# 28. *Axiom Systems of Aristotle Traditional Logic*

By Kiyoshi ISÉKI

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In this paper, we shall consider axiom systems of Aristotle traditional logic. Some axiom systems are obtained by J. Lukasiewicz ([3], [4]), I. Bocheński [1] and N. Kretzmann [2]. We shall give a method to find axiom systems. The method given below is useful for the purpose, and all axiom systems are found by our method.

As well known (see A. N. Prior [5]), in the Aristotle traditional logic, there are four types of categorical propositions, $a$ and $b$ being terms:

1) Every $a$ is $b$.
2) At least one $a$ is $b$.
3) At least one $a$ is not $b$.
4) No $a$ is $b$.

These propositions are denoted by $Aab, Iab, Oab, Eab$ respectively. Let $N$ be the negation functor, then $Eab=NIab$, $Oab=NAab$. By $X, Y, Z$, we denote the term functors $A, I, O, E$, then there are two different kinds of moods: *immediate inference* and *syllogism*. Moreover, the mood of immediate inference is divided into two types: $CXabYab$, $CXabYba$, where $C$ is the implication functor. These are denoted by $XY_1$, $XY_2$ respectively. On the syllogism, we have four types of moods:

I) $CKXabYcaZcb$,

II) $CKXabYcbZca$,

III) $CKXabYacZcb$,

IV) $CKXabYbcZca$,

where $K$ is the conjunction functor. These moods are denoted by $XYZ_i$ $(i=1, 2, 3, 4)$ respectively.

In these symbols, the Lukasiewicz axiom system is written in the form of

L1) $Aaa$,

L2) $Iaa$,

L3) $AAA_1$,

L4) $AII_3$.

Assuming some theses of propositional calculus, we have $II_1$, $II_2$, $EE_1$, $EE_2$, $AI_1$, $AI_2$, $EO_1$, $EO_2$ (see J. Lukasiewicz [3]).

From theses of the classical propositional calculus, we have the following deduction rules: