Existential Import

By Vern Crisler

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1. Formal & Material Import

Term symbols such as x, y, etc., can have many denotations. That is to say, these terms represent something, or supposit (stand for) something. They stand for the objects or things falling within the extension of the terms or concepts. Hence, each term symbol can be thought of as having just as many items in its extension as one likes, which can be symbolized as:

\[ x \{ x_1, x_2, x_3, \ldots x_n \} \]
\[ y \{ y_1, y_2, y_3, \ldots y_n \} \]

An object (or objects) represented by a term-symbol can exist either in material reality or in formal reality. A golden mountain, for instance, does not exist in the material mode, but can exist in formal mode, and can therefore be a meaningful substitution-instance of a term-symbol. A square-circle, on the other hand, does not exist either in the material mode nor in the formal mode, and is hence a meaningless substitution-instance of a term-symbol.

Any sentence in the square of opposition, or what can be called the statement array, can be symbolized either in formal or material modality:

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<th>Type</th>
<th>Formal</th>
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<tr>
<td>a</td>
<td>[f] S,P</td>
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<td>[f] S,P</td>
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Type a-1, for instance, is read as: “All (formal) S’s are P.” Its contradictory, Type o-1, would read as: “Some (formal) S’s are not P.” These are read this way only if a mode operator or context operator is made explicit. If not, the term “formal” drops out as just an implicit modifier of the subject. It is not important whether one wants to qualify an object as existing in formal or in material reality. What is important is that the two modes not be confused. Hence, the mode operators [f] and [m] can help prevent such confusion.

2. The Mode of Existence

The term “existential import” is ambiguous, for it does not make clear the distinction between formal or material existence. Still, it is probably safe to assume that most logicians use the term “existential import” to refer to material as opposed to purely abstract existence, fictional existence, or spiritual existence. Whenever I use the term “material” import, I mean what logicians refer to with the term “existential” import.
If one asserts the proposition type a-1:

(1) \([f] \text{S}_a \text{P}\)

it is important that its contradictory be type o-1:

(2) \([f] \text{S}_o \text{P}\)

not o-2:

(3) \([m] \text{S}_o \text{P}\)

This will ensure, for instance, that the universal affirmative sentence:

(4) "All golden mountains are tall." \([f] \text{G}_a \text{T}\)

has a true contradictory in the particular negative sentence:

(5) "Some golden mountains are not tall." \([f] \text{G}_o \text{T}\)

This will only be true if the particular negative sentence is in the same mode as the universal affirmative sentence. A formal mode could be a fictional world, for instance, and both sentences could be true in that possible world, though not at the same time.

On the other hand, if the universal affirmative sentence is held to be false due to lack of reference to the material domain, as in the following:

(6) "All golden mountains are tall." \(\text{G}_a \text{T} = \text{False because vacuous subject}\)

then at least its contradictory must be true:

(7) "Some golden mountains are not tall." \(\text{G}_o \text{T} = \text{True}\)

But how can that be? Since we are claiming that (6) is false just because there are no golden mountains in material reality (i.e., its falsity is traced to a materially empty term), how can (7) have any reference for its subject term? In other words, the subject term in (7) would be just as vacuous or empty as the subject term in (6), and the particular negative sentence would have to be false, too. This would render false both a proposition and its contradictory, which violates the principle of bivalence (law of excluded middle).\(^1\)

If we remember that predicating falsity of (6) on the basis of a theory that "empty" terms imply falsehood, we can accommodate this view by stipulating that such terms will convert the proposition from the material mode to a formal mode. We can then seek the true contradictory of (6) in the formal mode as well. Thus (7) should be converted to the formal mode upon the predication of falsity to (6) due to its lack of denotation. Hence, the contradictory of the false-because-empty sentence (6) should be:

(7*) \([f] \text{G}_o \text{T} = \text{True}\)

Notice the \([f]\) before the statement in (7*). If there really were golden mountains in material reality, then \([m]\) would be the appropriate mode operator for 7*.

The proper use of \([f]\) and \([m]\) should help avoid this equivocation in universal and particular sentences, and retain validity for all the relationships in the square of opposition.

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\(^1\) Note: this analysis of the problem goes back at least to J. N. Keynes, *Formal Logic*, 1906 edition, p. 228; see also, Veatch, below.
a) Henry Veatch discusses the case of the sentence, “Some sea serpents live in the sea” and the sentence, “All sea serpents live in the sea.” Mathematical logicians deny that the first can be derived from the second. Veatch responds: “To be sure, the inference would be false if in the first proposition the subject ‘sea serpents’ designated only possible existents, whereas in the subaltern it designated actual existents. But this would be a mere fallacy of changing the designation, and so far from being characteristic only of inferences from A to I, it might be involved in any inference whatever….”

Thus according to Veatch, the sentences in 1 and 3 above would be a change of designation, an illicit process fallacy, where the subject term has two different meanings. Veatch then considers the sentence, “All the dimes in my pocket are shiny” and reflects on what would be the case if the sentence were false: “If so, one might naturally feel that the A proposition which asserts that they are all shiny would be false. And yet if one does suppose this, then by the rule of contradictories on must admit the corresponding O proposition to be true, viz. ‘Some of the dimes in my pocket are not shiny.’ Unhappily, however, if the original A proposition was considered false simply on the grounds that there were no dimes in my pocket at all, then for the same reason the O proposition would have to be false also—and this would violate the rule about contradictories.”

Modern logicians, according to Veatch, accept this difficulty but use it to support their particular notion of existential import. Why assume, they say, that the phrase “All the dimes in my pocket are shiny” actually means the speaker has dimes in his pocket? It would be a lot better to assume that he doesn’t, and then difficulties arising from existential import would be of no concern. True, this would disrupt the square-of-opposition, and furthermore: “[T]he rules about subcontraries would have to be discarded, since both the I and the O would be false. Likewise, the rules of subalternation would no longer hold.”

