writing. We make certain noises to stand for certain experiences, and teach these noises to our children so that when they hear them in the future, they will be reminded of certain things. We then scrawl symbols on paper to stand for the noises and teach those symbols to our children as well. With the use of spoken and written signs, we can communicate our thoughts to others and put signs of them down in places where we are sure we will find them again when we need them. In effect, this gives us a measure of control over our mental operations.

The use of words and other signs enables us to improve our powers of thought as well as to control them. This chiefly occurs through the employment of general words, or, as Hobbes called them, universal names. A universal name is a name that is used to refer to a whole group of objects that are observed to be similar to one another in some respect. For example, whereas "Socrates," "Plato," and "Aristotle" are names of particular individuals, "philosopher" is a name that refers to all three of these individuals and a number of others as well--individuals who, in this case, are similar to one another in all sharing the same occupation.

As Hobbes saw it, once we have formed universal names, we can use them to summarize, expand, and generalize our knowledge. For example, universal names make it possible to collect many items of knowledge together in a way that would otherwise exceed the capacities of our powers of discrimination or memory. An animal, like the ewe mentioned earlier, could look at a collection of things, like her lambs, and know that it is large or small, or that it looks larger than some other ewe's brood. But a human being who knows the universal names for numbers can know exactly how many lambs the ewe has, can write down that number as an aid to memory, and then, by later consulting this note, discover that the ewe has lost one of her lambs (something that she herself, Hobbes supposed, is in no position to notice unless the number is so small that the loss makes a significantly different appearance). Indeed, a possession of universal words allows the person to determine things about the flock simply by performing calculations on the words. For example, if the lambs are standing neatly in a square formation, nine lambs wide, and twelve lambs deep, the person can know without counting them all individually that there must be 108 lambs in the flock. This knowledge is gained by performing a calculation just on the words "nine" and "twelve."

Universal names do not simply allow us to summarize and expand our knowledge in these ways. They also enable us to generalize it. Hobbes gave the example of someone learning by experience that the interior angles of a particular triangle add up to a straight line. One way to do this is to measure all of the angles of the triangle with a protractor and add them up to see that

they equal 180 degrees. But another way is with a demonstration of the sort described by Euclid: drawing a line that intersects the vertex of one angle of the triangle, parallel to the side of the triangle opposite that angle, and lengthening one of the lines making that angle beyond the vertex. Hobbes observed that if this demonstration does not make reference to any features of the triangle except those that it would have to have in order to be called by the universal name, triangle, then it will not just apply to that particular triangle, but to any figure that we call a triangle. Thus, by reference to the universal name, triangle, we are able to take a truth that has been demonstrated just of one particular triangle to hold of all of them, even in advance of any further inspection. There is a significant amount of mental labour to be saved here, and a correspondingly huge increase in knowledge. Through the use of universal terms, knowledge does not have to be limited to the knowledge of particular relations between particular objects, but can take the form of knowledge of general rules and principles.

But the use of universal terms brings disadvantages as well as advantages. A universal term is a name for a whole collection of individuals. But we are tempted to think that it is not just a name shared by all the individuals in the collection, but the name of a special sort of general thing: an archetype or prototype or essence that exists independently of the particular individuals. This temptation arises because we tend to think that every distinct name ought to name some distinct thing. So a general name ought to name a general thing, rather than just many particulars. Socrates is notorious for having made this assumption. He would ask people about the meaning of some general term like justice or piety and then complain when they listed a number of particular acts that are just or pious. He would demand that they identify the one thing that makes all the just acts just or the pious acts pious. The view that there is some general thing that all the particulars participate in passed from Socrates on to Plato and from Plato to Aristotle, eventually emerging as the theories of sensible and intelligible forms, essences, and real qualities presented by medieval scholasticism.

