15

KNOWING HOW AND KNOWING THAT

Reprinted from 'Proceedings of the Aristotelian Society', vol. XLVI, 1946, by permission of the editor

PREAMBLE

In this paper, I try to exhibit part of the logical behaviour of the several concepts of intelligence, as these occur when we characterise either practical or theoretical activities as clever, wise, prudent, skilful, etc.

The prevailing doctrine (deriving perhaps from Plato's account of the tripartite soul) holds: (1) that Intelligence is a special faculty, the exercises of which are those specific internal acts which are called acts of thinking, namely, the operations of considering propositions; (2) that practical activities merit their titles 'intelligent', 'clever', and the rest only because they are accompanied by some such internal acts of considering propositions (and particularly 'regulative' propositions). That is to say, doing things is never itself an exercise of intelligence, but is, at best, a process introduced and somehow steered by some ulterior act of theorising. (It is also assumed that theorising is not a sort of doing, as if 'internal doing' contained some contradiction.)

To explain how thinking affects the course of practice, one or more go-between faculties are postulated which are, by definition, incapable of

considering regulative propositions, yet are, by definition, competent correctly to execute them.

In opposition to this doctrine, I try to show that intelligence is directly exercised as well in some practical performances as in some theoretical performances and that an intelligent performance need incorporate no 'shadow-act' of contemplating regulative propositions.

Hence there is no gap between intelligence and practice corresponding to the familiar gap between theory and practice. There is no need, therefore, to postulate any Janus-headed go-between faculty, which shall be both amenable to theory and influential over practice.

That thinking-operations can themselves be stupidly or intelligently performed is a notorious truth which by itself upsets the assumed equation of 'exercising intelligence' with 'thinking'. Else 'stupid thinking' would be a self-contradictory expression and 'intelligent thinking' would be a tautology. It also helps to upset the assumed type-difference between thinking and doing, since only subjects belonging to the same type can share predicates. But thinking and doing do share lots of predicates, such as 'clever', 'stupid', 'careful', 'strenuous', 'attentive', etc.

To bring out these points I rely largely on variations of one argument. I argue that the prevailing doctrine leads to vicious regresses, and these in two directions. (1) If the intelligence exhibited in any act, practical or theoretical, is to be credited to the occurrence of some ulterior act of intelligently considering regulative propositions, no intelligent act, practical or theoretical, could ever begin. If no one possessed any money, no one could get any money on loan. This is the turn of the argument that I chiefly use. (2) If a deed, to be intelligent, has to be guided by the consideration of a regulative proposition, the gap between that consideration and the practical application of the regulation has to be bridged by some go-between process which cannot by the pre-supposed definition itself be an exercise of intelligence and cannot, by definition, be the resultant deed. This go-between application-process has somehow to marry observance of a contemplated maxim with the enforcement of behaviour. So it has to unite in itself the allegedly incompatible properties of being kith to theory and kin to practice, else it could not be the applying of the one in the other. For, unlike theory, it must be able to influence action, and, unlike impulses, it must be amenable to regulative propositions. Consistency requires, therefore, that this schizophrenic broker must again be subdivided into one bit which contemplates but

does not execute, one which executes but does not contemplate and a third which reconciles these irreconcilables. And so on for ever.

(Some philosophers postulate a special class of acts, known as 'volitions', to perform this desperate task. Others postulate some special impulses which can both motivate action and lend docile ears to regulative propositions.) In fact, of course, whatever 'applying' may be, it *is* a proper exercise of intelligence and it is *not* a process of considering propositions.

Regresses of this pattern show, I suggest, not only that the prevailing doctrine is mistaken in equating exercises of intelligence with acts of theorising, but also what sort of a mistake it is. It is that radical sort of mistake which can be labelled a 'type-mistake'. I shall here content myself with stating summarily what this mistake is. I do not develop this logicians' moral in the remainder of this paper.

