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IS EPISTEMIC LOGIC POSSIBLE?

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1. *The Problem of Epistemic Logic** Can there be such a thing as epistemic logic? The question is important. It is also unclear. What is meant by 'epistemic logic'?

Unfortunately, in this matter it is easier to find examples than definitions. Notable examples of "epistemic logic" have been proposed by von Wright [1], Lemmon [2], and Hintikka [3], among others. In order to get an example, one needs, apparently, only to take one or the other of the available systems of "alethic modal logic" and to substitute an epistemic operator such as 'it is known that' for the alethic operator 'necessarily'. Thus the theorem "If necessarily p then p" ("$Np \supset p$"), which is common to all the known systems of alethic modal logic, is supplanted in all the proposed systems of epistemic modal logic by "If p is known then p" ("$Kp \supset p$"). We shall call this the Epistemic Theorem, or ET. A Reiteration Theorem such as "If necessarily p, then necessarily necessarily p" ("$Np \supset NpNp$"), which distinguishes Lewis's system S4 from some others also, in the form "If a knows that p, then a knows that a knows that p" ("$Kap \supset KaKap$"), distinguishes Hintikka's system from the others. The trouble, as we shall see, is that it is not at all clear in what sense of 'logic' such examples are *logic* or in what sense of 'know' they are logics of knowing. Indeed, we shall see that every example faces the following dilemma: either it does not have anything especially to do with knowledge and is therefore epistemic in name only, or it does and is, in consequence, logic in name only.

Lacking any clear definition of epistemic logic we shall have to proffer our own. One relatively clear definition would be that epistemic logic consists of *logical truths in which epistemic terms* (such as 'know' and terms

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contextually definable in terms of 'know') *occur essentially*.[1] The reference to logical truths here has the purpose of requiring epistemic logic to be genuinely logic, while the reference to essential occurrences of epistemic terms requires it to be genuinely epistemic. It is, of course, only logical constants that occur essentially. Hence the effect of this definition, otherwise stated, is to make the question about epistemic logic equivalent to the question whether epistemic terms are ever logical constants.

This definition not only requires epistemic logic to be both logic and about knowing, as it should, but it also, as it should, gives us a criterion by which to distinguish ordinary truths of logic from distinctive truths of epistemic logic. We need only look to see whether the epistemic terms occur essentially as logical constants or whether they occur vacuously as, say, mere predicates of persons. Thus, the definition gives us a way to distinguish between:

(a) If a knows that p, then a knows that $p(Kap \supset Kap)$
(b) If a knows that p, then $p(Kap \supset p)$

Both of these may be admitted to be logical truths, but (a) is merely an instance of the ordinary logical truth "If q then q" containing two vacuous occurrences of the term 'know'. Of the two, only (b) (in which replacement of 'knows that' by, say, 'believes that' would make (b) false of some person and some statement) can plausibly be counted a truth of *epistemic* logic. In (a), 'knows that' is a mere predicate of a; only in (b) does it have any resemblance to a logical constant.

If (b) is an irreducible truth of epistemic logic, then, of course, our original question must be answered affirmatively: here is at least one distinctive epistemic truth. And although we shall raise some questions near the end about (b) let us admit that (b) is a convincing case, let it pass, and revise our original question accordingly, and it now becomes "Are there any *more* such truths?" After all, one theorem doth not a system of logic make.

E. J. Lemmon, a pioneer in epistemic logic, comes very close to confessing that there are not. He says [2, p. 78] "It begins to look as though a realistic logic of knowing contains no distinctive theorems apart from (b) and its logical consequences." The reason it looks this way is that all candidates for epistemic theoremhood other than (b) have so far run afoul

1. An equivalent definition could, of course, be given by talking about the validity of arguments. This definition is modelled on Quine's famous definition of 'logical truth', [4, p. 1]. A definition in fundamental respects like Quine's is sketched by von Wright in [5]; Lemmon [2] seems content with the looser (and unexplicated) notion of "analyticity"; Hintikka evidently prefers a definition in terms of "possible worlds" [3, p. 41], a notion which is not only problematic but of which he makes a peculiar use. Unlike Leibniz, who required logic to be true in *all* possible worlds, Hintikka is satisfied if it is true in only *one*. I cannot here argue the question of the nature of logical truth, though, of course, everything depends on it.

of what Quine calls "referential opacity": they resist the extensionality principle that truth functional equivalents are substitutable *salva veritatae.* Thus:

(c) $(p \supset q) \supset (Kap \supset Kaq)$

is provable in most systems of epistemic logic. But suppose that "p" is "Bugs Bunny is a rabbit" and "q" is "Bugs Bunny is an *oryctolagus cuniculus.*" Then "$p \supset q$" is true. Yet a man who knows rabbits but no Latin may know that p without knowing that q: that is, "Kap" may be true even though "Kaq" is not.[2]

One is tempted to suppose that such situations (i.e. (c)) can be saved simply by informing a of the fact that $p \supset q$, the presupposition being that he fails to know that q only because he does not know that $p \supset q$. In other words, one is tempted to replace (c) by the weaker statement:

(d) $Ka(p \supset q) \supset (Kap \supset Kaq)$

But although an exception to (d) certainly seems less likely, it too is not without exception. Any supposition to the contrary fails to take account of the existence of what might be called Logically Obtuse Men (for short, LOMs), these being men who do not always deduce (come to know) what obviously follows from what they do know. A LOM, for example, is any man who fails to recognize that q, although he knows that p and although it is true that if p then q, thus violating the consequence of (c):

(e) $(Kap \,\&\, (p \supset q)) \supset Kaq$

Or, a LOM is the man who, by being "too stupid to put two and two together" falsifies even so plausible a proposition as:

(f) $Ka(p \,\&\, q) \equiv (Kap \,\&\, Kaq)$

"Referential opacity" and "the Logically Obtuse Man" are but two labels denoting the fact that there are knowers and knowledge constituting counterexamples to every extant theorem (provable result) of every epistemic logic (excluding, of course (b)). The question of the possibility of epistemic logic is whether there is any way to explain these counterexamples away. In what follows we shall examine attempts to do so by Lemmon and von Wright and, in much more detail, the attempts by Hintikka, whose book represents the most plausible and sustained effort yet to formulate, interpret, and defend an epistemic logic.[3] We shall see that all

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2. For a stricter definition of referential opacity, see Quine's [6].