Hobbes, like most early modern philosophers, denied the existence of sensible and intelligible forms, essences and real qualities, and the attributed the mistaken belief in such things to a misunderstanding of the meaning of general terms. According to Hobbes, all things that exist are particular, and since it is things that cause our conceptions, they too must be particular (though they can become obscure and indeterminate as they fade over time [cf. HN III.7]). Not only do general things not exist, but it is impossible even to form a general conception. When we hear a general term, we always form a conception of some one of the particular objects that the term names. This is also what we do when we hear a particular name. The difference between the two cases is that we appreciate that the general term could be understood to refer to any of a number of other particulars that resemble the one we are conceiving in certain ways. For example, hearing the term “philosopher” we may form a conception of Socrates. This is just what we would do if we heard the name “Socrates.” But the difference is that we think that the former name could be applied to conceptions of a number of other people as well, e.g. Plato or Aristotle, whereas the latter name is only properly applied to Socrates. Consequently, when we use general terms we grant our auditors a license to conceive any one of a collection of individuals, and do not expect that they will conceive of just a certain individual, as we do when we use a particular name. As Hobbes put it, if you commission a painter to paint a “man,” you have no cause to complain if you had Socrates in mind when you said “man” but the painter made a picture of Plato. But you would have cause to complain if the painter made a picture of a dog.

There are other problems that arise because of our use of general names. Often different people (or even the same person at the same time) will end up understanding subtly different things to be collected under the name. For instance, some people insist that the name "man" collects all human beings under it whereas others understand it to refer just to male human beings. Hobbes gave the example of the name, "faith," which could be used to refer to the act of placing trust in someone to do something, or to the act of assenting to religious beliefs, or to the act of accepting someone else's testimony concerning a miracle or revelation (to mention just a few options). The resulting inadvertent ambiguities in our use of terms can muddle our reasoning and confuse our discourse. (The fallacy of equivocation, for instance, arises when someone gives an argument that employs the same general term in two different ways in two different places, thus making the argument appear valid when it is not.)

Reflecting on this circumstance, Hobbes remarked that understanding is the capacity to accurately specify the conceptions that fall under a term, and is even a capacity we share with animals. (While animals do not use words or set up signs, some of them understand them, and all of them are able to understand the signification of certain non-verbal signs in a general way.) This is a radical remark. In making it, Hobbes was distancing himself from the Aristotelian view that the understanding (or intellect, to use an alternative, Latin name for it) is an essentially spiritual power, exercised by an immaterial soul that grasps universal forms or essences apart from all matter. (According to Book III of Aristotle's *De anima*, such a power could only be exercised by an immaterial or spiritual agent.)

c. Reasoning. With this account of language established, Hobbes was in a position to go on to account for reasoning (meaning, here, not practical deliberation as guided by past experience, as discussed earlier, but a kind of deduction in accord with logical principles.) In broad outline, he said that when we reason we first break our experiences down into certain simple and common elements. These elements are simple insofar as they cannot be further broken down or analyzed. They are common in that they are commonly found in all of our experiences. The process of analysis whereby we uncover them is one akin to subtraction. Hobbes illustrated it with the example of seeing a person. Close up, this experience is rich and complex in detail. But imagine you walk backwards, away from the person. As you do so, the person's facial features become indiscriminate so that, from a distance, all you can say is that there is a person there, but not who it is. This is a kind of subtraction. If you go yet further back, you might not even be able to tell that you are looking at a human being, but if you see it move, you might at least think it is an animal. More has been subtracted from your experience. At a yet more remote distance, all you can tell is that there is something extended and shaped on the horizon. At this point you are beginning to arrive at simple, common elements.

Hobbes thought that when we analyze our experience into simple, common elements, we uncover such things as extension, shape, number, motion, colour, heat, cold, taste, smell, and sound.

All of our definitions of terms are simply lists of various of these simple, universal elements. For example, we define a triangle as a three-angled, plane figure. Three is a number, and the numbers are simple, common elements. Angles are shapes, and the shapes are simple, common elements. "Plane" means "extended in two dimensions," a combination of extension, a simple and common element, dimension, a mode of extension, and two, a number. Figures are collections of line segments (again a type of shape) joined end to end to enclose a space. So the

definition of a triangle is just a collection of various simple, common elements related to one another in a certain way.

Hobbes thought that all definitions are like this.