Adverbs expressing intelligence-concepts (such as 'shrewdly', 'wittily', 'methodically', 'scrupulously', etc.) have hitherto been construed in the wrong logical type or category, namely, as signalising the occurrence of special internal acts of that proprietary brand which we call 'thought' or 'theory'.

But in fact they signalise not that a performance incorporates extra acts, whether of this brand or of any other brand, but that the performance itself possesses a certain style, method or *modus operandi*. Intelligently to do something (whether internally or externally) is not to do two things, one 'in our heads' and the other perhaps in the outside world; it is to do one thing in a certain manner. It is somewhat like dancing gracefully, which differs from St. Vitus' dance, not by its incorporation of any extra motions (internal or external) but by the way in which the motions are executed. There need be no more moves in a job efficiently performed than in one inefficiently performed, though it is patent that they are performed in very different ways. Nor need a tidy room contain an extra article of furniture to be the *real* nominee of the adjective 'tidy'.

Phrases such as 'technical skill', 'scrupulous conduct' and even 'practical reason' denote capacities to execute not tandem operations but single operations with special procedures.

This is why ordinary language does not provide specific verbs corresponding to our specific intelligence-adverbs and adjectives.

(This is not quite true of the adverb 'voluntarily', since here philosophers have coined the specific verb 'to will'. But this verb has no ingenuous employment. If it was ever employed, it would be a proper

question to ask, 'When we will, do we always, sometimes or ever will voluntarily?' Attempts to answer this question would quickly get the verb relegated to its proper place, on the shelf tenanted by 'phlogiston'.)

To put it in Aristotelian terms, intelligence-concepts belong to the category not of ποιεῖν or of πάσχειν but of πῶς. This is why we, like Aristotle, squirm when we hear intelligence-criteria addressed as 'Values' or 'The Good'. For these locutions and associated courtesies suggest that they are superior but occult substances, which is an even worse type-mistake than treating them as superior but occult activities or occurrences.

Philosophers have not done justice to the distinction which is quite familiar to all of us between knowing that something is the case and knowing how to do things. In their theories of knowledge they concentrate on the discovery of truths or facts, and they either ignore the discovery of ways and methods of doing things or else they try to reduce it to the discovery of facts. They assume that intelligence equates with the contemplation of propositions and is exhausted in this contemplation.

I want to turn the tables and to prove that knowledge-how cannot be defined in terms of knowledge-that and further, that knowledge-how is a concept logically prior to the concept of knowledge-that. I hope to show that a number of notorious cruces and paradoxes remain insoluble if knowing-that is taken as the ideal model of all operations of intelligence. They are resolved if we see that a man's intelligence or stupidity is as directly exhibited in some of his doings as it is in some of his thinking.

Consider, first, our use of the various intelligence-predicates, namely, 'wise', 'logical', 'sensible', 'prudent', 'cunning', 'skilful', 'scrupulous', 'tasteful', 'witty', etc., with their converses 'unwise', 'illogical', 'silly', 'stupid', 'dull', 'unscrupulous', 'without taste', 'humourless', etc. What facts or what sorts of facts are known to the sensible which are not known to the silly? For example, what truths does the clever chess-player know which would be news to his stupid opponent? Obviously there is no truth or set of truths of which we could say, 'If only the stupid player had been informed of them, he would be a clever player,' or 'When once he had been apprised of these truths he would play well.' We can imagine a clever player generously imparting to his stupid opponent so many rules, tactical maxims, 'wrinkles', etc. that he could think of no more to tell him; his opponent might accept and memorise all of them, and be able and ready

to recite them correctly on demand. Yet he might still play chess stupidly, that is, be unable intelligently to apply the maxims, etc.

