

## I. Parts of Speech<sup>1</sup>

What I shall be chiefly up to in this work might be described as an investigation of the logic of attitudes, meaning by an 'attitude' what is expressed by the R in many sentences of the form xRp, where x is the name of an individual and p is a sentence. Examples of sentences of this form are 'Seneca asserts that all men are mortal', 'Othello believes that Desdemona loves Cassio', 'Charles wonders whether this is red', 'John fears that the power supply has failed'. Hence the phrases which express what I call 'attitudes' are ' - asserts that - ', ' - believes that - ', ' - wonders whether - ', ' - fears that - '.

As a preparatory to the investigation of the logic of attitudes, in this sense of 'attitudes', I propose in the present chapter to give a somewhat schematised account of the grammar of my own language, English, so far as it seems to me to be likely to bear on our main problem. For this, a convenient starting point - a basis for critical discussion - is a theory which has been put forward by a number of philosophical logicians in recent years, to the effect that [p. 2] all possible 'parts of speech' or 'syntactical categories' are definable in terms of the Name or Noun on the one hand and the Sentence on the other.<sup>1</sup> For example, an ordinary intransitive verb may be defined as an expression which yields a sentence when attached to a name, e.g. the verb 'smokes' yields the sentence 'Raleigh smokes' when attached to the name 'Raleigh'. An ordinary transitive verb similarly constructs a sentence out of two names, e.g. 'loves' yields 'Richard loves Joan' when attached to 'Richard' and 'Joan' in the appropriate way. Conjunctions construct sentences out of sentences, e.g. putting 'and' between 'Grass is green' and 'The sky is blue' yields the compound sentence 'Grass is green and the sky is blue'. In another of its uses (what Johnson<sup>2,3</sup> calls its 'enumerative' use [Ed. 'enunciative' in Prior's MS, *to be checked*]) 'and' constructs something like a compound noun - something which can replace a noun in many sentences - out of two other nouns; e.g. from 'John' and 'James' it constructs 'John and James', which may replace the single noun 'James' in 'James went to town'. A compound noun may also be constructed from a single other [p. 3] noun by means of an adjective, e.g. 'blind man' by means of 'blind' from 'man'. And we may construct compound nouns, or as we call them in this case 'noun clauses', by attaching the word 'that' to whole sentences, as in 'That two and two are five is false'.

This approach to grammatical distinctions has considerable prima facie attractiveness, and lends itself, moreover, to some instructive refinements. We may, for example, represent expressions which we use in constructing sentences out of other expressions as 'sentence frames', with bracketed blanks or dashes in the place [sic] where the other expression goes. Thus a transitive verb may be written as '( ) loves ( )' or ' - loves - ', and its function in sentence-building thereby made the more conspicuous. This device also makes it easy to see how one expression may have several functions, e.g. we may think of ' - loves - ' simply as constructing the sentence 'Richard loves Joan' out of 'Richard' and 'Joan', or as constructing the intransitive verb ' - loves Joan' out of the name 'Joan', which intransitive verb in turn constructs a sentence out of 'Richard'. This way, too [p. 4] we may develop useful extensions of our ordinary notions of the parts of speech. For example 'If - is going to come, then - will stay away' is a transitive verb in the sense that it is an expression by which we may construct a sentence out of two names; and we may

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<sup>1</sup> This text has been edited by Max Cresswell and Martin Prior. The original is kept in the Prior collection at Bodleian Library, Oxford.

regard 'If - then - ' equally as an expression constructing the compound sentence 'If John is going to come then Peter will stay away' out of the two simpler sentences 'John is going to come' and 'Peter will stay away', or as constructing the above transitive verb out of the two intransitive verbs ' - is going to come' and ' - will stay away'.

There are, indeed, symbolic languages in which a form like 'Richard loves Joan' would be carefully bracketed, and a distinction drawn between '(Richard) loves (Joan)' and '(Richard) [LOVES (Joan)]', where 'loves' and 'LOVES' are not regarded as interchangeable - the former constructs a sentence out of 'Richard' and 'Joan' and does not construct an intransitive verb (for constructing a sentence out of 'Richard') out of 'Joan', while the latter does construct an intransitive verb out of 'Joan' and does not construct a sentence out of 'Richard' and 'Joan'. Similarly we might have (I am going a little archaic to simplify the case) [p. 5] '(Richard sleepeth) not' and '(Richard) [(sleepeth) NOT]', where 'not' but not 'NOT' constructs a new sentence out of the sentence 'Richard sleepeth', while 'NOT', but not 'not', constructs a new verb 'sleepeth NOT' out of the verb 'sleepeth' which new verb constructs a sentence out of 'Richard'. Such distinctions as these are very meticulously drawn, for example, in the logical systems of Lesniewski. The English practice of putting one and the same expression to a number of different but related tasks at once may look comparatively slapdash; but in fact any language whatever must at some point copy English in this respect. For example, the square brackets in the Lesniewskian-style '(Richard) [(sleepeth) NOT]' at once construct the verb '( - ) [(sleepeth) NOT]' out of '( - ) sleepeth' and '( - ) NOT', and the whole sentence out of 'Richard', '( - ) sleepeth' and '( - ) NOT'. So the only question is whether English and similarly constructed languages introduce their multi-purpose expression too soon. Is there any genuine difference in sense between '(Richard sleepeth) not' and '(Richard) [(sleepeth) NOT]' which the English practice obscures? My own view is that there is not but we shall see later that we can only be free and easy at [p. 6] this point if we are prepared to be meticulous at another point.

