5.3. Doctrine of thought (Logic, Dianoëtica, Analytica) Philosophy Introduction to philosophy (1981/1982)

Bookmark: see p. 103

Bibliographic Sample. Historiographic:

-- Carl Prantl, Geschichte der logik im Abendlande, 4 Bde, 1855/1870, Leipzig, 1927-2 (still very valuable);

-- J.B. Rieffert, Logik (Eine kritik an der Geschichte ihren Idee), in Max Dessoir, Hrsg., Die Philosophie in Einzelgebieten, Berlin, 1925, S. 1/294 (the author deals with **a**/ the language logic. (Aristotle, Bolzano e.g.), **b**/ case logic (Kant, Mill, Trendelenburg e.a.), **c**/ pure logic (logistics; - Husserl, Meinong, Rehmke e.a.), **d**/ method logic ('Methodelogik': Kant, Fries, Windelband, Royce, Lotze, Brentano, Dilthey, e.a.); still valuable);

-- R.H. Claes, Overview of the evolution of logical theories from antiquity to the present, Leuven, 1974 (analogous to Rieffert, o.c., 9/60 's overview of the types of logic);

-- G. Jacoby, Die ansprüche der lorgistiker Auf die Logik und ihre Geschichtsschreibung, Stuttgart, 1962 'a necessary work, which makes clear the real distinction between "formal" or conceptual logic (in (the sense of Plato and Aristotle), on the one hand, and, on the other hand, the formalized symbolic calculus of logics (which, in this sense, erroneously calls itself "logic")).

Descriptive:

-- *H.-J. Hampel, Variabilität und Disziplinierung des Denkens*, Munich/Basel, 1967 ('a necessary work, which does not describe how people ought to think (normative logic, but how they, in fact, -- and very variously -- 'think' (factic logic): classical (which he conceives Parmenidean, -- which is wrong), variological, magical, ideological thinking and other modes of thought are discussed).

Methodical:

B. Bolzano, Versuch einer ausführlichen und Grösstenteils neuen Darstellung der Logik, 1837, 1 (this Catholic priest pioneered the theory of sets and the theory of real functions as a theory of statements in itself').

-- *E. Husserl, Logische Untersuchungen (I. Prolegomena zur reinen Logik,* 1901: Husserl pointed to Bolzano's excellent logical ideas in view of the victory of psychologism over logic);

-- O. Willmann, Abriss der Philosophie (Philosophische Propädeutik), Wien, 1959 (Erster Teil: Logik (1912-1), S. 1/142;

-- *Cf. K. Leonard, An Introduction to the Theory of Thought*, Antw./ Bruss./ Leuv., 1932 ('n Dutch adaptation of Willmann's Logic; 1944-2);

-- Chr. Twesten, Die logik, Schleeswig, 1925;

-- Ch. Lahr Cours de Philosophie, Paris, 1933 (Logique, I, pp. 485/715);

-- H.J. De Vleeschauwer, Grondbeginselen der Logica, Antwerp, 1931, (Kantian)

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-- D. Mercier, Logique, Louvain, 1922 (neo-scholastic);

-- F. Van Shilfgaarde, The Logic of Aristotle, The Hague, 19562 (Hegelian interpretation of Aistotle's logic);

-- Wesley, Salmon, Logic, Prentice-Hall, 1963 ('a happy form of modern logic yet traditionally worked out (deduction, induction, language and logic).

The relationship between antique-medieval formal logic and formalized logic, better known as 'logics':

-- W. Albrecht, Die Logik der Logistik, Berlin, 1954;

-- Br. von Freytag, logik (Ihr System und ihr Verhältnis zur Logistik), Stuttgart, 1955-1 1961-2 (in connection with the Bremen Philosophenkongresz (1950), where a confrontation took place in line between philosophical logicians and actual logicians: the thesis of 'pure' or 'philosophical' logic, i.e. the traditional, 'formal' (i.e. There are many logics today (according to the combinatorics at work in them), but there is, throughout the ages, only one logic (which identifies the concept and its processing in judgment and reasoning). under the point of view of (partial) identity of the concept relations) (something which Plato founded in his 'analusis' of ideas and on which a.o. J. Royce, The Principles of Logic, 1912-1, New York, 1961 (The Relation of Logic as Methodology to Logic as the science of Order, o.c., 9/34; General Survey of the Types of Order, o.c., 62/77) emphasized, but in a modern-platonic way and in connection with modern logics and its first applications in the empirical sciences);

As an aside, the Jenaer Konferenz über Fragen der Logik (1951) went in an analogous direction to the Bremerkongrezz.

-- O. Becker, Zur Logik der Modalitäten (in E. Husserl, Hrsg., Jahrbuch für Philosophie und phänomenologische Forschung, Bd. 11), Halle, 1930 ('n modalities treatment that connects symbol arithmetic with phenomenology, which is prepared in it).

Foundations research:

-- *J.K. Feibleman, Assumptions of Grand Logics*, The Hague/ Boston/ London, 1978 (Part II deals with the metaphysical conditions of possibility or presuppositions underlying the logic of Aristotle (as well as that of Frege and also Whitehead/ Russell); i.e., 'a fundamental or philosophical logic).

Order theories: besides the order theory of J. Royce mentioned above, see also

-- *M. Foucault, les mots et les choses*, Paris, 1966, p. 6/72 (l' ordre' with Descartes, esp. Pp. 70 ss. - mathesis as a theory of measurement and order);

-- Fr. Schmidt, Ordungslehere, Munich/Basel, 1956 (esp. S. 11ff. Historia).

-- *H. van Praag, Measuring and comparing*, Hilversum, 1968 (from distinction to order: addition (nevens) topological order (insertion)/order or

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sequence (post-joining); counting, weighing, measuring; gradation/ interval measurement/ time measurement are discussed);

-- Hans Driesch, Ordnungslehre, Jena, 1912-1, 1923-2;

-- Nelson Goodman, The structure of Appearance, Dordrecht, 1977-3 (1951-1) (systems theory, quality and concreteness theory, order, measurement;- and time theory).

Part I. Logic as order doctrine.

Intr. - Logic as propaedeutics.

Isokrates of Athens called the subjects of 'general development' the propaedeutics of philosophy. However, the word 'propaedeutics' also has a typically scientific meaning, and in two ways:

(i) propedeutics is the well-informed but elementary study of 'a science (e.g., the 'elements' of biology);

(ii) Formal or formal logic (in the antique-medieval sense) is called the propaedeutics of the other sciences (including philosophy), because it provides the structural tool for scientific and philosophical thought. This is how the '*Organon*' or the logical works of *Aristotle* were already, in the klassic antiquity, understood: 'organon' means working tool (ergon - work).

In this course it is conceived identitively, i.e. as the study of the of the (partial) identities, and indeed of the most universal identities, where the sciences and the philosophical sub-subjects (what Husserl would have called) examine the "regional" or private identities or structures. Logic is propedeutic for a very particular reason: it deals with the universal or, at least, the most useful universal identities.

IA. Logic as order(s) doctrine.

Sapientis est ordinare" ("It is the wise man's (meaning the thinking man's) own ordering"), said St. Thomas Aquinas, the greatest medieval thinker. For him, this meant that man who thinks, thinks 'orderly', i.e. - what we, since the antique stoics, call - thinks logically.

Here we come up against (this time not the epistemological but) the logical or analytical application of the principle of (necessary and/or sufficient) 'reason' or 'ground' or, also, 'criterion'. The orderly (understand: logical man) seeks a 'forma' (Gr.: 'morpheme') - according to A. Cournot (1801/1877)), *Traité de l' enchaînement des idées dans les sciences et dans l' histoire*, 1911-2, I, pp. 1/2-.

I.e., 'a "form" or network of relations of "formal", i.e., what is consistent with or related to the forma or structure. Thus there is informational, (meta)physical (preconstitutive, constitutive) and ethico-political order.

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Husserl has already pointed out the kinship between two parts of logic:

(i) formal logic as 'apophantics', which deals with the concatenation of judgments (usually on the basis of 'implications' or 'irreverences'):

(ii) what Husserl, with certain predecessors (Leibniz, de Morgan, Boole et al.) called 'Mathematical Analysis', which deals with collections, groups, - compositions, etc.,- 'a kind of combinatorics of any 'data'.

About *Husserl*'s fundamental or foundational investigative 'logic' (*Formale und transzendentale Logik* (*Versuch einer Kritik der logischen Vernunft*), The Hague, 1974), 'a work similar to *J. Feibleman's Assumptions of Grand Logics* (see above p. 2), we do not judge here now, except to distance ourselves from its centering on 'a transcendental' (or 'absolute') 'I'.

It is this dichotomy 'apophantic/ mathematical,' which we are going to keep as a model. - One finds, after all, 'a similar (analogous) division in the great antiquemedieval tradition: (i) judgment and reasoning; (ii) understanding, - usually in reverse order.

After all, apophantic (called 'discursive' in the antique-medieval tradition) logic, which deals with judgment and compound judgment or syllogism (capstone), rests on 'mathematical' (Husserl) or 'comprehensible' (traditionally) logic (pre-apophantic or prediscursive logic), which looks at contemplation or intuition, in its order(s) or structure (and which one can, with indulgence, call 'mathematical').

G. Jacoby, Die Ansprüche, S. 10, says:

"Logic begins with the ready delineation of the term 'logical'. This means 'consistent' ('folgerichtig'), 'right'.

(i) Behind 'consistent' there is, overtly or covertly, 'a subject-bound deductive derivation. And,

(ii) behind this (inferring) stand, as its subject-free, objective foundation - identities between tokens (Sachverhalte')."

From this brief doxography (representation of opinions), there appears to be a very high degree of agreement, even if there are profound differences. What 'identity(s)' is, can be briefly but suggestively made out from *Kard. Mercier's Métaphysique générale ou ontologie*, Louvain/ Paris, 1923-7, pp. 154ss., where the famous neo-scholastic distinguishes three 'identities' (in the chapter on the 'transcendental' unity of 'being'):

(i) the substantial or self-contained identity (pair of opposites; 'same/different');

(ii) the qualitative or capacity identity (opposition pair: 'equal/ unequal);

(iii) the quantitative or how-large identity (pair of opposites: 'equal large/ unequal large'). This means that so-called 'mathematics', which Descartes and Leibniz, after so many other thinkers before them, were talking about, also processes non-quantitative and even 'substantial' data: it is mathesis universalis, general mathematics.

LO. 5.

The backbone of logic.

This structure can be clarified in two stages:

(i). inheritances, 'peculiarities' (sometimes called 'properties', but this word is too qualitative and seems to exclude substantial and quantitative identities): 'grief is inherent, peculiar, to being ill';

"The consequence, no matter what, is inherent or peculiar to the cause" (e.g., "he who burns himself must bear the brunt": it is inherent in 'being burned' that one must bear the brunt; it is 'inherent' in it); "He who plays with fire is in danger of burning himself" ((the possibility, the danger) of burning himself is 'inherent' 'inherent', in playing with fire.

(ii). Behind these "peculiarities" or "inheritances" hide identities, which one now likes to call "structures.

a/ distributive' or distributive, better ,'spreading' identities (all red things are idetic under the point of view of (red) color);

b/ collective or shared identities (all parts of 'a whole are identical under point of view of belonging together into one identical whole or system, as people now like to say);

Experimentally-scientifically, this looks like this: the dependent variable (e.g., the moon's large appearance on the horizon) is somewhere 'inherent', 'proper', to (the viewing instrument-free interval between the viewer and the moon) the independent variable; this means that there is structure or 'identity on purely comprehensible or business coherence, there is 'functional' identity.

This can also be expressed in the opposite sense: "illness implies (includes, entails) sorrow"; "the cause implies the effect", "playing with fire implies the danger (the possibility in an unfavorable sense) of getting burned";

Experimental-Scientific:

The independent changeable implies the dependent changeable. This means that inheritance, i.e., inseparable connectedness or union, means "consequence," implication, "consequentiality. As a result, the duality of logic just mentioned is only the elaboration of two points of view

(a) the inherential (and hence structural) viewpoint, which is expressed in the concepts; from there, conceptual or structural logic;

(b) the implicative viewpoint, which manifests itself in judgments and reasoning; hence judgment and reasoning logic, i.e. discursive logic.

The scope of the logical (inherential and implicative). - One can distinguish three major application domains:

(1) The purely logical application:

(1) **a.** contents of thought and knowledge in themselves (which exhibit 'a conceptual, 'eidetic' (Husserl) or conceptual structural identity and of which we are going to devote the first part of this account);

LO. 6.

(1)b. Symbols, which, in conventional or agreed (stipulative) ways acquire structure identities either of a 'logistic' (symbo-logical) or of a purely mathematical nature; something about which, after this logic, we shall have a word;

Be it said once and for all that logic is not logistics:

Logic, which erroneously calls itself 'logic', does work with structural identities like logic, yet not embodied in concepts (conceptual, comprehensible, 'eidetic', intuitive structures embodied in knowledge content), but in phantoms (i.e., as Father Bochenski says, "blackened patches of paper" (with merely interpretable, possible content');

(2)a. The empirical application:

The natural and human sciences have as objects such data, seen under point of view of their structural identities; these can be, as *A. Menne/ G Frey, Logik und Sprache*, Bern/ Munich, 1974, S. 102ff. says,

= either 'things', whereby Menne and Frey first of all think of (thinking) machines, because they 'consistently' or 'correctly' carry out inferences in a mechanical way ('processing information by reasoning'), - something which should be understood much more broadly, because all natural things and processes show structural identities susceptible to 'analysis', i.e. to logic

= either human 'things', - with Menne and Frey thinking first of all of human 'acts' (in the praxeological sense), understood as reasoning acts,- something that should be understood more broadly, since all human things and processes exhibit structural identities, amenable to logic and 'analysis';

(2)b. The transempirical application:

'secular' things and processes, summarized above under the term 'empirical data', exhibit structural identities, yet also extra- and supernatural data (albeit in a transempirical or preternatural and supernatural way: already *F. Hampel, Variabilität und Disziplinierung*, S. 104/130 (*Magical Systems of Thought*); has pointed this out in a purely descriptive sense ('something is more than it is' he says,-better said 'something is in a sacred and/or fluid way more than purely secular (or earthly) is'), - something which we shall discuss in hierology.

Identical logic.

It is not surprising that *Ch. Twesten, Die Logik*, points out that 'logic' is the application of two axiomata: the identity principle ('what (o) is, is (so)') and the contradiction principle ('something cannot simultaneously not be (so) and be (so)'), both applicable to all 'being' (whether logical or empirical or transempirical). This will become clearer with time.

LO 07.

Formal logic.

G. Jacoby, Die Ansprüche, S. 106/118, explains how and why logic, understood in the Aristotelian sense as comprehensible logic, is called "formal.

'Forma', 'form', goes back, he says, o.c., 10.1, to Cicero, who translates the Greek 'eidos' not merely by 'species', but, in a logical sense, by 'forma'. Past Quintiliannus and Augustine, 'forma' ended up in Western logic. Boëthius seems to have created the term "formalis", "formal": according to them, God views all being through the "species" or "formae" (i.e. the mundus archetypus, the primordial world) in his mind. According to Albert the Great, the forma is 'in multis' and 'de multis', i.e. identically present in many things and involved in many things in their identity.

Aristotle introduced another concept of form: the key forms (deduction structure; induction structure) he called 'schema', model, coherence: key forms (syllogisms) organize concepts in terms of content according to identity structures. This then is, next to forma, the ordetype of form, (which consists in placing one or another substance (here conceptual substance) next to or underneath each other.

This notion of 'form' is, of course, distinct from the 'form' notion of logistics (and mathematics) as symbolic arithmetic: a + b = c, e.g., are merely agreed upon and, in their agreed uponness, ordered thanks to viz. structural identities placed in them by a human calculating subject, according to which arithmetic is then performed, without thinking of some possible ('semantic', 'interpretive') content of a comprehensible nature (o.c., 107/108).

In short, comprehensible formality and symbolic formality are not the same thing.

Note - The thinking-economic nature of logic.

Now it becomes clear why the principle of economy or saving is hidden in logic: by condensing 'many' things and processes into structural identities, i.e. into one form of thinking, the logically thinking person saves the means in view of the end. This can be compared with miniaturization: just as the microprocessors of Silicon Valley economically replace the mastoid calculators, so the one structure identities replace the many concrete applications in which they are realized. Proceed formally and schematically (and thus efficiently - effectively).

Note - The scholastic doctrine of order(s) is, idiosyncratically, found not only in the doctrine of the transcendental unity of "being," but especially in the doctrine of causality as the general effect of the causes at work in the universe. Cf. *D. Mercier, Métaphysique générale*, pp. 535/620. About which more later.

LO 8.

IB. Grammatical ordering as a heuristic model.

When one reads, e.g., *E. Willems, La phrase Greque et Latine* / The Greek and Latin full sentence, Liège, s.d., one sees that the work decays into two parts:

(i) the independent sentence and (ii) the dependent sentence. The principle of this division is the "arrangement" of words and sentences, respectively, and full sentences. This is twofold:

There is juxtaposition ('collection', distributive): 'I see you and you come to me'; this gives two juxtaposed sentences;

There is subordination ("straddling," "systematization," collective); "as soon as I see thee, thou comest to me"; this gives two sentences, one of which is supra-ordinate or principal, while the other is subordinate or subsidiary; both sentences together make up a sentence. Whether the independent sentence is declarative (communicative), interrogative (interrogative), or volitive (expressing will), it is, in its order, secondary to the other independent sentences.

This juxtaposition is the structural identity in a multitude of grammatically equivalent sentences.-Whether the subclause is

= noun (noun phrase, i.e. either subject or object phrase) is - and, as a noun, communicative, interrogative (indirectly i.e.) or volitive -,

= adjective (adjective, relative) and, as, adjective, definite or indefinite -,

= adverbial (adverbial) - and, as adverbial, reasoning (causal), intentional (final, purpose-designating, consecutive (consequential), temporal (time-determining), possibly (time-supposing) conditional (conditional), is concessive (admitting), volitive (expressing will), comparative (comparing), comparative-conditional (conditionally-comparative), local (indicating place), - through that multiplicity of shades the one structural identity comes through, viz. the subordination to a 'main clause so that a full clause comes into being.

To be compared with the variations on one theme in music, as Lévi-Strauss would say, and too right.

Note - The concept of juxtaposition ('coordination', which is unclear, said in passing) appears in *A. Kraak/ W. Klooster, Syntax, Antwerp*, 1958, p. 241; the relative sentences are discussed, in that work, p. 225/240; - but generative-transfor-mational.

H. Verkuyl, Transformational linguistics, Utr./ Antw., 1973), p. 74vv. discusses juxtaposition and subordination, as well as on p. 173vv. (the sentence embedding), also in Chomsky's spirit.

At once a first applicative model of ordering is given. But further on it will appear that logical and grammatical ordering are not the same, however related they may look: grammar works with sentences, logic with concepts (and their processing into judgments).

LO 9.

That words and concepts and sentences and judgments go together somewhere is true, but they remain distinct, just as knowing and thinking contents are distinct from words (spoken, written). Knowledge and thought contents can even remain purely thought; language phenomena not these are always spoken, written.

Those who, like Rieffert, therefore characterize Aristotelian logic as 'language logic' fall short: one may well say that Aristotelian logic expresses itself expresses in the vernacular - and in this sense - is 'language logic', where 'pure' logic calculates with meaningless symbols or works with concepts, as Husserl does, but then Rieffert forgets that Husserl's pure logic is always main object of Aristotle's logic and that logistics is not Aristotle's intention).

Part II. Logic.

II A. Comprehensible (conceptual, 'eidetic') logic.

Introduction: The dual approach to understanding or concept.

According to (a) *Ch.Lahr, Logique formelle*, pp. 491ss, the notion (concept, notion, idea) is the simple representation ('model') of 'an object. As *Plato* says (*Faidros*), the conception consists of collecting the data, spread in many directions, into one idea. Thus the idea (according to *O. Willmann, Geschichte d. Id.*, III, S. 211) is (i) image, (ii) but summary image. This means that the idea or concept is a kind of model, and a model of a purely cognitive or cognitive and cognitive nature, - a model which functions as a sign, and namely as a cognitive and cognitive sign in the intellectual intuition of our mind, - as distinct from the speaking and writing sign.

Husserl has emphasized that an eidos (concept, idea) is not a psychological fact (e.g. the experience following a fact), nor a conventionally constructed thing (i.e. by stipulative definition, as e.g. the mathematicians and logicians do, when they define a as equal to b + c) no, the concept is only 'essentialistically' correctly understood: the concept is a mode of being, which in itself, is merely possible and, for the time being, exists only in the knowing and thinking mind (intellect), not necessarily in reality.

Husserl calls the contemplation or intuition of 'a knowing and thinking content 'Wesensschau' (the contemplation of the being (of something)). In husserlian taa1say: in itself, a concept is a mere 'eidetic' or 'conceptual' reality.

(b) Well, Plato's dialectic discusses the concepts twofold:

(i) socratic: i.e. as inductively constructed definitions of realities, starting from the language of manners;

LO 10.