The intellectualist (as I shall call him) might defend his case by objecting that the stupid player did not 'really' or 'fully' know these truths. He had them by heart; but this was perhaps just a set of verbal habits, like the schoolboy's rote-knowledge of the multiplication table. If he seriously and attentively considered these truths he would then be or become a clever player. Or, to modify the suggestion to avert an obvious rejoinder, if he seriously and attentively considered these truths not just while in bed or while in church but while playing chess, and especially if he considered the maxim relevant to a tactical predicament at the moment when he was involved in that predicament, then he would make the intelligent move. But, unfortunately, if he was stupid (*a*) he would be unlikely to tell himself the appropriate maxim at the moment when it was needed and (*b*) even if by luck this maxim did occur to him at the moment when it was needed, he might be too stupid to follow it. For he might not see that it was the appropriate maxim or if he did, he might not see how to apply it. In other words it requires intelligence not only to discover truths, but also to apply them, and knowing how to apply truths cannot, without setting up an infinite process, be reduced to knowledge of some extra bridge-truths. The application of maxims, etc., is certainly not any mere contemplation of them. Equally certainly it can be intelligently or stupidly done. (This is the point where Aristotle's attempted solution of Socrates' puzzle broke down. 'How can the back-slider know moral and prudential maxims and still fail to behave properly?' This is only a special case of the general problem. 'How can a man be as well-informed as you please and still be a fool?' 'Why is a fool not necessarily an ignoramus?')

To switch over to a different example. A pupil fails to follow an argument. He understands the premisses and he understands the conclusion. But he fails to see that the conclusion follows from the premisses. The teacher thinks him rather dull but tries to help. So he tells him that there is an ulterior proposition which he has not considered, namely, that *if these premisses are true, the conclusion is true*. The pupil understands this and dutifully recites it alongside the premisses, and still fails to see that the conclusion follows from the premisses even when accompanied by the assertion that these premisses entail this conclusion. So a second hypothetical proposition is added to his store; namely, that the conclusion is true if the premisses are true as well as the first hypothetical proposition that if the

premisses are true the conclusion is true. And still the pupil fails to see. And so on for ever. He accepts rules in theory but this does not *force* him to apply them in practice. He considers reasons, but he fails to reason. (This is Lewis Carroll's puzzle in 'What the Tortoise said to Achilles'. I have met no successful attempt to solve it.)

What has gone wrong? Just this, that knowing how to reason was assumed to be analysable into the knowledge or supposal of some propositions, namely, (1) the special premisses, (2) the conclusion, plus (3) some extra propositions about the implication of the conclusion by the premisses, etc., etc., *ad infinitum*.

'Well but surely the intelligent reasoner *is* knowing rules of inference whenever he reasons intelligently.' Yes, of course he is, but knowing such a rule is not a case of knowing an extra fact or truth; it is knowing how to move from acknowledging some facts to acknowledging others. Knowing a rule of inference is not possessing a bit of extra information but being able to perform an intelligent operation. Knowing a rule is knowing how. It is realised in performances which conform to the rule, not in theoretical citations of it.

It is, of course, true that when people can reason intelligently, logicians can then extract the nerve of a range of similar inferences and exhibit this nerve in a logicians' formula. And they can teach it in lessons to novices who first learn the formula by heart and later find out how to detect the presence of a common nerve in a variety of formally similar but materially different arguments. But arguing intelligently did not before Aristotle and does not after Aristotle require the separate acknowledgement of the truth or 'validity' of the formula. 'God hath not . . . left it to Aristotle to make (men) rational.' Principles of inference are not extra premisses and knowing these principles exhibits itself not in the recitation of formulae but in the execution of valid inferences and in the avoidance, detection and correction of fallacies, etc. The dull reasoner is not ignorant; he is inefficient. A silly pupil may know by heart a great number of logicians' formulae without being good at arguing. The sharp pupil may argue well who has never heard of formal logic.

There is a not unfashionable shuffle which tries to circumvent these considerations by saying that the intelligent reasoner who has not been taught logic knows the logicians' formulae 'implicitly' but not 'explicitly'; or that the ordinary virtuous person has 'implicit' but not 'explicit' knowledge of the rules of right conduct; the skilful but untheoretical

chess-player 'implicitly' acknowledges a lot of strategic and tactical maxims, though he never formulates them and might not recognise them if they were imparted to him by some Clausewitz of the game. This shuffle assumes that knowledge-how must be reducible to knowledge-that, while conceding that no operations of acknowledging-that need be actually found occurring. It fails to explain how, even if such acknowledgements did occur, their maker might still be a fool in his performance.