3. I shall not here treat Hintikka's quantification theory, to which the entire issue of *Nôus*, Vol. I, No. 1 is devoted. But I would make comparable objections. Roughly, in connection with quantification, referential opacity is marked by failures of substitutivity of identities. Hintikka confesses on p. 52 of the *Nôus* issue however, that his treatment of quantification in epistemic contexts assumes: $(x)(y)(x=y \supset Ka(x=y))$.
But whether this is true is precisely the question at issue.

these attempts either: (1) deny the counterexamples by, in effect, making the term 'know' vacuous, or (2) deny that epistemic theorems need to be true. They therefore leave us with either of two very urgent questions: (1) In what sense is epistemic logic *epistemic*? or (2) In what sense is it *logic*?

2. *Logically Perspicacious Knowers* The epistemic logician's favorite remedy for the malady we have labeled "logical obtuseness" is a prescription originally concocted by Lemmon. It has been variously called the "rational man" or the "logically omniscient knower", but it shall here be known as the Logically Perspicacious Knower (for short, the LPK). Unlike the LOM, the LPK *always* lives up to the theorems of epistemic logic. Why? Simply because he is the knower the epistemic logician has in mind when he formulates epistemic logic. Lemmon puts it this way: "We must view epistemic logic as giving the logical truths concerning a logical fiction, a sort of 'ideal knower', the rational man", see [7]. Unfortunately, this medicine has unpleasant side effects. If epistemic logic is a logic of LPKs alone, then it isn't a logic for normal men. It therefore hasn't anything to do with what we normally call "knowledge", a thing possessed by normal men who are not always as perspicacious as might be desired.

It will be worthwhile to put this point more formally. In effect, Lemmon is restricting the range of the variable name '*a*' in the expression '*Kap*' to LPKs. But since all of us mortal humans are on occasion and to some degree logically obtuse, this eliminates actual knowers from the range of values of the personal variables in epistemic statements. Thus epistemic formulae have no interpretation in terms of, and are strictly meaningless when applied to, actual knowers. Hence Lemmon's qualification "realistic" and Hintikka's confession that "our results are not directly applicable to what is true or false in the actual world of ours. They tell us something definite about the truth and falsity of statements only in a world in which everybody follows the consequences of what he knows as far as they lead him" [3, p. 36].

The LPK thus exacts a great price. What is worse, the epistemic logician gets very little for his money. To be sure, by forbidding logic to be about LOMs the epistemic logician guarantees that there are no beings concerning whom his theorems are ever *false*. But since (saving God, and surely we can leave *Him* out of the question) there are no LPKs, he does so only by making it doubtful whether there are any beings of whom these theorems are ever *true*. Lemmon says that the LPK is a "fiction". The final cost of the LPK, then, is the price of an ontology of fictions, a very high price indeed!

Nevertheless, let us suppose the price paid. What has been purchased? So far we have pretended that we would know an LPK if we met him. But what are his distinguishing features? To ask this question is to realize immediately that we know nothing about the LPK except that he is, by definition, the being of whom the theorems of epistemic logic are true. But if that is so, to say that the theorems of epistemic logic are true of the LPK is merely to say that they are true of whomever they are true of: We can know whether we have bought the right medicine only after we have found out whether it cures us.

Hintikka enlarges this circle a little, but not much. He defines the LPK as a being who knows all the "logical consequences of what he knows" (p. 34). This means, from all appearances, merely that if a knows that p, and if "q" is a logical consequence of "p", then a knows that q, which is one of Hintikka's theorems (p. 30) and a special case of (e) above. Thus, to say that the LPK knows the logical consequences of what he knows is merely to say that he is the person of whom (e) is true. Or, in general, to say that the theorems of epistemic logic are true of the LPK is merely to say that they are the theorems of epistemic logic.

We understand the LPK, therefore, only if we understand epistemic logic, of which the LPK was supposed to make sense. Therefore we do not understand the LPK, except to this extent: whatever he may be, actually existing knowers, being more or less logically obtuse, are not examples of him. But the only sense of the word 'know' which is familiar to us, is defined precisely in terms of such actual knowers. We are therefore left with the question, In what sense of 'know' does epistemic logic have anything to do with knowing?

3. *Knowledge*$_1$ *and Knowledge*$_2$ As the most obvious way to respond to the fact that there are actual knowers who pose counterexamples to epistemic logic is to answer that there are possible knowers who do not, so the most obvious way to respond to the fact there is a sense of 'know' for which its theorems turn out to be false is to counter that there is a sense of 'know' for which they do not. Von Wright, apparently the first to adopt this way out, says "It is important to distinguish two interpretations of the phrase 'it is known (verified) that a', viz.

i 'the proposition expressed by a is known to be true (verified)', and
ii 'It is known (verified) that a expresses a true proposition.'

In this essay we shall throughout understand the phrase 'it is known (verified) that a' in the interpretation i above." [1, p. 29] If the reader is not clear as to what distinction von Wright intends here, he can perhaps take some comfort in the fact that there are at least two who are not clear. But we shall shortly return to this question.

Hintikka joins von Wright in this business of distinguishing two senses of 'know'. After announcing "By means of my rules it is readily seen that "$Kap \supset Kaq$" is valid as soon as p logically implies q in our ordinary logic" (p. 30), and then noting that there may be persons who know the axioms of a mathematical system but not all its theorems (p. 31), Hintikka distinguishes "active" from "virtual" knowledge (p. 34) and says that people always *virtually* know the logical consequences of what they know although they may not *actively* know them.[4]

Making a distinction to resolve a contradiction is an old and respectable practice in philosophy. But it is not sufficient to make a distinction. It is needed also to make it clear. The cryptic remark already quoted is, however, all that von Wright has to say by way of explanation of his distinction. His very next words are "As an undefined epistemic modality we introduce the concept *known to be true or verified*"—after which he proceeds to explain his symbols by giving us more symbols, scarcely pausing to note that being genuinely *epistemic* would already be a way of being defined in terms of knowledge.[5] Unfortunately, what is wanted is not formal elaboration but informal explanation. We need an *interpretation* of von Wright's epistemic modality, but this is precisely what von Wright does not supply. Nor, as we shall see in greater detail later, does Hintikka do any better by virtual knowledge.

As a defense of epistemic logic this is, of course, circular. It merely secures the theorems of epistemic logic by fiat: they are the truths about knowledge in the sence of 'know', whatever it may turn out to be, for which they are the truths about knowledge.

It is, however, not really the circularity that is objectionable. What is objectionable is the use of one unclear term to elucidate another unclear term. We started out by trying to make sense of epistemic logic. We were offered knowledge$_1$ and virtual knowledge. But if these have no definition except in terms of epistemic logic then we do not understand them unless we first understand epistemic logic: Thus we do not understand them.