One thinks of the cases of 'justice', which Socrates, one by one, discusses, in order to arrive at the general concept of 'justice' (from the applicative cases to the one regulative model): in a truly inductive way; i.e. by taking a preconceived notion (here 'justice') as a guideline (the 'lemma', as Plato says, i.e. the working hypothesis), however vague and unclear (unknown), and pretending that this notion, in its vague clarity, was already fully ready and clear in its conversational content of knowledge and thought;

(ii) Platonic: after this Socratic going through of word meanings tested against concrete cases, as if one of those word meanings were already valid, - see above - Plato proceeds according to his own 'analytic' (dissecting, dissecting the articulations, and this Twofold:

(ii)a. The question arises whether justice towards the gods and goddesses can also be understood under the same basic concept without falling into incongruity, contradiction, contradiction: checking whether there is any contradiction by taking justice towards the individual fellow human being and towards the city-state, as well as justice towards the gods and goddesses, is the first stage of the process of development. No one sees any contradiction in the terms if the concept is broadened to include justice with respect to the gods and goddesses;

Consequence: it is 'a conductive or according to composition in the logical field (now one would say: according to coherence or inner logical coherence) valid concept;

So much for the internal or immanent, intrinsic contradictory freedom or logicallyvalid coherence of that concept;

The method which Plato used with his students, to find out if there was any contradiction within the (broadened) concept of 'justice', is now called 'deduction', i.e. deduction of at first sight valid conclusions from what one already knows; - e.g. here: suppose (lemma) that we act perfectly just with regard to the gods and goddesses, do we or do we not do injustice to our fellow citizens?

Someone remarks that after all, to common knowledge, there are good, not so good and bad, yes even arch-worse gods and goddesses; consequence(draw) or deduction (in the second degree): after all, one cannot accede to seemingly righteous "demands" of arch-worse and even of just mere gods and goddesses without contradicting the dead simple concept of "justice";

(second) consequence: if one does not want to include a real injustice in the definition, the (seeming) justice with respect to some gods and goddesses should be banned from the general idea of justice; only under that condition is the broadened concept of 'justice' contradiction-free, smoothly coherent on a 'conductive' level (i.e. in its internal composition and coherence);

LO 11.

(ii)b. 'di.aretic', divisive, distributive:

With Plato this is a metaphysical work, which begins with the supreme idea of "the Good", i.e. in fact something like God in his "worthiness" (but without the refinement of the Supreme Being concept, as e.g. the Bible knows this);

Starting from that highest, i.e. all-embracing ("transcendental" or "ontological") idea, Plato descends to more private ideas, in which that omnipresent Good is partially and less purely present, to end with the individual or singular beings, in which the lowest degree of goodness is still somewhat perceptible, very diluted and very impure;

That metaphysics of Plato is open to much criticism, and we have cited it here, but merely to show what is extremely valuable in that "descending" dialectic of Plato, namely, the comprehensive coherence in which every idea, except the Supreme Idea (Goodness), which founds the "system" or, as Plato says, the "zöon noëton" (animal intelligibile) the living organism, in which all ideas find their place as in its vivifying framework.

Summary:

Every concept ('idea', notion, concept) is, in Plato's view, only contradiction-free if it is tested, first conductively (see ad. (ii)a), i.e. intrinsically, inwardly, in its 'composition, then divisively (see ad. (ii)b), i.e. extrinsically, outwardly, in its 'comprehensive coherence or frame of thought.

Cfr. *Rieffert, logik*, S. 15: "The first task is the formation of contradiction-free concepts (sun. agogè); the second the classification of them and their situating in a logically ordered system beginning from the superordinate to the subordinate concept (di.airesis)."

This dialectical review or analysis is articulated by J. Royce, The Principles of Logic, New York, 1961 (1912-1), p. 11, as the main task of logic:

"(Logic in this sense - not in the sense of judgment and reasoning, as Aristotle (and before him, the Eleates and Sophists, as well as Socrates somewhat and Plato) conceived it, but as the study of 'forms' (see above p. 3: *A. Cournot, Traité*), of 'categories', (basic concepts of a very general nature), of 'types of order(s)'), - logic, therefore, is the general science of order(s), the theory of forms concerning any ordered field of either actually existing or merely thought ('ideal') objects."

What else: "The universals, i.e. the general concepts or ideas, make up a system." (o.c., 12). Or still:

LO 12.

"(1) The realm of universals or ideas is, essentially, 'a system, whose unity and order(s) are of capital importance to the philosopher;

(2) inference (i.e., reasoning) is possible only because truths have weighty objective (i.e., situated in the truths themselves) relations (...);

(3) the order(s) and connection of our reasonable processes, if, at least, we follow the right methods, is a kind of picture of an order(s) and connection, which the individual thinking man finds, but by no means invents.

To sum up: one advances a correctly formulated method; one discovers, thanks to this real effort, a new domain, - a domain of types, of 'forms', of relations." (o.c., 14).

So much for this platonic introduction.

Why platonic? A. N. Whitehead once said that all Western philosophy was just one set of footnotes on Plato. Well, we are of the same conviction: only variants on Plato 's model conception of the idea (concept, notion, eidos, concept) and only variants on his conductive-divisive dialectic (i.e. systems research, internal and external, subsystematic and supersystematic) can advance the logical behavior of mankind today.

We are going to work out, in the corpus (i.e. full exposition) that now follows this introduction, those two points of view of Plato's doctrine of ideas (in the line, by the way, of *J. Royce* (1855 *Grass Valley* (California)/ 1916), except for the 'absolute' idealism that characterizes him and his valid ideas, by the way, more violate than favor).

(A) The model or information - aspect of the concept or idea.

As stated on p. 9 supra (ad (a)), the idea (concept) is the simple, better one-an unequivocal representation in the knowing mind of 'an object, - according to *Ch. Lahr, Logique*, 490. However, on closer examination, it appears that this "definition" has gaps: he distinguishes three precisions.

(i) Concerning the total knowability of the object in question,

A representation is either 'adequate', if it exhausts the knowability (exhaustive representation) or non-adequate (there always remains something more to know about the object, so this will almost always be the case) (incomplete representation);

R. Finxten, The notion of 'concept' in cognitive psychology (*An overview and critical analysis*), in *Philosophica Gandensia*, Meppel, *New Series*, 10 (1972), pp. 14/42, notes that 'a concept is always selective concerning the possible information, which can be found in the object: only the 'relevant' (meaningful) information is extracted by the conceptual subject, - apparently because every subject is 'an interpreter' (which Pinxten does not mention in this context);

LO. 13.

in the summary of the article, a.c., 35 (see also 18; 20. 22), Pinxten says:

"This presupposes derivation (reduction) of information, selection of 'relevant' information, - a reduction mechanism with (game) rules, a strategy; these are at work in every conceptualization (d. i. processing of a given object into a concept); such a thing can be explained by the discrimination-theory, i.e. of the relevant versus the irrelevant; cfr.i. processing of a given object into a concept); this can be explained by the discrimination theory, i.e. of the relevant; cf. Vermeersch, 1967).

Clue.

The Aristotelian-scholastic logic of understanding was, since long, familiar with the "choice" or selection or discrimination of the interesting ("relevant") from the total-knowable given:

(i) Aristotle himself refers to his theory of judgment as "peri hermeneias", de interpretatione, on interpretation; (i.e., judgment is labeled interpretation);

(ii) the concept itself is always 'formal' with respect to the material object and ipso facto interpretation: it extracts the 'forma' from the total object; *D. Mercier, Logique,* 1922-7, p. 98, thus rightly says: "Our categories (i.e. fundamental concepts) are not the direct expression but 'an interpretation of reality'."

More than that: the Aristotelian-scholastic tradition has always assumed, for one material (understand: reflexive or looped taken) object, more than one formal object (understand: point of view); which does prove that this tradition was clearly aware of the "discriminating character (// Vermeersch) or "explicating character" (Peirce).

The question arises: in what sense is a concept already one-single (isomorphic representation) then many-single (homomorphic representation)? The answer is clear: the idea is one-unambiguous with respect to the aspect ('forma' says the scholastics) which it 'discriminates', prefers, selects from the object; it is many-unambiguous with respect to the total or overall knowability ('material object', says the scholastics) of the object.

This proves that epistemology (one-syllable view) and interpretive view (more-syllable view) blend together without coinciding.

Cognitive aspect (isomorphism) and hermeneutic or interpretive aspect are distinct but not separate. No matter how isomorphic (one-syllable), always knowledge is only homomorphic (many-syllable). All "cognition" (as people now like to say) is always interpretation.

(ii) With respect to the content and scope of the term

The display character of the idea is again open to distinction.

LO. 14.

As an applicative model we take the pair 'group'/'gang', as W. Schuhmacher, Zur Substitution 'Gruppe -- = Bande' in der Umgebung BaaderMeinhof durch einen Teil der Medien in der BRD, in Philosophica Gandensia, New Series, 10 (1972), S. 78/79:

The author says that part of the German press, speaking of the Baader-Meinhof group, spoke of "gang" instead of "group.

'*Group*' is determined (definition) as "a number of organisms (i.e. living beings) whose behavior obeys a mutual 'steering' (directing influence)."

'*Gang*' is the same: it is, however, one kind of 'group' (division of group into types: divisive aspect); it is that group, "whose behavior is taken up by society as criminal" (a.c., 78).

Well, an idea is always, what the Greeks called, a way of unifying a given multiplicity: the concept seeks the one (the conceptual content, the 'comprehensio', the collection of ideal or cognitive elements) in the many (the conceptual extent, the 'extensio', the collection of members (of things or processes) to which the conceptual content refers, the realm).

Content/Size

The pairing 'comprehensio/ extensio' (content/ extent) comes from the scholastics. G.W. Leibniz (1646/1716), in the line of scholastics, spoke of 'connotatio' (ideal, notional, conceptual or knowing and thinking content) and of 'denotatio' (the collection of those elements to which the ideal content applies).

The two conceptual realists, G. Frege and A. Church, spoke of "Sinn" (content of knowledge and thought) and "Bedeutung" (reality, on which the "sense" or "meaning strikes, the realm).

Applied here: the notion of 'group', as a content (connotative), refers to all the numbers of organisms whose behavior obeys mutual direction (the Baader-Meinhof group, the group of inhabitants of a city, etc.), which collectively constitute the extent (denotation) of the idea.

Well, says Lahr, both aspect and can be more accurately described:

(i) Connotative, substantive:

An idea is "distinct," clear, if in its ideal elements-here: organism, number, behavior, obedience, direction, mutual-, it is accurately before the mind (and accurately expressible in language: linguistically "operational," one would now say);

The 'apposition of concepts' or definition (cf. supra p. 10: conduction or synagogue)' is an operation which 'analyses' the conceptual content, i.e. the content of knowledge and thought in itself, - 'eidetically' (in Husserlian terms), - i.e. solves and structures it in its relations. see above the definition of group given by Schuhmacher; expressed aristotelically: one adds, to a 'genos', genus, genus (universal collection), a 'diafora eidopoios', differentia specifica, specific difference (here the specific difference is: "whose behavior is taken in by society as criminal");

LO. 15.

(ii) denotative, circumscript:

An idea is 'ready' if it is (necessary and) sufficient to correctly represent, without possible confusion, i.e. unambiguously, the object which it is supposed to represent: this 'object' is here the set of elements (the multiplicity) to which it applies; -- the division, enumeration, di.airesis, divisio (see above p. 11), is that logical operation which analyzes the extent of an idea (here the types of "group": the Baader-Meinhof group, the emigrant group, the youth group, etc.), which are summarized in the content or definition).

It should be noted that the content of 'an idea is necessarily inversely proportional to its size: the larger the content, the smaller the size. See the ancient pythagorean definitions of Archytas of Tarentum (-400/-365):

(i) 'lull is calm in the air mass': to be improved by rearranging the content elements: a/ generic or gendered (universal) aspect: air mass;

b/ specific or specific (private) aspect: (air mass) at rest; - thus one sees that 'a definition is a reciprocal utterance whose proverb formulates (makes linguistically operational) the entire knowledge and thought content of the subject verbatim; - which is very important in the scientific field ('hard science');

(ii) 'sea-silence' is the calming of the movement of the waves'; to be improved by rewriting the ideal elements:

a/ generic (universal collection): the wave motion;

b/ species (subset): the calming (of wave motion); the wave motion if calmed or the wave motion as far as object of calming.

Review the definitions of Euklides' Elements, which come with thirty-five definitions:

(i) 'a point is that which has no parts'; to rewrite:

a/ gender: 'n being ('that which');

b/ that has no parts (species difference, which excludes all other types of being from the content);

(ii) 'a line is a length without a width'; to rewrite:

a/ generic: a length;

b/ deprived of, without width (distinguishing lengths with widths, i.e. 'another subset or 'kind' of lengths).

One can see that the distributive structure (discussed further) governs the structure of the definition.

Intentionality theory of scholasticism.

'Intentio' is the orientation of the mind (consciousness) toward something. Well, the mid-century thinkers distinguished two kinds:

(i) intentio prima (first intentio or attention) is that process (i.e. processing of information) that focuses on 'an actual or possible object; if one will, the spontaneous

LO. 16.

reaction of 'a subject who 'encounters' something (confrontation' of the (existential phenome-nology), who becomes aware of something, whatever this may be;

(ii) intentio secunda (second intentio or attention, mode of encounter) is that process, by which the information emanating from the given (that which the subject encounters) is reflectively 'processed': loopily, reflexively, the knowing-thinking mind returns to itself (reciprocal act, which viz. returns to itself) and attributes characteristics to the result of the first intentio (insofar as it is intentio); the scholastics have called the object of the second conscious approach 'ens rationis' (être de raison, purely intentional being); -- an example: I see a triangle; I make a table; I think of the concept of 'clean'; these are first intentes or forms of attention;

= I think about the fact that I see 'a triangle (sense contemplation is 'ens rationis', 'an intentional given); I consciously dwell on the fact that I make 'a table (act of me as subject,-this is 'an intentional reality); I think about the fact that I think about the concept 'clean' (I 'reflect' on my 'reflective' on 'an already intentional given' (i.e., the concept 'clean').

It is immediately clear that concepts are already second intentions or forms of attention when they enter logic; so are judgments and reasoning: someone has rightly said that logic is the study of second forms of attention (not from a psychological, nor from a "constructive," but from an "eidetic" or "ideational" standpoint).

Comparison with the so-called semantic language stages.

(i) If I say "Marleen Spaargaren is beautiful", then I am talking about the real Marleen Spaargaren and my language is what is called, in semiotics, the semantic zero stage or, in grammatical language, the direct speech or mode of speaking; - clearly this is parallel to the first intentio or form of attention of scholasticism, yet linguistically operational (expressed in language);

(ii) if, however, I say, "Marleen Spaargaren is beautiful" is a statement, I take that sentence to be a series of words of either a grammatical or logical nature; this is similar to the lateral speech or mode of speaking (in grammar): one speaks of a speaking; -- clearly this is parallel to the second intentio or attention-form of scholasticism, yet, again, linguistically operational;

(iii) if I parse the phrase: "Marleen Spaargaren is beautiful" is 'a statement' either grammatically ("Marleen Sp. is beautiful" is subject; "is 'a statement' is predicate) be it logically (the phrase ''Marleen Sp. is beautiful' is 'a statement that is either true or false), then I am speaking of 'discussed speech'; -- this is, grammatically, lateral speech in the second degree or order;

LO. 17.

It is paired with second intentio over second intentio; -- speaking (ii) is called, in semiotics, "object language" and speaking (iii) "meta-language," i.e., language over "language" (as it is sometimes said).

One can see that current semiotics is 'an elaboration of the mid-century suppositio doctrine (see theory of interpretation, p. 13). (Husserlian) phenomenology spins off the scholastic intentionalist doctrine. Both forms of thought are, in fact, complementary.

Connotative or knowing and thinking content structure.

The elements or constituents of a definition (in its saying) - consider (supra p. 14): group (subject) = number, organism(s), - behavior, obey, direct, reciprocal (saying) exhibit a modal structure:

(i) some are necessary; thus the 'essence' or 'beingness' (quod quid est) and the 'property' (prorium, idion) or 'inheritance';

(ii) others are not - necessary (incidental, accidental) (contingens, sumbebèkos);

Application:

ad (i) = 'number of organisms' is 'essence' (i.e. the basic set to which the subject to be defined belongs), generic; = 'behavior that obeys mutual direction' is 'property' (characteristic) - this characteristic is a necessary part of a group if it is to be 'substantial' (i.e. specific or generic);

ad (ii) data such as 'resident in Berlin'; 'neo-Marxist' etc. are incidental (not necessary). This collection of connotative constituents has been called, since Aristotle, 'kategoremen', praedicabilia: gender (basic collection), species difference; - 'singularity' ('characteristic'), subsidiary; - kind (type).

They structure the constituents of a knowledge content. (Cf. *D. Mercier, Logique*, pp. 99/105). These "notae", whether essential (generic and specific), inherent or subsidiary, which compose an idea, are the "synagogic" or conductive structure of an idea (see above p. 10).

They are of the intentional order: they constitute the 'eidos' (Plato, Husserl) which is the model for what 'a subject 'discriminates' (draws out) of 'a material' object in terms of relevance ('essentials'). 'Essentialism' (idealism).

A concept, considered in itself (reflexively), as a collection of knowable contents, expresses a 'being', or 'essence' (way of being). Unlike a judgement, the idea neither confirms nor denies; it is neither true nor false: it 'is' purely knowable and thinkable, especially if it is merely an object of second attention. Yet she is not 'nothing'; quite the contrary. Whoever believes in that kind of 'reality' (or his(her) way) is called an 'essentialist' or an 'idealist'.

LO. 18.(B) The order(s) aspect of the idea or concept.

(B)I. General harmology or order (order) doctrine.

As Descamps, La science dè l'ordre (Essai d'harmologie), in Revue Néo-Scholastique, 1898, pp. 30ss., puts it already in the title, 'harmology' is order (theory) doctrine.

According to the linguists, the words 'alarm', 'artist', 'harmony', 'aristocrat', 'aritmetic', 'poor', 'Aryan' have the same semasiological root, namely ar, which expresses the idea of 'aggregation', '(rank) arrangement'. The Latin 'ars' (art) originally means 'joinder', aggregation into a (work of art). Latin 'arma' (weapon) is derived from 'armus', shoulder, arm (the weapon extends the arm and shoulder).

'Articulation' (joint) is meaning related. The art of joining numbers is called arit(h)metic. In the exemplary or ideal sense, 'right joining' is harmony. The most harmoniously developed in society is called in Sanskrit, 'arya', noble hence: Aryan, Aryan), - in Greek 'aristos' (aristocrat).

Archutas of Taranton (-400/-365),

This Pythagorean, still lived from that primordial tradition: "If someone was able to dissolve ('genea', universal collections) all genera into one and the same principle ('archa', principium) and, from this, to recompose and merge ('sun.theinai kai sun.arthmèsasthai'), then such a man seems to me the most 'wise' and as one who has all truth as his share and as one who takes a stand, from which he can know God and all things, namely how (God) has put them together according to (the model of) the pair of opposites and the arrangement ('en tai sustoichiai kai taxei')."

One sees that Plato 's dialectic (see above pp. 9/12: conductive and divisive aspect of the order(s) of ideas) is the elaboration of this. Basically all harmology or theory of order is pythagorean-platonic.

Saint Augustine of Tagaste, De ordine (386/387), the first theory of order in separate book form, defines "order" as follows:

"Ordo est parium dispariumque rerum sua cuique loca distribuens dispositio" (order is the arrangement (placement), which assigns to each of equal and unequal things the respective (distributive) places),-in which one sees the idea of 'configuration' or placing order(s) hinted at.

'Thinking' is called *S. Augustine, Confessions*, 10, "ea quae passim atque indisposite memoria continebat, cogitando quasi colligere" (the things, which consciousness contained dispersed and unplaced, a.k.a. thinking collect).

LO. 19.

One sees here the (distributive) set theory emerging. Indeed, 'to think' is to see ('discriminate') a unity (common characteristic) in a multitude (of elements or collections), to discover similarity(s) in different things. In this sense, thinking (and ordering) is always 'heno.logical' (unitary). One sees that Augustine stands in the pythagorean-platonic tradition.

Edm. Husserl, Philosophie der Arithmetik, The Hague, 1970 (1891-1), begins with "the actual concepts of 'multiplicity,' 'unity,' and 'number,' - proving that, still, the antique idea of unity in multiplicity is normative.

That ordering is archaic (primordial, ancient) is shown by *H. Kühn, Das Symbol in der Vorzeit Europas, in Symbolon (Jahrbuch für Symbolforschung)*, Basel/ Stuttgart, Bd 2 (1953):

"Symbol and understanding contain that which goes beyond the individual case, the typical, the general, the binding, lasting." The author examines the depictions of the Ice Age (Cro-Magnon), Old Stone Age (the primordial mother, the birth of man, the worship dance of wizards, the staff, the stag, the spiral), Middle and New Stone Age (abstract-geometric allusions). Especially the latter (the stylized) anticipates the pythagorean-platonic tradition of thought.

la. The order(s) process or mechanism.

A mechanism consists of more than one "process": "process" means "an operation of data (information). What, now, does the order creation mechanism consist of?

C.S. Peirce (1839/1914), the great pragmatist (well distinguished from pragmatism), describes how, in a first approach (process) consciousness discovers - what he calls - 'quality', i.e. the given in itself, looped (reflexive, material), taken relation-free or 'absolutely'. J. Piaget, the intelligence-psychologist, would speak here of 'enclosed attention' ('centration', centered consciousness), which simply merges into a given.