This would seem to be a high price to pay to avoid the chance that a careless logician might commit an illicit process fallacy. Yet this is what he would do if he fails to distinguish whether a class has existing members, or is the null set. Veatch regards the notion of the null set as fuzzy, since we cannot tell whether the nullness refers to the absence of possible members, real members, fictive members, or what:

“[A]s soon as one takes account of the differing senses in which things may be said to be, then classes that are made up of possibles, as well as classes made up of mere beings of reason, would certainly not be null. True, in going from one such proposition to another . . . one would have to be careful not to change the designation. However, so long as one kept the same designation, all the traditional inferences based on the square of opposition could be maintained.”

We agree with Veatch’s answer. Our use of [f] and [m] is a good reminder that the designation of the terms in one sentence should stay the same in all the other sentences in the square of opposition.

Logic is not about what one supposes, believes, feels, or intends to say about a matter, but rather it is about what one is entitled to say about a matter. If logic is about what one is entitled to say, then the

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3 Veatch, p. 250.
4 Veatch, p. 251.
5 Veatch, p. 252.
denial of material existence to a subject term in a proposition turns the operational domain into a purely formal one, i.e., the material non-existence of the subject term results in an automatic formalization of the statement array.

The conventional view about existence holds that particular propositions assert existence, while universals do not. Veatch wonders, however, if the phrase “Some men are wise” is really translatable into the existential quantifier “There exists some wise men.” Veatch answers in the negative. In the first case—“Some men are wise”—the phrase does not necessarily say whether any men exist in the concrete, material world. It could just as well say that some men are wise somewhere, or at sometime, or in some domain of a formal world, rather than wise in the material world. The second case says that some wise men actually exist in the material world.

It would seem, therefore, that the interpretation of “Some” as “There exists” by mathematical logicians is simply a matter of choice.

b) Jacques Maritain, the French Catholic philosopher, can be described as representing traditional views on logic. In his book, Formal Logic, he devotes a few pages to the subject of the “concept” in logic, and to the suppositio of concepts. He points out that the substitution value (suppositio) of a term depends on what type of existence is involved, ideal or real:

“It is evident that if the antecedent. . . has a suppositio taken solely in relation to ideal existence . . . then the conclusion cannot have a suppositio taken in relation to real existence, an ‘existential’ suppositio.”

Maritain applies this principle to Descartes’ “ontological” argument:

“The ‘ontological’ argument by which Descartes sought to prove the existence of God—starting with and proceeding from the idea of a perfect being (and not from some existing thing) violates this rule in passing from ideal to real existence.”

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c) Pierre Coffey was a neo-scholastic philosopher and logician, who wrote very fine books on epistemology, ontology, and logic. In general, Coffey follows J. N. Keynes in his view of existential import (which will be discussed below). Nevertheless, Coffey argues that while traditional, Aristotelian logic never explicitly dealt with the subject of existential import, its understanding of the matter can be ascertained from its treatment of the square-of-opposition. According to Coffey, the traditional view of opposition, “will also hold good if the existence of S [the subject] be assumed independently of the import of the propositions themselves altogether. And this appears to have been the assumption really, if only implicitly, made in scholastic logic.”

4. Speaking of Hobbits

Consider the following sentences:

(HF) All hobbits have hairy feet
(HH) All hobbits have horns

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6 Veatch, p. 249.

8 Maritain, p. 63.
9 Pierre Coffey, The Science of Logic, Vol 1., p. 254
10 Michael Beaney, Frege, Making Sense, p. 49.
We know that (HH) is false. Surprisingly enough, however, (HH) would be true in terms of today’s mathematical logic (hereafter ML). Why is this so?

In today’s ML, if hobbits are non-existent, then the antecedents of both (HF) and (HH) would be false. A truth table for an “All x is y” or an “If x then y” type of conditional would have the following truth-conditions:

\[
XY = X \supset Y \\
TT = T \\
TF = F \\
FT = T \\
FF = T
\]

Because hobbits don’t exist, implications involving them in subject position would only fall under the last two lines, and would both be true, i.e., FT = T and FF = T. Letting H stand for hobbits, F for hairy feet, and O for horns, we would have in ML the following:

\[
(HF) = (x) (Hx \supset Fx); \text{ (for all x, if x is a hobbit, then x has hairy feet)}
\]

\[
(HH) = (x) (Hx \supset Ox); \text{ (for all x, if x is a hobbit, then x has horns)}
\]

Since there are no hobbits, then on the main interpretation of ML, (HH) would have to be regarded as true, i.e., line four, FF = T. And yet anyone who has ever read the Hobbit or Lord of the Rings knows that (HH) is false. Hobbits have hairy feet but they do not have horns. At least the respectable ones do not.

So what are we to make of ML? How could it allow such a counterintuitive result? Michael Beaney, who discerned this problem in ML, asks:

“Does this not constitute a serious objection to Frege’s logic?”\(^{11}\)

Given some of the rather snobbish claims made by (some) mathematical logicians vis-a-vis traditional logic, it is rather astonishing that such a simple proposition as (HH) could become so problematic in ML. Of course, the problem comes about due to the ML idea that a particular statement expresses material existence, and that a universal statement does not. On the other side of the coin, as Beaney points out, the view that logic has only existential import would make the first sentence false, since hobbits don’t have real existence. Yet we know it’s true.

It might be suggested that the ML could be salvaged by adopting a mode-operator, but it is not clear that Frege, Russell or their followers, would have been satisfied with such a device.

This issue of existential import has been used to criticize traditional logic. Beaney says,

“Ironically, this objection—that difficulties arise as soon as we try to pin down whether a proposition carries existential import or not—has frequently been made by Fregeans to syllogistic theory.”\(^{12}\)

So bad has it gotten that a popularizer of mathematics, Keith Devlin, speaks of “two invalid syllogisms” in Aristotle’s logic.\(^{13}\) His example is:

\[\text{11 Beaney, p. 49.}\]
\[\text{12 Beaney, p. 49.}\]
\[\text{13 Keith Devlin, Mathematics: The Science of Patterns, pp. 42, 45; he is referring to Darapti and Felapton. In addition, the increasingly popular Salmon rules (or star method) regard traditionally valid arguments (e.g., Darapti) as invalid.}\]
1. All green pigs are green
2. All green pigs are pigs
3. Therefore, Some pigs are green.

