LOGIC OF PROPOSITIONS *)
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In the logic of sciences our interest is not asked for the subject-matter, which in the various sciences forms an object of inquiry but it is asked for its systematic construction and extension (2.), for the meaning of the systems thus created (3.), and for the way in which the human mind approaches these systems (1.). The following classification comes up to this:

1. linguistic-psychological introduction;
2. formal logic or symbolic logic or logistics;
3. semantics.

According to the scheme the construction is required to be formal-logical. Starting from certain symbols and from certain combinations formed with these symbols, called axioms, it is endeavoured by the application of certain sharply formulated rules, to deduce new sign-combinations, called propositions. Herewith we abstract things from the conscious (geometry!) and unconscious associations which by the symbols and the manipulations with these are formed in our minds, or — more strongly — precede these manipulations.

In semantics an inquiry is instituted into the relations between our propositions represented by sign-combinations and things outside this sign-language. Psychological consideration about attendant active processes of thinking are excluded.

Finally there is the linguistic-psychological introduction, leading up to the sign-language, axioms and linguistic rules. It is here that psychology comes into the foreground; here an inquiry is set up in what way the human mind arrives at a formalism from the observations of every-day life or from those of scientific empiricism. By way of example the idonism of the Swiss mathematician F. Gonseth may be mentioned 1). In his opinion every science has an empirical basis, also general logic and mathematics.

For geometry he gives the following schema of formalization:

I. geometry of observations; 1st process of axiomatization, a pre-
II. intuitive geometry. axiomatization, progressing unconsci-

II. gives a regulated, structured collection of broad views, represent-
III. Euclidean school-geometry. ing I. schematically.

II. intuitive geometry; 2nd process of axiomatization, pro-
III. Euclidean school-geometry. gressing consciously.

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III. represents II. schematically in symbols; II. is an abstractum in respect of I., a concretum in respect of III.

III. Euclidean school-geometry; 3rd process of axiomatization.
IV. Hilbert-geometry.

In their transition from III. to IV. the axioms change their nature; from geometrical they become logical. Complete formalization has not yet been reached in IV.

According to Gonseth we can also imagine the formal construction of the logic of propositions to be formed in our minds in a similar way, starting from:

I. physics of observations of the arbitrary object; consecutively creating;
II. intuitive physics of the arbitrary object;
III. axiomatized physics of the abstract (logical) object and its existence or non-existence;
IV. formal logic of propositions.

To III. belongs the principium tertii exclusi in the form: the object A exists, or it does not exist, in symbols: A \lor A'.

With the transition from III. to IV. we abstract i.a. from the supposition that A designates an existing-, A' a non-existing object ²).

The laws of the formal logic of propositions may be considered as a deductive system; laws or propositions can according to fixed deduction-rules be derived from others; new deduction-rules too, can be inferred from the deduction-rules given; the same applies to the conceptions occurring in the logic of propositions. Within certain limits the choice of the basic conceptions, of the axioms (fundamental laws) and of the deduction-rules is susceptible to alteration. For the same logic of propositions different equivalent systems of axioms and rules are possible.

As a starting-point we choose the system of Russell and Whitehead simplified by P. Bernays ³). Two new axioms (V. and VI.) have been added here to this system.

First group of symbols: A, B, C, \ldots; A₁, B₁, \ldots; Aₙ, Bₙ, \ldots;

Second group of symbols: \lor, \land (relation-signs).

Third group of symbols: λ, ν (elementary formulae).

Fourth group of symbols: \equiv \hat{v} (assertion-sign).

²) It seems to us we can imagine only part of the logic of propositions IV. to have arisen from I. along these lines; for the complete logic of propositions this deduction becomes rather artificial. For the rest this channel is for Gonseth not the only one along which IV. can be produced from our knowledge of the world.