In a second process or approach the attention is directed at the 'relation': in the meantime 'collection' of data (classification) has happened, because more than one data appears and the consciousness relates (puts into perspective) this multiplicity. J. Piaget would speak here of 'coordination'.

J.Royce, Principles of Logic, p. 49, says: "Without objects, conceived as unique individuals, - Peirce would speak of 'qualities' - we cannot have classes. Without classes we can (...) have no relations. Without relations we cannot have order." But "relations are impossible without having classes as well." (o.c., 48).

LO. 20.

In other words, here is a circular definition. Better said: relation and collection (class) are contructively given, i.e. in a common intuition or perception. In other words, relation and collection are present in a coordinated way (Piaget). The 'grouping' of either 'qualities' (Peirce) or 'individuals' (Royce) - in each case 'data' (information quantity) - is that subjective process which coordinates, on the basis of contuition or common perception.

The process of aggregation or grouping is the discrimination, from a material fact, of a "structure," i.e., a network of relations between qualities (Peirce), individuals (Royce), elements of a collection (Cantor).

Coherence' is structure (without pronouncing on the nature of that coherence). - The 'nature' of that structure or coherence is called its 'rule', i.e. the set of properties that typify, characterize, define the network of relations.

A dialectical example:

Hegel's description of the 'dialectic' (i.e., interactional coherence,-one kind of 'rule' or 'nature' of structure, therefore) of the lord and the servant. (*Cf. G. Bolland*, *Hrsg.*, *G.F.W. Hegel, Phänomenologie des Geistes*, Leiden, 1907, S. 158ff.).

The "struggle" between the "noble" and the "mean" (un.noble) consciousness is described in it by Hegel. Thus Hegel says:

(a) The gentleman is, in his own eyes at least, twice free:

1/ socially, in the consciousness of the servant who recognizes him as lord;

2/ physical, in that the lord rules over nature and matter, through the labor of the servant, who transforms nature (matter) into an object enjoyable by the lord;

(b) the servant, on the other hand, is twice servant:

1/ fellow human, in that he "serves" the lord as a submissive or subject;

2/ physical because he is subject to nature in his work and processing of it (and in such a way that the enjoyable things he extracts from it are taken away from him by the lord)

What is Hegel doing here? He is practicing 'dialectics' (here not in the pythagoreanplatonic sense of p. 9v. above), viz. as 'grouping', taking together, of two terms, the lord and the servant, which, thereby, come to be exposed in their relation and, together, form 'a collection (of a social nature). A third term is involved, nature (matter):

1/ the servant has 'a relation to that nature (labor, processing, transformation);

2/ The lord, to that same nature, also has a relation, namely, through the servant and the result of the servant's labor, which is due to him.

Latent in that dialectical analysis of relations, is present what Hegel himself says: "struggle" (tension) between the lord and the servant and "struggle" (in a metaphorical sense with respect to the first type of struggle) between man (lord, servant) and nature (matter),

LO. 21.

As the prototype of this kind of dialectic, Herakleitos of Ephesos (-535/-465), puts it ('polemos', 'struggle', as a moving force in and behind all being). So much so that 'reversal' can take place: the day the servant no longer accepts his submissiveness and wants to reverse the roles, this 'struggle' comes out of its latency. This means that apart from the collection of visible data (lord, servant, nature and their (mutual) relations), the Heraklitean-Hellenic dialectic also takes into consideration a latent or invisible collection of data (reversal, role reversal, etc.).

Only these two collections together form the 'totality' (or 'Gestalt') which Hegel 'groups' out of the total given of reality. Thus a surface and a depth description can be distinguished in Hegel's dialectic.

Not surprisingly, Marx once said that "all the elements of (of course: 'Marxist') criticism are locked up in it." Hegel 's dialectic is (what would now be called) "poly.functional", i.e. more than one function or role is at work in the analysis.

Second applicative model:

J. Lambrecht, While He Spoke to Us, Tielt/Amsterdam, 1976, in which, from the forty-two parables of Jesus, the author makes a choice and performs a structural analysis on those parables, among other things; he places the individual parables in a broader framework and thus clarifies their role or function in the editorial context; for example, the parables of the ten bridesmaids, of the talents and of the last judgment are meaningfully situated in the framework of Matthew's end-time speech.

Cfr. A. Denaux, Reading Parables with Jan Lambrecht, in Collationes, 8 (1978): 1 (March), pp. 95/104, where critic notes that structural analysis is "subjective.

"With certain texts, each exegete sometimes discovers a different structure." (a.c., 97). We would say: structural analysis ('grouping') is, to speak with Vermeersch, discrimination (or 'interpretation'), selection among possible points of view.

Structural and structural.

Since, especially the structuralists, have put the emphasis on the unconscious or depth-side of the structuring 'labour' of man (e.g. unconsciously a child, without any explicit knowledge of grammar, really puts grammatical structures in the sentences it utters), one distinguishes between 'structural'- meaning 'all that is consistent with or related to structure - and 'structural', meaning that the unconscious or depth-side is also expressed: de Saussure e.g. assumed that unconscious structures of language 'govern' the superstructure (like Marx said that the unconscious infrastructure of socio-economic nature 'governs' the superstructure (e.g. our mentality).v. assumed that unconscious structures of language 'rule' conscious individual speech (as Marx said that the unconscious infrastructure (e.g. our mentality), and Freud, that unconscious mechanisms distort our consciousness).

LO. 22.

Ib. Comprehensive harmology or taxinomy (also: taxonomy).

'Taxology' is called the science of classification or classificatory science. It is applicable in the various types of human knowing (and science or philosophy, in particular).

'Taxo- or taxi- nomy' means the same thing: classification theory. So e.g. in biology taxonomy has as its object the classification of life forms according to well-defined 'laws' or rules.

One sees that this corresponds to Plato 's synagogue and diairesis (see above p. 9vv.). Indeed, taxology or taxi- nomy always works with concepts in order to order realities: before ordering realities, one should order one's concepts (which is exactly what Plato did with his conductive and divisive organization of ideas or 'dialectics').

G. De Landsheere, Introduction to educational research, Rotterdam/ Antwerp, 1973, p. 15, says:

"With taxonomy one wants to give an integrated set of precise definitions, which are easy to handle". The author emphasizes the operative or operational aspect: "Without this frame of reference, the dialogue between researchers is greatly hindered.-Research in the field of pedagogy lacks a clear classification." (ibid.).

An "integrated whole" is a system; definitions are ideas or concepts made operational in words. Just as, for De Landsheere, the problem is one of education, so (since the Pythagoreans and the Platonists especially) is the question for philosophy of philosophical taxonomy or taxology.

Aristotle, in his booklet *Katègoriai*, *Liber de praedicamentis*, on the fundamental concepts or categories, first speaks of the terms by which we designate the being (1/3);

Then he treats, in detail, the ten predicaments or categories (essence,- how great (quantity) and quality (quality), - relation, - place and time, situation and condition, - industriousness and inertia (action and 'passion', 'undergoing') (4/9); finally he gives a hypothesis, i.e. the doctrine of the constituent elements of the basic concepts: contrast, succession and simultaneity, movement, having (10/15). These hypotheoretical ideas are to be found in either all or most categories and are thus harmologically of extreme importance.

(B)II. Special harmology or theory of order.

Now we develop briefly - in Aristotelian language said: hypotheoreticordetheoretical or taxinomic basic concepts.

IIa. Order or taxeology.

'Taxis', (dis)positio, means arrangement, organizing of a multitude of elements.

LO 23.

At least two data (individuals (Royce), qualities (Peirce), elements (Cantor)) and at least one relation (relationship), - such is the smallest constituent of an ordering theory. E.g. 'me and my friend': me, (the other),- as my friend (i.e. the relation name or structure rule: friendship binds us both).

Relation Theory.

A Small Overview on the Most Basic Relationship Ideas.

(a) Namely, there are binary (dyadic, dual), ternary (triadic, triadic) and, generally, n-adic relations: me and my friend is a binary or dyadic relation (there are two terms, members, qualities, individuals). Polyadic relations are, e.g., those between a, b, c and those between a, b, c, d, e.

(b) If we now look not at the number of beings involved, but at the nature (rule) of the relation, we distinguish mutual' (symmetrical) and non-reciprocal (non-symmetrical) relations:

'Friendship' is a mutual relation 'it applies from both sides'; 'how-great difference' ('greater, less than') is non-reciprocal (if 12 is greater than 6, this does not apply vice versa); opposition is a mutual relation;

= 'transitive' (transitive) relations and non-transitive ones:

If a is greater (smaller) than b and b is greater (smaller) than c, then a is greater (smaller) than c (this is the elimination scheme: b falls away);

=The number of elements involved is given in the following equation: "one-to-one relation", "one-more (or much) relation" and "more-to-one relation".)

Cf. clarity theory. E.g., one man with many servants as subordinates; two lovers for one woman (Freud's and Girard's mimetic structure); the monogamous marriage.

Syntax.- There are two basic relations concerning order (see above pp. 8/9 (grammatical order (heuristic, i.e. as a finding process)). The syntacticians, since centuries, order sentences: - paratactic, juxtapositional (paratagma): more than one item of information is simply placed alongside another; in this way one 'gathers', i.e. constructs a set (distributive structure) of equivalent elements;

Hypotactic, subordinating (hypotagma): more than one fact is placed either 'above' or below the other (mastery, being mastered) - cf. action and passion of Aristotle - ;

In this way one disperses data: they become a system (collective structure); in other words, instead of sentences as elements, we now take any kind of data as realities amenable to syntax: a heap of beans of the same color is a syntagm, but paratactic; a bag is a woven textile.

LO. 24.

One can also speak a tautological or identitarian language:

A syntagma is a (partial) identity; in the parataxis there is similarity identity (the juxtaposition is the similarity) and in the hypotaxis there is sameness identity (the syntagmata have one and the same cohesion). Identical language pays attention to the unity in the multiplicity.

One can also speak a variological language

(looking at variation or diversity): a syntagm is an invariant (unchangeable) in the midst of variations (changeables); uniformity in the midst of pluriformity; conformity in the midst of difformity; homogeneity in the midst of heterogeneity. For example, the fixed boiling of water at $C100^{0}$ is an invariant (or "law") amidst a multiplicity of waters.

One can also speak "teleological language.

Kard. D. Mercier, Métaphysique générale, p. 539, says:

"Order is the placement (arrangement) by which different things are each in their place and fulfill their respective (distributive) purpose."

Shorter: order is the precise arrangement of things according to the relations that their purpose imposes on them."

This functional view gives emphasis to the purposefulness either of collecting or of scattering.

"To order," says Mercier, o. c., 536, "is to take things one after the other and place them according to the same principle of unity. (...) Order is the unity in multiplicity or still, the unity in diversity". This shows that Mercier speaks more than one language (functional, identitive, variological) to express himself.

Concerning the identitive type of language: Mercier, o.c., 154, notes that identity can be either pure (the same/not the same) or mixed (qualitative: equal/different; quantitative: equal great/not equal great). In the notion of 'joint com-mission' e.g. one has on both sides one equal number of members defending equal interests (quantitative and qualitative identities are visible here in 'placing' (ordering) around the same table (pure identity: same issues)). One has the three types!

The principle of substance says, "All that changes presupposes something ('identical') that changes (substantial invariant)."

The law principle says, "In the same conditions, the same causes (independent changeables) have the same consequences (depend. ver.)."

The deterministic principle says, "Within one given situation (of causes), only one resultant (of effects) is possible": these are three forms of extended identity principle.

LO. 25.

Of course, it should be emphasized that 'identity' here is 'a concept of relation.' Cf. *A. Tarski, Introduction à la logique*, Paris, 1971³, pp. 49/61, e.g. talks about 'le concept d' identité ou d' égalité', the concept of 'identity' or 'equality'.

For example, in the sentence "x is identical to y", "x is the same thing as y", "x equals y", "x = y". Here we are concerned in each case with comparative identity, i.e. with the relation between two or more data and the fact that they can be mutually interchanged.

Something else is the material or reflexive (loop) identity: in that case it concerns the general "being" of something. Such is what Aristotle calls 'tode ti' or 'protè ousia' (first substance), i.e. the given in its discernible concreteness and uniqueness (unity, Einmaligkeit).

Here, however, we are talking about 'deutera ousia', secunda substantia, second or formal identity, and this is always comparative (relative, if you will). Cfr. further the idiographic structure.

IIb1a. *Differential order(s)*.

Pythagorean harmology assumed that "the one" was both element and collection (we still say that "A twin (collection) consists of two twins (members)!"): as element it was immanent, intrinsic, in everything; as collection it was transcendent, transcending everything.

But the same pythagorean harmology also worked with 'sustoichia' (mv) - 'su.stoichia' (enk.) -, i.e. with pairs consisting of two elements (stoicheion), which were opposed to each other; thus the pairs of opposites were 'good/ evil (not good)', 'ordered/ disordered', 'definite/ indeterminate', etc. (cf. O. Willmann, Geschichte d. Id., I, 1, 2/2). (Cf. *O. Willmann, Geschichte d. Id.*, I, 272/273). This (bi)polar ordering remains with the whole of Greek thought.

The concept of differential.

A 'differential' is 'a duality (dyad, binary reality, bi.nomium (algebraic esp.)), but polarized, i.e. so arranged that the same term (identity, invariant) is affirmed once (positive) and denied once (negative) and that, between this binary set of the positive and the negative terms, 'an interval (intervening space) is slid, in which usually a positive change and a negative change of the two extremes are slid.

Combinatorially (cf. infra), 'a differential consists of three 'places', not randomly or haphazardly (stochastically) arranged, but ordered according to morphism (ordering rule) as a minimum.

LO 26 Economic model: by scale order e.g. as follows:

small (non-large) company Or, since Keynes: micro economy	medium-sized company	large (giant) company macroeconomics
Human-centered model : dwarf (homunculus (Paracelsus))	human	giant (meganthropos (Greek mythology))-
Aesthetic model: graceful (joli, gracieux)	clean (beau)	elevated(sublime)

C. Lefèvre, Le composition littéraire, Bruxelles, 1936³, pp. 13/14, says : "Pleasant, - pleasing, beautiful, elevated, - these terms clarify to us the aesthetic progression." (o.c., 14). If one includes laughter and weeping, it becomes:

laughable :	harmless	tragic
humorous	(ugly)	dramatic

Notes.

(i) The contradiction - too rightly in place in Aristotle's hypothesis - is ambiguous:

a/ the negation can be done by omission (privative) - 'A' becomes ' '-; thus blindness is deprivation of sight, death deprivation of life (which does not occur with 'a stone);

b/ the negation can take place by contradiction (contrair) - 'A' becomes 'Ä' (non-A) -; thus injustice is contrair or simply opposite to right, but they are possible somewhere simultaneously, under more than one point of view, in one and the same bearer of it; - the strong degree is the contradiction (incongruity: injustice and right cannot be present at the same time under the same point of view.-.

(ii) Infinitesimal differential.

Zènon of Elea (-/+ 500) asserted, in a famous sophism (fallacy), that Achilleus, the swift-footed one, can never overtake the tortoise, the slowest of animals, once she has left before Achilleus; reason(s): the interval must first be emptied; which takes time; which allows the turtle, again, to move forward; result (according to Zeno, at least): the interval diminishes, but never becomes zero (limit - or limit concept).

Lahr, Logigue, 701, notes that Zeno here confuses equally large and

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proportionally large distances. - After Zeno, Aristotle and Archimedes and, later, Leibniz (infinitesimal calculus) elaborated on this operation: 'differentia' (gr.: diafora) is 'difference'; it is clear that a differential is composed of differences: the infinitesimal differential is a series of micro-differences (miniaturization).

Applications:

(a) Homeopathic medicines, since Hahnemann, have been based on microposology;

(b) the Cartesian coordinates are differentials (from -x to +x and from -y to +y), amenable to miniaturization;

(c) the dialectic has clarified one aspect :

Ainèsidèmos of Gnossos (Crete)(-/+ -50), the heraklitean skeptic, observed that 'a small dose of wine acts tonic, while 'a large dose (note the differential) makes one drunk; - modern Hegelian-Marxist dialectic calls this the law of gradual (miniaturization, micro-scaling) quantitative change in tandem with the sudden (discontinuous) qualitative leap; -- usually 'sensing' and 'agreement' are at work in determining the leap: When is a décolleté demure and when is it cut 'too deep'? When does wine have a tonic effect and when does it induce drunkenness; - One takes the giving of points concerning intellectual or other achievements: one agrees that 5/10 is still permeable; why not 6/10 or 4/10? In the case of wine action, clearly no 'feeling' or 'agreement' but a threshold capacity of the organism (metabolism) is at work; - dialecticians have 'a feeling' for the qualitative jumps in our measurements and value judgments.

(iii) The series.

Descartes, with his universal mathesis (theory of order), who always wants to measure nature and, while measuring, to order it in ordered sequences (cf. *M. Foucault, Les mots et les choses*, 70/71), and, with him, the intelligentsia of the XVIIth to the XVIIIth centuries,,- later C.S. Peirce, Dedekind, Cantor, etc., - they clarified the concept of 'series'. Well, in the differential the sequence is present. The sequence or order, in a series, is open or closed (circular, cyclic). Immediately one sees what rich organizing power is present in the differential.

IIb1b. Analogous arrangement.

It is since the Pythagoreans that the systechy 'tautotès (identitas)/ heterotès (alteritas), (identity/non-identity) in Greek thought is clear (*O. Willmann, Gesch. d. Id.*, I, 273). Plato, Aristotle worked with the pair of opposites 'equal/ unequal'. D. Hume (elements are associated according to

1/ similarity and contiguity (appurtenances, belts), as well as

2/ cause-effect relationship),

Comte (facts as elements are associated according to 1/ similarity and 2/ sequence), Russell (logical atomism),- they all work on with the systechy 'identical/ different', which can be worked out to range (= differential):

totally identical	non-total identical	total non-identical
	partly (partial)	

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This differential arrangement needs to be interpreted differently if we want to understand its true scope, by introducing the systechie 'internally/externally' or the systechie 'immanent transcendent':

immanent (type 1): immanent (type 2): transcendent: either simply totally identical part identical extrinsic, or and extrinsic (materially identical) (formally identical) and beyond.

G. Jacoby, Die Ansprüche, S. 117, cites Ch. Twesten, who claims that logic (in the idealist or essence believer sense-see above pp. 17/18 (essentialism or idealism in the antique-medieval sense of idealism)-) is formal, i. e. in its essence, the theory of the application of the two principles, that of identity (what (so) is, is (so)) and that of contradiction or dilemma (something cannot be (so) and not (so) at the same time and under the same point of view).

Here this is abundantly clear: that which does not either 'be' something totally (reflexive or material identity) or approximate that same something part-identical (without ever being material: all universal concepts, all 'models' in that case), 'is' simply to be called external or transcendent with respect to the object considered.

Well, 'analogical' or 'analogical', i.e. part-identical is what we are talking about here now: the definition which may be called classical, is 'partim idem, partim diversum' (partly the same, partly different). This is the object of all logical operations (and here logic differs from ontology or general metaphysics, that the latter speaks and thinks by logical (part-identical, analogical) means about the total identities that the universe has to offer). Cfr. supra pp. 12/13 (more-unambiguousness of every idea or concept or model with respect to the object to be known in its overall (or total-identical) knowability).

Cultural History Application.

In analyzing the world of ideas of archaic cultures, one encounters the following applicative models of analogy :

(i) *informative*

(epistemological, interpretive, logical, methodological): archaic (whether primitive, antique or mid-century) man is called 'naive realist', i.e. he is convinced (and this on the basis of his daily experience - logical, empirical, transempirical) that his conceptions (ideas, concepts, models of thought) are present in his own mind, but, at the same time, are present outside him (transcendent, external) (in an analogous or part-identical structure, apparently);

(ii)a metaphysical

(pre.constitutive): the Supreme Being either male or female (think of the Mother Goddess religions in the non-Biblical cultures) is at the same time 'elevated' (transcendent (type 2: both beyond and transcending) and immanent (omnipresent in nature and man);

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(ii)b *physical* (natural, constitutive):

the so-called animatism or omnipresence belief of archaic mentalities (primitive, antique, middle ages) sees at the same time above every being (material, better inorganic; organic (plant, animal); human) a 'soul' (living principle; hence the primal or archaic vitalism), which is also 'present in' it.

The culture founder's belief (dema-, salvation founder's belief) - especially among the planter cults - consists in the fact that, in the primeval time (which is both a transcendent, above and beyond every moment of time and an immanent, situated in every moment of time (or better: eternity)), "heroes" (salvation heroes), of a "godlike" nature, have performed exemplary or exemplary (exemplary) "deeds" (jeests) - e.g.e. cultivated a kind of plant-, which each one of us, if believing, can repeat, if he wants to enter into the 'eternal now' (of the worship or cult), together with the cult leader (leader) and the believing people (mystery religion);

(iii) *Ethical-political: M. Eliade, Traité d' histoire des religions*, Paris, 1953, p. 41, notes: "We can identify, even among the least evolved groups from an ethnographic point of view, a set of truths incorporated into a system, and this coherently, indeed, into a theory (e.g., among the Australians, the Pygmies, the Firthlanders, etc.).

This collection of truths constitutes not only a "world view" ("Weltanschauung"), but moreover a pragmatic ontology (we would even say: a doctrine of salvation ("soteriology"), in the sense that, with the help of these "truths", (the archaic man) tries to save himself by working himself into reality.