Another technicality which has been usefully introduced in connection with this analysis of parts of speech is the term 'functor'. If we say that the sentence 'Raleigh smokes' is a 'function' of the noun 'Raleigh' (or 'is the same function of "Raleigh" as "Socrates smokes" is of "Socrates"'<sup>4</sup>), we may say that ' - smokes' is a 'functor' which yields a sentence when its one argument is a noun, or that it is a sentence-forming functor with (or of) a single noun-argument.

The two obvious difficulties about this whole procedure are that the notions of 'name' or 'noun' and 'sentence', on which everything else depends, are themselves very much less clear than one could wish. For example: the sentences of ordinary speech are in general subject to inflections of tense, and whether they are true or false may depend on the time at which they are uttered or otherwise promulgated; but the sentences or 'propositions' of pure formal logic are often said to be tenseless, and invariant as to their truth-value. Thus the Aristotelian example 'Socrates is sitting down'<sup>5</sup> is not a 'proposition' by this last standard, [p. 7] but only such remarks as '5.00p.m., 342 B.C., is a moment at which the posture of Socrates is a sitting one'. But this limitation is one which I have discussed elsewhere,<sup>6</sup> and I shall say no more about it here, and will throughout make free use of examples of the Aristotelian type.

Again, are 'John stays away' and 'John should stay away' sentences when they occur in 'If John stays away, Peter will be offended', or in 'If John should stay away, etc.'? No doubt both of them

could be sentences; 'John should stay away' would be one if, e.g., it was a pronouncement or piece of advice as to how it would be wise or proper for him to behave on some occasion. But that is clearly not what is intended here, nor in the other form is 'John stays away' the (habitual) present-tense assertion that it might be taken to be on its own. These forms, as here used, are inseparable from the introducing conjunction 'If', and I should say myself that they are not properly speaking sentences, but rather sentences with a bit of conjunction woven into them. It is as if the whole were short for 'If it should be that John will stay away, then Peter will be offended'; the conjunction here 'If-it-should-be-that - , then - ', [p. 8] and in the more idiomatic form the 'it-should-be-that' which belongs inseparably with the 'if' has been woven into the antecedent sentence, so that the idiomatic antecedent is no more a genuine sentence than 'If John will come' would be.

But the ambiguities of the term 'name' or 'noun', in English at least, are even more manifold and serious. It will already have been obvious to many readers, for instance, that in one of my examples I glossed over the differences between singular and plural nouns or noun-complexes by selecting a verb which happens to have the same form in both numbers - 'John and James' and the singular 'James' will go equally well with ' - went to town'; but I could not have played this trick with the present tense. And a logic of singulars and plurals would, I suspect, be worth developing; I shall, however, continue to ignore it here. In the present chapter, but only in the present chapter, I shall also ignore the question as to whether 'That two and two are five', which was described above as a name constructed by means of 'that' out of a sentence, really is a name in the sense in which 'John' is one. Such 'noun-clauses' are the usual grammatical objects of verbs like 'believe', 'assert', 'fear', and as such are too much bound up with our [Ed. 'out' is typed in MS] main topic to be properly dealt [p. 9] with in this preliminary survey of a wider field. 'Abstract nouns', which form a connected topic, may be similarly put aside for later mention. There is one distinction, however, which we had better look at immediately, namely that between 'proper' names or nouns and 'common' ones.