Now, since ML denies existential import to universal propositions, there is no way to derive the particular conclusion of 3 above. To do so would be to commit what logicians call (somewhat pompously) an “existential fallacy.” But what if we use a context-operator, as suggested in the first part of our essay? If [f] or [m] are too abstract, we could always use a more concrete context-operator, say, [p] for Pigland, here taken as a fictional or formal domain. The following is the dictionary of terms: G = green pigs; g = green; p = pigs, and [P] is the domain of Pigland. Hence,

\[[P] \text{ (All } G \text{ are } g; \text{ All } G \text{ are } p; \text{ therefore,}\text{ Some } p \text{ are } g)\]

In logical arithmetic, this would be:

\[[P] \text{ Gag + Gap = (as above)}\]

\[[P] \text{ Ge}^{-}g + po^{-}G = (\text{No green pig is non-green + some pig is not a non-green pig)}\]

\[[P] \text{ po}^{-}g = (\text{Some pig is not non-green)}\]

or,

\[[P] \text{ pig [sorry]}\]

“Some pig is green.”

In logical algebra, this would be,

1. \([P] \text{ } \neg G + g\]
2. \([P] \text{ } G \text{ } \& \text{ } p\]
3. \([P] \text{ } 0 + g \text{ } \& \text{ } p\]

The conclusion is \([P] \text{ p } \& \text{ g}, \text{ or “Some pigs are green— in Pigland.” Does this not bring home the bacon? One would think a context operator would help solve the same problem in ML.}\]

It should be noted, that the problem above is not about the move from two false antecedent statements combined to form a true consequence. Going from FF=T is just what we would expect from the definition of implication. The problem is in ascribing falsity to the antecedent simply because it doesn’t refer to the material world. Frege and Russell were willing to sacrifice logical comprehensiveness in order to achieve logical economy—which amounted to a positivist construal of what can be said in logic. Beane’s conclusion is that “fictional contexts cannot be incorporated into the Fregean system.”\(^{14}\) His reasons for this are that Frege wanted to develop a logical system that was useful for science, not for fictional domains, and that Frege wanted his logic to be universal, i.e., abstracted from all context-dependence.

L.J. Cohen wrote: “If economy may be purchased here at the cost of comprehensiveness, then why not elsewhere also? The road seems open to those who would wish to disregard the logic of non-extensional discourse because all classical mathematics is extensional, and to advocates of other similar economies... The problem of systematisation is being shirked, not solved, once the ideal of comprehensiveness

\(^{14}\) Beane, p. 52.
is sacrificed to considerations of economy.”

Beaney says, “It is, we may say, Frege’s decontextualism that would have made him resistant to the [contextualizing] strategy suggested for dealing with the counterintuitive results that his system appears to yield.”

Frege was therefore trying to develop a presuppositionless logic, but it appears that Beaney is right when he says that “[t]he idea of a presuppositionless logic is incoherent…”

I think ML advocates really wanted to develop a system of logic that would match their positivistic worldview, just as some British logicians were committed to the nominalistic doctrine of Empiricism (capital “E”). One cannot find a more sneaky way of smuggling nominalism into one’s symbolism than by adopting the notion that universal statements do not assert existence and that particular statements do assert existence. Nominalism, of course, is the view that universals do not exist, and only particulars or individuals exist.

For those of us who are philosophical realists, the ML view of existential import must remain a choice, not a requirement.

5. The Golden Age of Logic

The golden age of logic occurred during the 19th century, when such giants as Boole, Keynes, Venn, Carroll, and others, were presenting logic in algebraic form. William Bartley, the editor of the modern edition of Carroll’s *Symbolic Logic* calls this state of logic the “algebraic” period, coming in between the period of Aristotelian logic, and the period of today’s ML. Bartley ably summarizes the main characteristic of this period of logic:

“Logic as presented by Carroll is no aid towards the foundations of mathematics but a kind of instructional aid, of obvious pedagogical utility, for detectives.”

ML swamped the older algebraic logic, and the latter, as Bartley pointed out, “never quite reached the textbook stage.” This was unfortunate, but the situation now appears to be changing a bit. For instance, Copi’s latest textbook on logic now includes admittedly an all too brief discussion of grid puzzles and other “game”-like approaches to logic, but it does represent an improvement over the rigidly Peano-like postulational approach favored by some modern logicians. Most of the game-type logic puzzles can still be found in the Dell or Penny Press logic magazines, and in some preparation guides for academic entrance examinations. It is hoped that algebraic logic can become part of the textbook tradition again, combined with a solid foundation in traditional logic.

a) John Venn: Venn was one of the foremost algebraic logicians, and devoted two chapters of his *Symbolic Logic* to the question of the import of propositions. He points out that “All x is y” usually assumes that there are x’s and indirectly that there are y’s. Venn points out, however, the statements about the future cannot refer to actual existence. Also, ideal statements are

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16 Beaney, p. 53.
17 Beaney, p. 53.
20 Bartley, p. 27.
ideal precisely because there are none who fit the ideal, e.g., to use a simplified example, “perfect men do not break the rules.” This does not imply that even if a man were to refrain from breaking the rules, that perfect men actually exist. It is ideal precisely for that reason. Venn says, however, that in popular usage we do not “without warning” make predicates of non-existence subjects.

Venn speaks of the “conceptualists” who do not think that subjects have any reference to existence or non-existence. The conceptualist says, “All A, if there are any, are B.” This expression, “if-there-are-any” is much like the “warning” given above when predicates are made about non-existence subjects.

Stanley Jevons, in contrast to the conceptualist, adopted the view that every term represented a fact. Venn regarded this restriction as “capricious” and one that reduces “to absurdity.” He says: “Are we never to assert anything or deny anything about X or Y, unless we are certain not only that there are things which are X and Y, but also things which are not X, and not Y?” He thus rejected both logical idealism and logical materialism.