To give just one example, we shall see that the majority of acts performed by men of archaic cultures are, at least in their minds, merely the repetition of an archetypal act (geste primordial, or 'geste' in the sense of a primeval act, 'jeest') performed 'in the beginning' ('in the mythical primeval age', says M. Eliade elsewhere) by a divine being or a mythical figure. The act in question is meaningful only to a certain extent to the extent that it repeats a transcendent model, an archetype."

One sees that the eminent religious scientist of international fame clearly expresses both the (in human history) immanent and, at the same time, the transcendent in the majority of life and coexistence ('ethical-political') acts of humanity, archaically speaking.

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Remark.

See M. Eliade, o.c., pp. 373/391, for more precision concerning the structure of the symbols either in the magical-religious sense or in - what he calls - the 'empirical-rationalist' sense (the 'magical. religious' he also calls the 'cosmological'). His thesis is that what was, since prehistoric times, magical-religious or 'cosmic' is, with time, under the influence of 'a certain 'enlightenment' (which thinks exclusively empirical-rationalistic), desecrated and 'degraded' (sic p. 376) to either simplistic 'superstitions' (recipes without magical-religious basis) or economic- aesthetic 'values'.

See also *M. Meslin, Pour une science des religions*, Paris, 1973, pp. 195ss. (*on myths and symbols*). 'Symbol' in the religious-historical sense has always been related to the systechie 'immanence/ transcendence', and informatively, preconstitutively (meta.physical), constitutively (physical), ethico-politically understood.

Conclusion: the analogical order(s) is a key work on cultural history.

The analogical method.

Anticipating the theory of method (see infra), we now wish to clarify the basic structure of analogy, as the antique-medieval tradition prepared it:

"The basic insight of ontology, namely that 'being' is pronounced in many ways (on pollachos legomenon, Arist.) according to Aristotle, is elaborated by the scholastics (of the middle ages) in the form of a doctrine concerning the analogy of 'being'." (*O. Willmann, Historische Einführung in die Metaphysik*, S. 456).

Immediately, there is a reaction both against "unlimited fragmentation" ("atomism") and against "unlimited monolithic interpretation" ("monism") of reality, Willmann adds.

Too right. - Analogy' arises, if one 'arranges' more than one data either side-byside (proportional or proportional analogy) or subordinate (attributive analogy) - see above pp. 8/9 (grammatical heuristic model), pp. 23/24 (parataxis, hypotaxis) -.

Indeed, = *paratactically* ordered data can be compared as members of one and the same collection: "John is the rooster of the gang" is a metaphorical (see higher p. 8/9 interpretation theory: semasiology) shortening (in speaking) of an ideal proportion (i.e. relation couple), which comes down to this: "As the rooster is to the (gang of) chickens (relation 1), so is John to the gang (of boys)";

= *hypotactically* ordered data can be compared as parts of one and the same whole (systemic coherence): "This apple is healthy" is a metonymic shortening (in language) of an ideal connection (conduction, contuition), which boils down to this: "because this apple contributes to (functional connection) health it is 'healthy'.

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In other words, proportional analogy becomes, semasiologically, metaphorical speech, while attributive analogy becomes, semasiologically, metonymical speech. The former relies on the distributive structure (which gathers according to common properties); the latter on the collective structure (which is systemic according to cohesion). Cf. *G. Söhngen, Analogie und Metapher (Kleine Philosophie und Theologie der Sprache)*, Freiburg/ Munich, 1962 (analogy is, for Söhngen, the key, the essence and the work of language, - logical, aesthetic, but also energetic-ethical).

'Analogy', now, as a method is called comparatism or comparatives science. *M. Meslin, Pour une science d. rel*, pp. 153/168, notes that, as far as the science of religion is concerned, antiquity (especially late antiquity) already pointed to the identity of the gods and goddesses hidden under a multitude of names given to them by different cultures; that the religious rationalism of the Enlightenment (XVIIIth century) established a striking 'resemblance' (understand: analogy) on a world scale (the myths, e.g., are very similar); that, however, it was not until 1880 that the Enlightenment (XVIIIth century) established a similarity between the gods and goddesses.e.g. the myths are very similar); that, however, only in 1856 Max Müller fully introduced comparativism, starting from comparative grammar (of the Indo-European peoples); that later, at the beginning of the XXth century, the evolutionists introduced "evolutionary" comparativism.

But all these comparatisms suffered from one defect: they were too superficial. Religious science, says Meslin, nevertheless preserves the comparative or analogical method, yet with respect for the differences of cultures and situations: the original or unique (idiographic structure) is preserved and the concrete context of a phenomenon that at first sight seems analogous is thoroughly brought to the fore. This leads to an analogical and corporatist differential:

nomographic method of comparison:	idiographic method of comparison
too general and superficial	precise and explored, viz.
(vague or too immediate analogy)	situated in the concrete context

The platonic participatory theory (methexis)

This is an analogical explanation of the being; so is the Aristotelian analogy. The middle ages elaborated on both methods.

Current communication theory (whether or not it has been elaborated steering-wise) and especially structuralism constantly work with analogical methods. Cfr. *H. Zelko, Modern Discussion and Meeting Techniques*, 1964, pp. 37/39, who points out, in passing, the limits of method:

a/ The objects of comparativism must lie pretty much on the same plane,

2a/ The similarities between the comparata (compared obj.) must be perfect,

2b/ Any difference between them weakens, indeed destroys, the analogy.

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One sees that, here, analogy almost becomes identity,-so strictly is it included; it is also conceived in a systemic way: the objects compared must lie almost on the same plane, i.e. show 'an almost identical coherence.

This is truly the counterpart of the vague, very general comparatism of some structuralists e.g. or of a psychologist like *G.B. Vetter, Magie and Religion (Their Psychological Nature, Origin, and Function)*, New York, 1958, PP. 395/412, who 'compares' communism and Catholicism as 'successful' social movements, as if they were two 'religions': he has drawn up a list of forty-five identities or, better, 'similarities' for that's all there is to it; look at eighteenth-century comparatism:

"Both are (...) 'evangelistic,' emphasizing action and results; both are catastrophic and revolutionary; both have personal, authoritative, and more or less deified founders, Jesus, - Marx; both founders emerge from the same cultural pattern, Jewish; both are 'apocalyptic ' (not in the sense of world and culture end inclined) and 'revelatory' and insist on present sacrifices with an eye to future results;

Both preach 'an unquestioning confidence in the truth of their creeds; their ideals are honored with the deadly seriousness one reserves for the sacred; (...)

Both have sacred texts or writings, the Bible and Das Kapital; (...) both sacred texts are long-winded, repetitive and stupid; the lesser people in both rarely read these sacred texts (...)".

Thus it continues (o.c., 397/400), until number forty-five is reached.

The assessment would lead too far, but, in addition to excellent points of comparison, this enumeration without comment as to the exact scope (similarity and difference, which is sometimes very large) shows very clearly unacceptable points.

For example, the "deification" of the founders: what does Vetter mean by "deification"?

It is clear that the criticism of Meslin, above, also applies to this: one looks for vague analogies, instead of placing sharply defined general traits, which are identical, back into their concrete context (system) (the differential, yes, the unique (idiographic) irreducible ánd of communism ánd of Catholicism is simply wiped away: reason: the author confuses 'social ideologies' with 'truly sacred religions', apparently misled by social psychologists like *D. Katz/R. Schanek, Social Psychology*, New York, 1938 (with a so-called 'functional analysis' of the Catholic Church in it)).

Such a comparatism is characteristic of the Enlightenment, which lacked an elementary magical-religious experience and lived on a vague deism.- With all this we are at the antithesis of 'n Zelko, who made strict demands on comparatism (and in itself and in connection two or more data are compared).

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IIb1c. Systechic differentiation.

One now compares both the differential and the analogical order: they show striking identities, which we will now, briefly, analyze.

(i) The types of opposition, as on p. 26 supra, also return for the analogous structure. So that we can be brief.

(ii) The series formation also returns (see page 27 supra). We see it e.g. in the following analogical differential:

Identical (without more) (utterly, absolutely id.)	partial identical (1) (very identical) (rather, rather id.) u	partialidentical (2) (very different) rather, rather difference) indecided) (zero point)

Applications are e.g. the polarity profile of *Ch.E. Osgood e.a.*, *The Measurement of Meaning*, 1957;- in an opinion poll about a person among a multitude of people (image poll) e.g. the judgement about a person's competence emerges: the person in question is found (i) extremely, very, rather competent, (ii) undecided, (iii) rather, very; extremely incompetent. If one now adds to these seven 'notae' (characteristics) each time the number of interviewees who expressed them, then one has even mathematisation.

E.g., D. Szanton, Cultural Confrontation in the Philippines, in Cultural Frontiers of the Peace Corps, Cambrdge (Mass.)/ London, 1966, pp. 35/61 (esp. p. 53): the adaptation of the people of the "Peace Corps" in the Philippines showed a whole range or spectrum, going from rejection and aversion through aloofness to acceptance and fondness toward the native population and culture.

So far analogy is also apparently 'differentially' structured. That is why we call both, the differential and the analogous, 'a more than dual systechy.

Now the series in itself.

A small word about this. We start from Aristotle's concept of succession (in his hypothesis). *Kard. D. Mercier, Métaph. généralé*, pp. 176ss., defines

(i) 'collection' (crowd) as elements ('units', 'members', 'individuals' called), distinct among themselves, yet made one (collected) under one perspective (common-sense property);

(ii) 'number', as elements, distinct among themselves, yet made one starting from one point of view, in such a way, however, that one counts them up to a final number, in which they are all included. Counting is thus the characteristic of number, and in such a way that the final number represents the number. "The (elementary) unity (or element), the distinctness (or even separation) of more than one unity (elementary understanding), the (totally understood) unity in that multiplicity of units (= elements), the localisation of the

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units (= elements (o.c., 179). The moralization of the elements, similar to computer memory (which always keeps track of the 'state' or 'condition'; cfr. *J. Lagasse et al., Logique séquentielle*, Paris, 1976³, p. 2), is the specific (fourth) aspect, which distinguishes 'collection' from 'number'.

But with that, the concept of 'series' has been exposed: by counting the members, the numerator projects the elements into the series of (natural) numbers. *J. Royce, Principles,* pp. 53ss., defines 'series' as follows:

" 'a class of (...) individuals such that there exists (between them) a single relation (called B), which is dual (dyadic), transitive (transitive), and wholly non-reciprocal (non-symmetrical) and which is such that, any pair (a, b) of the distinct elements (...)

One also chooses, whether the relation (aBb) or vice versa (bBa) is true; since B is, by definition, completely non-reciprocal, (aBb) and (bBa) can never be true at the same time with respect to any pair". Cf. also *H. van Praag, Measuring and comparing*, Hilversum, 1968, pp. 47/51 (*sequence either serial or cyclic* (circular)).

Applied to systechiae extended to more than two members (differentials either pure or analogous), this amounts to saying that such systechiae, turned into series, are subject to the laws of the series. In this sense Aristotle's hypothesis (category theory, part 3) is truly fundamental: for it observes that, in the fundamental concepts or basic ideas, both opposition (systechy) and succession (series) are at work, namely structurally, i.e. hidden in depth.

Measurement.

Already in archaic times and in Greek antiquity, but particularly emphatically since the late-mid-century "first industrial revolution" -- in which people like Coppernicus, Tycho Brahe, Kepler, Galilei et al. situate themselves, with their experimentalmathematical mentality -- measurement has become "an element of science.

Measurement is a form of comparatism: one takes a natural or arbitrary 'measure' (= unit, measure, element), on the one hand, and, on the other hand, the reality to be measured; the series of numbers (natural or other) serves as a counting set, in which one 'totalizes' to a number and the corresponding number (see above).

IIb2. *Combinatorial-configurative order(s).*

- The paradigm or textbook example of combinatorial configuration is tinkering, which is a diatactic (arranging, taxeological) activity viz:

(i) disassembly points to a pre-given structure; reassembly assumes a lemmatic (hypothetical) working structure that can be repaired or found;

(ii) tinkering can, if need be, be computational: **a**/ one counts the number of structures, here called 'configurations'; **b**/ one sums them up;

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(iii) tinkering is, always, consciously or reasoned, purposeful. One can call 'thinking' the adult and idealistic form of tinkering: a child learns, already tinkering, to think; thinking is, indicating, giving a place and making 'configurations'.

Combinatorics.

Galenos (129/199), the famous physician,- Raymundus Lullus (1235/1315) - with his 'Ars generalis, i.e. a system of basic concepts and judgments, from which, by combinatorics (structure formation) and mechanical operations, the most special professional sciences are constructed, as it were;

Descartes, with his *Mathesis universalis*,- *Leibniz* (1646/1716) with his *Dissertatio de arte combinatoria* (1666),- they all worked in the direction of a theory of connection or mutual arrangement, a combinatoria.

'Combinare', combine, comes from the Latin 'cum' (with) and 'bini' (the distributive or divisive noun for two, i.e. two each). The word 'combinatorics' puts more emphasis on the manipulative aspect, i.e. causing changes in the elements that are 'worked', 'manipulated' (moved) in combining.

'n Strong sense of freedom and power is latent in the manipulation of elements and relations: J. Pucelle, Le contrepoint du temps (Méthodologie de la liberté), Louvain, 1967, - book which, with two previous works (La source des valeurs, Le règne des fins), forms 'a trilogy, - discusses, in 'a second chapter, 'the labyrinth of exchange solutions ('alternatives')' - 'a kind of axiomatics of choosing;

Indeed, freedom implies choice;

Choice implies a localization of possibilities; proposer sees five:

1/ The swap solution (alternative: one or the other),

2/ preference (rather, one rather than the other),

3/ The accumulation ('cumul': the one and the other),

4/ The variety (now one thing, then another),

5/ The refusal (neither one nor the other);

Thus an axiological combinatorics arises, - from which the great applicability of combining already appears immediately, and this in the existential field, i.e. in reacting to the accomplished facts which determine our free choice ('design', Heidegger and Sartre would say), itself.

One compares this with *J. Royce, Principles*, pp. 72ss., on the "possible modes of action that lie within the reach of a reasonable being.

1/ To sing or not to sing (dilemma, contradiction),

2/ singing and/or dancing (summering),

3/ singing and dancing (implication: one together with the other),

4/ do nothing (neither ... nor ...:omission),-

possibilities processed in a logical algebra. Cfr. applied to automata and information k: J. Lagasse/M. Courvoisier/J.Richard, Logique combinatoire, Paris, 1976.

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'Praxeology' (theory of action ('praxis')), elaborated logistically or not, and description of existence meet here in this combinatorics of action-life in freedom. Associating, dissociating possibilities (modal combinatorics) is proper to deliberation before and during the act of choosing. Cf. O. Becker, Zur Logik der Modalitäten, 1930, ad II (Die logische Deutung des mathematischen Intuitionismus von der Modalität aus,mit besonderer Rücksicht auf E. Cassirers 'Philosophie der symbolischen Formen'), esp S. 541ff. (on the difference between Aristotle's modalities and Heidegger's 'possibility' as 'existential' (i.e. as a feature of human 'existence' or 'existence' as, thrown into the world (passive aspect: 'having history'), yet 'designing' that world and oneself in it (active aspect: 'making history')).

Configuration Theory.

C. Berge, Princ. de comb., p. 1, defines 'n configuration or 'Gestalt' ('form', but then understood as a form of placement or arrangement; cfr. supra pp. 8/9 (grammatical model of juxtapositions and subdivisions), p. 23 (logical arrangement)) as the placement of data (objects, points of interest, etc.) obeying well-defined constraints.

Example: to "place" (arrange) in a cupboard a number of packages that is too large; to give the children in a class a place on a given number of benches; to make a subdivision (lots according to a number of rules);

Biblically: Noah having to fill the ark with a specimen of all the animal couples; - on a broader scale: 'spatial planning' (according to Dr. Hudig, the science of the spatial development of human settlement, yet such that this development is guided in 'good' (purposeful) directions: which implies the placement, and indeed the desired placement of settlements; other definition: the science of the spatial development of the human (the obligatory structure) landscape); thereby distinguishing, - typically combinatorially - between 'spontaneous' and 'planned' planning (planology) with 'survey' (overview of the configuration and its transformations).

The spatial arrangement proves that configuring, combining, is a structural (spontaneous, unconsciously active) activity, an "existential" (to speak with Heidegger), - not just a structural consciousness activity.

This is shown by J. Claes, De dingen en hun ruimte (A metabletic study of perspectival and non-perspectival space): especially since the Baroque period, Claes has examined the changes in the sense of the 'where', the 'place' and the 'space' of things (in the line of J.E. van den Berg).

This also points to what is called "design," design, usually in the industrial and/or artistic fields.
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Sharper delineation of "configuration.

Now these applications of it - gives C. Berge, o.c., 2:

(i) 'a first collection of elements (objects, points of interest, etc.,- Berge thinks the 'matter' of the configuration too 'chosistically', too much as 'things' and too little as knowing and thinking content, eidetic or conceptual, ideal 'points')

(ii) is depicted (model concept and especially clarity concept) in a second collection, provided with a given structure or coherence.

One sees that combinatorics represents the subjective side and configurational theory the objective side of ordering without question. They constitute an intentional relation.

Task of combinatorics as a theory of configuration.

C. Berge, o.c., 3/10, provides an overview, which we systematize as follows:

(i) the actual configuring or combining of elements into a configuration is twofold: either one analyzes a known configuration in its relations and elements or - the heuristic form - one tries to find a configuration (proposer refers to the Chinese Yi-King, the mantic or divination book in China (used mainly Taoist) - dating from + -2200;

It is worth noting that archaic cultures, especially in the mantic field, apply combinatorics, sometimes in an ingenious way: a splendid example is described by the Italian African expert *A. Gatti, Bapuka*, Zurich, 1963, S. 137/147 (the village chief Kuanakali resolves a conflict by magically throwing "wise" stones and that in a way that Gatti considers almost impossible even for educated European judges);

(ii) the mathematical aspect of configuration: one can either proceed denumeratively, i.e. count the number of configurations (see above p. 33/34 (series notion; number notion), - this in an exact or approximate way or proceed enumeratively, i.e. list the number of configurations one by one (or at least go through classes of them one by one);

(iii) the goal-oriented aspect of configuring: one thinks, according to Berge, of the commercial traveller who wants to visit all the capitals of the American states just once with the least effort and e.g. to make it even more difficult - arrive at his starting point; - what now, in operational 'research' or investigation, is called 'optimization'.-- Which, structurally at least, corresponds to the rational form of tinkering!

Types of combinatorics.

There are two, mainly at least, the natural or physical and the human.

Nature Combinatorics.- Astrology, since gray antiquity, has had an awareness of what nature combines and configures: think of the words "constellation" (celestial body configuration), conjunction (in the late middle ages: conjunction) (conjunction of two planets), opposition (two planets with a celestial body as an interval).

LO. 38.

 \pm 1600, the word 'business cycle' appears in English, French and German, as a designation of the temporal event (dangerous or happy cycle); as an economic term it appears, in Germany, +1700.'Hochkonjunktur/ Tiefkonjunktur', business cycle research, studying business cycle fluctuations, etc., become common in the XIX th.

Also the word 'aspect' (ad.spicere, view), which, astrologically, means planetary position (cf. state or condition in computing), has become transitive (and means 'global' (not 'total', meaning all elements) view). 'Opposition' has become, especially politically, very common, as well as 'constellation' (instantaneous grouping of parties e.g.).

Although natural, the constant change of position of celestial bodies appears as a mysterious combinatorics, which constantly forms and transforms configurations. It was therefore easily the model for that other form of mantis (divination) which conceived the 'stars' as images of earthly data (sovereigns, ordinary people) and thus got caught up in the 'combinatorics' of governments and commercial affairs, not to mention the cunning which the ordinary mortal has always practiced. The mobile, indeed the manipulative aspect of 'order(ning), comes into its own here.

Not only the heavenly bodies, - all of earthly reality 'combines', 'configures'. A simple example: there is, under our feet, a constant movement of water; if one digs from high to low (series), then one comes

(i) Resist rising capillary or pore moisture;

(ii) at some point, one strikes the phreatic plane (where the hydrostatic pressure is zero);

(iii) From there, the ground or phreatic water begins. In fact, this is also a kind of differential, but (as, in Cartesian coordinates, the y-axis) vertical.

At first glance trivial, this structure is, in fact, very frequent in modern thought: one thinks of the "Ueberbau/ Unterbau" - theory of K. Marx (suprastructure (ideology, religion, higher culture)/ infrastructure (socio-economic organization)).

One thinks of the classification of moral feelings by Vl. Solovjef:

1/ Respect we have towards what is above us;

2/ endearment we cherish, normally, towards what lives at our level (fellow humans, nature beings);

3/ We feel shame with regard to what is, especially within us, but also around us, below the reasonable moral level of behavior. One thinks of surface and depth psychology, which works with superconscious, conscious and subconscious layers. One thinks of the problems which Nietzsche in particular raised with regard to the 'higher' Apollonian (rational-moral) and the 'lower' Dionysian (infrarenal-immoral) behavior in cultural analysis.

LO. 39.

Human combinatorics.