English is one of a group of languages in which the grammatical behaviour, so to speak, of these two types of nouns is markedly different, though there are other languages, such as Latin and Polish, in which the distinction is not quite so easy to make. By and large, expressions which construct grammatical English sentences out of proper names will not construct grammatical English sentences out of common names; and vice versa. For example, we can say 'Raleigh smokes' and 'Richard loves Joan', but not 'Horse smokes' or 'Cat kills rat'; and we can say 'There is no such thing as a dragon' and 'Every man is an animal', but not 'There is no such thing as a Pegasus' or 'every John is a Peter'. It is no doubt easy to think of exceptions, and even to imagine situations in which one would have a use for the particular sentences just alleged to be ungrammatical; but it is perfectly clear which are the 'natural' and which the 'unnatural' English constructions in the group just given. [p. 10] It is also clear that singular demonstrative pronouns may replace proper names in most contexts (or at all events, where the proper names are names of people, they are replaceable by such phrases as 'This person' or 'This individual'), but they cannot in most contexts replace common ones. There are, moreover, a variety of expressions in English the function of which is precisely to link proper names or demonstratives to common names, and where these expressions (e.g. ' - is a - ', ' - owns a - ') are employed it is usually quite clear which 'position' is to be occupied by which sort of name, and it is not possible to interchange them. For example, we have 'This is a rose' and 'Henry is an undertaker' but not

'Rose is a this' or 'Undertaker is a Henry', and we have 'James owns a horse' but not 'Horse owns a James' or even 'Horse is owned by a James'.

From the last point mentioned it will be clear that the part of our language in which we use proper nouns and demonstratives and the part in which we use common nouns are not by any means completely isolated from one another but interact in a variety of ways. Thus the expression '- is a -', which is not a proper verb if by 'verb' we mean a sentence-forming functor of proper names, nevertheless yields a verb when a common name is supplied; '- is a deputy' [p. 11] is a verb as surely as its synonym '- deputises' is one. We also have the form 'thing that -', often abridged to '-er', for constructing common nouns out of proper verbs; e.g. 'thing that eats', 'eater'. And at this point we may well wonder, as a number of logicians have wondered, whether the common noun is not in the end a dispensable part of speech. For whether we punctuate 'x is a thing that deputises' as 'x is-a thing-that-deputises' or as 'x is-a-thing-that deputises', what does it really mean beyond the plain 'X deputises'? If we had a language in which all common nouns were replaced by the corresponding verbs (these being invented where not already existing), and all sentence-forming functors of common nouns by analogous functors of verbs, could not we say all that we can say now? For instance, instead of 'Every man is an animal' we would say 'Whatever humanates animalises', or if you like 'Whatever isaman isanimal', where the common nouns 'man' and 'animal' and the functor 'Every - is a -' have been simultaneously replaced by the corresponding verbs and the functor 'Whatever -s -s'. And this possibility of replacement by verbs is taken by some logicians as the mark that distinguishes common nouns from proper nouns. Only [p. 12] proper nouns, we might say aphoristically, are properly nouns at all.

I noted earlier in passing, that this distinction is not as clearly marked in some other languages as it is in English, but I doubt whether there is any language from which it is quite absent. There are more contexts in Latin than in English in which it is a matter of indifference whether one inserts a common noun or a proper noun or a demonstrative, e.g. one may equally well have Hic est caecus, Brunellus est caecus, Asinus est caecus; but even in Latin there are plenty of contexts in which it is admissible to put one type of expression and not to put the other, e.g. Omnis Brunellus est caecus and especially Omnis hic est caecus are as bad Latin as their translations would be English.<sup>7</sup> And even where you have sentences made up of common nouns and simple verbs the schoolmen noted a revealing difference. Homo may occur as subject both of Homo est species and of Homo currit, but not in the same way. In Homo est species, for which 'Man is a species' is a philosophically accurate as well as a literal translation, Homo is a quasi-proper name of an abstract entity - the schoolmen said it has suppositio [p. 13] simplex and directly 'stands for' the 'universal' which it 'signifies' (supponit pro quod significat) - and takes a correspondingly abstract verb. (One can say of the abstraction Man that it is a species, but not of any individual man that he is one.) In Homo currit, on the other, it has suppositio personalis, and stands not for a kind of individual but for an individual of that kind.<sup>8</sup> In English we make the distinction by saying that what runs is not Man (that can no more run than the individual man can be a species) but a man; so we translate the form as 'A man is running', making it quite clear that 'man' is not attached to the plain '- is running' as 'Socrates' might be. But the medieval distinction shows that the difference was felt in Latin even where it was not expressed.