He also thought that our definitions are purely stipulative. Once we have analyzed our experience into simple, common elements, we can proceed to put those elements together in any way we please, and assign any name we please to that combination, as long as we are explicit about what is included and excluded from the combination, as long as we do not contradict ourselves, and as long as we do not use the same name to refer to any other combination of ideas.

This may seem problematic. If it is up to each of us to define universal words as we please, would this not result in a sort of anarchy, where everyone ends up generating their own private language, and no one can talk to anyone else? Hobbes was not terribly concerned with this possibility. As long as we carefully and explicitly define our universal words in terms of simple, common elements that everyone else can recognize, we will make ourselves understood. Other people may think we are using words in a non-standard or perverse way, but they will see exactly what we are saying from our definitions.

Hobbes' position on definition might seem to pose another problem. If we just define terms in any way we please, how can we be sure that we will not end up building castles in the air, and talking about things that do not exist? Hobbes' answer to this question was to say that each person must judge from their own experience whether a given definition of a term is useful or not — that is, whether the term names any combination of simple elements that they encounter in experience, or would like to bring into existence. But the fact that certain terms may not be useful or may not refer to anything that we encounter in experience has no bearing on the legitimacy of our definitions. Usefulness is one thing, legitimacy another, and as long as the definitions are explicit and non-contradictory, they are legitimate.

Once we have properly defined our words, we can proceed to form assertions with them, by relating them to one another. These assertions can be made in such a way that they are true or false simply in virtue of the definitions of the terms involved, and independently of any reference to what actually exists in the world. For example, when I say that gold is malleable, what I say is true as long as everything that is signified by the name of the subject (gold) is included among the things that are named by the predicate (malleable). And this would be the case even if there were no gold existing anywhere in the world. What makes the sentence true is that the definition of the universal name, gold, falls within the scope of the definition of the universal name, malleable. This is why Hobbes said that truth has nothing to do with the things that may or may not exist in the world, but has rather to do with the sentences or affirmations we construct when we string names together. What makes a sentence true is the definitions of the words involved in that sentence, not the objects it talks about.

It was accordingly very important for Hobbes that universal names be carefully defined, and that this be done at the outset of a science, as it is done in geometry. As noted before, the definitions can be stipulative and arbitrary and the worst that will happen is that the science might not end up talking about anything that actually exists in the world. The latter is something that each individual will have to determine from their own experience. But the definitions must at all costs refer to simple conceptions we have obtained from experience and they must explicitly lay out what simple conceptions are included and what are excluded from the meaning of the term.

Once terms have been carefully defined, it should be possible for us to proceed to gain knowledge simply by thinking about what is contained in the definitions of the terms. As Hobbes put it in *Leviathan*, we can "turn the reckoning of the consequences of the things imagined in the mind into a reckoning of the consequences of appellations."

A major change in the operations of the mind occurs when this happens. As long as we are confined to "reckoning of the consequences of the things imagined in the mind," we are limited to thinking of what objects have been connected with what other objects in our past experience. This is a type of "reckoning" that is intrinsically prone to error, because things that have been observed to be connected or to happen after one another in a certain sequence in the past may not always continue to do so in the future. But when we group kinds of things together under universal names, and then carefully define those names and start to "reckon" just with what follows from the definitions of those names, then we reach conclusions that are necessarily true and universally valid.

The type of "reckoning" we engage in here is described in more detail in *De corpore* as involving addition or subtraction, which Hobbes conceived to be something that does not just happen in mathematics, but in our formulations of the definitions of words (where we add more into or take more out of the definition), our formulations of propositions (where we predicate more or less of a subject, adding what we assert and subtracting what we deny), and our arguments and demonstrations (where we demonstrate that something further must be asserted or denied of a subject based on what has previously been asserted or denied). As in arithmetic so here the rules we follow when calculating our results are truth-generating and truth-preserving, so that the only way we can arrive at false conclusions is if, through human frailty, we make an error in observing the rules (as we sometimes add up sums incorrectly).