The most famous and still useful harmology is the pythagorean arithmètikè (technè), arithmetic. The root '°ar' (join) sticks in 'ar.ithmos', - which we translate by 'number'. Better true 'number form' or 'number configuration'. And, even then, one may miss the most pythagorean aspect of 'configuration' as they, the pythagoreans, sensed it: 'harmonia', i.e., the element of 'beauty' in configuration.

Conclusion: 'arithmos' is best translated by 'gatalvormharmonie'. Only then does one have the full meaning in mind. Analyze this briefly, taking as our guide what *O*. *Willmann, Gesch. d. Id.*, I, 288, writes:

"The Pythagoreans did not only calculate with 'numbers', but they 'saw' them as space forms and a construction (meaning: of a spatial nature), 'gramma', was, for them, always an arithmetical problem. Even more: they not only 'saw' the 'numbers' (meaning: as space forms), but they also 'heard' them, in view of the fact that it was their habit to consider the tones as lines and as numerical ratios".

One easily recognizes the dimensions of the configuration mentioned above by Berge:

a/ spatial (the 'seeing' of the 'visible' or 'eidos', view) as geometric structure;

b/ arithmetic (number mathematical) (the 'arithmetic' related to the structure);

c/ musical (the "hearing" of the structure, - the aesthetic element, akin to Berge's goal-oriented aspect).-

Only in this way does it become understandable that, as W. Jaeger once remarked, the Greeks, since Pythagoras, continued to think in number-form harmonies: one looks at the application of this beautiful thinking to the ethical-political order, as the Pythagoreans did:

What, for example, is "justice"? She is:

(i) numerical 'arithmos', i.e. different from the unit ('1') more than one, at least two,- implying number and number;

(ii) Space mathematical but here understood metaphorically: the relationship between at least two city-state citizens (one thinks of distributive or distributive justice or commutative justice (exchange justice));-- but it is more:

(iii) it is always "musical", inspired to beauty by the Muses, just like the sounds of the lyre, which, as microcosm (miniature universe), resonates with and is attuned to the macrocosm (the immense universe) - think of the differential of aesthetic values (from small-scale graceful to large-scale elevated) m.a.w. the optimization (cf. Berge, who takes operational research as a model, i.e. the "cosmos" of manufacturing processes and business organizations) is here musically in the first, though not only place.-

Perhaps our modern thinking would gain, optimization was still conceived not only utilistically - effectively, but aesthetically.

LO. 40.

IIc. *Philosophical theory of sets.*

We now have the guiding principle to define the basic collections which are philosophically 'relevant' (representing scope). Here the comparative method takes the form of what Erich Przywara calls the 'transpositive' method: comparing one with the other, one finds the idea, present in the one, back in the other (cf. *G. Copers, De analogieleer van Erich Przywara*, Brussels, 1952, p. 90vv, where Przywara's method of transposition is applied philosophically: the problem (of analogy) is conceived as the same, by Przywara, with Plato, Aristotle, Augustine, Thomas, Kant, Hegel, Heidegger, etc., to which the 'transposition is applied).

Second point: what is the transition from analogy and differential theory, explained above, to set theory? *Kard. Mercier, Logique*, pp. 180ss., gives the key: what is identical in different (distinguished and/or separated) data, is 'a dictum de omni et nullo' (kata pantos kata mèdenos, says Aristotle, Analyt. pr., 1:1), is something that is said out of everything and out of nothing, i.e. out of all the elements of a set at once, in their identity, and out of none in its distinction and/or separation from all other elements.

In other words, as *Rabier, Logique*, says - according to Mercier - there are two points of view to understand this Aristotelian statement: 'connotative' (comprehensive, ideal, knowable) - and then this is 'a creature insight, identical in all applicative models - or 'denotative' (extensive, material, knowable) - and then this is 'a "summary S of well-defined distinct objects of our contemplation or thought o, which are called the 'elements' of S, into a whole" (according to the founder of extensive logic and mathematics *G. Cantor* (1845/1918), *Beiträge zur Begründung der transfiniten Mengenlehre*, 1895/1897)). In this denotative view, "identity" then becomes "common property.

One sees the profound difference of method:

(i) in the connotative, idealistic view, one begins with the abstract essence of things, which is susceptible to universalization afterwards;

(ii) in the denotative mathematical view, one begins with the universal (and thus common in 'a multitude of elements) which, in retrospect, is amenable to 'abstraction' (if this word can apply to it).

IIc. Set and system, set and system.

It is striking that, already from the earliest times, collection and system are thought of together, without therefore always being mistakenly confused.

LO. 41.

D. Nauta, Logic and Model, p. 175, says "a system is a collection with a structure (the structure, he says, of a system is the total - the whole network - of relations between the elements of that system). So much for what is plausible. But listen: "Collections, in which the elements are not brought into a coherent whole by any relation, we will call 'classes' of objects. Examples of such classes are the collections of red objects, a choice - set of entities whose choice is left to chance, etc." (o.c., 175).

That would mean that class exhibits no structure at all: yet there is one structure, namely, the distributive or dispersive structure, - that structure which Cantor calls the fact that the elements have one or more common properties, distributed (distribuere = to distribute, to spread over 'a set of objects) over each; those common property(s) are that which is identical, one in that multiplicity of elements (connotatively speaking).

Therefore we follow with emphasis *W.C Salmon, Logic*, Englewood Cliffs, N.J., 1963, pp. 38ff. where he says:

"A class is a collection of entities (ids, data). If we speak of the class as such (as a class), we speak 'collectively'. If we speak of the members as individuals (singles), we speak distributively. In other words, there is a minimum of collective in mere collecting (even if one collects elements 'chosen by chance', the act of collecting itself is, formally, collective (and founding, i.e. the purely local gathering, e.g.)).

That is why we think that the view mentioned above p. 8/9 (grammatical ordering both juxtapositional (collecting, distributive) and subordinate (systemic, collective)) and p. 23/24 (logically repeated ordering, para- or collecting and hypo- or systemic) is still the most 'logical'. It is well known to scholastics: *Ch. Lahr, Logique*, p. 499, distinguishes two kinds of 'wholes', which one can 'divide':

(i) the mere logical division splits up 'a (mere) 'logical' whole or collection, 'an 'omne' (as the Latin says), i.e. 'a general idea, says Lahr, present in its distinct representatives or agents;

(ii) the (meta)physical division splits up 'a more than merely logical, i.e., (meta)physical whole, 'a "totum" (Latin), i.e., that kind of whole which consists of "integrating parts".

He refers to the Latin saying: 'omnis homo', the human race, differs from 'totus homo', the whole human being (as a composite being). One singular is meant distributively, the other collectively.

LO. 42.

Also *D. Mercier Métaphysique générale*, pp. 156ss., points out the duality 'collection/system', but under a different name:

(i) the logical 'compositio' or 'composition' is exclusively the result of the mind, which 'universalizes' what it has abstracted (separated out) from (sensory or transempirical) experience;

Example: the concept of "human nature" or "humanity", which comes from the experience of concrete people as an abstract idea, attributes it to all human individuals individually; the formula "all people", "people in general", is thus a logical whole, of which each member of humanity is a logical "part";

(ii) the 'real' either metaphysical or physical 'compositio' or composition - 'metaphysical' and 'physical' usually serve to denote the preconstitutive and constitutive aspect of being,- which is of secondary importance here - concerns (meta)physically distinct parts, which, together, constitute 'a whole.

IIc1a. The distributive structure.

Once again, for the umpteenth time, we give the essentials of the division:

a/ 'a given set of things or processes (syn- and diachrony, about which later),

b/ different or separate with respect to each other yet one or identical under one point of view, i.e. their common characteristic - e.g. all young girls,

c/ however, in such a way that each individually possesses the whole common property - e.g. each member of the class of 'young girls' is itself, individually, entirely 'young girl'; under that point of view they are 'commutative', i.e. interchangeable (which is not the case with the parts of a complex system e.g.; - which is indeed a different structure from the systematic but still a real structure).

All (universal), quite a few, some, few (private (partial)), one (singular, individual), none (zero case)

Gender (generic) - species (specific) external, transcendent.

That the above diagram is a true differential is shown by the following;

All, (collection 1) not all (some do, some don't (collection 2) ('some' in technical sense) borderline (collection. 3), all don't (collection 4).

In the sequel, we denote these distributive main types by the letters u(niversal), p(articulate), s(ingular), n(ul case).

It should be noted that, in legal language, "horizontal" regulation covers all elements (activities, products), while "vertical" regulation covers only part of them.

LO. 43.

'Respective' and/ or 'respectively' are distributive terms: if one considers more than one piece of data, but each of them taken separately, one considers them 'respectively'; e.g. "the respective posts of president, writer and treasurer are for x, y and sit or "these posts are for x, y and z respectively";

One also says "the gain, respectively the loss" (written in between): then it means something like 'and/ or' (it depends on the case separately) (eventualis).

Proverbs interpret the distributive viewpoint: in Portuguese:

"cada ovelha com sua parelha" (every ewe with her double); more generally, "cada qual com seu igual" ('cada' means the distributive pronoun: 'every one'); in French, "qui se ressemble, s' assemble".

The difference between 'global' and 'total' can now be accurately expressed: 'total' is global to the distributive, i.e. including all elements, while 'global' leaves the elements out (roughly, vaguely).

Ideology

In Greek, 'ho sullogos' or 'hè sullogè' means collection; 'legein', 'sullogizein' means 'to collect, to read together' ('to read ears' is to collect ears, even still with us); 'katalogos' means 'collection list' (catalog: enumerative).

Aristotle says of Socrates' understanding that it is "to hen para polla, unum ad multa, the one next to the many (unity and collection).

Plato says, "Ek pollon ion aisthèseon (emerging from many perceptions) eis ben logismoi xun.airoumenon (it is summed up to something once by thought): (*Faidros*, 249),

Aristotle uses the word "kat'holou" (katholou), standing in opposition to "kata meros" (per part), to denote what was later, in the Middle Ages, called "universale" (general understanding), summarizing a concept.

Classification.

See supra pp. 13/15 (connotation/denotation), 17 (categories, predicabilities), esp. 22 (taxinomy). - *Ch. Lahr, Logique*, p. 612, says: "To classify is to arrange beings according to their similarities and differences into a number of methodically distributed groups." Such a thing always involves, directly or indirectly, collecting, of course. Hence 'class' means 'collection', yet according to the concept of 'rang.arrange' (emphasis on 'rank').

It should be noted that scientific artificial classifications are called 'systems': Linné e.g. classified the plants according to the flower (opacity and nudity is 'criterion' or class characteristic) and worked out such a (classification) system;-which proves that even collecting is a form of system formation (think of the combination of juxtaposition and subdivision).

LO. 44.

It should be noted, further, that *D. Nauta, Logic and Model*, pp. 65; 93, mentions 'another use of words:

(i) 'A collection, which one does not regard as a closed entity (given, being), is nowadays - he says - called 'class', with the consequence that 'a class (which is therefore a kind of 'collection', in that case, of course) may not function as an element of 'another collection'; so e.g. the class of all things, the class of all collections (Cantor's collection of all collections);

(ii) Nauta himself uses the word 'class' and 'collection' "often interchangeably," he says. It should be remembered that Nauta is speaking in the context of logistics (where symbol calculation is at work and not simply reasoning).-- For more on classification see *M.L. Wijvekate, Methods of Research*, Utr./Antw., 103/131(classification).

We note, in passing, the distinction between 'closed' classification and 'open' classification (in the closed classification all classes also contain all cases (elements), while in the open, this is not the case; e.g. the list of students at the hivo (in the future people will drop out or be added: the list is, in a certain sense, never finished; see further: diachronic class); interestingly, open classification can be provided with a corrective, viz. by complementation (dichotomy) - the present students and 'the rest' (i.e. all those who ever join or fall away) - or, which is the same, by unilateral delimitation - all the students before, resp. after the present; - below/above; greater than/less than).

Applicable model.

'n A few decades back, the notion of "Negroness" ("négritude") became topical (think *Cl. Wauthier, L'Afrique des africains (Inventaire de la négritude); L.S. Senghor, Liberté I (Négritude et humanisme)*).

Wauthier says that any serious "inventory" (enumerative treatment) of "Negroness" should be more than pure literature of the Negroes: Ethnology, economics, politics, - history should also be included (Senghor as a poet, Peter Abrahams as a novelist, Cheikh Anta Diop as an analyst of the Egyptian type of Negroism, Jomo Kenyatta as a writer and abductor of tribal organizations, Sekou Touré as an African Marxist, the African priests as religious scientists, - they all see a piece of Negroism);

I.e. to classify, to collect, 'Negroness' should include, if possible, all - universal aspect - and not some private aspect - cases and species.

Defining it, Senghor says, "Negroism is the collection of the cultural values of the black world, as expressed in the lives, institutions, and products of blacks."

LO. 45.

According to others (A. van Bijnen, e.g.), "Negrodom" is "lightly reducible to (i) 'A revolt against slavery,

(ii) awareness of maturity and

(iii) 'a self-affirmation drive: and this with political offshoots.

Senghor's description was rather a denotative one - in which cultural domains blackness is found, this characterization is rather a psychological-sociological one. Yet there is more than the strongly reductive and secular interpretation of Van Bijnen in the Negroid: one reads *J. Jahn, Schwarzer Orpheus (Moderne Dichtung afrikanischer Völker beider Hämisphären*), Munich, 1954, vfl. the Nachwort, S. 165ff., to establish that "common traits" (Cantor) or identities (partial) (Jacoby) are sometimes, especially in human affairs, not easily aligned. Cf. also *Antillean Cahiers*, Amsterdam, 1955vv. (with Negro contributions written in Dutch). In such cases one experiences what used to be indicated by the word 'imponderabile' (mv.: imponderabilia), 'something imponderable'.

A.F. Parker-Rhodes, The Theory of Indistinguibles (A Search of Explanatory Principles Below the Level of Physics), Dordrecht, 1981, develops a new mathematical theory concerning the problem of distinguishing between certain objects, which, traditionally, were identified (identification problem) according to their place in space or in another reference system; in that perspective, the world appears as an unlimited collection of indistinguishable things (a parallel of set theory).

This leads us back to the theory of clarity and teaches us the value of the concept of 'imponderabile' (that which escapes classification in the strict sense and yet is apparently there): this is perhaps a dowsing or mantic aspect of 'collecting'; after all, the dowser has a different reference system (framework from which he perceives and distinguishes ('discriminates')) than the average person, who usually has this capacity latently. There is a mantic collecting that works with imponderables. Negativity for instance is partly clear partly imponderable, imponderable, - like so many things and processes in and around us.

IIc1b. *The collective structure.*

Systematology, 'system technology', systemology, systems theory,-these are the names - for several decades now - given to the analysis of system, resp. systems.

One can (cf. Cs Peirce) also speak of continuum and segments, to denote system and parts of a system. Or of whole and parts.

LO. 46.

Distinction 'collection/system'.

Lahr, Logique, 493, says that 'a property which is merely general is peculiar to each member individually: thus each person individually is 'mortal', the property, which is collective or collective, is peculiar only to all members 'en bloc' (taken together): thus all people together form the earth population, the humanity. This means that the parts of a whole, the segments of a continuum, the (sub)systems of a (super)system, are zamels or elements, but not identical, i.e. interchangeable (commutative operation), unless within a group of elements with identical function within a system. Pure elements are 'loose' elements, only connected by a distributive property, nothing more, and therefore 'the same'.

In the system, the distributed or distributive property is cohesion within the same system or whole, - co- and adhesion, being together. The elements here are

(i) either parts (natural) or portions (artificial) and

(ii) aspects (global properties, -- not -- total properties i.e., which, only together, make up one reality.

However different they may be from one another, they are identical from one point of view, namely that they belong to one and the same whole. - One thinks of the Matthew effect, of which the formula reads: 'if a increases, then b decreases, whenever one favors both a and b' ('a dyad, therefore, where coherence works like the two ends of a scale.).

The difference in function is striking, but so is the identity: the same (kind of) favoritism (independent changeable) acts twofold (dependent changeable).

Functional Structure.

Here, apparently, is situated the concept of 'function' (role, dependence): the arm, the nose, the stomach,... all these have a role in the body and signify interdependence (both of the whole with respect to the parts and of the parts among themselves). The nose, the stomach, once separated from the whole, die, together with the whole (if at least 'vital' parts are removed), which then loses its integrity (if non-vital parts) or even its existence (if vital parts).

For a dialectical connection - which differs from the above 'organic' connection (biological model of connexion) - see above pp. 20/21: in a dialectical system the connections are rather psychological-sociological, although not exclusively (think of the relation 'man / nature' in dialectics).

Here another type of function is situated, the mechanical one: the concept 'machine', at least in its earlier definition, is a model of that: the parts of the machine 'function' each in their own different way, but collectively. The model is that of pure mechanical relations between independent and dependent agents of change (conditioning, causality), but in such a way that purposefulness governs the functioning.

LO. 47.

Which, of course, is even further removed from Hegel's dialectical coherence. Society is compared either with an apparatus of a mechanical nature (mechanism) or with a biological body (organicism, biologism), but it is clear that the dialectical relations are more than that. Immediately we have an elementary but important typology of "systems". It should be noted, however, that nowadays the word 'machine' or 'mechanism' (mechanismic conception instead of mechani(ci)sm) has acquired a metaphorical meaning, although always in the context of 'technical thinking' (information, communication, systems theory), which makes 'machine' and 'system' (purposeful system, at least) synonymous:

- (i) there are inorganic machines: 'an atom e.g.;
- (ii) there are organic 'machines';
- (ii) a plant: e.g., a tree, an ecosystem, a biotope;
- (ii) b animal: 's herd of elephants, 's little king;

(iii) human: 'a human organism, 'a normal school, 'a multinational corporation,also the nervous system in humans (subsystem) or a religious sect (subcultural system). This refers to Ludwig von Bertalanffy (1901/1972), Boulding, Gerard, Rapoport, who, in 1954, founded the Society for General Systems Research,- in which the word 'system' (machine) was conceived analogously: there is only an analogy, no strict identity between the different levels of coherence and functioning concerning systems.

For more détails concerning the evolution of the system concept see G. Thinès/A. Lempereur, Dict. gén. des sc. hum., pp. 935/940.

It should be noted that 'system' comes from the Greek 'su.stèma': thus Aristotle says, 'to holon sustèma tou somatos' (the whole system of the body); incidentally, 'sustèma' already has several meanings in Greek (semasiologically):

(i) informative: 'a collection of interrelated doctrines ('a wise system,- concept to which Hegel attached decisive importance);

(ii) physical:

(ii) a the total or mass of the parts of an object (e.g., the body), the gathering of more than one object in a body (e.g., a bag of beans),

(ii) b sociological: group of people (crowd, guild, college, league, association),

(iii) a legal: 'a constitution (as a system of institutions),

(iii) **b** poetic: 'a rhyme stanza, 'a musical chord.

It should be noted that, in Greek, the word means both collection and system.

Two pairs of systems.

Typologically, we pause to consider two couples:

(i) supersystem/subsystem: the hippie culture e.g. is described, sociologically, as a subculture within the (encompassing or super)culture, with the dominant culture acting as a supersystem;

LO. 48.

(ii) complex and/or complicated (intricate) systems: the cyberneticians or controllers - since *Norbert Wiener*, *Cybernetics* (*Control and Communication in the Animal and the Machine*), 1948¹ (the founding book of today's thematized control science; - remember that already the pre-Socratic philosophers clearly distinguished between

(i) complexity (complication), i.e. the fact that a large number of elements (parts, aspects) of different natures make up a system,-a clinic building with its wards, a tree park, in which the trees and shrubs stand together in one community; and

(ii) complexity, i.e. the fact that a large number of parts, sections and aspects of an identical nature together make up one system,- an arboretum, in which the tree species - not as in an ordinary park - are neatly arranged next to each other by species (identity), a pine forest (all trees are of one species, pine), the components of a telephone exchange, - in the diachronic sense: the domino effect (where one initial change brings about all the others in a series of e.g. three thousand playing cards); - homoiomeries of Anaxagoras and Aristotle.

Note.- Thinking and systematization, scattering, go together:

= Plato spoke of a 'son noèton', animal intelligibile, a system of knowledge and thought (coherence of ideas);

= *Aristotle, Politika*, 1:5, says: "Ho de logos architekton" (thought is like the master builder, constructing elements into a coherent whole). We are beginning to realize this!

System differential.

Contextualism, i.e. the realization that every object of research has its own irreducible identity and even isolation and only becomes meaningful in a "context", a "system of reference" (continuum), in such a way that its own identity and context are congruent, i.e. attuned to one another (cf. in the ethical field: *J.Gustafson, Christian Ethics*, in *P. Ramsey, ed, Religion*, 1965; id., *Context versus Principles*, in *The Harvard Theolo-gical Revue*, 58 (1965), 171/202; *P.Lehmann, Ethics in a Christian Context*, 1963);

Integration, i. e. the degree of fitting together of the parts, components, parts and aspects of a system (think of VI. Solovjef's integralism), -- these are the two aspects which allow us to build a differential:

total integration	non-total integration	apartheid
(internal 1)	(partial) (internal 2)	(external)
Non - differentiation	differentiation 1	differentiation 2

It should be noted that, in a complex system, differentiation (mutual difference of the parts), in the internal sense, goes together with system integration, i.e. 'differentiation' here means 'differentiation within - and not outside - the considered system'. The scheme above concerns not only systems among themselves, but also the internal 'integration' of one system in itself, taken materially or reflexively.