It should not be concluded from the preceding remarks that the distinction von Wright and Hintikka intend does not exist. On the contrary, it corresponds exactly to Quine's distinction between referentially opaque and referentially transparent uses of the term 'know', which is roughly that a term '*Ka*' is used transparently in case the following is logically true and not otherwise:

(g) $(p \equiv q) \equiv (Kap \equiv Kaq)$

Knowledge$_1$ and virtual knowledge are, evidently, knowledge in the transparent sense. The difference, though it is considerable, is only that the

4. Hintikka also puts this by saying that there is a "virtual implication" between "*Kap*" and "*Kaq*" whenever "*p* logically implies *q*", an expression that seems to me to commit so many sins as to be hopeless. See note 6.

5. Evidently, for a modal logician what makes modal logic to be *logic* is its purely formal features; what makes it to be *modal* (i.e. alethic, epistemic, doxastic, deontic, or whatever) is the particular interpretation to be assigned to the "uninterpreted" modal operator. The result is that modal logics are *interpreted formalisms*, a notion I find paradoxical. This paradox is not generally noted. Nor is the fact that the capacity for variation of interpretation (in terms of such diverse notions as necessity, knowledge, belief, obligation or whatever) is very good evidence that the modal operator is not a logical constant of *any* kind.

distinction is now made by reference to truth functional logic, which is unproblematic and which we understand, whereas before it was made by reference to epistemic logic which is problematic, and which we do not understand.

Understood as knowledge in the transparent sense, then, the distinction is clear. Unfortunately, the epistemic logicians cannot be pleased to have it thus clarified. For, first, they have proposed their distinction as a solution to the problem of epistemic logic. But since that problem is precisely the existence of referentially opaque uses of the term 'know' the putative solutions amount merely to a restatement of the problem. Secondly, and more seriously, the solution thus clarified constitutes an implicit reduction of epistemic to ordinary truth functional logic. For, in essence, to say that the '*Ka*' of epistemic logic is referentially transparent throughout is to say that its presence makes no difference to the truth functionality of the contexts in which it occurs. This may perhaps be made clear as follows: Call expressions of the form '*Kap*', "epistemic sentences"; their parts '*Ka*' and the like, "epistemic operators", and their parts '*p*' and the like, "propositional contents". Then, using this purely schematic language, we may say that the transparent epistemic operator is the one that makes no *logical* (in the sense that it makes no *truth-value*) difference to the compounds in which it occurs: That is, truth functionally speaking, the transparent sense of 'know' is the logically vacuous sense.

We therefore come to precisely the same conclusion as we reached in connection with the LPK: epistemic logic as a logic of virtual knowledge or knowledge_1 is simply logic in irrelevant and misleading dress. This is not surprising: the LPK was, of course, simply any being who had knowledge in the transparent sense alone.

4. *Defensibility* The LPK preserved the logical truth of the theorems of epistemic logic by being that individual for whom, by stipulation, they were true. The notion of virtual knowledge preserved their logical truth by being that sense of 'know' for which they were, again by stipulation, true. Both stipulations were intended to preserve the logical truth of the theorems of epistemic logic, and both did, although they managed this only by making its relevance to actual knowers and active knowledge problematic, and by reducing epistemic logic to logic. Hintikka, who enthusiastically endorses both notions, attempts therefore to supplement them by adding a unique defense and interpretation of epistemic logic which is designed to secure its relevance to knowledge. Since the essence of this effort, however, is to reject the requirement that the theorems of epistemic logic be *true*, the result is merely to pose the question "In what sense is 'epistemic logic' logic?"

Hintikka begins his excellent and much discussed book by saying "The word 'logic' which occurs in the subtitle of this work is to be taken seriously. My first aim is to formulate and to defend explicit criteria of consistency" (p. 31). He has no sooner begun to formulate these criteria than he begs leave to "reinterpret consistency as defensibility" (p. 31)—although he does not retract his claim that the term 'logic' is to be taken seriously. Consistency has, of course, to do with truth, and therefore the terminological shift signals the surrender of the notion of truth, as Hintikka informs us that the rules of his epistemic logic "are not concerned with the *truth* of statements at all; they merely tell us that certain adjunctions preserve the defensibility of sets of sentences." (p. 32)

The cause of this terminological change is the fact that the very first theorem Hintikka is able to prove is simply false, and he knows it. He says "By means of my rules it is readily seen that "$Kap \supset Kaq$" is valid as soon as p logically implies q in our ordinary propositional logic.[6] (Actually, what is provable in Hintikka's system is the much stronger statement (e) "$(Kap \ \& \ (p \supset q)) \supset Kaq$". But in one respect this distinction does not matter: both the stronger and the weaker claim are false.) As Hintikka himself immediately recognizes, however, "it is clearly inadmissable to infer 'he knows that q' from 'he knows that p' . . . for the person in question may fail to see that p entails q"; (It would be equally inadmissable to make the inference were we to replace "p entails q" by "$p \supset q$".) Thus, in place of the term 'valid' (his equivalent of 'logically true') Hintikka uses the neologism '*self-sustaining*'. Theorems of epistemic logic are to be called "self-sustaining", which means that their denials are, to employ another neologism of Hintikka's *indefensible* (p. 32). Thus, to put it using Hintikka's idiosyncratic "model-set" language, the claim that (e) is a theorem means that the set[7]

(h) $\{$"Kap", $p \supset q$, "$-Kaq$"$\}$

(which, notice, is composed of the two conjuncts of the antecedent of (e) and the denial of (e)'s consequent) is indefensible.[8]

6. Presumably Hintikka means by "p logically implies q", that "$p \supset q$" is a *tautology* (logical truth), not merely that "$p \supset q$" is *true*. I take it that he would express the latter by saying simply "p implies q", leaving the word 'logically' out of it. His expression "p virtually implies q", I therefore take to refer to a special epistemic logical relation which exists between two espitemic statements "Kap" and "Kaq" whenever "$p \supset q$" is a tautology. But I am not at all sure that Hintikka is perfectly scrupulous in observing the use-mention distinction.

7. I really have not been able to discern any consistent principle governing Hintikka's use of quotation marks. In the description of sets, he usually quotes the epistemic statements but not the others, a practice I follow here. But a statement in quotes is *named* not *asserted*, which raises the question whether names of statements, or statements, or both are elements of "model sets." This in turn raises a question of interpreting the claim that "model" sets are "inconsistent" or "indefensible." Names of statements cannot be incompatible with statements or with other names of statements.

8. A model set formulation of the claim that "$p \supset p$" is a theorem would be that the set $\{p, -p\}$ is inconsistent [3, p. 57], which presumably means that the conjunction "$p \ \& \ -p$" of its elements is a contradiction.

