Abstract. A system of natural deduction rules is proposed for an idealized form of English. The rules presuppose a sharp distinction between proper names and such expressions as 'the c', 'a (an) c', 'some c', 'any c', and 'every c', where 'c' represents a common noun. These latter expressions are called quantifiers, and other expressions of the form 'that c' or 'that c itself', are called quantified terms. Introduction and elimination rules are presented for any, every, some, a (an), and the, and also for any which, every which, and so on, as well as rules for some other concepts. One outcome of these rules is that 'Every man loves some woman' is implied by, but does not imply, 'Some woman is loved by every man', since the latter is taken to mean the same as 'Some woman is loved by all men'. Also, 'Jack knows which woman came' is implied by 'Some woman is known by Jack to have come', but not by 'Jack knows that some woman came'.

Natural deduction rules ordinarily are applied only in the case of artificial languages, but it is interesting to try to formulate such rules for English, or rather for an idealized form of English.

The rules for the sentential connectives and, or, it is false that, and if... then would of course be essentially the usual ones. Let 'p', 'q', 'r' stand for arbitrary sentences. Let '¬p' stand for 'it is false that p', and let 'p ⊃ q' stand for 'if p then q'. (Single quotes are being used to refer to the expressions written between them, except that metavariables between single quotes are to be replaced by instances of expressions that they stand for. Such replacement, however, of course would not occur in sentences in which the metavariables themselves are first introduced or in which the context indicates that the metavariables are themselves being referred to.) The rules for the above connectives could be chosen as follows, using proof methods like those of my book, Symbolic Logic (Ronald Press, 1952):

Rule of indirect proof: 'p' is a d.c. (direct consequence) of a proof having hypothesis '¬p' (as its only hypothesis) and having contradictory steps 'q' and '¬q'. (All the usual rules for negation are known to be derivable from this rule.)
Rules for conjunction: ‘p and q’ is a d.c. jointly of ‘p’ and ‘q’ (introduction rule); and each of the latter is a d.c. of ‘p and q’ (elimination rule).

Rules for disjunction: ‘p or q’ is a d.c. of ‘p’; also, ‘p or q’ is a d.c. of ‘q’ (introduction rules); and ‘r’ is a d.c. jointly of the following three things: (1) ‘p or q’, (2) a proof having hypothesis ‘p’ and conclusion ‘r’, (3) a proof having hypothesis ‘q’ and conclusion ‘r’ (elimination rule).

Rules for conditionality (i.e., for implication): ‘q’ is a d.c. jointly of ‘p’ and ‘p ⊨ q’ (elimination rule, also called modus ponens); and ‘p ⊨ q’ is a d.c. of a proof having hypothesis ‘p’ and conclusion ‘q’ (introduction rule).

The procedure referred to in my book as reiteration will be assumed to be available for use in proofs in the usual way.

Consider, next, the possibility of formulating rules that play the same role for English that quantifier rules play for formalized languages. Such rules will be specified below, at least in tentative or outline form. These rules will be so chosen, for present purposes, as to avoid many of the ambiguities of actual English usage. For example, the sentence, ‘Every man is loved by a woman’, will not be treated as equivalent to ‘A woman loves every man’, though often in ordinary usage they might be regarded as equivalent. It will later be shown that the former sentence will mean, according to the proposed rules, that for each man some woman exists who loves him, while the latter sentence will mean that some woman loves all men.

Before these quantifier rules are formulated, it is necessary to draw a sharp distinction between certain kinds of noun phrases. Insistence on the sharpness of the distinction is already a deviation from actual English usage and a step toward constructing an idealized form of English. The distinction is made between noun phrases of the following four kinds:

(1) Proper names that are merely proper names (and not descriptive phrases in disguise). Even if these do not exist in actual spoken English, we assume that they do exist in the idealized form of English with which we are concerned. We will regard such noun phrases as ‘New York City’, ‘Richard M. Nixon’, and so on, as being examples of proper names of this sort. For convenience in constructing examples of proofs, common given English names such as ‘Jack’, ‘Jill’, ‘Jane’, and ‘George’ will be treated as examples of such proper names. The letter ‘b’, with or without a numerical subscript, will be sometimes used to stand for an arbitrary proper name.