REVIEWS

Numerical cross references are to previous reviews in this Journal or to A bibliography of symbolic logic (this Journal vol. 1, pp. 121-218) or to Additions and corrections to the latter (this Journal, vol. 3, pp. 178-212).

References beginning with a roman numeral are by volume and page to previous reviews (or to works previously reviewed). When necessary in connection with such references, a third number will be added in parenthesis, indicating the position of the review on the page. Thus "III 157" will refer to a review beginning on page 157 vol. 3 of this Journal (or to the publication reviewed); "III 157 (1)" and "III 157 (2)" will refer respectively to the first and second reviews beginning on page 157 of vol. 3 (or to the publication there reviewed).

References such as 7145, 1253 are to the entries so numbered in the Bibliography. Similar references preceded by the letter A or containing the fraction of or a decimal point (as A17I, 794I, 3827.1) are to the Additions and corrections. A reference followed by the letter A is a double reference to an entry of the same number in the Bibliography and in the Additions and corrections.


The content of this paper is announced as mainly a translation of portions of the author's forthcoming book, O sentido da nova lógica (São Paulo, Brazil).

The author begins with a distinction between what he calls purely designative occurrences of names and occurrences which are not purely designative. The distinction depends on the substitution principle for equals, according to which, if A and B are names and A = B is true ('=' representing the 'is' of identity), then A may be substituted for B or B for A in any sentence without altering its truth. It appears that in ordinary English usage there are certain kinds of occurrences of names for which this principle is not valid, and it is proposed to distinguish those occurrences to which the substitution principle is applicable as purely designative.

Some examples of occurrences of names which are not purely designative are supplied by (1) 'Giorgione was so called because of his size' and (2) 'Philip believes that Tegucigalpa is in Nicaragua.' Both of these sentences (let us suppose) are true. Nevertheless, despite the truth of (3) 'Giorgione = Barbarelli' and (4) 'Tegucigalpa = the capital of Honduras,' the sentences are false (5) 'Barbarelli was so called because of his size' and (6) 'Philip believes that the capital of Honduras is in Nicaragua.' Regarding (1), Quine has the immediately acceptable explanation that the sentence must be construed as a mere abbreviation of (7) 'Giorgione was called 'Giorgione' because of his size'; substitution of 'Barbarelli' for the first word of (7) yields an entirely true sentence, and there is no question of substitution of either 'Barbarelli' or 'Barbarelli' for the fourth word of (7), since there is no occurrence there of 'Giorgione' (but only of 'Giorgione') and the equality (3) is therefore irrelevant. He goes on to say that it is unnecessary to explain the instance (2) in an analogous fashion by construing it to represent (8) 'Philip believes 'Tegucigalpa is in Nicaragua.' But he does not add, as the reviewer would, that there are objections to such a construction of (2) which are not easily superable—e.g., it would seem that (8) has the consequence that Philip understands English, whereas (2) does not.

In the distinction between purely designative occurrences of names and other occurrences, and its criterion, Quine is fully anticipated by Frege (494), who distinguishes in the same way between the ordinary (gewöhnlich) and the oblique (ungebräuch) use of a name. In fact the relationship between Quine's present paper and Frege's of 1892 is close throughout, even to the use of similar, and in one instance identical, illustrations. Quine's failure to refer to Frege's paper indicates that he is unacquainted with it, but it is probable that he is indirectly indebted to Frege through Russell's 1119.

Quine goes on, however, to give an alternative criterion for the distinction in question, which is original with him and which seems to the reviewer to be of considerable importance.
An occurrence, namely, of a name A in a sentence M is purely designative if the inference is valid from M to $\exists x \, N$, where N results from M by replacing the given occurrence of A by the variable ‘x’. Thus the ontology to which one’s use of language commits him is determined not merely by the names which he employs but also by the inferences which he admits involving these names in relation to quantifiers (cf. Quine IV 170 (1), V 27 (2)).

The reviewer is unable to agree with Quine’s further comment here that the principle under which $\exists x \, N$ is inferred from M is a principle only by courtesy, being simply the logical content of the idea that a given occurrence is designative, and that it is therefore anomalous as an adjunct to the purely logical theory of quantification. It is indeed possible to follow Quine in taking existential quantification as given, and then to regard this principle as defining the notion of a purely designative occurrence; but it is equally possible to take the latter notion as given and to regard the principle as characterizing existential quantification. The fundamental thing is that logical systems containing names and quantifiers demand such a principle of inference, and it seems immaterial whether the principle is stated directly or in the form of a syntactical criterion for purely designative occurrences.

In the latter half of the paper the author discusses modality, and related intensional concepts, including that of attributes or properties as distinct from classes. The point is brought out that an occurrence of a name within a clause governed by a modal operator—e.g., ‘it is necessary that,’ ‘it is possible that,’ ‘it is probable that’—is oblique (not purely designative) in the same way as an occurrence of a name within a clause governed by ‘believes that,’ ‘asserts that,’ ‘rejoices that,’ and the like. Also a similar point is made regarding occurrences of names within a context governed by ‘the attribute of.’ The importance of this as a limitation upon the application of intensional concepts is clear. In particular the author’s conclusion seems sound that serious doubt must affect any attempt to overcome the now well-known difficulty of defining adequately the term ‘soluble in water’ (cf. II 49 (2), III 137 (2), VII 43 (2, 3)) by the device of employing a modal operator as a means of rendering a contrary-to-fact conditional clause; for it is essential that in such a sentence as ‘this crystal is soluble in water’ the subject shall have a purely designative occurrence.