Whatever may be its importance or unimportance in the various natural languages, this distinction between proper and common names is basic to the understanding of the broadly 'Russellian' type of logic which I shall be employing or assuming in most of what follows; it is of course for this reason that I am emphasising the distinction now. The [p. 14] fundamental logical language which is either used or hinted at in Principia Mathematica is one with no nouns in it but proper ones, and ones, moreover, which are 'proper' in a rather tight sense - expressions whose sole function in the sentence is to identify some object or other. It has been questioned whether there are or could be expressions which identify an object without in any way describing it, but the logical importance of this question has, it seems to me, been much exaggerated, perhaps by Russell himself as well as by his critics. We may say that an expression  $\underline{x}$  'functions purely as an identifier' in a sentence, say ' $\underline{x}$  is red', if and only if the sentence is so understood that it will count as true if and only if (i) some object is identified by  $\underline{x}$  (no matter how), and (ii) that object is red; as false if and only if we have (i) but not (ii); as just 'not saying anything' if (i) fails. For example, 'This rose' (with its accompanying gesture) may be said to function purely as an identifier in the sentence 'This rose is red' if we count it as true so long as there is a definite object which 'This rose' is being used to pick out, and that object is red, even if it is in fact a carnation.<sup>2</sup>

[p. 15] Russell's 'names', then, in the more fundamental part of his logical language, are all of them simple identifiers. This part of his language also contains verbs or 'predicates' which form sentences out of names (monadic or one-place predicates forming them out of single names, dyadic or two-place predicates forming them out of pairs of names, and so on), and conjunctions and expressions like 'It is not the case that - ' forming sentences out of other sentences or pairs or groups of sentences. To this apparatus, still in what I am calling the more fundamental part of his logical language, he adds the mathematical devices of variables and quantifiers. Standing indifferently for any identifiers he has the variables  $\underline{x}$ ,  $\underline{y}$ ,  $\underline{z}$ , for verbs the variables  $\underline{\phi}$ ,  $\underline{\psi}$ , etc., and for whole sentences the variables  $\underline{p}$ ,  $\underline{q}$ ,  $\underline{r}$ , etc. He writes the sentence-form ' $\underline{x}$   $\underline{\phi}$ 's' as  $\underline{\phi}\underline{x}$ , ' $\underline{x}$   $\underline{\phi}$ 's  $\underline{y}$ ' as  $\underline{\phi}\underline{x}\underline{y}$ , etc.; 'It is not the case that  $\underline{p}$ ' as  $\sim\underline{p}$ , ' $\underline{p}$  and  $\underline{q}$ ' as  $\underline{p}\underline{q}$ , ' $\underline{p}$  or  $\underline{q}$ ' as  $\underline{p}\vee\underline{q}$ , 'If  $\underline{p}$  then  $\underline{q}$ ' (in one sense of 'If') as  $\underline{p}\supset\underline{q}$ , and 'If and only if  $\underline{p}$  then  $\underline{q}$ ' as  $\underline{p}\equiv\underline{q}$ . In the more compact Polish symbolism which we shall be occasionally using later, the last five of these are respectively  $\underline{Np}$ ,  $\underline{Kpq}$ ,  $\underline{Apq}$ ,  $\underline{Cpq}$ ,  $\underline{Epq}$ .

The term 'quantifier' is slightly ambiguous. In one sense it means a prefix of the form 'For all  $\underline{x}$ ' or 'For some  $\underline{x}$ ', [p. 16] these being represented by Russell respectively as ' $(\underline{x})$ ' and ' $(\exists\underline{x})$ ' and in the Polish symbolism respectively as  $\underline{\Pi}\underline{x}$  and  $\underline{\Sigma}\underline{x}$ . Or we may use the term just for the 'For all - ' and 'For some - ' part of these prefixes, i.e., in the Polish symbolism for the  $\underline{\Pi}$  and the  $\underline{\Sigma}$ . This ambiguity is not important; the point of the device of quantification, however it be described, is the construction of actual sentences from sentence-forms containing variables. Thus from ' $\underline{x}$  is red' we may form 'For all  $\underline{x}$ ,  $\underline{x}$  is red' and 'For some  $\underline{x}$ ,  $\underline{x}$  is red'. In English, simple quantifications of this sort are expressed by introducing a quasi-noun 'thing' and saying 'Everything is red' for the first quantification and 'Something is red' for the second. If we prefix the first or 'universal' quantifier, 'For all  $\underline{x}$ ', to an implication-form with the same variable  $\underline{x}$  in both the contained sentence-forms, we obtain such forms as 'For all  $\underline{x}$ , if  $\underline{x}$  is red then  $\underline{x}$  is colored'. In symbols, this form is  $(\underline{x}).\underline{\phi}\underline{x}\supset\underline{\psi}\underline{x}$ , or in the Polish  $\underline{\Pi}\underline{x}\underline{C}\underline{\phi}\underline{x}\underline{\psi}\underline{x}$ . Russell called these 'formal implications'; in English we render them in a variety of ways, e.g. 'Everything that is red is coloured', 'Whatever is red is colored', 'If anything is red it is coloured'.