We shall see that Venn’s own view is the same as the view adopted by modern ML, a nominalistic understanding of the universal and the particular. He asks us to conceive of the universal affirmative in terms of the denial of a particular, i.e., “All X is Y,” (¬X + Y) is really “(Some X is not Y),” ¬(X¬Y). The phrase, “All unicorns have horns” is equivalent to, “It’s not the case that ‘Some unicorns do not have horns.’” Venn is substituting sentence denial for universal term predication. But how does this justify such an understanding of existential import?

The claim is that the universal statement only represents the view that there are no such things as X’s that aren’t Y’s. If X and Y are concepts or classes, it means that: “All x is y simply empties out x¬y, whilst ‘No x is y’ empties out xy.”

“Empties out,” of course, is a metaphor for the “−” negation sign: All x is y = ¬(x¬y) and No x is y = ¬(xy). But again, aside from metaphors how does this retranslation of universals into the negation of particulars really justify the interpretation of universals as always lacking existential import? We still don’t know from such retranslations whether the denotations of x or y are real beings or merely beings of reason.

As noted, Venn suggests that for A statements, we should not use the forms, xy, ¬xy, and ¬x¬y, but should use ¬(x¬y). By using the latter form, we avoid sub-alternation (i.e., xy). For Venn, then, the statement, “All hobbits have hairy feet” would not entail that “Some hobbits have hairy feet.”

This view is not only deeply counter-intuitive, but the retranslation of A’s into denials of O’s does not actually provide a justification for Venn’s view of existential import. The mere assumption that universals lack existential import is not a justification. Why shouldn’t it be the case that sometimes the expression, “All hobbits have hairy feet” implies the sub-alternate—that “some hobbits have hairy feet”? Just on say-so? After all, the sub-alternate seems to follow logically from the universal as an

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22 Venn, p. 50.
23 Venn, p. 155.
24 Venn, p. 158.
25 Venn, p. 162.
immediate inference—what Maritain called the “maintenance” of the same truth.

When Venn comes to the “some” propositions, he opts for existential import. His reasons, however, for adopting the view that particular statements are always meant to imply the existence of their subjects are not persuasive. He claims, for instance, that “some x is y” suggests a “tone of reality and of sober fact.” Nevertheless, we have good grounds to dispute such a characterization.

b) John Neville Keynes: Keynes is known by a few as the father of the economist, John Maynard Keynes, but is more widely known among logicians for his excellent book, *Studies and Exercises in Formal Logic*. With respect to existential import Keynes preferred the “modern” view that universals do not assert, and particulars do assert, the existence of their subjects. Nevertheless, he regarded it as a pragmatic choice, a matter of convenience, and he did not have the same dogmatic view of the matter as do some modern logicians.

It’s not always clear, however, what Keynes meant by existence. He points out that “every judgment involves an objective reference...a reference to some system of reality distinct from the act of judgment itself.” The system of reality to which reference is made is called the “universe of discourse” (after De Morgan). The nature of the reference is of different types. For fictitious objects, the reference is to “a series of statements about persons and events made by a certain author.” Thus, the statement, “Hamlet killed Polonius” is regarded as “elliptical.” “For the reference,” says Keynes, “is not to real persons or to the actual course of events... but to a series of descriptions given by Shakespeare in a particular play.”

It appears that Keynes is correlating the reference in fictional worlds not to the imaginary objects and events in those worlds, but rather to the actual descriptions of those things in our world, to the text or codex that serves as the vehicle for conveying those objects and events to us. Thus, “such statements have objective reality, although the persons and events themselves are fictitious.”

For Keynes, then, “reality is the ultimate subject of every proposition.” And he means it. Every proposition affirms something within a universe of discourse, and the universe has “real content.” In one sense, existence must be “something in the mind,” for we must be able to attach some meaning to any term used in a proposition. Furthermore, existence can be taken as a “mental process.” Thus, word combinations such as “round-square” or “root of minus one” are not objects existing before the mind, since they are impossibles, but they represent the “idea” of such combinations.

However, Keynes says his view of existence is different from these views. He defines existence in much the same way Venn does, in terms of sentence negation. For the A proposition, the universe of discourse would be defined as \( \neg(\neg S \land P) \) and the E proposition as \( \neg(\neg S \land P) \). The I proposition would also be defined negatively as \( \neg(\neg S \land P) \) and the O as \( \neg(\neg S \land P) \). The issue is whether the S, P terms in the parentheses can be said to exist if they are defined purely under negation. To this Keynes says that:

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28 Keynes, p. 211, agreeing with Bradley’s *Principles of Logic*, p. 41.
“No general criterion can be laid down for determining what is actually the universe of discourse in any particular case.”

Nevertheless, one must know the universe of discourse for a proposition to have meaning. Fortunately, most propositions, Keynes assures us, will be of the meaningful sort, e.g., “All men are mortal.” This is because such propositions refer to objects in our “actual physical universe.” Oddly enough, other “exceptional” propositions such as, “The wrath of the Olympian gods is very terrible,” and “Fairies are able to assume different forms,” will still have reference to our actual physical universe. Keynes explains how:

“The universe of Greek mythology does not consist of gods, heroes, centaurs, &c., but of accounts of such beings….The universe of folk-lore does not consist of fairies, elves &c., but of descriptions of them, based on popular beliefs…."

Thus, for fictional or mythical worlds, the reference to reality is to “accounts” and to “descriptions” in our real, physical world (usually found in books, magazines, bookstores, or libraries). This is another way of saying what was said earlier, that such expressions should be treated in an “elliptical” fashion. It would seem then that for Keynes the term “existential” must refer to existence in our real, physical world, not to what we have above referred to as “formal” existence. Thus, he contrasts “objective” existence with existence in the “world of thought.”

It must be said at the outset that Keynes’ “elliptical” interpretation of reference within mythical or fairy tale worlds is not what we normally take to be their reference. For example, when we refer to objects or events in Homer’s fiction or in Tolkien’s Middle-Earth, we are really referring to those objects and events, not to the sentences or propositions found in books that serve as the vehicles for communicating the meaning of those objects and events to us. Surely it is the case that propositions and sentences do not constantly interfere with the course of the Trojan War as do the Olympian gods, nor do commas and periods and sentences let slip the One ring into the Fire-mountain of Mordor, as does Gollum. We clearly distinguish, even in fictional worlds, between the content expressed by propositions, and the logical, linguistic, and textual apparatus used to convey such meaningful worlds to us.