LO 49

The concepts of "integration" (sometimes equated with "organization" or "arrangement") and "differentiation" are correlative, at least if they are systematically determined.

The starting point in both is formed by 'a multitude of elements (inorganic (parts), organic (cells, organisms), human (individuals, groups)); yet,

(i) a regarding integration, the elements are unequal (to distributive or also to collective structure, i.e. purely different or also independent);

(i) **b** with respect to differentiation, the elements are equal (i.e., merely equal or also dependent); those elements undergo a process (change, transformation, or transformation):

(ii) a upon integration, the elements become (more and more) equal (just equal or also still un-equal);

(ii) **b** in differentiation, on the other hand, the elements become (gradually or suddenly) unequal (simply unequal or also independent).

On close analysis e.g. of the biological, psychological, sociological models, to be found in *G. Thinès/ A. Lempereur, Dict. gén. d. sc. hum.*, (*différenciation, intégration* (*organization*)), the structure indicated above always emerges, but incoherently and confusingly.

'Synergy'

Instead of integration/differentiation of systems, internal and external (subsystematic/supersystematic), one can also speak of 'synergy'. *H. Van Lier, Synergische architectuur* (*Architecture and politics*), in *Streven*, 22 (1969): 7 (April), p. 691/704, starts from the biological (applicative) model of synergy:

Either different organs work together (integrative model) to perform the same function: stomach, liver, intestines, etc. regarding digestion - or one organ (integrative model) performs different functions: e.g. with the same mouth one eats but performs oral love play.

The author refers to G. Simondon regarding engineering applications: different functions of a machine - e.g. rigidity and cooling of an engine, rigidity and bearing of an airplane fuselage - are initially accomplished in different "organs" (parts) - cylinder and water, skeleton and cladding;

Later, with 'concretization' (i. e. introduction of synergy), models emerge in which different functions are fulfilled by one part: a wing that provides rigidity and cooling at the same time, a self-supporting fuselage, in which cladding is also skeleton.

LO. 50. Van Lier gives the following diagrammatic scheme :

functions: (organs) Organs:		
(functions)	non-synergic	synergistic (concrete)

Applicative models of 'integration'.

Besides the biological and the technical applications, just above, there are e.g.

(i) *technically* as "systems construction", i.e. the method, in terms of architecture, in which prefabricated parts ("organs", the synergist would say) are assembled (integrative aspect) into a building finished in function of its purpose (house, factory, sports building);

(ii) economic: cf. W. Brauers, Input-output analysis and international economic integration (A proof of quantitative research for the European Economic Community), Antwerp/Utrecht, 1968 ('integration' was used, then, in two main meanings,

a/ 'n active ('n task and process),

b/ 'n final (the result of the process);

Tinbergen defines as follows: "the creation of the most desirable structure regarding international economy with a view to (-) the removal of artificial obstacles to 'optimal functioning and (+) the introduction, deliberately, of all desirable elements regarding 'coordination' (mutual adjustment) or unification."

(Tinbergen sees this definition in an optimizing sense);

(iii) *social:* one thinks of *K. Mannheim*'s reaction against the compartmentalizations that divide modern society (cfr. *Freedom, Power and Democracy Planning*, London, 1951).

Cybernetics.

Steering, in the antique sense, - one thinks of *Aristotle's Politika* (where goaldirectedness (of a constitution e.g.)

(i) is susceptible to "par.ek.basis" (deviation) and

(ii) susceptible to 'ep.an. orthosis' (also: 'rhuthmosis'), feedback (feed back)) - was, since 1948 mainly, mechanically re-founded. In doing so, systems theory served as the basis:

uptake, input black box of	the system	release, output	
receptor	center	effector	

Indeed, communication, i.e. transmission (and absorption) of information (idea, concept, sign), often interpreted, by the machine, as 'control', steering (signal for an act of reaction), is characteristic of the cybernetic systems, which mainly process information - and not energy and/or matter alone, - and in a circular manner such that the release (output) works back on the absorption (input).

LO. 51.

It should be noted that the basic work of cybernetics (kubernètikè technè, ars gubernandi, art of steering), namely *N. Wiener, Cybernetics or Control and Communication in the Animal and the Machine*, speaks of both the living being (animal, animal) and the apparatus (machine): this refers to the 'bionic' aspect of cybernetics.

S. Gérardin, Bionics (Link between biologist and engineer), World Academy, s.d., refers to J. Steele (1960), but already to Leonardo da Vinci (1505), who noticed the same - purely formal or, better, analogous - structure between a flying machine and a flying dog or bat. Analogy is purely at work here: bionics is indeed the science of artificial systems, the functioning of which is an imitation (mimetic or imitative aspect) of those natural (organic) systems, which either possess the specific traits of those artificial systems or proceed analogously to those same systems; in other words, computer science: bionics is the ability (theoretically, technically) to understand the information concerning organic systems (e.g. a dolphin).e.g. a dolphin) to the solution of technical problems (e.g. constructing a torpedo).

It should also be noted that systems theory also has humanistic ramifications. E.g. *P. Watzlawick et al., The pragmatic aspects of human communication*, Deventer, 1970:

(i) Basic theory is the general systems theory ('organismic', i.e. conceived as processing ('synthesis') and transcending both mechanism and vitalism) of L. von Bertalanffy and others (one thinks of K. Goldstein e.g.);

(ii) the area of application is especially the so-called training groups, where the 'sensitivity' (here in the sense of 'finely tuned sense of "inponderabilia" - see above p. 45 -, e.g. in relation to fellow human beings, however not without several times a real paranormal disposition) is practiced and formed (one thinks of the group dynamics of Moreno et al.);

(iii) central to this is the communication and interaction - what E. Berne calls "transaction" - between the persons of the (small) group, with its direct communication and interaction, from person to person;

(iv) a two 'grammatical rules' (understand: axiomata, working hypotheses) govern the 'I - thou' relation:

1/ You are always influencing and, conversely, you are always being influenced ("feed back" called); realize this;

2/ one influences with words (verbal) but even more without words (non-verbal); realize this 'verbal' and this 'analogous' (here in the sense of 'non-wordly') feed back; indeed, tone, facial expressions, etc. play into the mutual ('feed back') reactions and correctives towards the fellow;

(iv) b three 'rules' govern the intentions, misunderstandings and agreements, and power relations in the 'I-you relationship':

LO 52.

1/ What I think, mean, say, does not necessarily apply to the other and vice versa; do I realize it?

2/ Every time I say something, I say something about how 'I' want the other to treat me; do I realize it?

3/ who is in control and who is letting themselves be in control? - do i realize it? (competitiveness, subversive behavior, etc.).

One can see that, compared to Hegel's dialectic, this is 'a form of "dialectic" understandable to the average mind (common sense), at least limited to the interpersonal "systems".

Systems theory as 'ontology'.

L. Apostel et al, De eenheid van de cultuur, Meppel, 1972, has as its supporting idea the systems theory as unifying instrument of our culture. The contributions range from cognitive psychology and communication science to art and natural sciences. Compared to the mainly ecclesiastical-scholastic philosophy, which had as its basic concept 'substance', i.e. independent being, in connection with the rest of being, it is clear that the concept 'system', in connection with system environment, has taken its place. And, indeed, the natural and human sciences are gradually using more and more the language of systems theory. That is the reason why we have discussed so extensively both the concept of 'system' and the domains of application (from the inorganic over the biological to the human).

(i) L. von Bertalanffy, Robots, Men and Minds (Psychology in Modern world), New York, 1967, o.c., 53/115, makes a case for a world and life vision that works with systems and system environments. Towards a New 'Natural Philosophy' (The Open System of Science) is the eloquent title, - pretty much in the same formal line as L. Apostel's thought.

But von Bertalanffy, o.c., 112/115, - Education: Science and Humanities - makes a case for what is very important, not human, scientific but simply human ('existentially') speaking: a paideia, a humanitas, in which both the abstract, symbol-calculating systems thinking of the positive sciences and the concrete thinking of the person-occupying 'humanities' (alpha sciences) come to an even-handed 'integration'.

P.C. Snow's "Two Cultures" still weighs on us, in its duality. The problem can be outlined, in Piaget's terms, as follows: Scientist symbol-calculating systems thinking (sometimes called 'systems-technology' for a reason) risks becoming, in many people's minds, a form of 'centration' (enclosed, yes, for the rest, closed thinking), as opposed to which the hermeneutical-phenomenological-existential and the (Hegelian-Marxist) dialectical approach to the reality of systems and their environments looks like - in piagetian terms - 'coordination', i. e. taking into account what non-systemic thinking can and cannot taking into account what is non-system and non-system context, but the together-with-others' (Heidegger) 'I-in-the-world. or the 'I-against-God' (Kierkegaard), conceived in such a way that one does not lose oneself in systemtechnology

LO 53.

Not that one should go exactly as far as the critical sociologist *Pitirim Sorokin*, in his *The Crisis of Our Century*, Antwerp, 1951, in which he anticipates the current "new philosophers" by advocating a Christian idealism which opposes the current secularization and which he, To the great displeasure of many reader-admirers, he thinks to see growing pre-eminently in the 'alternative' groups and mentalities (small religious groups, sects, conscientious objectors, peacemakers, non-violent persons, Quakers, many unselfish individuals, idealists, artists, educators, sometimes statesmen, etc.).a., 'eccentric' figures).

No, it can also be 'established': indeed, apart from structuralism and totalitarian ideologies (Marxism, fascism), which either system-theoretically (interpreted structurally) or Hegelian (interpreted totalitarians) give priority to 'the' system or 'the' systems' over the person, there are the many theologians, politicians, economists, educators, in whose language the word 'system' has a clearly pejorative sound, viz. as a collection which is so strongly structured and 'integrated' that it completely closes itself either around the logical mathematical mind or around the living persons in society.

This systemic pressure sometimes erupts among today's youth, who - one thinks of the Swiss youth, last summer (1981) and elsewhere - label "the system" (logically-mathematically controlled and sociologically pressing) as "ice cream.

This revolt of the free spirit of the "individual" first erupted not in May 1968, but last century, in the person and work of a Schelling (with his emphasis on the "positive" (understand: non only system-technological-rational) philosophy) and of a Kierkegaard (with his emphasis on the "individual - towards God" not "centered" on Hegelian systems thinking).

Indeed, already biological systems exhibit more: organization (absorption, processing and reaction with respect to esp. information) and structure maintenance (cf. *H. Maturana et al, Auto-poiesis and Cognition (The Realization of the Living)*, Dordrecht, 1980, which characterizes living systems as self-founding); psychological systems show even more: behavior; human systems show even more: consciousness, by which, instead of being centered by one or more limited objects, they can coordinate, i.e. situate themselves in a reference system or comprehensive whole, which is more than infra-human reference systems, i.e. ontological, meaning the 'being' as 'being-without-more'.

LO. 54.

Up to there on ontological assessment of systems theory,- limited to the merely logical-empirical systems. i.e. the transempirical excluded.

(ii) M. Eliade, Traité d'histoire des religions, Paris, 1953, p.11, says:

"(...) 'A Religious Phenomenon, as such (i.e., as a religious phenomenon, distinct from all others), will only expose itself on condition that it is grasped in its own mode of being, i.e., if it is studied on the religious level. To want to uncover such a phenomenon through physiology, psychology, sociology, economics, linguistics, art, etc., is tantamount to trying to find a way out of it. ... amounts to betraying it; it amounts to letting escape precisely what is singular and irreducible in it, namely, its 'sacred' character!".

Somewhat further, o.c., 39: "The examples cited so far have, we believe, allowed us to establish some guidelines:

1/ The sacred is qualitatively different from the profane (...);

2/ (the fact that the sacred reveals itself in and through the profane is called Eliade 'the dialectic' of the sacred; well) this dialectic of the sacred applies to all religions and not just to the so called 'primitive forms' (of them);

3/ One nowhere meets only 'elementary' hierophanies (the cratophanies of the eccentric, of the extraordinary, of the new: the 'mana' (i.e. the sacred as power-charged), etc.), but also traces of (...) forms considered higher (Supreme Beings, moral laws, mythologies, etc.);

4/ One meets everywhere - and even outside these traces of higher religious forms - 'a system, into which the elementary hierophanies fit themselves. The 'system' is not exhausted by these elementary forms; it is there thanks to all the religious experiences of the tribe (the mana, the kratophanies of the strange, etc., totemism, ancestor worship, etc.), but it includes in addition a corpus (i.e. collection of data around a theme) of theoretical lore, which cannot be reduced to the elementary hierophanies just like that:

Thus, for example, the myths about the origin of the world and of humanity, the mythical justification of the present human state of salvation, the theoretical appreciation of rites, moral conceptions, etc., all of which are of great importance to the world. It is appropriate to emphasize this last point".

We believe that this text from a man of world fame in the field of hierrology speaks for itself. We only want to point out the religious subsystems, - parts of the religious (super)system; e.g. the fact that a possessed person calls himself possessed by 'the legion' (i.e. a complex of spirits, deceased and nature spirits specific to a region (cf. *Mk* 5:1/20)); likewise the guardian angel and his 'protégé'.

LO 55.

IIc1c. The analogical analysis of set and system.

The German Historical school of law, society, and economics-though not overly appreciated today-remains curious on one point: the concept of "organic.

O. Willmann, Gesch. d. Id., III, 736/736 writes that in it the immanent purpose (teleological aspect) precedes as universal (distributive aspect) the singular and as the whole (collective aspect) the parts. Well, all along we have used that notion of the 'organic' (not the mechanistic, which also exists) as the norm to see ready, however without including the finalistic aspect (which will happen later).

The scholastics spoke a non-organic language, which we, incidentally, prefer, because it is "neutral," as a means of description. Indeed, the analogy (cf. above p. 22ff.) decays into at least two types:

The proportional or proportional analogy (similarity):

it consists of two relations (see above p. 22ff., esp. concerning para- and hypotaxis), which are compared under only one (single or compound) point of view, viz. the distributive; usually the vernacular expresses this 'transpositively' or metaphorically: 'the mountains give birth, and a ridiculous mouse emerges' (Latin proverb), in which the frustration differential is pronounced, viz.

small achievement	great expectation
nascitur ridiculus mus	gignunt montes
(a little mouse is born)	(the mountains give birth).

Proportionally appropriate: as the (small) mouse stands against the (large) mountains, so my, your (small) satisfaction stands against my, your (large) expectation) - or something like that;

The attributive or attributional analogy:

this consists in a function within a system (hypotaxis, this time, instead of parataxis, as in the proportional analogy) being comparatively and, as it were, confusingly (through the abbreviated manner of speaking) transferred from one fact to another (metonymic speaking): for example What a provocative garment" (in which the provocative "hinein-interpretiert" is projected into the garment - part of a total female or male mode of appearance): not the garment "in itself" (outside the "system" of man and the garment he wears), but the man who via the garment - at least for the hinein-interpretative fellow man - behaves towards the other, "is" provocative.

We will see that all structures, no matter how, can be reduced to this double-structure.

LO. 56.

Bibliographic Sample.

Regarding the concepts of "collection" and "system", there is a multitude of books and articles that are either no longer current or are conceived in an overly symbolic way. Therefore:

(i) this long digression above on distributive and collective structures and (ii) now this select bibliography.

Collection Theory:

-- J.-L. Krivine, Théorie axiomatique des ensembles, Paris, 1969 (the author begins by saying that "we possess 'an intuitive (understand: not yet symboolcalculated) notion of 'collection' and that it is on this intuitive notion that he gives the axiomata (presuppositions) of the theory");

-- *E. Bouqué, De algebra der verzamelingen en relaties*, Ghent, 1967 (also begins with the (now) 'naive' theory of collections; - noting that the naïve consists solely in not using a symbolic calculus on collections."

-- are remarkable, as counterparts or applications: *A. Dunes, Esquisse d' une théorie des abstrats*, Paris (*Contribution à l'informatique en droit*), Paris, 1969 (French transla-ation of the Anglo-Saxon 'abstract', i.e. word that ushers in a section, key word; - in jurisprudence: the words that, placed at the top of texts, briefly represent the content and allow for a quick reading: summary words, i.e. collection words);

-- Barry Mitchell, Theory of Categories, New York/ London, 1965 (adhering to Eilenberg and MacLane (1940+), 'a generalization of the concept of collection);

-- *G. Witter, Mathematics (Introduction to the axiom axiom)*, Utr./Antw., 1967, pp. 49/69;

-- *M. Barbut, Mathématiques des sciences humains* (I (*Combinatoire et algèbre*), II (*Nombres et mesures*), Paris, 1967/1970;

-- N. Picard, Mathématique et jeu d'enfants, Paris, 1970, pp. 115ss. (ensembles et éléments), 121ss. (relations), 145ss. (structures et modèles); -- up to there the mathematical elaboration;

Logistic:

-- A. Tarski, Introduction à la logique, Paris, 1971, pp. 63ss. (classes), 81ss. (relations);

-- J. Anderson et al, Natural Deduction (The Logical Basis of Axiom Systems), Belmont (Ca1.), 1962, pp. 139ss. (Introduction to Predicate Logic);

-- *D. van Dalen, Formal Logic (An Informal Introduction)*, A'm/Utr., 1971 (esp. p. 39vv.: predicates and variables);

System Learning:

-- *F. Emery, ed., Systems Thinking* (*Selected Readings*), Harmondsworth, 1969¹, 1971² (open systems, environment, human organizations, management);

-- P. Delattre, Système, structure, fonction, evolution (Essai d'anal.), Paris, 1971;

-- J. de Rosnay, Le macrocosme (Vers une vision globale), Paris, 1975;

-- D. Ellis et al, Systems Philosophy, Englewood Cliffs, N.J., 1962;

-- P. Watzlawick et al, Changements, paradoxes et psychothéraple, Paris, 1975.

LO. 57.

Note.- Aristotle (Met. 4, 2, 1 and 2) notes that 'analogous' words are used 'homoiotropos', convergent, interlocking, in that they belong to one area ('archè'). Is e.g. 'healthy' to be called: all that pertains to health (what possesses health, processes it, indicates or betrays it, we call 'healthy'). Or what is similar to it.

Consequence: set theory and systems theory are based on convergence (cf. *O.Willmann, Abr. d. Phil.*, Wien, 1959⁵, s. 342ff.). The systechie 'divergent/convergent' lies behind this: elements, taken by themselves, are divergent, but the 'collecting' comparison and the system learning make them converge, i.e. come together in one point (at least one common property is necessary and sufficient for this).

"Initially apart/ eventually together", behold the formula (if need be "initially unequal/ eventually equal").

Note.- Variology.

This means the study of the 'varia', the differences, i.e. the opposite of the similarities, which have been the focus so far. Variology is dissimilarity theory. In the diachronic sense, this is change theory. Or: divergence theory (syn- and dia-chronic).

Paradoxically, divergence or variology is based on similarity theory: a difference (variation, change, divergence) can apply to one, several or all elements of a collection or system or to the structure of a system.

Note - Interval (diastematic structure)

or interval is an example of con- and divergence: what is between two (or more) extremes is between 'an interval.

Configurative:



This is true intermediate arrangement: all elements or structures within 'a boundary 1 and 2 have the common property of being situated 'between' gr. 1 and gr. 2. It is essentially a configurational property.

Note- 'Dia.stèma', intervallum, space summarizing between boundaries, makes divergent data converge. A remarkable application is flexibility or pliability ('the jug goes to water until it breaks): the breaking point delimits intervallic extremes. Also the concept of 'limit', a.o. in differential calculus (miniaturization of differences (p. 26 above) - think of Zenon of Elea (-/+ -500), who did this by dicho.tomia, division, of the interval between the turtle and Achilleus, towards a limit, which is approached but never reached - can be situated here.

LO. 58.

Note- Taseology or tension theory.

At least two 'forces', 'instances' provided with 'tendencies' (purpose), such that the number of competing elements of the set of forces exceeds the number of stakes. Stake" is the common goal of mutually exclusive (co-)-thieves.

The simplest applicative model is that of dynamics (theory of forces): balance of forces consists of at least two forces 'tending' (being directed) towards one and the same 'place', however, so that only one force at a time can reach that goal. Or: two children play with one ball (for one ball); two camps (groups) compete for one stake.

Summary:

(i) elements, (ii) provided with target direction, (iii) such that competition (mutually exclusive rivalry) determines that target direction, - which often happens because the number of competitions, the elements exceeds the number of targets (stakes) (scarcity situation).

'Tasis' (gr.)

means 'tension'; hence 'taseo.logy'. F. Cuvelier, De stad van axen (Een topologische verkenning van krachten tussen mensen), Antwerpen, 1976, gives, cast in stories, a description of all kinds of axen influences, which determine the intersubjective relations between city dwellers. It is clear that both the game structure and the conflict structure are applications of the tension structure.

-- *F. Buytendijk, The Football*, in *Tijdschr. v. Fil.*, 13 (1951): 3, pp. 391/417 (single-issue, written in existential spirit, phenomenology (phenomenon-description) of the soccer shows the taseological structure by means of 'an application).