[p. 17] But there is another segment, a dependent one, of the Russellian language which contains the equivalent of ordinary English common nouns. Here Russell uses the letters  $\alpha, \beta, \gamma$  etc. for 'class-names', which may be taken as common nouns, and introduces various expressions which construct sentences out of class-names and complex class-names out of simpler ones, and also expressions which link this part of his language with the part which I have described as fundamental. The most important items of the latter sort are the form  $\hat{x}(\varphi x)$  for the common noun ' $\varphi$ -er' or 'thing that  $\varphi$ 's', and the functor  $\underline{\varepsilon}$  for '- is a -', linking an identifier with a common noun, and so giving the form  $\underline{x\varepsilon\alpha}$ . Russell gives a method, which need not be reproduced here,<sup>10</sup> for replacing any expression in his 'class calculus' by an expression in what I have called the more fundamental part of his language; the principle effect of this is, as we should hope that 'y is a  $\varphi$ -er',  $\underline{y\varepsilon\hat{x}(\varphi x)}$ , turns out to be an inflation of  $\varphi y$ , ' $y$   $\varphi$ 's'.

The various sentence-forming and common-noun-forming functors of common nouns are all defined in terms of this [p. 18] basic apparatus. Thus the form 'Every  $\alpha$  is a  $\beta$ ', written  $\underline{\alpha} \subset \underline{\beta}$ , is defined as the formal implication 'Whatever is an  $\alpha$  is a  $\beta$ ', or in full 'For all  $\underline{x}$ , if  $\underline{x}$  is an  $\alpha$  then  $\underline{x}$  is a  $\beta$ ',  $(\underline{x}).\underline{x\varepsilon\alpha} \supset \underline{x\varepsilon\beta}$ ; and the form 'An  $\alpha$  exists',  $\exists!\alpha$ , as 'Something is an  $\alpha$ ', or in full 'For some  $x$ ,  $x$  is an  $\alpha$ ',  $(\exists x).x\varepsilon\alpha$ . The form 'The  $\alpha$  exists', or 'There is exactly one  $\alpha$ ', is written  $E!\alpha$  [Ed. The iota is inverted in the MS] (why this rather than the simple  $E!\alpha$ , will be explained shortly), and can be defined as:

'At least one thing is an  $\alpha$ ; and at most one thing is an  $\alpha$ ',

i.e.

'Something is an  $\alpha$ ; and for any  $x$  and  $y$ , if both  $x$  is an  $\alpha$  and  $y$  is an  $\alpha$ , then  $x$  and  $y$  are one and the same thing'.

(The two-place predicate '- is identical with -', which appears in the last part of this, is represented in Russell by the ordinary equality sign, and defined in a way we need not here consider.) The form 'The one and only  $\alpha$  is a  $\beta$ ', symbolised (for reasons we shall later go into) as  $\underline{\alpha\varepsilon\beta}$  clearly amounts to 'There is exactly one  $\alpha$ , and every  $\alpha$  is a  $\beta$ '.

All this amounts to a very thoroughgoing exploitation of the possibility of treating common nouns as a dispensable [p. 19] element of language,<sup>11</sup> yielding handy abbreviations in practice but in principle dispensable in favour of the corresponding verbs, with similar 'changes of key' for the various functors which take common nouns as arguments. What we may now ask ourselves is whether it is possible to return the compliment - to treat the mechanism based on identifier and proper verb as conversely replaceable, should one wish to do without it, by one using common nouns. We might also put this question in the following way: It is clear that that part of our language which contains common nouns and no other sort could be developed in its own right, so to speak, and not just as a by-product of the identifier-and-verb mechanism. Symbolically, we might have Russell's class variables  $\alpha, \beta, \gamma$ , etc., and such functors as  $\subset, \exists!$ , and  $E!$ , introduced without any method of translating into the identifier-and-verb mechanism, though we might define some of them in terms of others. We might, for example, introduce a symbol  $\varepsilon'$ , not like the Russellian  $\varepsilon$  for the functor '- is a -' linking a proper

and a common noun, but for the functor 'The only - is a - ', linking two common nouns; and it will be found [p. 20] that many of Russell's definitions in terms of  $\varepsilon$  will still do when they are replaced by this new  $\varepsilon'$ . For example, 'Every  $\alpha$  is a  $\beta$ ' can be defined as 'For all  $\gamma$ , if the only  $\gamma$  is an  $\alpha$  then the only  $\gamma$  is a  $\beta$ ' (cf. the Russellian definition of it as 'For all  $x$ , if  $x$  is an  $\alpha$  then  $x$  is a  $\beta$ '). (This use of the quantifier with common-noun variables instead of identifier variables requires some comment; but that will come better in a later chapter.) And our question now is: Can we give systematic translations of expressions containing identifiers and verbs into this language directly built up from common nouns?