In any case, Keynes conducted an exhaustive study of the results of the various views of existential import, and the following table is based on his diagnosis (see next page):
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<th>Type</th>
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<td>SP-mixture</td>
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In the above chart, “SP-existence” refers to the view that existence is asserted for all terms in a proposition, both subject and predicate. “S-existence” refers to the view that only the subject has existence, while “SP-non-existence” refers to the idea that none of the terms in a proposition has existence. “SP-mixture” refers to the view that particulars assert, and universals do not assert, the existence of their subject terms. A “Y” in a box means that the operation is valid, and an “N” means that the operation is invalid. The blank spaces are where the operation is logically undefined or where Keynes did not provide any information about the operation.

There are a few things to note about this chart. First, it fails to make clear a distinction between the existence of material objects in the database and the existence of *possibilia* within the database. As we have seen, this is important, for the denial of the material existence of objects removes them from the relevant domain and repopulates the data-base with purely formal objects. Second, it is obvious that the only interpretation that works for all the sentences in the square-of-opposition is the “SP-existence” interpretation (as long as domains are not confused). Thus, we agree with the view that the square-of-opposition presupposes the rule that every proposition is understood to assume the existence of both its subject and predicate. Obviously, the existence referred to does not necessarily mean material or concrete existence, as Keynes believed. Third, we would go even farther, and say that not only does the square-of-opposition presuppose the existence of both subject and predicate for its sentences, it also assumes that there is more than one subject and more than one predicate in the domain of discourse. Why is this so?

The reason for this arises from the nature of the A and I propositions. Take, for example, the sentence:

(1) All Brandybucks are hobbits.

Putting aside questions of truth or falsity, we have in the above a claim that the class of all
Brandybucks are members of the class of hobbits. This is based on the standard interpretation of the A proposition. In Middle-Earth, of course, we know that Bagginsses, Boffins, Tookes, Grubbs, Chubbs, Burrowses, Hornblowers, Bolgers, Bragirdles, Goodbodies, Brockhouses, Proudfeet, and Sackville-Bagginses are all hobbits. If we want to preserve the standard interpretation, we actually don’t need all of these hobbits; we can do with just one family, say, the Bagginsses. Thus, in order for (1) to be a representation of A, we not only must presuppose the existence of Brandybucks, but also the existence of at least the Bagginsses. If we did not make this assumption, the A proposition would represent the conjunction of (1) and its converse, hence:

(2) All Brandybucks are hobbits and all hobbits are Brandybucks.

Thus, if only Brandybucks existed as the subject, hobbits would then correspond to no other family. Proposition 2 would be expressed in logical algebra as:

(3) \((B \supset H) \& (H \supset B)\)

However, (3) shows that (2) is simply equivalency, and this is not what the A proposition represents under the standard interpretation of A in the traditional array. In addition, in the predicate-class, there has to be more than one member (hobbits) in order for there to be a plural subject.

For the I proposition, the standard interpretation not only requires the existence of more than one subject, but also requires the existence of more than one member within the subject. Consider the following I proposition:

(4) Some Bragirdles are hobbits.

If some members of the Bragirdle family were not distinguished from other members of the Bragirdle family, then (4) would really be an A proposition, “All Bragirdles are hobbits.”

For that reason, it’s better to adopt the view that in A and I, both subject and predicate have existence, and then to make note of the difference between a real being and a being of reason. Both subject and predicate have existence, but under different modes of being.

In the process of discussing his “elliptical” view of import, Keynes had difficulty with the following sentence:

(5) Some things that children fear are ghosts.

If we take (5) as a secondary form, we can convert it back to its original form as:

(6) All ghosts are some things that children fear.

Using conversion by limitation, we have:

(7) Some things that children fear are ghosts.

As can be seen (7) is equivalent to (5). However, if (5) is not regarded as a secondary form, then its primary form is I, which means that it can be converted simply to,

(8) Some ghosts are some things that children fear.

This is quite a bit different from (6), and the predicate term in (5) cannot be said to be distributed. That is why (8) has the some-operator before ghosts, for we cannot assume, without committing a fallacy, that the predicate in (5) refers to all ghosts rather than to some of them.
If (5) is taken as a primary form, it provides a counter-instance to the view that the I proposition must be interpreted always to refer to material or concrete existence—“There exists something or other,” etc. As Wolf noted long ago, (5) does not imply the concrete existence of its subject, ghosts, even though it’s in particular form.

In his reply to Wolf, Keynes argues that the “things” referred to in (5) “must be interpreted to mean ‘things, real or imaginary.’” Wolf was denying that the I proposition implies existence, and Keynes was right to draw the distinction between real things and imaginary things. He goes on:

“Moreover, ‘imaginary things’ have a reality of their own, though it is not a physical, material reality. Ghosts, therefore, do exist in the universe of discourse to which reference is made.”

We agree, and this is what we have been saying all throughout this essay. As long as existence can be interpreted as either material or formal, there is no need to deny that the I proposition presupposes the existence of its subject and predicate. Similarly, there is no need to deny that the A proposition presupposes the existence of its subject and predicate, for the same distinction between existence as material realia, and existence as formal possibilita, works as well for the A proposition as it does for the I proposition.

On Keynes’ own view of the meaning of existence, however, the term “ghosts” in (5) would have reference to our real, physical world, in that it refers to the descriptions derived from scare-stories in books or magazines.

As noted, Keynes adopted what would become the modern view of existential import, but he admits that this “hypothesis will be found to lead to certain paradoxical results.” Nevertheless, he thinks it will also lead to a “more satisfactory and symmetrical treatment of logical problems than is otherwise possible.” On our view, the “paradoxical results” are far worse than Keynes’ thought, and certainly are not outweighed by the promise of a “satisfactory and symmetrical” treatment of whatever problems Keynes was talking about.