All this intellectualist legend must be rejected, not merely because it tells psychological myths but because the myths are not of the right type to account for the facts which they are invented to explain. However many strata of knowledge-that are postulated, the same crux always recurs that a fool might have all that knowledge without knowing how to perform, and a sensible or cunning person might know how to perform who had not been introduced to those postulated facts; that is, there still remains the same gulf, as wide as ever, between having the postulated knowledge of those facts and knowing how to use or apply it; between acknowledging principles in thought and intelligently applying them in action.

I must now try to speak more positively about what it is like to know-how. (*a*) When a person knows how to do things of a certain sort (e.g., make good jokes, conduct battles or behave at funerals), his knowledge is actualised or exercised in what he does. It is not exercised (save *per accidens*) in the propounding of propositions or in saying 'Yes' to those propounded by others. His intelligence is exhibited by deeds, not by internal or external dicta. A good experimentalist exercises his skill not in reciting maxims of technology but in making experiments. It is a ruinous but popular mistake to suppose that intelligence operates only in the production and manipulation of propositions, i.e., that only in ratiocinating are we rational. (*b*) When a person knows how to do things of a certain sort (e.g., cook omelettes, design dresses or persuade juries), his performance is in some way governed by principles, rules, canons, standards or criteria. (For most purposes it does not matter which we say.) It is always possible in principle, if not in practice, to explain why he tends to succeed, that is, to state the reasons for his actions. It is tautology to say that there is a method in his cleverness. But his observance of rules, principles, etc. must, if it is there at all, be realised in his performance of his tasks. It need not (though it can) be also advertised in an extra performance of paying some internal or external lip-service to those rules or principles. He *must* work judiciously; he *may* also propound judgments.

For propounding judgments is just another special activity, which can itself be judiciously or injudiciously performed. Judging (or propositional thinking) is one (but only one) way of exercising judiciousness or betraying silliness; it has its own rules, principles and criteria, but again the intelligent application of these does not pre-require yet another lower stratum of judgments on how to think correctly.

In short the propositional acknowledgement of rules, reasons or principles is not the parent of the intelligent application of them; it is a step-child of that application.

In some ways the observance of rules and the using of criteria resemble the employment of spectacles. We look through them but not at them. And as a person who looks much at his spectacles betrays that he has difficulties in looking through them, so people who appeal much to principles show that they do not know how to act.

There is a point to be expounded here. I have been arguing in effect that ratiocination is not the general condition of rational behaviour but only one species of it. Yet the traditional associations of the word 'rational' are such that it is commonly assumed that behaviour can only be rational if the overt actions taken are escorted by internal operations of considering and acknowledging the reasons for taking them, i.e., if we preach to ourselves before we practise. 'How else [it would be urged] could principles, rules, reasons, criteria, etc. govern performances, unless the agent thought of them while or before acting?' People equate rational behaviour with premeditated or reasoned behaviour, i.e., behaviour in which the agent internally persuades himself by arguments to do what he does. Among the premisses of these postulated internal arguments will be the formulae expressing the principles, rules, criteria or reasons which govern the resultant intelligent actions. This whole story now seems to me false in fact and refutable in logic. We do not find in fact that we persuade ourselves by arguments to make or appreciate jokes. What sorts of arguments should we use? Yet it certainly requires intelligence or rationality to make and see jokes. But worse than this, when we do, as often happens, go through the process of persuading ourselves to do things, this process is itself one which can be intelligently or stupidly executed. So, if the assumption were correct, it would be necessary for us to start one stage further back and to persuade ourselves with second-order arguments to employ first-order persuasions of a cogent and not of a silly type. And so on *ad infinitum*. The assumption, that is, credits the rationality of any

given performance to the rational execution of some anterior performance, which would in its turn require exactly the same treatment. So no rational performance could ever be begun. Aristotle's Practical Syllogism fails to explain intelligent conduct, since its explanation is circular. For the postulated syllogising would itself need to be intelligently conducted.

