# INDEPENDENT POSTULATES FOR THE "INFORMAL" PART OF PRINCIPIA MATHEMATICA*

BY E. V. HUNTINGTON

1. *Introduction.* It has long been recognized that Section A of Whitehead and Russell's *Principia Mathematica* contains two distinct theories of mathematical logic—one a "formal" or "official" theory, the other an "informal" or "unofficial" theory. The "formal" theory is embodied in a series of numbered propositions, while the "informal" theory includes, besides the numbered propositions, certain other propositions inserted by way of explanation or commentary. Since some of these explanatory propositions are actual additions to the text, not deducible from the numbered propositions, it appears that the "formal" theory is the more restricted (in the number of its theorems) and the "informal" theory the more inclusive of the two.

The contrast between these two theories presents an important problem in the foundations of mathematics; but in spite of the voluminous literature that has grown up around the "formal" theory during the last twenty years, little attention has been paid to the "informal" theory; moreover, the special notation in which the whole of the Principia is expressed is still unfamiliar to many mathematicians.

The purpose of the present paper is to show that the "informal" theory of the Principia, when translated into more familiar mathematical language, is capable of being represented by an ordinary abstract mathematical theory; and for this abstract mathematical theory a set of independent postulates is worked out in the usual way.†

---

* Presented to the Society, June 16, 1933.

† The scheme of translation here employed (representing the assertion sign by a "subclass $C$") was first used in 1933, in my paper entitled *New sets of independent postulates for the algebra of logic, with special reference to Whitehead and Russell's Principia Mathematica*, Transactions of this Society, vol. 35 (1933), pp. 274–304, with corrections on p. 557 and p. 971. The present paper is a simplification and extension of Appendix II of that paper. An earlier scheme of translation (representing the assertion sign by the notation "$=1$") is found in a paper by B. A. Bernstein entitled *Whitehead and Russell's theory of deduction as a mathematical science*, this Bulletin, vol. 37 (1931), pp. 480–488. The "sub-