One would think that giving up subalternation would be a severe blow to such symmetry. Similarly, with regard to subcontrariety (Some S is P and Some S is not P can both be false). The falsity of Some S is P would entail the truth of No S is P, but on Keynes’ view of existential import, No S is P (or All S is not P) does not lead to the conclusion that Some S is not P.

Keynes and Venn were in agreement on existential import. We have already discussed Venn’s views on logic above, but we should note one other aspect of Venn’s understanding of logic. In a footnote to his book on formal logic, he argues that the distinction between imaginary and actual existence cannot really clear up any difficulties in the use of the square-of-opposition. Unfortunately, Venn does not provide any reasons for this claim, but he merely refers the reader to Keynes’s discussion.

Keynes, as we have said, adopted the modern view that universals do not assert, and that particulars assert. He rejected the view that propositions imply or assume the existence of their subjects and predicates (our view). His reason for rejecting this latter view is the one stated at the beginning of Keynes’s paper...
of this essay, that it would lead to the view that A and its contradictory O would both be false if their subjects did not exist:

“On this supposition. . . . It follows that a pair of contradictories as usually stated, and also a pair of sub-contraries, may both be false. For example, All S is P and Some S is not P both imply the existence of S in the universe of discourse. In the case then in which S does not exist in that universe, these propositions would both be false.”

This, of course, assumes that the universe of discourse remains the same as between formal or material existence. Since Keynes only allows existence to refer to our real, physical universe, he has no room for formal existence, and thus his views on existential import are misdirected. In our view, illicit process of the subject can only be avoided if a statement is opposed to another statement in the same mode of existence, and Keynes’ restricted understanding of existence has no resources to deal with the issue in a satisfactory manner.

Keynes gives as one of his reasons for accepting what is known as the modern view that “we seldom do as a matter of fact make predications about non-existent subjects.” If this is meant to refer to the formally non-existent (e.g., round-squares), he would be quite right, but if it refers to the materially non-existent, he would be quite wrong, and we can call mathematicians and literary essayists in as witnesses.

In reply to the point that the “universe of imagination” is the only applicable domain for sentences involving unicorns, Keynes said that:

“[A]ny person making the statement would certainly not be referring to the world of imagination or the universe of heraldry. . . .”

By this Keynes meant that some (misguided) soul who was discussing unicorns as if they really existed in our world, would be intending to refer such unicorns to our real, physical world, not to the world of fiction or fairy tale. That is true, but logicians, above all, should be able to make the elementary distinction between what is the case, and what’s possibly the case. That is, the logician should be able to distinguish the real world from a possible world, and also understand what effects each could have on the interpretation of the square-of-opposition.

c) Stanley Jevons: Jevons denied that any proposition in logic implied the existence of its subject or predicate terms. However, as Keynes pointed out, Jevons’ own practice assumed the existential implication of propositions throughout his logical equations, and also at one point flatly contradicted himself, by requiring that terms in logic assume that things actually exist.

Aside from the contradiction noted by Keynes, it is not clear whether Jevons’ claim that logic does not imply the existence of its terms only referred to material existence, or to some other kind of existence.

Summary of Different Views:

As can be seen, the algebraic logicians differed among themselves regarding existential import, but some of them were already adopting the counter-intuitive view that served as the basis for ML symbolism. Our position, however, is the following:

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35 Keynes, p. 228.
36 Keynes, p. 237.
37 Keynes, p. 217.
(a) the subject and predicate terms within a proposition must assume existence;

(b) there must be at least one more subject and predicate under the standard interpretation of A and E;

(c) a distinction must be made between members of the subject, under the standard interpretation of I and O;

(d) the denial that a sentence implies material existence automatically converts all of its contraries, contradictionary, subalternates, etc., into the domain of formal existence, and the rules (a) through (c) hold for all sentences in that domain.

6. Fred Sommers and Existential Import

Fred Sommers discussed P. F. Strawson’s attempt to use “truth-value gaps” as a way of interpreting such expressions as, (1) “the present king of France is bald.” The “present king of France” has no existence, so under Russell’s view of existential import, the proposition would be false merely because its subject term was vacuous. Russell regarded the subject term as entailing that there was a present king of France and the proposition was false for that reason.

Strawson, however, argued against entailment and said the proposition is neither true nor false unless (2) “the present king of France exists” were true. Thus, on Strawson’s view, “the present king of France exists” was presupposed rather than entailed by “the present king of France is bald.” If “the present king of France exists” is false, then a truth-value gap arises on Strawson’s reading. According to Sommers, theory appears weak because it opens too wide a truth-value gap.38

Sommers adopts an “enthymeme” approach to the subject of existential import. He believes that there is a suppressed premiss behind (1) namely the premiss that “Every bald (person) exists.” This basically ascribes existence to the predicate class. He presents the following syllogism:

1. the present king of France is a bald person
2. every bald person exists
3. hence, the present king of France exists.

On the supposition that the presence king of France does not exist, the following syllogism results:

5. it is not the case that the present king of France exists
6. every bald person exists
7. it is not the case that the present king of France is a bald person

Thus the conclusion of 7 is incompatible with 1. Sommers says, “Thus the enthymemic explanation of the existential import of (1) does not require us to read (1) as an existential statement. Nor does it threaten a truth value gap.”39 He illustrates further with the expression, “Some blue swans are omnivores.” We can symbolize this as:

8. S & O

Sommers regards 8 as false just because “there are no blue swans.” He invites us to construct the following syllogism, which we will do using logical calculus. Here O =

38 Fred Sommers, The Logic of Natural Languages, p. 209.
omnivores; $S = \text{blue swans};$ and $\text{Ex} = \text{existence}$:

9. $-O + \text{Ex}$  
10. $-\text{Ex} -S$  
11. $-O + 0 + -S$

Conclusion: $-S + -O$, “No blue swans are omnivores.” This obviously contradicts (8) above, since “No $S$ are $O$” is really $-(S \& O)$.