What has happened once again is that intellectualists have tried to explain prudence, say, or skill by reference to a piece of acknowledging-that, leaving unexplained the fact that this internal operation would itself have to be cannily executed. They have tried to explain, e.g., practical flair by reference to an intellectual process which, unfortunately for their theory, again requires flair.

We should, before leaving this side of the matter, notice one variant of the doctrine that knowing-how is reducible to a set of knowings-that. It could be argued that as knowing-how always involves the knowing of a rule (in some broad sense of 'rule'), this could be equated with the knowing not of *any* sort of truth, but of the truth of a general hypothetical of the pattern 'whenever so and so, then such and such'. For much, though not all, intelligent behaviour does consist in taking the steps likely to lead to desired results. The knowledge involved might therefore be knowing that when actions of a certain sort are taken in certain situations, results of a certain sort tend to occur.

The answer to this is twofold: (1) a man might accept any set of such hypothetical propositions and still not know how to cook or drive a car. He might even know them well enough to be a good teacher and still be stupid in his own performances. Conversely a girl might be a clever cook who had never considered any such general hypothetical propositions. If she had the knack or flair, she could do without news of the inductive generalisation.

(2) The suggested general hypotheticals are inductive generalisations. But making sound, as distinct from rash inductions is itself an intelligent performance. Knowing how to make inductions cannot await news of this higher-order induction, that when people assemble certain quantities of evidence in certain ways and produce conclusions of certain sorts, those conclusions tend to be true. Else induction could never begin; nor could the suggested higher-order induction have any data.

There is another difficulty. Sometimes we do go through the internal operation of persuading ourselves to do things, just as we often go through the external operation of persuading other people to do things.

Let us suppose that the persuasion is cogent, i.e., that the recipient is convinced by it. What happens then? Does he necessarily do what he has been persuaded to do? Does he necessarily practise what he preaches? Notoriously not. I frequently persuade myself to smoke less, filling and lighting my pipe at the very moment when I am saying 'yes' to the conclusion of the argument. Like Medea, I listen and am convinced, but I do not obey. You say, 'Ah, but you weren't "really" or "effectively" convinced. You said "yes" in some theoretical or academic way, but you were not wise enough to say "yes" in the practical way of putting your pipe back in your pocket.' Certainly. This proves that unwisdom in conduct cannot be defined in terms of the omission of any ratiocinations and consequently that wisdom in conduct cannot be defined solely in terms of the performance of any ratiocinations. The intelligent application in practice of principles, reasons, standards, etc. is not a legatee of the consideration of them in theory; it can and normally does occur without any such consideration. Indeed we could not consider principles of method in theory unless we or others already intelligently applied them in practice. Acknowledging the maxims of a practice presupposes knowing how to perform it. Rules, like birds, must live before they can be stuffed.

(*c*) We certainly can, in respect of many practices, like fishing, cooking and reasoning, extract principles from their applications by people who know how to fish, cook and reason. Hence Izaak Walton, Mrs Beeton and Aristotle. But when we try to express these principles we find that they cannot easily be put in the indicative mood. They fall automatically into the imperative mood. Hence comes the awkwardness for the intellectualist theories of stating what are the truths or facts which we acknowledge when we acknowledge a rule or maxim. We cannot call an imperative a truth or falsehood. The Moral Law refuses to behave like a fact. You cannot affirm or deny Mrs Beeton's recipes. So, in the hope of having it both ways, they tend to speak guardedly of the 'validity' rather than the 'truth' of such regulative propositions, an idiom which itself betrays qualms about the reduction of knowing-how to knowing-that.