Some expounders of the discipline called 'ontology' by the Polish logician who invented it, Lesniewski, speak as if this problem were solved in that discipline simply by treating identifiers as a sub-class of common nouns. In the language of ontology, it is suggested, the name-variables may stand indifferently for proper and for common names, and the functors which form sentences out of names may be thought of indifferently as verbs or as the functors which I have distinguished above from proper verbs as having common rather than proper noun arguments; while the important Lesniewskian functor  $\underline{\varepsilon}$  does duty equally for the [p. 21] Russellian  $\underline{\varepsilon}$  and for my functor  $\underline{\varepsilon}'$  of the preceding paragraph (where  $\underline{\alpha\varepsilon'\beta}$  is a variant of the Russellian  $\underline{\alpha\varepsilon\beta}$ ). But this way of regarding 'ontology' seems to me to rest on a misunderstanding. None of the names for which Lesniewskian name-variables can stand has the purely identifying function assigned to the Russellian proper name; that is to say, no Lesniewskian name is so used that its failure to identify some single real individual will mean that the sentence in which it occurs just 'does not say anything'.

An alternative approach to the problem of translating an identifier-and-verb logical apparatus into one based on common nouns, may be suggested by the fact that there are expressions in English which seem to have the function of constructing identifiers out of common names, notably the definite article and demonstrative adjectives. 'The flower in my button-hole' and 'This rose' would both seem capable of replacing the plain 'This' in 'This is red'; and if one failed to indicate anything by them - if, e.g., there were no flower in my button-hole, or several - one might well judge that one 'hadn't said anything' by the sentences so constructed. This is, notoriously, the view of phrases [p. 22] beginning with 'The' which was put forward in Frege's 'Sense and Reference' and again in Strawson's 'On Referring'; and one might argue that all identification is effected, implicitly if not explicitly, by some such construction of an identifier out of a common noun. Symbolically, all that one requires here is a special functor, say the  $\iota$  of the Russellian (or Peanese)  $\iota\alpha$ , to stand for the identifier-forming 'The' or 'This'. For sentence-forming, if we adopt this second procedure and have our new names - in a new 'syntactical category' of the form  $\iota\alpha$ , we shall also need some means of forming proper verbs. This could be done simply by introducing, along with  $\iota$ , the Russellian  $\varepsilon$ . The whole procedure would then exhibit a nice complementariness to Russell's own converse procedure of introducing common nouns into identifier-and-verb logic by the twin functors  $\hat{x}$  and  $\varepsilon$ . Here  $\hat{x}$ , as we have seen, forms the common noun  $\hat{x}(\varphi x)$  out of the verb  $\varphi$ ,  $\varepsilon$  combines with a preceding x for giving us the basic functor ('This is a - ') for forming sentences out of common nouns. In the converse procedure, where  $\iota$  forms the proper noun  $\iota\alpha$  out of the common noun  $\alpha$ , the  $\varepsilon$  combines with a following  $\beta$  to give us the basic functor (' - is a  $\beta$ ') for forming sentences out of proper nouns, i.e. [p. 23] the basic proper verb. But whereas Russell gives a method for translating sentences containing  $\hat{x}$  and  $\varepsilon$  into ones which contain neither, I cannot see any way in which one might in the other

system replace sentences containing  $\iota\alpha$  and  $\varepsilon$  by ones containing neither. Nor, even swallowing this complication, have I much idea what a system of this sort, developed with appropriate axioms, would look like in detail.

Russell's own form  $\iota\alpha$  does not belong to this train of thought and is not presented as a form of proper name but as a form of something more complicated which he calls a 'definite description'. To understand this rather different method of handling the definite article, it will be useful to begin by noticing the resemblance which that part of speech bears to words like 'Every', 'Some' and 'A certain', a resemblance which led Johnson to group them all together as 'applicatives'. I have insisted earlier on that expressions which form sentences out of common nouns are not properly speaking verbs; they do nevertheless, at least in English, often finish up with verbs, at all events with what in other contexts would certainly be verbs. 'Every - is an animal', 'Some - is blind', 'The - is dead', 'A certain [p. 24] - had two sons' are not verbs, but their concluding portions ' - is an animal', etc., seem certainly to be verbs, and are replaceable even in the contexts I have given by grammatically simple verbs like ' - smokes' or ' - dies'. To put it another way, the blank in such sentence-frames as ' - is an animal', ' - is blind', ' - had two sons', ' - smokes', ' - dies' may be filled not only by a proper noun or demonstrative but by a common noun preceded by an applicative. No one would be quite happy about drawing from this fact the conclusion that such expressions as 'Every horse', 'Some animal', or 'A certain man' are proper names. In the case of 'A certain man' there is no doubt a temptation to say this, and some medieval writers in fact did say that aliquis homo was the name of an individuum vagum; but this seems so obvious a confusion of a vague way of referring with a vagueness in the thing referred to that it is enough to make us see the temptation as a temptation, and avoid it. And is it not enough also to make us uneasy about treating the syntactically similar expressions 'The man' and 'The only man' as proper names?

