$$abcd + ab'c'uv + a'bd'uv' + a'cd'u'v + b'c'du'v' = 0$$

or since, by hypothesis, the resultant $abcd = 0$ is verified,

$$ab'c'uv + a'bd'uv' + a'cdu'v + b'c'du'v' = 0.$$

This is an "equation of condition" which the indeterminates u and v must verify; it can always be verified, since its resultant is identically true,

$$ab'c' . a'bd' . a'cd' . b'c'd = aa' . bb' . cc' . dd' = 0,$$

but it is not verified by any pair of values attributed to u and v.

Some general symmetrical solutions, *i. e.*, symmetrical solutions in which the unknowns are expressed in terms of several independent indeterminates, can however be found. This problem has been treated by SCHRÖDER[1], by WHITEHEAD[2] and by JOHNSON.[3]

This investigation has only a purely technical interest; for, from the practical point of view, we either wish to eliminate one or more unknown quantities (or even all), or else we seek to solve the equation with respect to one particular unknown. In the first case, we develop the first member with respect to the unknowns to be eliminated and equate the product of its coefficients to 0. In the second case we develop with respect to the unknown that is to be extricated and apply the formula for the solution of the equation of one unknown quantity. If it is desired to have the solution in terms of some unknown quantities or in terms of the known only, the other unknowns (or all the unknowns) must first be eliminated before performing the solution.

41. The Problem of Boole.—According to BOOLE the most general problem of the algebra of logic is the following[4]:

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[1] *Algebra der Logik*, Vol. I, § 24.

[2] *Universal Algebra*, Vol. I, §§ 35—37.

[3] "Sur la théorie des égalités logiques", *Bibl. du Cong. intern. de Phil.*, Vol. III, p. 185 (Paris, 1901).

[4] *Laws of Thought*, Chap. IX, § 8.