But what does 'indefensible' mean? To be sure, it is meant to be an epistemic analogue of 'inconsistent', as 'self-sustaining' is meant to be an epistemic analogue of 'valid'. But the analogy is not exact, and we really have a better idea of what indefensibility is *not* than we have of what it *is*. We know only that, despite the evident analogy, 'indefensible' does *not* mean 'inconsistent': (h) for example, is not inconsistent. On the contrary, Hintikka says that its elements may all be "simultaneously true" (p. 31). As Chisholm observes, "the sentences that Hintikka calls 'indefensible' may be true and, indeed may be known to be true" [7, p. 780]. This, has, of course, the paradoxical consequence that theorems of epistemic logic may be false, a result which makes it especially important to understand what 'indefensibility' does mean. Unfortunately, as Chisholm also observes, "the author leaves this difficult question pretty much to the reader" [7, p. 780].

It is true that Hintikka makes some effort to explain it. In fact, he makes two efforts. One effort is to define defensibility as "immunity to certain kinds of criticism", an expression he endeavors to unpack by talking about a person who is immune because he knows all the "logical consequences of what he knows" (p. 31) (or at least acknowledges them when they are pointed out to him).[9] In short, one effort is to explicate indefensibility by invoking LPK's: indefensibility is inconsistency for LPKs (self-sustenance is logical truth for an LPK). Another effort is to present indefensibility as a property of denials that a person knows all the logical consequences "implicit" in what he knows. This makes indefensibility to consist in denying that any man "virtually knows" all the logical consequences of what he knows, or, as a wag might put it, it makes indefensibility to consist in denying a theorem of epistemic logic. The two efforts, then, are to invoke the already discussed notions of the LPK and virtual knowledge. But if the notion of indefensibility is reducible to the LPK or to virtual knowledge, we already know what objections are to be made to it.

Sensing that these two attempts are inadequate, Hintikka emulates von Wright and takes refuge in the formalities. Referring to his formal rules, he says: "The notion of defensibility is therefore exactly as intuitive or as precise as these rules. Any objections to my notions have to be directed against them." (p. 34)

Let us ignore the familiar circularity which requires us to understand epistemic logic in order to understand the interpretation which is supposed to make sense of it for us. Let us, instead, take Hintikka's advice and *examine* his rules.

Consider first, the pivotal rule which Hintikka calls (A.PK*), and which reads as follows:

If a set λ of sentences is defensible and if "Kap_1" $\epsilon\lambda$ "Kap_2" $\epsilon\lambda$, ... , "Kap_k" $\epsilon\lambda$, "Paq" $\epsilon\lambda$, then the set $\{p_1, p_2, \ldots, p_k, q\}$ is also defensible.

9. It seems likely that Hintikka has confused (e) "$(Kap \,\&\, (p \supset q)) \supset Kaq$" with the very different (weaker) proposition "$(Kap \,\&\, Ka(p \supset q)) \supset Kaq$".

The expression *'Paq'*, which we here encounter, is to be read: "it is possible for all that *a* knows that *q*." It is contexually defined by means of another of Hintikka's rules as equivalent to *'-Ka-q'* which is to be read "*a* does not know that not *q*" (p. 3 ff). If we henceforth include *'Pa'* in what we call an "epistemic operator", then we may say that inspection of the rule (A.PK*) reveals it to be, in essence, an instruction to test the *defensibility* of a set of epistemic sentences by inquiring (using normal truth functional means which are made available by Hintikka's other rules) (p. 69) into the *consistency* of the set's propositional contents, now bereft of their containing epistemic operators. The rule thus makes the entire logical interest in an epistemic set to devolve upon its propositional contents. In effect it says "Throw away the troublesome operators *'Pa'* and *'Ka'* so that you can get to what matters logically", "where what matters logically" are evidently the *'p'* and *'q'*. The motivation for introducing the new expression *'Pa'* is to facilitate this process of getting at what is of logical interest by bringing the negation signs from outside an epistemic operator inside to bear on its propositional contents. Thus, Chisholm remarks that "*Paq*" merely means "*q* is logically compatible with the set of all those sentences *t* such that *a* knows that *t* is true." [7, p. 779]

Hintikka offers two (though, he says, provably equivalent) formulations of his epistemic logic. One is by means of "rules" such as (A.PK*); the other is in terms of "conditions" for what he calls "alternative sets", alternative sets being sets of statements which represent *a* as knowing "at least as much as" he is represented as knowing in the sets to which they are alternatives. (p. 52) This difference in formulation makes no difference to the question at hand. If anything, the new formulation makes the point clearer.

In the new formulation, conditions (C.KK*) and (C.P*) (see p. 70) jointly do the work of rule (A.PKK*), and determine a procedure that Hintikka calls a "reductive strategy" (p. 57). It is well named, being reductive in two senses: It proceeds by reducing knowledge claims to their propositional contents, and it is an epistemic version of *reductio ad absurdum*. On pages 58-59 Hintikka uses it to prove (f) "$(Kap \,\&\, Kaq) \equiv Ka(p \,\&\, q)$". First he assumes that "*Kap*", "*Kaq*", and "$-Ka(p \,\&\, q)$" are all members of a set μ. Then, using the definition of "*-Kaq*" as "*Pa-q*", the set μ is rewritten as {"*Kap*", "*Kaq*", "$Pa\text{-}(p \,\&\, q)$"}. Next an "alternative set", μ^*, representing a "possible world" in which *a* knows "at least as much as he does in" μ, is formed by dropping, in accordance with (C.KK*), the *'Ka'* from the two left hand elements, and, in accordance with (C.P*), the *'Pa'* from the right hand element of the rewritten μ. The result, μ^*, is the set $\{p,\ q\ \text{-}(p \,\&\, q)\}$, which is explicitly contradictory. Thus, by means of (C.P*) and (C.KK*), the original assumption that *a* knows that *p*, and that *q*, but does not know that *p* & *q* has yielded an explicit contradiction. Hintikka claims that this procedure constitutes a proof that the original set, μ, is indefensible, and therefore a *reductio ad absurdum* proof that (f) is self-sustaining (by definition of 'self-sustaining').

Clearly, *this procedure makes the indefensibility of a set of epistemic* *sentences to consist in the inconsistency of their propositional contents.* The use of the conditions (C.KK*) and (C.P*) is merely to facilitate the discovery of this contentual inconsistency. Clearly, also, this procedure makes the self-sustenance of an epistemic theorem to consist in the fact that removal of its epistemic operators (sometimes after '*Ka*' operators have been judiciously replaced by '*Pa*' operators, or *vice versa*) yields a truth functional tautology. For example, the above claim that (f) is self-sustaining amounts to no more than the claim that "$(p \,\&\, q) \supset (p \,\&\, q)$" is a tautology, and the claim that (e) is a theorem amounts to the claim that "$(p \,\&\, (p \supset q)) \supset q$" is a tautology. In short, a theorem of epistemic logic is any statement that turns out to be a theorem of truth functional logic when the epistemic terms have been judiciously eliminated.