Russell in fact succumbs to this temptation to the extent of introducing a symbol-sequence  $(\iota x)(\phi x)$ , for 'the [p. 25] thing that  $\phi$ 's', 'the  $\phi$ -er' (the form  $\iota\alpha$  is a special case of this, being short for  $(\iota x)(x\varepsilon\alpha)$ ), and allowing it to stand as argument to a verb-symbol, giving us such forms as  $\psi(\iota x)(\phi x)$ . But the difference between 'The  $\phi$ -er' and a proper name, and its resemblance to 'Some  $\phi$ -er' and 'every [sic]  $\phi$ -er', become plain when we examine Russell's recipe for translating the form  $\psi(x)(\phi x)$  [sic] into his basic vocabulary. 'The  $\phi$ -er  $\psi$ 's', he says, is to be taken as meaning

For some one  $x$ , (i)  $x$   $\phi$ 's, (ii) whatever  $\phi$ 's is identical with  $x$ , and (iii)  $x$   $\psi$ 's.

This seems straightforward until we remember how very complicated it is possible for a 'verb' to be in this language. A Russellian verb may be an ordinary verb like ' - smokes', but it may also be something like 'If - smokes then Susan will be anxious'. A verb in this sense is really a context - it is the context which completes a proposition when the subject-name is given. So what the Russellian translation-recipe amounts to is this: Given the form 'The  $\phi$ -er' in any propositional context, say  $\psi$ , translate the whole by just writing 'For some one  $x$ ,  $x$   $\phi$ 's, whatever  $\phi$ 's is identical with  $x$ , and - ', and then finish the sentence by taking the context that was wrapped around 'The  $\phi$ -er', [p. 26] and wrapping it instead around the variable  $x$ . And at this point trouble begins.

Trouble begins because in many cases there is no such thing as the context of a proper name or of a 'The' phrase, for there are two or even several contexts, wider and narrower. For example, in 'It is not the case that Socrates smokes', we might say that the verb '- smokes' is the context which yields with the name 'Socrates' the proposition 'Socrates smokes', and 'It is not the case that - ' then forms from this the negative proposition given. But equally we might say that 'It is not the case that - ' forms with the simple verb '- smokes' the negative verb 'It is not the case that - smokes', and this verb is the context which immediately yields with the name 'Socrates' our given proposition as a whole. And in this case it does not really matter what we say, as we reach the same sentence in the end by either route. But when working out the Russellian translation of 'It is not the case that the man in the moon is blue', the question of what we regard as the 'context' of 'the man in the moon' is not at all trivial. We begin, certainly, by writing 'For some one x, x is at once human and in the moon, whatever is at once human and in the moon is identical with x, and - '; [p. 27] but what do we do now? Do we write 'It is not the case that x is blue' (taking the context 'It is not the case that - is blue' that was originally around 'the man in the moon' and putting it around 'x'), and then stop? Or do we first put, after 'and', '- the man in the moon is blue' (wrapping around 'x' the simpler verb '- is blue', which can equally be regarded as the original context of 'the man in the moon'), and then put 'It is not the case that - ' before the whole (just as it was put before 'the man in the moon is blue' in the original)? It does matter which of these two we do, because so long as there is no man in the moon (or more than one) the first translation will give us a falsehood and the second a truth. (It is false that for some x, a [sic] is at once human and in the moon, and therefore false that for some x, this and a couple of other things; but for the same reason it is true that it is not the case that for some x, this and a couple of other things.)

One would obviously run into the same sort of trouble if one introduced - though Russell does not do this - a symbol-sequence  $(\Pi x)(\phi x)$  for 'Every man', with the instruction to translate  $\psi(\Pi x)(\phi x)$  as 'For all x, if x  $\phi$ 's then x  $\psi$ 's). For how are we to apply this translation to 'It is not the [p. 28] case that every animal is a horse'? We start, certainly, by writing 'For all x, if x is an animal, then - ', but do we complete this by '- it is not the case that x is a horse' (yielding the falsehood that no animal is a horse), or do we put after 'then' simply 'x is a horse' and then put 'It is not the case that - ' before the whole (yielding the truth that not every animal is a horse)? In this case the idiomatic force of 'It is not the case that every animal is a horse' is undoubtedly that rendered by the second procedure, in which the recipe is applied in the immediate context and the wider context supplied to that after translation; and on the whole, though less definitely, common idiom favours a similar treatment of 'The'. ('It is not the case that the man in the moon is blue' would normally be read as the true statement that it is not the case that there is a unique man in the moon who is blue, rather than the false statement that there is a unique man in the moon who is not blue.)