-- E. Fink, Spiel als weltsymbol, Stuttgart, 1960 (the theoretical exposure);

-- J. von Neumann/ O. Morgenstern, Theory of Games and Economic Behavior, Princeton, N.J., 1944 (the logistic-mathematical theory of game(s) with application to economic life);

-- J. Williams, Game Theory, Utr./ Antw., /1966 ('strategy' ('a now widely used word) means not so much cunning plan, but complete (not confusing) plan,- o.c., 29/31);

-- Ph. Orsini et al, Les jeux de réflexion, in Science et Vie, 124 (pp. 10/17:

-- *A. Deledicq, Comment inventer un jeu*? (short 'praxeology' (theory of action) of the game).

-- *H. Robinson, Renascent Rationalism*, Toronto, 1975, p. 171, defines 'clash', conflict, as follows: the individually necessary and collectively sufficient conditions for 'conflict' are:

(i) tension (see above), i.e. within 'a common situation (identitive or con-vergent aspect), mutually exclusive tendencies (differential or divergent aspect);

(ii) in which, to distinguish from ordinary tension as well as from play (which Robinson does not do: for him all play is already collision and conflict), still come not only harmful but attacking aims; such that each person involved realizes at least the situation and has a minimal influence on it. "Wars, fights and quarrels" (o.c., 171/172) are examples.

LO. 59.

However, "sporting events and leisure games" are "tension applications", but cannot be identified with war or quarrel (at least in terms of definition)! What Robinson says about "inner" ("psychic") conflicts is correct, if one understands the above definition metaphorically: inclination and duty, desire and (neurotic) repression (repression) can "clash".

Cf. *R.Stagner et al, The Dimensions of Human Conflict*, Detroit, 1967 (four studies with summary theory of marital, racial, industrial and international "conflicts");

-- R. Denker, Aggression (Kant, Darwin, Freud, Lorenz), Amsterdam, 1967;

-- A. Plack, Der Mythos vom Agressionstrieb, Munich, 1974 (criticizing Freud, Mitscherlich, Lorenz on the extent of the urge to attack);

-- Vl. Soloviev, La justification du bien, Paris, 1939, pp. 251ss.; 257; 279ss.);

-- *H. Girard, La violence et le sacré*, Paris, 1972 ('n conflictuology, which criticizes ánd Descartes subject - object relation within the consciousness ánd Freuds Oidipoes complex ('conflict' between two 'lovers' of the 'the mother', viz. the father and the son), starting from the scapegoat rites).

IIc2. *Three applications of philosophical set theory.*

Three applicative models of collection and system are now very briefly sketched, namely the kinetic structure (which represents change in time or, expressed philosophically-abstractly, 'movement' (kinèsis, motus)), the ontological (which expresses 'being' and/or 'beingness' (beingness)) and the idiographic (which expresses the unique individual in its concreteness).

IIc2a. The kinetic (sometimes also 'variological' or change) structure.

The "processual" philosophy of *A. Whitehead, Process and Reality,* Cambridge, 1929 (cf. *R.Whittemore, Studies in Process Philosophy*, I and 11, The Hague, 1974; 1976) has made this structure particularly timely. Indeed, from Herakleitos of Ephesos (-535/-465), who saw in all "being" both movement (and even reversal into its opposite) and immutability ("logos" or universe law), to Whitehead, who saw both "process" or change and invariance or immutability as complementary reality constituents, the systechy:



The starting point of every structuring of movement (change) has been (see above p. 58v.). Process' (pro.basis, pro.cessus, progress) is, strictly speaking, a kind of movement, namely that which completes a program, but the word is also taken more broadly, as the subsequent realization of a collection or a system. The 'after' is decisive;

Cf. *M. De Tollenaere, A Philosophy of Time*, Leuven, which discusses the so-called diachrony or time:

LO. 60.

(a) Aristotle and the scholastics conceive of time as a 'quantity', namely as the order of 'before' and 'after', if necessary measured by number and figure (modern expression: irreversibility, i.e. what once was ('before'), never comes again (never 'after'));

(b) existentially, time is a 'now' that I experience from moment to moment, while the 'before' is 'lived through' as the 'past' (mine, that of others or of the whole cosmos) and the 'after' as the 'future' (mine, etc.); there is something striking in this: while I am locked in the 'now', I transcend (transcend) this narrow 'now' towards the past and future (the 'now').) is 'lived through'; thereby there is something striking: while I am locked up in the 'now', I transcend (transcend) this narrow 'now' towards the past and the future (situated within that 'now' interval, I nevertheless oversee the whole system of all possible moments of time; - this 'overseeing' of time is the so-called 'transcendental' aspect, that of the 'now'. This 'surveying' of time is the so-called supratemporal aspect, which has dominated Western thought from Platon to Kant, while dialecticians (Hegel, Marx), historicists (E. Troeltsch and others), existentialists (Heidegger, Sartre and others) emphasize the (radically) temporal aspect (we come into being, rise and fall without fail); cf. *K. Kuypers, Het tijdsprobleem in de antieke en moderne ontologie*, in Alg. Nederl. *Tijdschr. v. Wijsbg. en Psychol*, 40 (1947): 1 (Oct), pp. 41/64.

It should be noted that "phaseology" classifies the order of the "naeen" into "phases" ("fasis" is the ascent or "appearance" of a celestial body) on the basis of sufficient difference (see higher pp. 57,- 33, 42, 48).

Note: Basic phasology exhibits following periodization (division into "periods", "sequences"):

(i) protology ('protos' = first(e)) or beginning time doctrine;

(ii) kairology ('kairos' = turning point) or turning or turning point theory;

(iii) eschatology ('eschatos' = last(e)) or end-time doctrine.

This is the basic scheme of all diachronic sequences (cosmic, human).

The interrelationship between the phases may differ: for example, there are deterministic (necessarily-irreversible) and non-deterministic processes (including goal-directed (teleological, goal-determined) and stochastic (chance-determined));

Cf. M. Wijvekate, Methods of research, Utr./Antw., 1971, pp. 132/164 (behavioral or attrition models).

Special emphasis is given to the active part of human freedom in 'a process (course, 'naeen') in creativity or ingenuity theory:

-- D. Dutton et al, The Concept of Creativity in Science and Art, The Hague, 1981;

-- C. Hausman, A Discourse on Novelty and Creation, The Hague, 1975; after all, creation is process control by the (creative) human being, who responds to old stimuli in a new way or responds to new stimuli in an adapted way. The so-called model building theory and the de-velopment theory reflect this aspect, though technically interpreted. (*R. Foqué, Ontwer-psystemen*, Utr./Antw., 1975;

-- J. Berglund et al, Operational Analysis, Amsterdam/Brussels, 1968, pp. 15/25

(modeling at decisions)

LO. 61.

Application.

According to G. Tarde (1843/1904), philosopher and sociologist, the classification into cultural-historical periods can be done on the basis of mimeticism (people imitate people): if a qualitative change (e.g. the invention of the wheel, the rise of philosophical thought) finds sufficient quantitative imitation in a cultural environment then one can speak of a new period at a certain moment (the qualitative leap). the invention of the wheel, the rise of philosophical thinking) finds sufficient quantitative imitation in a cultural environment then one can speak of a new epoch at a given moment (the qualitative leap) (the rule is: one (singular) innovator finds several (private phase) imitators, until, in the long run, as good as all (quasi-universal phase) people do so).

One sees that this mimetic scheme returns with Th. Kuhn: exemplary solutions to typical problems find imitation on a sufficient scale.

This distributive change can increase to such an extent that the structure of a culture changes: not only distributively, but collectively a culture changes. The other-in-the-time, i.e. the new, is both distributively and collectively describable.

Up to now we have been talking about the change itself and its course or process. One can also, like the ancient and mid-century philosophers, look at that which changes (the independence or substance): a multitude of elements (divergent or differential aspect), which go through the same 'naeen' or course (the common characteristic by which they are identitive and converge), represents a substance, i.e. that which changes (yet remains minimally unchanged through the change).

But here is the interval: between utter unchangingness and utter change (leaving 'nothing' of the substance) the real substance or invariant is situated in the midst of the variations.

Example: the topological structure, which exhibits two traits:

(i) the elements (e.g., 'a set of points in geometry) are interelementary (mutually; e.g., interpunctuate here) immutable;

(ii) the whole is, nevertheless, flexible or malleable (one thinks of a lump of clay, which one deforms without it splitting anywhere). The ancients and the middle ages would have said: 'substantial' (here: interelemental) unchanged, 'accidental' (here: the malleable whole) changeable.

As an aside, topological structure dates, in mathematics, to M Fréchet (1878/1973) and F. Hausdorff (1868/1942), cf. "shape memory" of materials (materials, once deformed under a pressure, spontaneously resume their shape after the pressure factor ceases to act;

L. Delaey et al, Materials with shape memory, in *Our Alma Mater*, 32 (1978):1, pp. 23/42). In addition to this physical, there are biological and cultural types of change.

LO. 62.

Opm.- The theory of evolution

or cosmological:

-- *H. Jans, Man and the cosmos: a new positioning*?, in *Streven*, 49 (1982): 5 (Feb), pp. 442/453)

or organic:

-- E.Carp, Teilhard, Jung and Sartre on evolution, Utr./Antw., 1969;

-- J. Monod, Le hasard et la nécessité, Paris, 1970 (esp. pp. 35/55 (Vitalismes et animismes));

the metabletics

-- J. van den Berg, Metabletica, Nijkerk, 1956¹, 1957⁴(mainly psychological-culturalhistorical), related to the history of science by *Th. Kuhn, The Structure of Scientific Revolutions*, Meppel, 1972 and to the archaeology of laws by *M. Foucault, Les mots et les choses* (Une archéologie des sciences humaines), Paris, 1966;

-- id., *L'archéologie du savoir*, Paris, 1969 (archival analysis textual science understanding);

the dialectic

-- H. Albrecht, Deutsche Philosophie heute, Bremen, 1969, S.110/144 (Hegel, Marx,-Bloch, Adorno, H. Marcuse); -- even structuralism (notwithstanding its emphasis on synchrony)

-- J. Broekman, Structuralism (Moscow, Prague, Paris), Amsterdam, 1973;

-- L. Sève, Méthode structurale et méthode dialectique, in La Pensée (Revue du rationalisme moderne), No. 135 (1967, oct), pp. 63/93),

All of these methods (and ideologies) attempt to structure change, i.e., to capture it in some structure. They amount to variations of what has been said above.

Specifically Christian schemata for thinking the change can be found with people like -- *J.H. Newman* (1810/1890), head of the Oxford Movement (*An Essay on the Development of Christian Doctrine*, 1845, on the "development (historical aspect) of the in itself unchanging dogmas (ideational aspect) of Christianity"),

-- Vl. Soloviev, La justification du bien, Paris, 1939, e.g. p. 38 (the historical development of in itself unchanging moral attitudes such as shame, endearment and reverence),

-- O. Willmann (1839/1920), *his 'n Geschichte des Idealismus* deals with the development ('historical' principle) of the ideal side of reality ('ideal' principles).

IIc2b. Two typically philosophical sets, resp. systems.

Philosophical thinking is directed towards the so-called 'material' of the object, i.e. the object (anything) taken reflexively (loopily). - It has been said, since Parmenides of Elea (-540/...), that philosophical thinking visions the 'being' of the object (anything), i.e. the 'being' as 'being' (as Aristotle says), as non-nothing. -But this view coincides with looking at the object (whatever this may be) in its individual - concrete nature (idiographic). - About that now a short word.

LO. 63. IIc2b1. The ontological or transcendental structure. Bibliogr. sample:

-- C. van Peursen et al, Metaphysics (The history of 'a concept'), Meppel/Amsterdam, 1981.

The name 'metaphysical' structure is also common. One says 'transcendental' (i.e., that which is related to and corresponds to what is 'transcendent' (exceeding, transcending) to indicate that 'being' is not limited to one kind of 'being' (reality), like the ordinary 'universals' or general concepts. One says 'ontological' because 'on' (genetic: 'ontos'), in Greek, means 'being' (being, something).

Note.- Kant uses the word 'transcendental' to denote what is characteristic of the knowing subject. So one does not confuse 'transcendental' with 'transcendental'!).

'Being' is determined as follows: those elements which have as a common property of being 'non-nothing' ('something') in any way-, belong to the set (and system) called 'being' and they are therefore 'being' or 'beings'.

Consequence: everything (and everything of everything), i.e. all things and processes, according to extent and content, makes up 'being'. The extent of 'being' is everything. Its content is 'non-nothing', 'something', 'reality' without more.

This means that the concept of being transcends all other concepts, which are merely 'categorical' (i.e. not transcendental) and 'universal' concepts, - is more comprehensive than they are. After all, absolutely nothing falls outside 'being'; absolutely everything falls within it. After all, 'being' is omnipresent: after all, if there were absolutely no 'being' anywhere, then there would be absolutely nothing there.

It is sometimes said, "Opposite 'being' is 'nothing!' Note: writing or speaking is not the same as thinking! After all, the 'nothing' is nothing but the 'being' insofar as there is nothing outside that one and only 'being'! The absolute 'nothing' 'is' simply absolute nothing. But we do have a word that 'describes' such a thing.

Outside of 'being' there is absolutely nothing: not even God! After all, He is one being among many being. He is indeed 'transcendent' in the sense that He transcends all finite or created being (as the creator 'out of nothing' of them), but He too falls within the scope of 'being' without more. People do say, 'God creates out of nothing', but no one 'thinks' this.

After all, God creates out of nothing-except Him-but certainly not out of absolute "nothing" (which is, after all, absolute nothing). That expression means: God creates out of the abundant riches of Himself. Immediately it is clear that God's omnipresent presence is different from His omnipresent presence: God is omnipresent as creator; 'being' is omnipresent as reality-without-more (as non-nothingness).

Modal view of "being".

A pure concoction (e.g., a crooked straight, an old child, absolute nothingness, etc.) is impossible. A concoction (e.g., the earth now without communism) is possible in itself, but not actually real (i.e., non-nothing, something)...,

LO. 64.

'Impossible', (absurdly incongruous), possible, actual (actual actual), - such are the basic concepts of modal thinking. Well, both the possible (even the never realized or actual possible) and the actual are, both, 'being', 'something', non-nothing: the fact that a man can experience fear for a mere possibility proves it; the calculation with 'all possible' data, too. There is, in other words, the possible and the actual 'being'.

Diachronically, the past, the present and the future are 'being' ('actual'), though not in the same way: only the present is actual; the past was it once; the future will be it once. In other words, one does not confuse actual reality (one kind of reality) with reality-without-more (or 'being').

Note - Other designations of 'being'.

Everything' (in the absolute sense), the 'universe' (again, taken absolutely), are names used to designate the absolute collection, the absolute system. Even - synchronically - 'the' space, if taken without more, designates the synchronically conceived 'being': 'space', taken absolutely, includes all possible places (understand: there where all possible being is situable, in the physical and in the metaphorical sense).

Likewise with 'the' time: 'the' time includes all possible moments of time, i.e. the diachronic situability (the framework) of all possible being in time seen diachronically. This double abstract frame of thought, space (synchronic) and time (diachronic), although not coinciding with the measurable time and space, the so-called time-space, as modern physics understands it, since Einstein and the theory of relativity, is another word for the totality (collection, system) of all that 'is' (non-nothingness).

'Being' is the encompassing frame of reference for all experience and thought: without this frame our experience is 'blind'; without the o.w. measurable time-space, this frame is 'empty'.

IIc2b2. The idiographic, individuological structure.

The proper structure has been called 'idiographic' since Wilh. Windelband (1848/1915), neo-kantian of the Badener Schule, who identified 'idios' (own, proprius) with 'individual-unique' (in the spirit of romanticism, incidentally).

He contrasted this with "nomo.thetic" (nomos = lawfulness, general property; thesis = positio, proposition; - which sets up laws), i.e., which concerns the species-namely.

This structure is called "individuological," in that it brings up the individuum, the individual, the divided being (posed in opposition to the species).

The idiographic structure is called 'concrete' because it represents the individual in its 'being', i.e., as it is, and this implies its situating in the whole in which it belongs, with which it is fused (concretum).

LO. 65.

The demonstrative (deictic (Peirce)) pronoun, connected with a time and/or place adverb, expresses the individual-concrete linguistically: Hegel (1770/1831), Marx's teacher, says that already the sensory contemplation, which grasps something 'here and now', is 'language', i.e. syn- and diachronically ordering situating (cfr. *J. Taminiaux, Le langage selon les Ecrits d' Iena*, in *Tijdschr. v. Fil.*, 31 (1969): 2 (June), 363/377 (esp. p. 368)). Indeed, the speaker situates in relation to himself, his interlocutor and the other data 'something'.

The individual - concrete structure.

(i) The individual is (as the German Romantics said) the singular being of a thing (this pearl here), a person (this patient), - a landscape (its "local color"), a historical figure (de Gaulle) or a cultural movement (the Enlightenment since the XVIIIth century). In other words, the singular, but in its difference from the rest of the collection.

(ii) The structural character is evidenced by the fact that all that possesses irreducible, unique 'core', so that it is only vol-identical with itself (materially or reflexively it 'is' only itself) and, at the same time, part-identical with the rest (formally, relatively it 'is' only within the framework in which it is situated), is idiographic'.

Indeed: 'a complementation or dichotomy (dichotomy) is at the root.

a/ A member of a collection or system is in itself (material, loopy, reflexive, volitional) unique and thus irreducible to something else; it 'appears' without more. This both synchronically (put it next to something else: it draws itself off) and diachronically ("To repeat is to behave, but in relation to something unique, something 'singular' which does not have its equal or equivalent". (*G. Deleuze, Différence et répétition*, Paris, 1972, p. 7);

In other words, "flat" imitation is impossible; only creative recapture of the paragon (to which the imitation does no more than remind) is possible.

b/ A member of a collection or system, the unified or singular as well, is, in fact, always, though distinct, separate from the rest; namely, as part-identical with the rest, as analogous to it, it 'converges' with its environment; in other words, it is 'concrete' (far-grown), both synchronically and diachronically. Ranke, the romantic historian, says:

"Jede Epoche ist unmittelbar zu Gott" (each epoch as something singular and inimitable, is directly related to God), says truth (volidentical), yet exaggerates (partidentical: there are always similarities and connections with previous and subsequent and simultaneous cultural epochs)."

See higher pp. 28, 34 (vl. 28.33): totally equal, partially equal; volidentical, partialidentical, as the basis of this idiographic structure.

LO. 66.

The ideography(s)

Idiography is description of the individual-concrete structure. One can do this ontologically:

-- *G. Jacoby, Die Ansprücha der Logistiker auf die Logik, Stuttgart*, 1962, esp. s. 11/13, does this brilliantly.

One can also do it professionally:

-- J.-Cl. Piguet, La connaissance de l'individuel et la logique du réalisme, Neuchatel, 1975;

-- J.Claes, Psychology (A double birth), Ant./Amst., 1980, p. 5/16 (Praeludium: full and scant presence, metabletic).

Ontological idiography.

Aristotle says that the 'tode ti' (res hic et nunc, the given here and now) is 'protè ousia', prima essentia, first being(s) (as opposed to the abstract concept, which reflects only second beingness of something).

Kard. Mercier, Logique, p. 91, says that, in judgment, the subject, about which the saying expresses something, is always, in the last instance, individual and concrete.

F.W. Schelling (175/1854), the Romantic thinker, was, in his later period, a proponent of the "positive" way of thinking, which emphasizes the "that" ("Dasz"), i.e. the factually existing, situated in its framework; thus he opposed the "negative" or merely abstract philosophy (which put the "what" ("Was") or universal concept at the center and thus became alien to reality and life). The existential thinkers, among others, elaborated this positive way of thinking: 'to exist' is to actually exist as a human being, situated ('thrown') in time and space (situational ontology).

Subject matter idiographies.

The form in which the professional scientist casts idiography is called 'monograph', i.e. the description of a single object ('a person, a region, etc.), in which the individual-concrete has the emphasis.

The prosopography is that kind of monograph which has 'a person (pros.opon) as its object; the biography or life description is the narrative - historical form of it.

The mono- or idiographer first of all pays attention to the expressions of the individualconcrete object; in other words, he proceeds 'idio.syn.cratically': the individual-concrete makes itself known by the striking in its behavior.

This multitude of idiosyncratic expressions or striking 'signs' he processes according to the method of the convergence of indications, which, individually, may not work convincingly, but, collectively, provide certainty (cfr. *H. Pinard de la Boullaye, l' étude comparée des religions*, I (*Ses méhodes*). Paris, 1923³, pp. 509/554, where that method is thoroughly elaborated).

Applications. - Linguistics.

Idiographic linguistics is concerned with the idiom or idiosyncrasy of the individual language user and with the idiom or idiomism specific to a region, social group, age, etc. (which can be recorded in an idiotikon or idiographic dictionary), and different from the general language (general linguistics). (recordable in an idiotikon or idiographic dictionary), and different from the general language (general linguistics).

LO. 67.

Litterature Science.

Leo Spitzer (1887/1960) is a textuologist, who focuses on linguistics and literature as main sciences, with history as auxiliary science; he understands literature as **a**/ an act of language (linguistic), **b**/ which is the expression (idiosyncratic) of an original personality, with typically individual characteristics (cf. *H.Weber, La méthode de L Spitzer en critique littéraire*, in *La Pensée* (Rev. du rationalisme mod.), No. 135 (1967, oct), pp. 175/181).

Ethico-political

(i) *The idiographic ethics* (political) expresses itself in the so-called casuistry, i.e. the raising of individual-concrete questions of conscience, and in the "deontology" (doctrine of duties of groups (e.g. medical, psychotherapeutic, managerial, etc. groups),-both drawing from the general ethics (political).