But the reviewer would question strongly the conclusion which the author draws that no variable within an intensional context (e.g., within the scope of such a modal operator as ‘☐’ for ‘it is possible that’) can refer back to a quantifier prior to that context (outside the scope of the modal operator). The conclusion should rather be that in order to do this a variable must have an intensional range—a range, for instance, composed of attributes rather than classes. To paraphrase an argument which Quine applies to a somewhat different illustration, let ‘b’, ‘f’, and ‘m’ mean respectively the class of bipeds, the class of naturally featherless creatures, and the class of men. Then the sentence is true (9) $\exists b \, m \land ☐ f(b \neq m)$ —the non-existence of featherless bipeds other than men being a zoological accident. But, where ‘a’ is a class variable, the inference from (9) of the sentence ‘$\exists a \, a = m \land ☐ a \neq m$’ must be in error, since, having ‘a = m’, we could substitute ‘m’ for ‘a’ and infer further the false sentence ‘$☐ m \neq m$’. There is no similar objection, however, to the inference from (9) of (10) ‘$\exists f(x) \, (\phi x = z x) \land ☐ \sim (\exists x) (\phi x = z x)$’, where $\phi$ is a variable for attributes; and it would seem that in a logical system containing both modal operators and quantifiers such inferences should be retained.

This leads naturally to Frege’s conclusion that a name in its oblique use does not lack a denotation (or designatum) but rather has a different denotation, namely it has as denotation that which would be its sense in its ordinary use. For this reason it would seem to be desirable, for the purpose of discussions like the present one, to adopt some notational device to distinguish the oblique use of a name from its ordinary use—just as quotation-marks are now commonly employed to distinguish the autonomous use of a name from its ordinary use, on the ground that the denotation is different. In a formalized logical system, a name would be represented by a distinct symbol in its ordinary and its oblique use. (From this point of view our notation in (9) and (10) is inaccurate—it was intended only to serve a temporary expository purpose.)

The reviewer has emphasized before the importance of Frege’s distinction between sense and denotation (cf. V 162, V 163, VII 100 (2), also an abstract in this JOURNAL, vol. 7, p. 47).
The distinction may be explained by employing a modification of Quine's own words from the paper before us: to determine that two names or other expressions have the same sense it should be sufficient to understand the expressions, but to determine that two names have the same denotation it is commonly necessary to investigate the world. In fact Quine here introduces a distinction between meaning and designation which closely parallels Frege's between sense and denotation. The one significant difference is that Quine regards meaning as exclusively a syntactical or semantical concept (he suggests, e.g., that the meaning of an expression might be identified with the class of all the expressions synonymous with it); while Frege's sense is an abstract object not having a syntactical make-up. In particular, it is not clear that Quine would be willing to identify the meaning of a sentence, as Frege does the sense, with the proposition which the sentence expresses. (The translation of Frege's "Gedanke" as "proposition" is clearly justified by his explanation, "nicht das subjektive Thun des Denkens, sondern dessen objectiven Inhalt, der fähig ist, gemeinsames Eigenthum von Vielen zu sein.")

In the reviewer's opinion, the advantage lies with Frege's concept of sense, especially since Quine himself seems willing, at least provisionally, to countenance such intensional abstract objects as attributes. It would thus be necessary in the case of class names to add only that the sense is the associated attribute. Such multiplication of abstract entities as is demanded in order to provide senses for names of all kinds seems a small price to pay for the gain in simplicity and naturalness. (This is not to say, however, that the identification of senses of class names as attributes is necessarily the only, or the best method.)

There remains the important task, which has never been approached, of constructing a formalized semantical system which shall take account of both kinds of meaning, the relation between a name and its denotation, and the relation between a name and its sense. It would be a desideratum for such a system that the object language should contain for every name in it a name of the associated sense, and should be capable of expressing the relation between a sense and the denotation which it determines.

The reviewer believes that many of the questions which Quine raises without being able to answer them will find their answers in the construction of such a system of semantics. Ultimately it is only on the basis of their inclusion in an adequate system of this kind that such otherwise indefensibly vague ideas as "understanding" of an expression, "attribute," "objectiver Inhalt des Denkens" may be regarded as logically significant.

ALONZO CHURCH


This is a text-book (in Latin) of traditional logic, based primarily on the Scholastic logic but including also certain additions to the traditional doctrine from other sources. It is a well-arranged, clear, and concise account, but suffers from all the defects of a thoroughlygoing traditional viewpoint.

The book is relevant here because the author undertakes to provide also some account of the nature and methods of symbolic logic. It would seem to the reviewer, however, that the account is too fragmentary and unsystematic to give the student a just idea of the subject.

The author's statement (pp. 45–46) of the advantages of the logistic method is on the whole good, but tends to emphasize too much the superficial matter of replacing words by other symbols, and too little the matter of exact formulation of the rules of inference. In a passage immediately following, it is said that logistic cannot take the place of "logica realis," because symbols require interpretation and concepts require analysis. The argument here, so far as valid, would apply to any formal logic, thus also to the traditional formal logic; but the reviewer would urge that it is precisely the formal method which is best suited to the treatment of such particular things as the author mentions (e.g., the comprehension of concepts).

Necessary corrections to traditional formulations, suggested by comparison with elementary branches of logistic, are in general not made or even mentioned. An exception is in connection with disjunctive propositions and the disjunctive syllogism, where the distinction is drawn sharply between exclusive disjunction ("sensus stricto") and inclusive disjunction ("sensus lato") and it is pointed out that the inference ponendo tollens is valid only for