Indefensibility thus understood is clear, and so therefore is epistemic logic. What is not clear is why anyone would suppose epistemic logic, thus understood, to be, in any significant sense, epistemic. It is merely logic applied to the propositional contents of what happen to be knowledge claims.

The only explanation that comes to mind is that Hintikka confuses epistemic sentences with their propositional contents. For he uncritically supposes that if a set of contained propositions is logically objectionable, the set of containing epistemic sentences is objectionable as well. Indeed, the assumption is the basis of his "proof" procedure. Thus, in the proof outlined above, the original set μ is said to be indefensible solely on the grounds that the alternative set μ^* is inconsistent. This assumption, which is plausible so long as the epistemic operators are all '*Ka*' operators without negation signs (it is not possible that $Ka(p \,\&\, -p)$, for example), loses all plausibility when '*Pa*' operators and denials of '*Ka*' operators are introduced.

The mistake is made explicit in Hintikka's informal commentary on this "proof", which, he says, is best thought of as "an abortive attempt to describe consistently a state of affairs" in which someone knows that p and knows that q but does not know that p and q (p. 58). But, there is no difficulty at all in consistently describing such a state of affairs; indeed it is not too hard to discover an actual instance. The set {"*Kap*", "*Kaq*", "$-Ka(p \,\&\, q)$"} is logically unobjectionable: What is objectionable is the set $\{p, q, -(p \,\&\, q)\}$. In earlier pages, Hintikka was clearer that an indefensible set may be composed of elements all of which are "simultaneously true." But unlike in earlier pages, he is not at this point worried about securing the *truth* of his theorems. He is concerned solely to secure their relevance to *knowledge*.

It is this mistake which Chisholm means to bring out when he comments that Hintikka's term 'indefensible' is *misleading*, explaining that [7, p. 780 f]

> If I know that you do not accept some of the consequences of some of the things that you know or that you believe something that is logically false, and if I say as much, then my true sentence is 'indefensible'. Ordinarily, however, we should say that what is indefensible in such a situation is not my own sentence, or statement of it (questions of etiquette aside), but what

> it is that I am describing, namely your neglect to draw all the consequences of what you know, or your acceptance of something that is logically false.

This is exactly right, and it is devastating, although Chisholm himself does not seem to realize how decisive a blow he has struck. Chisholm adds that 'shocking', 'disappointing', and the like would be less misleading terms. Not so: if *a* does not know all the logical consequences of what he knows, and if I say so, it is still not *my statement* but *a*'s stupidity which is "disappointing", "shocking", "scandalous", or whatever.

Confusion so deep will not be so easily eradicated. The question is not the choice of condemnatory words, but *what* is to be condemned by means of those words? The painful fact is that confusion as to the proper subject of epistemic logical predicates is fundamental to Hintikka's "proof" procedures. Wanting to appraise not merely propositional contents but epistemic statements, he condemns descriptions of failures of knowledge when it is only the failures of knowledge that can be condemned. This is exactly analogous to accusing *Jones* of asserting a contradiction because he has reported (by, perhaps quoting Smith) that *Smith* has uttered one. In short, Hintikka's "proof" procedure requires systematic commission of the use-mention fallacy.

The preceding argument ignores Hintikka's rule (A.PKK*), of which he would surely remind us, and which reads as follows:

If a set λ of sentences is defensible and if "Kap_1" $\epsilon\lambda$, "Kap_2" $\epsilon\lambda$, . . . , "Kap_k" $\epsilon\lambda$, "Paq" $\epsilon\lambda$, then the set {"Kap_1," "Kap_2," . . . , "Kap_k," q} is also defensible.

According to Hintikka, "the applicability of (A.PKK*) as distinguished from (A.PK*) presupposes that a statement of the form "*a* knows that *p*" can be criticized not only by discussing whether *p* is true, but also by discussing whether the bearer of the term *a* is in a position or condition really to know it." (p. 18)[10] If, then, there are any distinctive, irreducible epistemic theorems, they are theorems whose proofs essentially involve the rule (A.PKK*).

Hintikka proves one such theorem, the Reiteration Theorem (RT):

(i) $Kap \supset KaKap$

Straightforwardly interpreted, the RT expresses the Cartesian doctrine of the self-illumination of the knowing mind, according to which any man who knows something also knows that he knows it. But Hintikka's RT cannot be straightforwardly interpreted. A person *can*, Hintikka admits, both know something and also fail to recognize that he knows it.[11] Thus the RT does *not* mean that the set

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10. Note the tacit confession that (A.PK*) makes the question whether *Kap* to consist in the question whether *p*.

11. See pp. 117 ff. Nevertheless Hintikka talks in Chapter IV as though "*KaKap*" were a *logical* consequence of "*Kap*".

(j) {"*Kap*," "*-KaKap*"}

is inconsistent. It means only that (j) is *indefensible*.

But what does *that* mean? We have thus far been able to make sense out of Hintikka's notion of indefensibility by interpreting it as the inconsistency of propositional contents. That interpretation is no longer available to us. If it were, then the claim that set (j) and its equivalent set {"*Kap*," "*Pa-Kap*"} are *indefensible* would amount to the claim that the set {*p*, "*-Kap*"} is *inconsistent*—which would be tantamount to the claim that "$p \supset Kap$" ("Everything true is known by *a*" or "*a* is omniscient") is *self-sustaining*. Not only is this absurd (though it is very agreeable to have logic assure one of omniscience), but it cannot have been intended by Hintikka.[12] For then the *whole* of epistemic logic, including (A.PKK*), would reduce to ordinary truth functional logic. The application of (A.PKK*), like (A.PK*), would "presuppose" only that "*p*" is true.

'Indefensibility' cannot, therefore, (nor can Hintikka want it to) mean the same thing in connection with (A.PKK*) and the RT, as it does in connection with (A.PK*) and the ET. Hintikka himself unembarrassedly makes this point when he says that there is no one interpretation of 'defensible' or 'know' which will satisfy both (A.PK*) and (A.PKK*), it being necessary to interpret the term one way in connection with the one and another way in connection with the other. (A.PKK*) is designed to express a "primary" sense of the word 'know' while (A.PK*) captures a "secondary" sense (p. 19, ff).

But if this is so, the fundamental terms of Hintikka's epistemic logic are equivocal, and his epistemic logic fails to reduce to logic pure and simple when (A.PKK*) is added only because he has violated the fundamental rule of good logical practice: have distinct symbols for distinct logical concepts. Hintikka has an embarrassment of riches: not one, but two epistemic logics. Of one of these we have so far made some sense. It is the one which deals with 'know' in the secondary sense, which, for the truth of "*Kap*", presupposes only the truth of "*p*", and which is, therefore, equivalent to ordinary truth functional logic. Of the other we have yet to make any sense. Perhaps we may do better in the next section.