In principle, we should be able to do this sort of "reckoning" about causes and effects as well. This would occur when we have studied the cause and the effect so thoroughly, and understood the simple natures that go into their definitions so well, that we are able to calculate in advance how and when the effect will follow from the cause. When we reason about causes and effects in this way, our reasoning constitutes science or, as Hobbes also called it, philosophical knowledge. Unlike experiential knowledge, this reasoning is not "a posteriori" or after the fact (we do not have to first see what effects follow from what causes and then generalize from this experience), but "a priori" or knowable in advance. From a proper analysis of the cause we should be able to deduce what its effect will be even in advance of seeing it happen, and likewise from a proper analysis of the effect.

> By philosophy is understood the knowledge acquired by reasoning from the manner of the generation of anything to the properties, or from the properties to some possible way of generation of the same, to the end to be able to produce, as far as matter and human force permit, such effects as human life requires. ... By this definition it is evident that we are not to account as any part of it that original knowledge called experience, in which consists prudence, because it is not attained by reasoning, but found as well in brute beasts as in man, and is but a memory of successions of events in times past, in which the omission of every little circumstance altering the effect frustrates the expectation of the most prudent; whereas nothing is produced by reasoning correctly, but general, eternal, and immutable truth. [*Leviathan* IV.xlvi.1-2, cf. *De corpore* I.2]

Despite the fact that he maintained that all conceptions originate from experience, Hobbes was no empiricist, therefore. He preferred knowledge that has been deduced in advance or "a

priori" from stipulative definitions to knowledge obtained after the fact, by induction from past experience. This is something that calls for further comment.

Note. Hobbes' Empirism. At the outset of *Leviathan*, Hobbes declared, "there is no conception in [our minds] [that] has not at first, totally, or by parts, been begotten upon the organs of sense" (*Leviathan* I.i.2). It is important to understand the implications of this claim. Hobbes was saying that all our conceptions originate from sense experience, not that all of our knowledge is based on induction from sense experience. In other words, Hobbes was making a psychological claim about how our conceptions arise rather than an epistemological claim about what makes a proposition count as knowledge. The view that all our thoughts arise from experience is called empir*ism*. It needs to be carefully distinguished from the view that all our knowledge is based on induction from sense experience, which is called empir*icism*.

Hobbes believed that induction from experience, or "prudence" as he called it, is not the only form of knowledge. We are also able to analyze our experience to isolate certain simple, universal elements. And while our representations of these elements might originate from experience, they are just so much raw material that we can proceed to work with as we please in constructing stipulative definitions for terms. Once we have laid out a number of definitions, we may proceed purely deductively, as is done in geometry, to derive a number of propositions that are necessarily true in virtue of the laws of logic. Like many mechanists, Hobbes was much fonder of trying to obtain knowledge by deduction from the supposedly first principles of the mechanical philosophy than by induction from experience. It is in fact his antecedent commitment to a mechanist account of everything in nature, including human nature, that motivated Hobbes' empirism. The machine of the mind can only be set in motion by impacts from objects hitting it from without. What it does must therefore be due to the motions it has received.

ESSAY QUESTIONS AND RESEARCH PROJECTS

1. Explain in detail how Hobbes could have taken the chain of thought involved in "ranging," "reminiscence," "expectation," "conjecture," and "prudence" to be produced by purely mechanical operations. Setting aside all contemporary knowledge of the workings of the brain and central nervous system and judging just from the perspective of the time, is this enterprise successful, or do you see difficulties with explaining these mental phenomena purely by appeal to motions occurring in the brain and heart?
2. Can the enterprise of explaining the sequence of our thoughts as a consequence of purely mechanical operations be extended to account for our use of language and for scientific "reckoning" involving names, or is there something about language and scientific reasoning that resists reduction to the consequences of colliding motions in the brain? Does Hobbes' project of giving a mechanical account of the workings of the mind break down when it gets to these operations?
3. Consider, by reference to *Leviathan* IV-V and *De corpore* VI.11-19 whether Hobbes' rejection of universals is consistent with his views on simple natures. Are simple natures a kind of universal?
1. Simple natures figure importantly in the philosophies of Bacon, Hobbes, and the early Descartes (in his *Rules for the direction of the mind*). Attempt a history of the development and employment of this notion by philosophers in the early modern period.