APPENDIX 2

Leibniz on Analysis

All proof, according to Leibniz, depends on the Principle of Identity, which states that a proposition expresses an 'identity' if the predicate is explicitly either identical with or included in the subject. Now Leibniz believed that 'always, in every true affirmative proposition, necessary or contingent, universal or particular, the concept of the predicate is in a sense included in that of the subject' (*LAC*, p. 63); so that if this inclusion could be made explicit, if it was not already, a *proof* of the proposition could be achieved. Proof thus proceeds by reducing the proposition to an 'identity' by successive applications of the rule of 'substitution of equivalents', i.e. by *analysing* each term in turn by means of a definition. As illustrations, consider the following two proofs of '2 + 1 = 3' ('Two plus one is three') and 'Logicians are thinkers', respectively:

(A)

(1)	2 + 1	=	3		
(2)	1 + 1 + 1	=	3	(by the def. '2 = 1 + 1')	
(3)	1 + 1 + 1	=	2 + 1	(by the def. '3 = 2 + 1')	
(4)	1 + 1 + 1	=	1 + 1 + 1	(by the def. '2 = 1 + 1')	

(B)

(1) Logicians are thinkers
(2) Sharp-minded philosophers are thinkers
(by the def. 'Logicians are sharp-minded philosophers')
(3) Sharp-minded enlightened intellectuals are thinkers
(by the def. 'Philosophers are enlightened intellectuals')
(4) Sharp-minded enlightened stimulating thinkers are thinkers
(by the def. 'Intellectuals are stimulating thinkers')

In both cases, (4) is an 'identity' in Leibniz's sense, and cannot itself be demonstrated, being something that is immediately *intuited* as true. (Cf. MacDonald Ross, 1984: pp. 62-3; Ishiguro, 1990: pp. 56-7.) But if it is possible to *analyse* downwards from (1) to (4), to *prove* a proposition, then it must be possible to *synthesize* upwards from (4) to (1), to *discover* (the fact expressed by) a proposition. (Cf. Kneale, 1962: pp. 332-3.) Once the basic terms are found, Leibniz believed, we can move in *either* direction, and a universal character can thus be combined with a *calculus ratiocinator* to provide *both* a logic of proof *and* a logic of discovery (cf. §2.1 above).