What is the use of such formulae if the acknowledgement of them is not a condition of knowing how to act but a derivative product of theorising about the nerves of such knowledge? The answer is simple. They are useful pedagogically, namely, in lessons to those who are still learning how to act. They belong to manuals for novices. They are not quasi-premisses in the postulated self-persuasions of those who know

how to act; for no such self-persuasions occur. They are imperative because they are disciplinary, because they are in the idiom of the mentor. They are banisters for toddlers, i.e., they belong to the methodology and not to the methods of intelligent practices. What logicians have long half-realised about the *venue* and functions of their rule-formulae has yet to be learned by moral philosophers about their imperatives and ought-statements. When they have learned this they will cease to ask such questions as whether conscience is an intuitive or discursive faculty. For knowing how to behave is not a sort of knowing-that, so it is neither an intuitive nor a discursive sort of knowing-that. The question itself is as nonsensical as would be the corresponding question about the sense of humour or the ability to infer. Other bogus ethico-epistemological questions also vanish, like the question whether imperatives or ought-statements are synthetic or analytic, *a priori* or *a posteriori* truths. How should we deal with such questions if posed about Mrs Beeton's recipes?

Another ethical muddle is also cleared up. Philosophers sometimes say that conscience issues imperatives or dictates. Now 'conscience' is an old-fashioned faculty-word, but if the assertion means that the conscientious man exercises his consciousness by issuing propositions or prescriptions, then this is false. Knowing how to behave is exhibited by correct behaviour, just as knowing how to cook is exhibited by palatable dishes. True, the conscientious man may be asked to instruct other agents how to behave, and then he will, if he knows how, publish maxims or specific prescriptions exemplifying maxims. But a man might know how to behave without knowing how to give good advice.

Sometimes a man might give good advice who did not know how to behave. Knowing how to advise about behaviour is not the same thing as knowing how to behave. It requires at least three extra techniques: ability to abstract, ability to express and ability to impress. In another class of cases, a generally conscientious man might, in certain interference-conditions, not know how to behave, but be puzzled and worried about his line of action. He might then remind himself of maxims or prescriptions, i.e., he might resume, for the moment, the adolescent's task of learning how to behave. He would be issuing imperatives or ought-propositions to himself, but he would be doing so just because he did not know how to behave. He would be patching up a gap in his knowledge-how. And he might be bad at self-counsel without being a bad man. He might have a correct 'hunch' that his self-suasions were invalid, though

he could detect no fallacy in them. There would be a circle in the attempted description of conscience as a faculty which issues imperatives; for an imperative is a formula which gives a description or partial definition of what is known when someone knows how to behave. You couldn't define a good chef as one who cites Mrs Beeton's recipes, for these recipes describe how good chefs cook, and anyhow the excellence of a chef is not in his citing but in his cooking. Similarly skill at arguing is not a readiness to quote Aristotle but the ability to argue validly, and it is just this ability some of the principles applied in which were extracted by Aristotle. Moral imperatives and ought-statements have no place in the lives of saints or complete sinners. For saints are not still learning how to behave and complete sinners have not yet begun to learn. So neither experiences scruples. Neither considers maxims.

Logical rules, tactical maxims and technical canons are in the same way helpful only to the half-trained. When a person knows how to do things of a certain sort, we call him 'acute', 'shrewd', 'scrupulous', 'ingenious', 'discerning', 'inventive', 'an expert cook', 'a good general', or 'a good examiner', etc. In doing so we are describing a part of his character, or crediting him with a certain dispositional excellence. Correspondingly when we describe some particular action as clever, witty or wise, we are imputing to the agent the appropriate dispositional excellence. The way in which rules, standards, techniques, criteria, etc. govern his particular performances is one with the way in which his dispositional excellences are actualised in those performances. It is second nature in him to behave thus and the rules etc. are the living nerves of that second nature. To be acute and consistent in reasoning is certainly to apply rules of inference to the propositions considered. But the reasoner does not have both to consider propositions and to cast sidelong glances at a formula; he just considers the propositions efficiently. The rules are the rails of his thinking, not extra termini of it. The good chess-player observes rules and tactical principles, but he does not think of them; he just plays according to them. We observe rules of grammar, style and etiquette in the same way. Socrates was puzzled why the knowledge which constitutes human excellence cannot be imparted. We can now reply. Learning-how differs from learning-that. We can be instructed in truths, we can only be disciplined in methods. Appropriate exercises (corrected by criticisms and inspired by examples and precepts) can inculcate second natures. But knowledge-how cannot be built up by accumulation of pieces of knowledge-that.