5. *Epistemic Logic and Performatives* On the assumption that logic has essentially to do with truth and falsity, we have pretended that Hintikka's epistemic logic must have been intended as a logic of *statements*, a statement being definable as the sort of thing of which 'ture' or 'false' can be predicated. But the decision to replace 'inconsistent' by 'indefensible' and the consequent announcement that epistemic logic "tells us nothing about truth and falsity" means that it is not meant to be a logic of statements after all. On the contrary, Hintikka says that it is meant as a logic of "sentences" whose rules "merely tell us that certain adjunctions always preserve the defensibility of sets of sentences." (p. 32)

12. Hintikka comes close, however, to proving an omniscience theorem on p. 79, where he says that it is *epistemically* indefensible to say "*p* & *-Kap*".

If we employ the old but honorable distinction between the *act of asserting something* and the *something* thereby asserted, calling the former a "sentence" and latter a "statement", we shall have a rough idea of what Hintikka means by the distinction. For Hintikka, a sentence is an act of making a statement; the statement is what is made. Indefensibility is a property, not of the statement made, but of the making of it. It is a point which Hintikka also puts by saying that indefensibility is "of a performatory character" (p. 77), using Austin's term to refer to the performance of "uttering". Thus, when he says "If you want to see in the equivalence [of "*Kap*" with "*KaKap*"] a more interesting truth [than Cartesianism], you may try the quasi-performatory character of 'I know' statements rather than the transparency of our minds" (p. 111), he means, to quote Chisholm, that the RT says "not that knowing in any sense implies knowing that one knows; it is rather that if a man does not know that he knows . . . then he shouldn't *say* that he knows."

Previously we wondered how a true statement could be objectionable. Now we have a partial answer: it is not the statement but the act of making it that is objectionable. This answer is, however, only partial. We can all understand that there may be nothing wrong with what-is-said even when there is something wrong with saying it. One must not, for example, remind an ugly woman of her affliction. But as Chisholm also observes, Hintikka is not discussing tact. He claims to be talking logic [7, p. 786 f.].

To account for his insistence on this point, we must realize that Hintikka is speaking, not merely of speech acts, but of speech acts *in the first person*. His paradigm case is the person who claims in one breath to know that p and in the other not to know that he knows it, (and, we shall see, the person who says "I know that $p, p \supset q$, but I do not know that q"). In pedestrian parlence, such a person would be accused of "contradicting himself."[13] Hintikka's epistemic logic is a monument to his conviction that this usage embodies sound logical intuitions.

He realizes, however, that such statements are not, by ordinary criteria of logic, "inconsistent". For suppose the person in question is a. Then a having said:

(k) Kip & $-KiKip$

(where "Kip" = "I know that p") has said:

(l) Kap & $-KaKap$.

But (l) may, as Hintikka freely acknowledges, be true, it being entirely possible for a to know something and not yet to have realized self-consciously that he does. Therefore, since $a = i$, (k) may also be true. But what can be true cannot be inconsistent. Therefore, neither (k) nor (l) is inconsistent.

His loyalties thus divided between plain talk and plain logic, he grasps

13. See Hintikka's Section (4.5) ff for the basis of the following remarks.

the horns and resolves his dilemma by saying that the above are objectionable *as sentences* though not *as statements*, indefensible though not inconsistent. Here Hintikka correctly uses 'statement' to refer to something independent of speaker, and incorrectly uses 'sentence' to refer to something that is not (he should have used 'sentence-token'), and his point is that what is objectionable is for *a to say* (k), and therefore (l), *about himself*. Someone else, say b ($b \neq a$), could assert (l) about a, but a cannot assert (l) about himself, because, by so doing, he would be asserting (k). The difference, in short, lies wholly on the side of the speaker and in his speech act.

This limitation to the first person is a point on which it is easy to be misled. Since the first person pronoun makes statement dependence explicit, one might think that Hintikka ought to formulate his results by using the first person pronoun. Instead, he throughout uses the impersonal variable name '*a*' in deliberate preference to the personal pronoun 'I', and he vigorously insists that his results are not valid merely for the "first person singular pronoun" (p. 68). Nevertheless, they are valid merely for the *first person*. Hintikka is capitalizing on the fact that there are *two modes* of first person reference. We may call them Plebian first person and Royal first person. Plebian first person makes use of the personal *pronoun* 'I', and is a first person *mode* of first person reference. Royal first person is a third person mode of first person reference, it being a way of referring to oneself by, say, the use of one's own name or title. Hintikka, who wishes not only to condemn "I know that p but do not know that I know it" but also "Jones knows that p but does not know that he knows it" -as-said-by-Jones, formulates his results by using '*a*' rather than 'I'. This gives his epistemic logic an appearance of generality which it does not in fact enjoy. For Royal and Plebian first person are equally *first person* references, different only in the manner in which they accomplish reference. Hintikka's epistemic logic is thus an impersonal logic to about the same degree as, considering the loop holes, the U.S. graduated income tax is a burden on the rich.

Hintikka is himself aware of this restriction to first person when (A.PKK*) and the RT are concerned. On p. 22 he does note that (A.PKK*) is to be applied only to cases where the speaker "knows that he himself is being referred to", and, in a footnote, he says, dropping the reference to pronouns, that it would be impossible to generalize his results beyond the first person (p. 74). He never explicitly places a comparable restriction on (A.PK*) and theorems such as "$(Kap \;\&\; (p \supset q)) \supset Kaq$", but it is a limitation which would make them considerably more plausible than they have heretofore seemed and would also integrate (A.PK*) and (A.PKK*) into the same system of logic, and avoid the charge of equivocation. According to vulgar idiom, it is also "self-contradictory" to deny knowing what one expressly acknowledges to follow from what one claims one does know.

It follows that epistemic logic, interpreted as a set of criteria for assessing acts of advancing first person knowledge claims, is a much more restricted thing than it might seem, and consists of much weaker claims than one might think. This weakness is, however, also a strength. For, so interpreted, epistemic logic is a very plausible thing indeed. *There is* something wrong with (k). The question is, What? Or rather, the question is whether its defect is *logical.*

By way of explanation of what he claims is logically wrong with saying (k), Hintikka refers us to his discussion of Moore's problem about:

(m) p but I do not believe that p.

This, he says, violates "the general presumption that the speaker believes what he says," (p. 67) and therefore, by uttering it, "the speaker gives his hearers all they need to overthrow" it; it is "self-defeating", "indefensible for the speaker to utter" (p. 72). Indefensible sentences, then, are "self-defeating" speech acts by means of which the speaker "overthrows" what he says about himself in the very act of saying it. So far, so good, but we must now explain the explanation, and in particular the metaphor "overthrow".