On the face of it, it seems that Sommers’ idea of predicate-existence as an approach to existential import is misdirected. It is difficult to see how the contrast of 8 with 11 has anything to do with existential import. It is merely what one would expect from the square of opposition, that $E$ and $I$ are contradictories. When Sommers says that “a statement can have existential import without being an existential statement”, I am at a loss.

Happily, Sommers goes on to describe the issue of existential import in terms of “different domains of application.” In my opinion, however, once one speaks of different domains of logical terms, then there is no need to go through all the worry of adding additional premises of existence.

The domain of a term causes that term to have what Sommers calls “amplitude.” A real thing, such as a horse, would have “standard” amplitude, and a fictional horse, such as Pegasus, would have “non-standard” amplitude. This is very similar to the $[f]$ and $[m]$ context operators suggested earlier, though his own suggestions for context operators are not abstract enough in my judgment—they are more like my $P$ for Pigland. For Sommers then, statements like “some $S$ is $P$” are subject to the “range condition” that $S$ be a member of a particular domain.

Moreover, Sommers appears to draw a distinction that is important. For instance, with respect to the proposition, “the most famous progeny of Medusa was a flying kangaroo,” this is false because no member of the world of Greek mythology is a flying kangaroo. But does this mean that (a) no material kangaroos can fly, and for that reason are not a part of Greek mythology, or that (b) no Greek poet ever wrote about them? If the latter, then the argument would be consistent with our $[f]$ and $[m]$ mode-operators. If the former, then there would be a clash of mode-operators, along with paradoxical results. As Sommers points out:

“To the terms of a universal statement, we assign the amplitude of terms in the contradictory particular statements. For example, if in ‘some horse was unfed’ the terms ‘horse’ and ‘fed’ have amplitude $I$, the same amplitude will be assigned to the terms of ‘no horse was fed’ and the terms of contrary and contradictory statements will all have the same amplitudes.”

If we’ve interpreted Sommers correctly, this is essentially the same thing we have said above, that statements with mode-operator $[f]$ should not be arrayed against statements with mode-operator $[m]$. Rather universals in $[f]$ should be arrayed against contradictory particulars in $[f]$. Similarly, universals in $[m]$ should be arrayed against contradictory particulars in $[m]$. And never should the twain $[f]$ and $[m]$ meet.

7. Material Implication

The logician-philosopher, Gordon Clark says, “[O]rdinary English, or ordinary logic, has no room for existential import.”

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40 Sommers, p. 212.  
41 Sommers, p. 213.  
42 Sommers, p. 215.  
Moreover, “Logic alone does not assert the existence or nonexistence of anything. It would seem therefore that we can dispense with existential import and preserve the validity of subalternation.” Clark appears to interpret “existential import” as meaning existence in our real, physical world. He thus adopts a conceptualist view of logic, that it does not assert the existence or nonexistence of anything in our real physical world. The conceptualist viewpoint is right insofar as it does not adopt the view that all existence is material existence. However, it does not get to the heart of the issue, which we have discussed above in great detail.

We can see the problem arising with respect to implication. In propositional calculus, the form “if p then q” is called a “material” conditional. It is defined, as noted, by means of the truth-values, TT=T, TF=F, FT=T, FF=T. It is curious that the word “material” is used to describe this conditional, since it seems as though it could just as well be called a “formal” conditional. To put it another way, “if p, then q” describes, in my opinion, either a purely formal relation or a material relation, that is, implication can refer to either one.

The logician Irving Copi speaks of the “paradoxes of material implication.” He provides examples:

(1) If the moon is made of green cheese, then the earth is round.

Under the truth-table, this would be FT=T.

(2) If the moon is not made of green cheese, then the earth is round.

This would be TT=T.

(3) If the moon is made of green cheese, then the earth is not round

Thus, we would have FF=T.

According to Copi, “these seem paradoxical because we believe that the shape of the earth and the matter of the moon are utterly irrelevant to each other. . . .” He believes that the “paradox” is “easily resolved” if we recognize that “implies” has different uses, for instance: p implies q by definition, or p implies q by causation, etc. An English teacher may say, “If someone’s a bachelor, he’s unmarried.” A weatherman may say, “if it’s cloudy, it will rain.” The former is definitional implication and the latter is causal implication. Copi denies that these are examples are what is meant by the notion of “material implication.” He says:

“But subject matter or meaning is strictly irrelevant to material implication, which is a truth function. Only truth and falsehood are relevant here.”

Thus the $\supset$ sign (or the $\rightarrow$ sign) is a minimal sign of implication, a truth-functional sign. It does not in itself represent a definitional or causal implication, which have to be determined by the context. However, because it is a minimal or default sign, it can still represent different types of implication.

From our point of view, the paradoxes are a bit misleading. Some “if, then” statements seem to be paradoxical only because we are interpreting the domain of discourse as our material, physical world. Thus, we might say that “if the Yankees win the World Series, I’ll eat my hat.” This is an expression of skepticism about the chances of a baseball team at the World Series, and nobody expects the speaker to eat his hat in

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44 Clark, p. 89.
46 Copi, p. 343.
47 Copi, p. 344.
the literal sense (though a Yankee fan might enjoy seeing it).

The reason that the statement is meaningful is that we presuppose that the domain of discourse is our real, physical world, the world of bats, baseballs, baseball gloves, and hats. And yet what if the speaker was a fictional character in a science-fiction world that differed just slightly from ours, and where hats were items on the menu? The statement would not serve its intended purpose in such a (formal) world. In such a world, there would be no “paradox” resulting from the implication.

The same goes for the above statements 1 through 3. What would happen if a possible world existed that was just different enough from ours, so that all moons really were made of green cheese? The implication would occasion no comment. There is also the proverbial claim that one would be a monkey’s uncle if some specified antecedent were true. But what if this statement were made in the land of the Planet of the Apes? It would not occasion any comment either, for you could very well be a monkey’s uncle in that land. Thus, paradoxes only arise for implication if our domain of discourse presupposes material existence. It would seem that the simplest way to handle these so-called paradoxes is the way we have suggested above: do not confuse two different types of existence, formal or material.