That common speech generally decides this problem in this way is not, I think, accidental. The fact of the matter is that in 'It is not the case that the man in the moon is blue', neither '- is blue' nor 'It is not the case that - [p. 29] is blue' is the context of 'the man in the moon', in the sense in which it might be the context of 'this' or 'Socrates'; rather, 'The man in the moon - ' is the context of '- is blue'. Or it is at all events a context of this verb; but when we see it this way the plurality of contexts is no longer a source of ambiguity. For we reach exactly the same statement, the true

one that says there is no unique blue man in the moon, by proceeding in any of the following ways:-

1. Attaching the sentence-forming functor of two verb-arguments 'The thing that - , - ' (call it F1 for short) to the two verbs ' - is human and in the moon' and ' - is blue', and then attaching 'It is not the case that - ' to the sentence thus formed.
2. Attaching the functor 'It is not the case that - ' to F1 to form the new sentence-forming functor of two verb-arguments 'It is not the case that the thing that - , - ' (call this NF1), and then attaching this to ' - is human and in the moon' and ' - is blue'.
3. Attaching F1, at its first argument-point, to ' - is human and in the moon', to form the sentence-forming functor of one verb-argument 'The thing that is human and in the moon - ' (call this F2), then attaching this to ' - is blue', and then prefixing 'It is not [p. 30] the case that - ' to the whole.
4. Forming NF1 as in (ii), attaching it to ' - is human and in the moon' to form the new functor of one verb-argument 'It is not the case that the thing that is human and in the moon - ' (call this NF2), and attaching this to ' - is blue'.
5. Forming NF2 not as in (iv) but by forming F2 as in (iii) and then prefixing 'It is not the case that - ' to it, and then attaching NF2 to ' - is blue' as at the end of (iv).

Symbolically, if we write  $\phi$  for 'The  $\phi$ -er', and 'The  $\phi$ -er  $\psi$ 's' in the Russellian manner as  $\psi\phi$ , treating the verb as the context of the description, then it matters immensely whether we read  $N\psi\phi$  as  $(N\psi)\phi$  or as  $N(\psi\phi)$ . But if we write it as  $\phi\psi$ , making the description the context of the verb, then no bracketing is needed to distinguish  $N\phi\psi$  from  $\phi N\psi$ , and the meaning of the form is unaffected whether we represent its formation as  $N((\phi,\psi))$ ,  $(N)(\phi,\psi)$ ,  $N((\phi)\psi)$ ,  $((N)\phi)\psi$ , or  $(N(\phi))\psi$ .

What I am now suggesting is something like this: If a complex form  $YZ$  is a sentence we may sometimes be in doubt [p. 31] as to whether to regard  $Y$  as the sentence-forming functor and  $Z$  as its argument, or vice versa. And we can sometimes decide this point by considering a more complex sentence  $XYZ$  of which  $YZ$  is a part. If  $Y$  is the sentence-forming functor and  $Z$  the argument, then it should make no difference whether we think of  $Y$  as forming the sentence  $YZ$  out of  $Z$  and  $X$  as then forming the sentence  $XYZ$  out of  $YZ$ , or of  $X$  as forming the functor  $XY$  out of  $Y$  and this functor as then forming the sentence  $XYZ$  out of  $Z$ . And the freedom we have allowed ourselves to think of the sentence-forming functor of sentences  $X$  as being ipso facto a functor-forming functor of functors, depends on our being careful that, in its second use, it is really the functor (in a given complex) we attach it to and not its argument.

## Notes

<sup>1</sup> The locus classicus here is Ajdukiewicz (1), but see also Curry and Feys (1), pp.264-6, 274-5.

<sup>2</sup> Johnson (2), Part I, pp.28, 122.

<sup>3</sup> [No footnote 3 in MS, this empty footnote inserted to maintain sequence.]

<sup>4</sup> Cf. Johnson (2), Part II. pp. [sic].

<sup>5</sup> Categories, Ch. V.

<sup>6</sup> Prior, Time and Modality.

<sup>7</sup> Cf. Peter of Spain (1).

<sup>8</sup> Peter of Spain (1).

<sup>9</sup> Cf. -Royal Logic. [sic: Port-Royal Logic?]

<sup>10</sup> See P.M. and Prior ( ) (F.L.)

<sup>11</sup> Though this way of putting it is not so much Russell's own (he talks rather of treating 'classes' as 'logical constructions') as Peirce's.