One plausible explanation is that, in normal circumstances, a's saying "p" is justification enough to conclude that a believes that p. Our criterion for whether a person believes something is usually simply that he says it. In normal circumstances, saying is believing. Of course, there is the possibility of insincerity, which, if it occurs, will defeat our criterion and upset this pretty equation. But suppose a is sincere in saying "p". Then our criterion applies and he believes that p. Thus when he adds that he does not believe that p, he says what is condemnable as *false*. Suppose, on the other hand, that he is not sincere when he says "p" and does not believe that p. Then his act is condemnable as *insincere*. In *either* case, something is condemnable. Hence something is condemnable.

The case of saying (l) "*Kap* & -*KaKap*" is similar. Asserting the first conjunct "gives rise to the presumption that" the second conjunct is true. We not only expect people to believe what they assert; we expect them to "know what they are talking about." Thus, if a says (k), he is condemnable either for not knowing what he is talking about (when he says that he knows that p), or for saying what is false (when he adds that he does not know that he knows it), but in either case, he is condemnable.

This makes good sense. But if this is all there is to epistemic logic, epistemic logic consists merely of such maxims as: (1) Be sincere; (2) Know what you are talking about; and (3) Always tell the truth. All are excellent maxims to which no one can take exception. But the question remains: What have they to do with *logic*? Insincerity is a defect of morals; not knowing what you are talking about is a defect of character or upbringing; and making false statements (that are not lies) is caused by ignorance.

Nevertheless, Hintikka is convinced that being a self-defeating act is a specifically logical defect (p. 65). Why? The answer seems to be that, like what are called "analytic" statements, self-defeating speech acts are not merely condemnable, but *easily seen to be condemnable.* Somewhat as one can impeach "some bachelors are married" by examining a minimal number of bachelors, so one can impeach Jones' assertion of (m) without independent inquiry into Jones' beliefs: for if Jones said it sincerely, it is false; and if it is true, then he said it insincerely.

This, however, only makes an already loose notion of analyticity a good deal looser. No doubt, it is gravely objectionable to say what any fool can see to be false. But it is time to recognize (as Hintikka himself suspects when he pretends that what he has been doing by means of his "reductive strategy" is deriving contradictions) that there is really only one objection from logic to any speech act: that by means of it the speaker makes a statement which is logically false. The *act* is objectionable because the *statement* is, and otherwise it is not. The explanation of indefensibility in terms of self-defeat-in speech acts thus makes epistemic logic plausible without making it logic.

There remains, however, one other interpretation of Hintikka's remark that indefensibility is "of a performatory character" which does make it logic. Hintikka, we may remember, uses the term 'performative', as Austin later apparently came to use 'illocutionary act', to mean simply the speech performance. In Austin's "Other Minds" [8] the term carries more weight. When Austin says there that 'I know' in "I know that *p*" is a performative, he seems to mean two things, one negative and one positive. The negative, and really important point, is that "I know that *p*" is *autobiographically* or *descriptively vacuous*, saying nothing about the speaker and grammatical subject. Thus Austin says "To suppose that 'I know' is a descriptive phrase is only one example of the descriptive fallacy so common to philosophy." The positive point is that 'I know', although not essential in a *descriptive* way, is nevertheless essential to a *performance* which can be compared to warrantying what one is claiming to know. Thus Austin says "When I say 'I know', I give others my word: I give others my authority for saying that S is P." (See also [9].)

In this discussion, Austin seems to use the word 'descriptive' to mean what we have here meant by 'statement' so that the joint effect of negative and positive sides of his thesis is that *"I know that p" is statementally (descriptively) equivalent with "p"*. Ordinarily we might suppose that "I know that *p*" is equivalent with the conjunction of "*p*" and some statement about, say, the speaker's state of mind. But Austin seems to be challenging this assumption and advancing in its place a redundancy theory of knowledge which says that the truth value of "I know that *p*" is the same as that of "*p*" and that the two differ only performatively.

Let us suppose that Austin's account as thus interpreted is correct. Then "*Kip*" is truth functionally equivalent to "*p*" (as is "*Kap*" when *a* is talking). This has some very interesting consequences for epistemic logic. The most interesting is that the Epistemic Theorem and Reiteration Theorem both turn out to be nothing more than cumbersome and misleading formulations of the tautology "$p \supset p$" ("*Kap*" being equivalent to "*p*", and "*KaKap*" being equivalent to "*Kap*") with extraneous and irrelevant epistemic operators tacked on, and needing, by means of Hintikka's rules, to be pulled off before any evaluation is possible. This suggests that Hintikka's logic may be, in a sense even Hintikka perhaps does not suspect, a logic of 'I know' in its performative use.[14] For suppose one were to go about constructing a "logic of knowing" according to Austin's account. Two rules would become central, one expressing the descriptive vacuity, the other the performative essentiality of 'I know'. The first would allow dropping off epistemic operators because they make no difference, and the second would permit adding them on because, since they can then be dropped, they make no difference. In other words, the first would be Hintikka's rule (A.PK*) and the second would be his (A.PKK*). One's logic would also have two corresponding theorems: "$Kap \supset p$" and "$Kap \supset KaKap$", the Epistemic and Reiteration Theorems. In short, one would have Hintikka's epistemic logic.

But notice that the essence of such an epistemic logic is that *it is epistemic in a descriptively vacuous sense of the term 'know'*. It is therefore simply logic. The theorems of epistemic logic are just so many disguised tautologies. The Reiteration Theorem, for example, is simply the tautology "$p \supset p$", and the theorem "$(Kap \,\&\, (p \supset q)) \supset Kaq$" is the tautology "$(p \,\&\, (p \supset q)) \supset q$". Not even Lemmon's apparent exception, the Epistemic Theorem escapes this reduction.

We have, then, two different interpretations of Hintikka's remark that epistemic logic is a logic of performatives. Jointly these interpretations yield the now familiar dilemma: either epistemic logic concerns self-defeating speech acts and has, perhaps, something to do with knowledge but nothing to do with logic, or else it concerns a performative use of 'know', which, because it is descriptively vacuous has plenty to do with logic but nothing essentially to do with knowing.

6. *Epistemic Logic as Normative Science* Epistemic logic *a la Hintikka* was to avoid invalidation by counterexamples by being a logic of defensibility rather than a logic of truth, and was to manage this by being a logic of speech acts rather than statements. As we have seen, the plausibility of such a logic, which is considerable when it is restricted to speech acts in the first person, may be due simply to the fact that the acts of saying "p" and "I know that p" make the same statement, viz. "p", so that a person cannot affirm one and deny the other without thereby uttering a strictly *self-contradictory* statement. In short, the plausibility of such a "logic" may very well be that it is just logic after all.