Clark was one of the few modern day logicians who challenged the accepted tradition regarding material implication. However, his argument against the tradition denied that there were really different types of implication. He says that “implication and validity are each identical in every argument.” This means that for Clark all implication is material implication. This is at least consistent with Clark’s conceptualist view of logic, which only concerns the form rather than the matter of arguments. He is certainly right when he says that logic is not history and that validity does not guarantee truth:

“It is valid if the form of the conclusion is true every time the forms of the premises are.”

As we have argued, however, a purely formal or conceptualist view of logic does not get to the heart of the matter, which is that a proper respect for the realm of discourse in logic will prevent any confusion in the use of logic or of implication. For further, see the discussion under (4).

8. Inconsistency in Aristotle’s Logic?

Writing in 1928, F. S. C. Northrop thought he detected an inconsistency in Aristotle’s logic and that it could only be remedied by the modern view of universals as non-referring and particulars as implying existence. He gives the following four propositions to demonstrate his point:

1. All just acts are expedient acts.
4. All inexpedient acts are unjust.
5. Some unjust acts are inexpedient acts.
15. All unjust acts are expedient acts.

According to Wu, Northrop believed that 1 and 15 were both “consistent and contradictory.” On the surface, I don’t see how 1 and 15 are remotely contradictory. The notion that all just and unjust acts are expedient may be false, since it seems they could just as easily be inexpedient, but there

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49 Clark, p. 39.
is no contradiction or even contrariness between them. The sentences would only be contraries if they were turned around: “All expedient acts are just acts”; and “All expedient acts are unjust acts.” They could not both be true in light of the square of opposition. But 1 and 15 are not turned around like that. Additionally, you could create a contradiction by saying, “All just acts are expedient”; and “All just acts are inexpedient.” But again, Northrop didn’t state his sentences that way. Let us see in tabular form all the sentence adjustments that result from Northrop’s premises:

<table>
<thead>
<tr>
<th>#</th>
<th>Normal</th>
<th>Obverse</th>
<th>Converse</th>
<th>Contraposition</th>
<th>Inverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>JaE</td>
<td>Je=E</td>
<td>−Eej</td>
<td>−Ea−J</td>
<td>−Ji−E</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>−Ea−J</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>−JaE</td>
<td>−Jo−E</td>
<td>−Ji−E = −JoE</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>−JaE</td>
<td>−Jo−E</td>
<td>−JiE</td>
<td></td>
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</tbody>
</table>

Line 1 shows all the relevant sentence adjustments. Now Northrop says that 4 and 5 follow from proposition 1 (JaE), and it’s easy to see why, since they are immediate inferences with respect to proposition 1. Note that 4 and 5 are included under contraposition and inversion so that the equivalence with 1 is obvious. Northrop continues:

1. “But proposition 5 contradicts proposition 15. By obversion proposition 5 becomes ‘Some unjust acts are not expedient.’ Since this is the corresponding O form of proposition 15 which is an A, it follows . . . that proposition 5 contradicts proposition 15. But, since 1 implies proposition 5, and 5 contradicts proposition 15, it follows according to the rules of the syllogism that proposition 1 implies the contradiction of proposition 15.”

Let’s take a look at this. The partial inverse on line 5 is −JoE (from −Ji−E), and yes Northrop is right that it contradicts −JaE of line 15. But so what?

The “corresponding” O form of 15 is −Jo−E (Some unjust acts are not non-expedient acts”) as can be seen from the chart. Converting from A to I to O in 15 requires a negation sign on the term for expediency, just as going from I to O in 5 requires the removal of the negation sign. So far I don’t see any problem.

Perhaps Northrop means by “corresponding O form of proposition 15” what would better be called its contradictory sub-alternate. Does Northrop’s complaint merely boil down to the fact that the partial inverse of JaE (−JoE) contradicts −JaE? Again, so what?

Using logical algebra, it comes as no surprise that −J ⊃ E is contradicted by −J & −E. If we change −J ⊃ E to J + E, then deny J + E, we have −(J + E). By De Morgan’s rule we have −J & −E as a result. Any problem with that?

The universal proposition JaE does not contradict −JaE, any more than J ⊃ E contradicts ~J ⊃ E. But that they may not be inconsistent in their universal form

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51 Wu, p. 419.
doesn’t mean a contradiction is excluded in the sub-alternates. A subaltern does not entail its universal statement. While you can go down to a subaltern from a universal, you cannot go up from a subaltern to a universal. In other words, the process described on line 1 resulting in the inverse form only goes one way. You cannot start with a particular inverse and work your way up to a universal statement.

Hence, simply because the particular inverse of JaE (¬JoE) is the contradictory subalternate of ¬JaE, it does not entail anything of any logical significance. Or at least Northrop hasn’t provided any reason that it should.

If someone has a scruple about it, they could just as easily deny that the particular inverse is a legitimate move, and not bother about existential import. Nevertheless, the fact that two universal statements may not contradict each other in themselves says nothing at all about whether any of their partial inverses might not do so. I see nothing in any of this that requires a nominalistic view regarding existential import, or requires us to fault Aristotle’s logic.

In an earlier portion of his paper, Wu claims that Venn diagrams prove the need for the modern view of existential import. In saying that “All X are Y,” a circle labeled X overlaps a circle labeled Y. All portions of the X that aren’t in Y (the shaded crescent moon) are denied existence, indicating “emptiness.” Thus, Venn diagrams show that “All X is Y” is “interpreted as the denial of the existence of a certain class. . . . The diagram for the given proposition shows the emptiness of a certain region rather than asserting the existence or non-emptiness of any area.”

However, Wu forgot that the overlapping circles of the Venn diagram also create a “football” in the middle of the two circles. This football shape represents “all x that is y,” and so could very clearly represent the assertion of existence. Therefore, Wu’s silly attempt to use a Venn diagram to prove the modern nominalistic view of existential import rests on an illusion.

9. Recommended Reading

The following books have been helpful to me in writing this essay:

Henry Veatch, Intentional Logic

George Engelbretsen, Something to Reckon With: The Logic of Terms

Fred Sommers, The Logic of Natural Languages

Michael Beaney, Frege: Making Sense

52 Wu, p. 416.