An explanatory word is necessary here. 'Discipline' covers two widely disparate processes, namely, habituation and education, or drill and training. A circus seal can be drilled or 'conditioned' into the performance of complicated tricks, much as the recruit is drilled to march and slope arms. Drill results in the production of automatisms, i.e. performances which can be done perfectly without exercising intelligence. This is habituation, the formation of blind habits. But education or training produces not blind habits but intelligent powers. In inculcating a skill I am not training a pupil to do something blindly but to do something intelligently. Drill dispenses with intelligence, training enlarges it. (It is a pity that Aristotle's sensible account of the formation of wise characters has been vitiated by the translator's rendering of ἐθισμός as 'habituation'. Aristotle was talking about how people learn to behave wisely, not how they are drilled into acting mechanically.) When the recruit reaches the stage of learning to shoot and read maps, he is not drilled but taught. He is taught to perform in the right way, i.e., to shoot and to use maps with 'his head'. Unlike the seal he becomes a judge of his own performance—he learns what mistakes are and how to avoid or correct them. He learns how to teach himself and so to better his instructions. He acquires not a habit but a skill (though naturally skills contain habits). (Neglect of this distinction between conditioning and training is what vitiates Hume's account of Induction.) The fact that mathematics, philosophy, tactics, scientific method and literary style cannot be imparted but only inculcated reveals that these too are not bodies of information but branches of knowledge-how. They are not sciences but (in the old sense) disciplines. The experts in them cannot tell us what they know, they can only show what they know by operating with cleverness, skill, elegance or taste. The advance of knowledge does not consist only in the accumulation of discovered truths, but also and chiefly in the cumulative mastery of methods.

One last point. I have, I hope, proved that knowing-how is not reducible to any sandwich of knowing-that, and that our intelligence-predicates are definable in terms of knowing-how. I now want to prove that knowing-that presupposes knowing-how.

(1) To know a truth, I must have discovered or established it. But discovering and establishing are intelligent operations, requiring rules of method, checks, tests, criteria, etc. A scientist or an historian is primarily a man who knows how to decide certain sorts of questions. Only secondarily is he a man who has discovered a lot of facts, i.e., has achieved

successes in his application of these rules etc. (though of course he only learns how to discover through exercises in discovery; he does not begin by perfecting his method and only later go on to have successes in applying it). A scientist, that is, is primarily a knower-how and only secondarily a knower-that. He couldn't discover any particular truths unless he knew how to discover. He could know how to discover, without making this or that particular discovery.

(2) But when I have found out something, even then irrespective of the intelligence exercised in finding it out, I can't be said to have knowledge of the fact unless I can intelligently exploit it. I mean this. I might once have satisfied myself of something, say the distance between Oxford and Henley; and I might have enshrined this in a list of road distances, such that I could on demand reel off the whole list, as I can reel off the multiplication table. So in this sense I have not forgotten what I once found out. But if, when told that Nettlebed is so far out from Henley, I cannot tell you how far Nettlebed is from Oxford, or if, when shown a local map, I can see that Oxford to Banbury is about as far as Oxford to Henley but still cannot tell you how far Oxford is from Banbury or criticise false estimates given by others, you would say that I don't know the distance any longer, i.e., that I have forgotten it or that I have stowed it away in a corner where it is not available.

Effective possession of a piece of knowledge-that involves knowing how to use that knowledge, when required, for the solution of other theoretical or practical problems. There is a distinction between the museum-possession and the workshop-possession of knowledge. A silly person can be stocked with information, yet never know how to answer particular questions.

The uneducated public erroneously equates education with the imparting of knowing-that. Philosophers have not hitherto made it very clear what its error is. I hope I have provided part of the correction.