There remains one last interpretation of epistemic logic which construes it as having nothing essentially to do with statements and truth. According to this interpretation, epistemic logic is a *normative* science, telling us not what people *in fact know* but rather what they *ought* to know, given that they know something else.

No epistemic logician has yet explicitly endorsed such an interpretation,[15] but Hintikka's term 'indefensibility' certainly has normative

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14. See Max Deutscher's review of Hintikka, [10]. Allan White in his review [11] also notes that Hintikka is trying to formulate a logic of speech acts.

15. But also see pp. 37 f of Hintikka's book.

connotations. So does Lemmon's LPK, which is most plausibly construed as an ideal worthy of emulation by LOMs. Furthermore, such an interpretation has undeniable appeal. Professionally committed as he is to logicality and rationality, every logician is a sort of priest of the LPK for whom failure to be logical is the gravest of sins. He cannot deny, for example, that he thinks it indefensible to fail to know (or acknowledge)[16] all that follows from what one does know (or claims to know), more especially when it is pointed out to him.

But if the logician cannot deny the appeal of a normative interpretation of epistemic logic, he can wonder what sense it makes. Normative notions are, after all, notoriously difficult to analyze, and are philosophically more problematic than descriptive notions. Can we really expect to clarify comparatively unproblematic talk about what *is* the case by means of obscure and problematic talk about what *ought* to be the case?

Historically, normative interpretations of logic were a reaction to nineteenth century psychologism, which took principles of logic to be descriptions of the necessities of thought, and so concluded that no one could "think" contradictions. The normative interpretation agreed that logic has to do with thought, but cautioned that it prescribes norms for correct thought and does not describe the actual processes, which may be quite illogical. This was quite an improvement.

It still is. Epistemic logic construed as consisting of descriptive statements about the necessities of actually existing knowledge is merely false, and is much more palatably construed as determining a set of canons for logically consistent knowledge.

Improvement though it is over psychologism, however, any normative interpretation of logic still suffers from three defects. First, the interpretation needs interpreting. Second, it turns things around: one shouldn't "think" a contradiction because it would be illogical to do so; a contradiction isn't illogical because one shouldn't think it. Third, the normative interpretation is itself at least quasi-psychologistic, unless interpreted as Peirce interpreted it. As Peirce saw [12], to say that logic is a normative science of thought is to say, in a misleading way, that it really hasn't anything to do with *thought* as such, but that it has, rather, to do with truth, truth being already normative for thought (for pragmatic reasons): if you ought to "think" the conclusion of an argument, it is solely because its premises are true and the argument is valid. From the normative interpretation, therefore, we get no clarification but only connotations of the irrelevant.

7. *Summary and Conclusions* We have considered two ways, and two variations on each way, in which epistemic logic has been defended against the charge that its theorems are not logical truths about knowing or knowers. The first way is to counter that there is a sense of 'know' for

16. Actually, epistemic logic is much more plausibly construed as a logic of *acknowledgments* than as a logic of *knowledge*.

which they are logical truths; or that there are knowers who never present counterexamples. The second way is to deny that they need to be true, and to present them instead as criteria for the assessment of defensible speech acts, or as norms for knowledge. Which defense the epistemic logician elects seems to depend on whether he is, at the time, concerned to defend epistemic logic against the charge that it isn't true or against the charge that it isn't about knowing.

We have seen that the first defense saves epistemic logic from the charge of falsehood only because the sense of 'know' for which its theorems are true is the logically vacuous transparent sense, and only because there are no logically perfect knowers for the theorems of epistemic logic to be true of. We have seen that the second defense at first glance makes it doubtful whether epistemic logic is logic, since logic in that sense which has governed our discussion consists precisely of logical *truths*. But we have also seen that this defense too ultimately borrows what plausibility it possesses from the fact that it is merely a defense of logic in epistemic disguise. Presented as a set of criteria for defensible speech acts, epistemic logic makes sense only if these are criteria assessing the statemental contents of those speech acts. Its cash value as a normative science consists in the fact that logic, pure and simple, is *already* normative for knowledge.

Not having examined all possible ways of defending epistemic logic which may occur to the fertile brains of epistemic logicians, we cannot claim to have seen that there can be no such thing as epistemic logic. Nevertheless, we have seen enough to make it look as if the failure of epistemic logic is no accident but is inherent in the nature of the case. If it is to deserve the epithet 'epistemic', epistemic logic needs a logically essential use of the term 'know', but if it is to deserve the encomium 'logic' it also evidently needs a sense of the term that makes no logical difference. A term that makes no logical difference is, however, scarcely a logically essential term. What the epistemic logician wants is for the term 'know' to be *both* a logical constant and an ordinary predicate of persons, but he can't have that.

Were it not for the Epistemic Theorem, "$Kap \supset p$" it seems likely that the dubiousness of the rest of the putative theorems of epistemic logic would long ago have caused it to be consigned to the garbage heap of discarded philosophical ideas. If epistemic terms are descriptively vacuous, as Austin contends, the Epistemic Theorem is equivalent to "$p \supset p$", and requires no special consideration. But if epistemic terms are descriptively vacuous, then the evidently false converse of the Epistemic Theorem, viz., "$p \supset Kap$", the Omniscience Theorem, would also be equivalent to the tautology "$p \supset p$".

The case of the Omniscience Theorem perhaps has a solution in a "semantical theory of knowledge" similar to a semantical theory of truth. Or, more likely perhaps, Austin is only partially right and there are uses of 'know' that are descriptively vacuous but also uses that are not. If so, it seems likely that the Epistemic Theorem may be an instance of the first, and the Omniscience Theorem an instance of the latter. It may be, that is, that when we are talking about knowledge, we are sometimes talking about *what-is-known* (and this is the case in the Epistemic Theorem) and that we are sometimes talking about the *knowing* (and this is evidently the case in the Omniscience Theorem), and that we can have a logic of knowing in the first, but not in the second case.

There is an old but honorable distinction between the act of knowing and the content which is relevant here. The word 'knowledge' is ambiguous referring sometimes to the act and sometimes to the content. If we ask whether there can be a logic of knowledge, we are therefore asking two questions. The result of this paper is that the answer to the one is "yes" and the answer to the other is "no". There is no doubt that we can have a logic of contents of knowledge. In fact we already have such a logic, though it contains no epistemic operators. But it appears that there can be no logic of knowledge in the sense that there can be a logic of the acts of knowing. In short, we can have a logic of what we know (which, however, treats the *fact* that we know it as irrelevant); but it appears that we can have no logic of the knowing.

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