One thinks of the situational ethics of existentialism (conscientious behavior is only fully there when it is individual-situational) and of the "conextual" ethics (*J.M. Gustafson, Christian Ethics, in Religion*, 1965), which claims that it is not the situation that makes the context of action ethical, but that the context makes the situation ethical.

(ii) *The idiographic politics* (social theory) is governed by the conception. - The concepts of 1/ nominalism, 2/ ultra- or hyper-realism and 3/ (moderate) realism on concept (idea) have:

a/ 'a metaphysical meaning: 1/ the concept is a mere human product (label of things);
2/ it is a preconstitutive fact (existing before things, pre-existent); 3/ it is in the (individual) things (as the abstract nature of them);

b/ 'a socio-political significance:

(1) *the socio-nominalist* thinks of the element of the set (system) without its fusion with the rest: he is therefore anarchic; he is the defender of the free individual, in all cultural fields (economic, political, etc.); he understands it like the crystallographers the idiomorphic crystal, which, in its form, lawfully, unhindered by anything, develops in all directions;

-- Max Stirner (1806/1856), Der Einzige und sein Eigentum, thought this through solipsistically as absolute egoism; the ordinary liberal or libertarian thinks this more moderately;

(2) *the social-ultrarealist* thinks of the unique individual purely in terms of its fusion with the whole: he is therefore a collectivist (socialist, communist); -- structuralists like Lévi-Strauss see the individual as an element in a collection of interchangeable data (coins, women 'circulate' in (primitive) society as spare parts within a system structure of commutations (exchanges); a structuralist like Foucault labels the individual as foam ('the death of man; d. i. the individual as conceived by classical humanism): the element of the collection or the individual as it is conceived by the individual.i. the individual as conceived by classical humanism): the element, at the crossroads of relations and structures, only to sink back into the ocean of networks immediately afterwards

LO. 68.

One would say that collectivists and structuralists suffer from amnesia:

H. Bergson (1859/1942), *Matière et mémoire* (*Essai sur les relations du corps à l' esprit*), 1896, pointed out that amnesia proceeds methodically (the proper names are forgotten before the species names; then the quality words weaken; finally one forgets the verbs (which express imitable acts).

(3) The social - (moderate) - realist

He thinks the element of the (human) collection and system both in its irreducible singularity and in its fusion with the rest: he is therefore either personalist (the person in the community context) or solidarist (the persons in solidarity with each other).

It should be noted that the organicist speaks sometimes in solidarity and sometimes in collectivism.

Note - The theories of play (of child and adult) clearly reflect the above idiographies (cf. *Ph. Kohnstamm, Personality in the Making*, Haarlem, 1929, pp. 233/258): one suppresses the 'I-consciousness' at work in play, the other (K. Bühler e.g.) emphasizes it.

Conclusion. - Only a solitary ontology which thinks together both the volitional side (= the element as Singular) and the partial-identical (analogical) side (the common property, which 'collects' and 'distributes'), can think in a balanced way.

IIB. Judgmental and reasoning logic.

It comprises two parts:

(a) the being principles ('what is (full or partial identity) is (full or partial identity); the non-being is not;

(b) reasoning (i.e., judgmental complexes) supported by common properties (i.e., partial identities or analogies (convergences of distributive, collective, and kinetic nature)).

IIBa. Judgmental logic.

Introduction.

From Platon (-429/-347) and his pupil Aristotle to N. Chomsky (1928/...), since 1957 (transformational-generative grammar), a duality dominates the analysis of the sense of judgement: Platon namely. distinguished, first, between the "onoma" (nomen, noun phrase) and the "rhèma" (verbum, verb phrase), which, by Aristotle, were denoted as "hupo.keimenon" (sub.iectum, subject) and "katègoroumenon (praedica-tum, predicate).

LO. 69.

Logically, it comes down to this:

(i)a. the data met in reality form the subject; - e.g. 'the beans in this bag', 'Ornella Muti', 'all people' (private, singular, universal: distributive structure!);

(i)b. the formal object, i.e. that (one-sided) aspect of those data, which, in the encounter with it, strikes the speaker or judge (interpretation aspect), constitutes the saying: '(the beans from this bag) are white'; '(Ornella Muti) is a beautiful woman'; '(all people) are mortal'.

(ii) the (judgmental) sentence as a whole or the 'saying' is a statement about the right relation between subject and proverb (subject and predicate); that saying is always 'ontological': it pronounces on whether and how, at least in the speaker's interpretation, that relation 'is' in reality.

It should be noted that in expressions such as 'x is 'a beautiful woman' (since the subject is 'empty', this is yellow real judgment), it is still about 'ontological' saying: after all, it is possible ('possible' is non-nothing, is 'being') that x is in fact (as an applicative model) 'a beautiful woman'.

Note - Semasiology always plays a basic role.

As an example: *J.H. Walgrave, Is Christianity 'a humanism?*", in *Cultural Life*, 1974: 2(Feb) p. 147/156, says the author:

"To that question, logically, three answers are possible: first, Christianity IS a humanism; second, Christianity is not a humanism; finally, Christianity is in some sense, but in another sense not a humanism."

After all, it depends on what exactly one understands by 'humanism'. In this case the subject, Christianity, is identical in all three possibilities; but the phrase, 'humanism', although word-for-word identical, is very different ideologically (according to the content of knowledge and thought).

Does 'humanism' mean something like "to consider what is proper to earthly man as achievable purely secularly (= inner-worldly, earthly)", then Christianity is not a humanism, unless partially (in that it also has a partial earthly, inner-worldly realization of man); does 'humanism' mean, however, "to consider what is proper to earthly man as achievable, among other things, on this earth (secularly, inner-worldly)", then Christianity is a humanism.

In other words, the statement can be affirmative (affirmative), negative (negative), or conditional (restrictive) (yes, no, or in some sense yes and in some sense no).

This shows that judgments have two aspects:

(i) *'a linguistic* (cfr. *R. Wall, ed., Linguistics and Philosophy (An International Journal,* Dordrecht, 1976+) and

(ii) 'a logical (cfr. M. Scheler, Logik 1 (Ein Fragment), Amsterdam, 1975 (Scheler, the phenomenologist, talks among other things about the peculiar logical 'law');

LO. 70.

J. van Benthem, Do laws of thought exist?, in *Alg. Ned. Tijdschr. v. Wijsb.*, 65 (1973): 2 (April), pp. 120/125 (logistic critique of modern dialectics (esp. concerning 'contradiction')).

We refer to p. 5 supra: structural-inherent aspect and implicative aspect; applied here: after all, one can say: '(Given my experience) I say that it is inherent (inherent) in the beans from this bag that they are white'; or still: '(Given my experience of them) I say that 'these beans from this bag' imply that they are 'white' ".

In other words, the predicate is proper, inherent, in the subject; or: the subject implies the predicate. - Traditional logic is "ontological"; it pronounces on the "being" or "nonbeing" of the relation between subject and predicate; that relation is one of inheritance or, conversely, of implication; central therefore are relations (structures) and its ontological stature (whether those inheritances, implications exist or not). Claiming that traditional logic is purely ontological and sees no relations is therefore complete nonsense. What does concern us is the being or reality type of those relations.

IIBb. Reasoning logic.

Introduction.

Actually, already every judgment is 'a reasoning, since there is 'a pronouncement on inheritance or implication and its presence or absence in it.

As SC. Peirce has seen so well, judgments are always reasoning (from basic structures or identities (i.e., partial identities: 'being white' and 'the beans from this bag' are partial identifiers)).

This is precisely why the logic of understanding (with its basic structures) was so thoroughly elaborated. 'A reasoning only elaborates linguistically what, implicitly, is present in the judgment, in an 'enthymematic' way (Aristotle would say: in an unspoken way).

Bibliographic Sample:

-- W. de Jong/ W. de Pater, From reasoning to formal structure (Some chapters in logic), Assen, 1981 (the first chapter deals with "logical validity," "logical forms of reasoning," etc.; the concluding chapter brings applications syllogistic (and also class logistic)).

IIBb1. Syllogistics (closure theory).

The core of all reasoning is the concluding speech, i.e. that (language) speech which logically 'closes' (is justified). Sullogismos' said the ancient Greeks, since Aristotle, i.e. taking into account simultaneously several assertions such that they 'close' (are consistent).

Or: 'right', 'correct'.

The syllogistic decays into two parts: the distributive and the non-distributive (see above the basic structures).

LO. 71.

IIBb1a. Distributive syllogistics.

Basis of this closure theory is the distributive structure (u, p, s, n).

We start from Cs Peirce's theory of deduction: *Cs. Peirce, Deduction, Induction and Abduction* (Hypothesis), in *Popular Science Monthly*, 1878 (in which the proposer distinguishes between **a**/ analytic derivation or deduction and **b**/ synthetic reductive derivation, i.e. either induction (generalization) or abduction (hypothesis));

-- *K.T. Fann, Peirce's Theory of Abduction*, The Hague, 1970 (Fann distinguishes two periods in Peirce's conception: the first sees the three types of abduction as mutually independent forms of clarification; the second, as three stages in methodical research);

-- *J. Royce, The Problem of Christianity*, Chicago/London, 1918; 1968², pp. 391/395 (induction and abduction).

The dichotomy "analytic/synthetic" (reductive), This one covers "a modal dichotomy.

Bibliogr. sample:

-- J. Stallmach, Dynamis und Energeia (Untersuchungen am Werk des Aristoteles zur Problemgeschichte von 'Möglichkeit' und 'Wirklichkeit'), Meisenheim-a-Glan, 1959 (linking to N. Hartmannis ontology (1938; 1949²), which raised the issue of modalities (possible, real), the author examines Aristotle's conception of them).

It is Aristotle who, plain and simple, introduced the modal view into thought. In short, modal thinking hinges on the notion of necessity ("N") and the diffe-rential that can be made with it:

N (-necessary) yes	N (-necessary) does not,
-N (non-necessary) yes	-N (non-necessary) no.

It was noted that '-N well' or '-N not' are the same as 'possible' (either or not) and that 'N not' (necessarily not) is the same as 'impossible'. The 'actual' (the actual being) can be either necessary or non-necessary.

H. Reichenbach (of the Berliner Kreis) drew attention to the types of "possible/impossible": technically possible (if our techniques make it feasible: e.g., measure the speed of light), physically possible (if, in nature, it is possible somewhere), merely logically possible (if it is non-onground or contradictory); cf. *D. Nauta, Logic and Model, Bussum*, 1970, p. 263.

Applied here to the derivations: one will see that the deductive derivation is necessary (logically compelling), yet actually teaches nothing new, while the inductive and abductive derivations are non-necessary (logically doubtful), yet teach something new (are heuristically fruitful).

The ground plan.

Each "derivation" (de-, in-, abd.) consists of two prepositional phrases and one logically resulting post-sentence (two premises or antecedentia and one conclusion or consequent).

LO. 72.

The symbolic abbreviated diagram is:

phrase 1 ^ phrase 2). conclusion - preposition 1 and preposition 2 imply the conclusion-. Or : the conclusion is inherent (peculiar) to both prepositions thought together.

Configurational derivation of the three derivation types.

Peirce assumes the deductive derivation (i.e., particularization) (particulization) or unification (singularization)): applicative model:

Rule: all women of pleasant appearance, are beautiful; (= Maior; M);

Application: well, Ornella Muti exhibits such a pleasing mode of appearance; (= minor; m);

Result or conclusion: so Ornella Muti is beautiful. (Conclusio; C).

Rule (= Rule or universal set) ^ *App.* (= Application or private set or also singular case; which is so here with Ornella Muti; she is after all one application of the Rule)).

Rs (= Result, viz. of the logical operation or inference).

One can also say, in scholastic language, M n m). C (from the Maior and the minor follows logically the Conclusio).

This diagram is a (logical) configuration. One can perform transformation or transformation operations on it to the number of two:

(i) inductive configuration:

Ornella Iviuti exhibits a pleasant mode of appearance (*App*) (m); well, Ornella Muti is beautiful (*Rs*) (C); so all women with such a pleasing appearance are beautiful (*Rule*) (M). *Short: App* ^ *Rs*). *Rule* (inductive or generalized derivation).

(ii) abductive configuration:

Ornella Muti is beautiful (**Rs**) (C); well, all women, who exhibit a pleasant appearance, are beautiful (*Rule*) (M); so Ornella Muti exhibits such a pleasing appearance (*App*) (m).

Short: Rs ^ Rg). Tp (abductive or presumptive derivation). Once more the three configurations together :

Deduction :	<i>Rule</i> ^ <i>App</i>). <i>Rs</i> (M ^ m). C)
Induction:	<i>App</i> ^ <i>Rs</i>). <i>Rule</i> (m ^ C). M)
Abduction:	<i>Rs ^ Rule</i>). <i>App</i> (C ^ M). m

Two modes of formulation.

The reasoning or derivation can articulate in two ways. One sees, herewith, that mentally (ideally, knowingly and thinkingly) the two formulations are identical, but not linguistically. If one uses subordinating sentences, then the reasoning is categorically (assertorily) articulated (as above: "All women ...; well, Ornella ...; so Ornella ...". If, however, one introduces subordinating sentences, then the formulation is hypothetical (conditional):
LO. 73.

"If all women, who exhibit 'a pleasing mode of appearance, are beautiful and (if) Ornella Muti exhibits such a pleasing mode of appearance, then Ornella Muti is beautiful."

The implication is evident from the "if and (if), then" connection: it is the purely logical formulation, because, even in the categorical formulation, the entire logical value lies in that "if, then" - connection (and its validity).

The logician, being a logician, does not check whether, in fact, the prepositional phrases are true (the epistemologist does this); he only checks whether, in fact, the postpositional phrase follows logically compellingly from the prepositional phrase yes or no. Cfr. supra p. 8 (ancillary and subordinate sentences).

The deductive derivation.

After the above, there is not much more to say about the differentiation or unification (everything stands or falls with the distributive structure). A few more examples.

Peirce's bean example: If all the beans in this bag are white, and (if) this bean comes from this bag, then this bean is white (unification: from the universal to the singular); -

If all the beans in this bag are white, and (if) these beans come from this bag, then these beans are white (differentiation: from the general to the private or from the universal set to the subset);

short: from u to s (unification); from u to p (verbalization).

Aristotle's example: If all humans are mortal and (if) Socrates is human, then Socrates is mortal (from u to s).

Jan Lukasiewicz (1878/1956), Polish logician from the School of Lwow (Lemberg), founder of multivalued logistics, describes deduction as follows:

(i) regulatory model:

(i)a1 (*hypothetical law* (= u) :)

If A (universal assertion), then B (private or singular assertion); (i)a2 (experimental or, at least, empirical determination) Well A (universal determination); (i)b So B (derivation);

(ii) Applicative model (so-called "interpretation"):

(ii)a the loose data:

A = All water boils at one hundred degrees Celsius'; B = this water, that water, etc. boils at one hundred degrees Celsius';

(ii)b the formulation:

"If all water boils at 100° C., then this and that water boils at 100° C. (= If A, then B); well, all water boils at 100° C. (= Wenu A); so this and that water boils at 100° C. (= therefore B)." Lukasiewicz's formulation only "makes sense" if the universal law reflects a creature's understanding. Which is denied or doubted by some logicians and especially logicians.

LO. 74.

The inductive derivation.

Now for the generalization.

Cfr. *Chung-Ying Cheng, Peirce's and Lewis' Theories of Induction*, The Hague, 1969 (including on the probabilistic and non-probabilistic interpretation of induction;

Induction can be denoted as a probabilistic derivation from the sample to the 'population' (i.e. universal collection but such that, the more sample tests are performed, the more the accuracy increases);

-- D. Cary Williams, La probabilité, l' induction et l' homme prévoyant, in L' activité philosophique contemporaine en France et aux Etats-Unis, t. I (La philosophie Américaine), Paris, 1950, pp. 197/219 (review on the major theories of induction: probabilism, positivism (frequency theory), critical naturalism and pragmatism, organicism (o.m. A.N. Whitehead, Science and the Modern World, New York, 1926; the so-called 'organicists' on induction believe that reality provides 'an objective foundation for induction), logi(s,ti)sche view);

-- *H. Leblanc, Statistical and Inductive Probabilities*, Englewood Cliffs, N.-J., 1962 (attempting to "reconcile" the two rival schools concerning "probability," the statistical and the inductive probability views);

-- J. Royce, The Principles of Logic, New York, 1961 (1912¹), pp. 15/34 (relying on Peirce's Logic of Induction, in Studies in Logic by Members of the Johns Hopkins University, 1883, and his Uniformity article (in Baldwin's Dictionary of Psychology and Philosophy);

-- W. Salmon, Logic, Englewood Cliffs, N.-J., 1963, pp. 53/88).

Inducing is guessing at the generality of the distribution from a limited number of samples (from sampling to population).

Example: the inspector, in class, questions three pupils out of twenty-four; he generalizes from those three to all twenty-four; 'ab uno disce omnes' (Do you know one, so you know z' all); in that case one generalizes from one singular case to all (e.g.e.g. someone has had an unpleasant experience with a priest; since then all priests have been dismissed; or with a doctor, etc.; -- such irresponsible generalizations or inductions happen daily).

All empirical (and certainly all experimental or trial, - better true: sample) sciences proceed inductively: they go from the facts (understand: samples) to the laws (understand: universal distributions or uniformities), which they test precisely, in its applicative models or samples. This is heuristic 'n ground behavior.

Lukasiewicz's performance:

(i) formula: If A (general law), then B (application). Well, B (application). So A (law).
(ii) Interpretation: If all water boils at 100° C., then also this and that water. Well, this and that water boils at 100° C. So all water boils at 100° C.

Peirce's sample: This bean or beans come from this bag (sample

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'sampling'). Well, this bean or beans are white. So all the beans from this bag are white.

The distinction between universal and statistical generalization.

There is a stochastic aspect to all induction: 'stochastic' means 'haphazard'; if the sampling ('facts') is not haphazard, then there is no pure induction.

Consequence: there is a probability aspect to all induction. And therefore also a statistical aspect.

But there is 'an allusion of that probability and statistic within the inductive process: Salmon, o.c., 56, formulates this as follows: "Z percent of the replicated cases of F are G".

Conclusion: Z percent of F are G.

This is the general formula for induction based on addition ('enumerative induction', by Salmon, is generalization of after cases to all cases).

(i) If the conclusion is "One hundred percent of F are G" (i.e., "all F are Gil) or "Zero percent of F are G" (i.e., no F are G), then it is about 'universal induction.

(ii) If Z is some percentage between zero and one hundred then we are talking about 'n statistical induction.

In other words, the interval between "all" (100%) and "none" (0%) is decisive.

Applicative model: "If these beans (sample, 'fact') from this bag are 2/3 white (better: if these beans come from this bag and (if) they are 2/3 white), then all beans from this bag are 2/3 white (population, 'law').

J. Royce, o.c., p. 29, formulates it as follows: "A proportion v percent of the P's possess the character k. Well, the P's are 'n 'fair' ('fair') sample (sample) of the large set V. So, probably and approximately, at least, 'n proportion v percent of the large set V possess the character k." 'Fair sample' defines Royce, of course, as 'at random' (haphazard).

The distinction between ancient and modern induction

(i) *The ancient induction* dates back to Socrates. It includes two types:

a/ from the individual (subset) to the species (universal set); this is called the socratic induction;

b/ from the complete enumeration of the individuals (if necessary subsets) to the set ("Man, horse, mule live long; well, man, horse, mule are gall-free animals; therefore ..."); this is called the Aristotelian induction.

The difference between the two types lies in that the Socratic is connotative (and refers to the conceptual content, while the Aristotelian or summative denotation! is and refers to the conceptual scope;,

(ii) *Modern induction* dates back to *Francis Bacon of Verulam* (1561/1626), *Novum organum scientiarum* (1620): causality' or causation (effectivism) is central; the relationship between cause and effect becomes the focus of induction:

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Between two or more "phenomena" (e.g., a drug and a healing process) a relationship is established, with one (e.g., the healing) following the other (e.g., taking the drug); causal or effective induction examines, from sample (a subset of cases), whether in all cases (lawfulness) that order is there or not.

Note.- (i) 'An Inductively drafted law should, always, be formulated with the initial word "until now" (e.g. "Until now, experimentally, all water boiled at 100° C. One knows, after all, never with absolute certainty whether there are no exceptions at all!

(ii) In the same order of thought, it is clear that induction errors either occur because of one-sidedness (not pure haphazardness) or because of the too small number of samples.

(iii) The authority argument, insofar as it is justified and more than psychosocial dependence, is one form of induction: "X is 'a reliable 'authority' concerning d (the domain of his 'competence'); well, X claims something concerning d; therefore, that claim is reliable." This can be rewritten to: "The great majority of X's assertions concerning d are true; well, X asserts, concerning d, something; so that assertion is true". (Cfr. Salmon, o.c., 64).

(iv) The analogy argument. (cf. supra pp. 27/33), very often used in everyday life and in professional science, is another form of induction: e.g. a medical researcher experiments with monkeys or rats and mice to find out whether a drug can be used for humans; he establishes e.g. that a drug produces rather important side effects (causal induction; see supra) in laboratory animals; he concludes from this that this is also the case in humans. He concludes from this that this will also be the case in humans; the starting point is, after all: "Experimental animals and humans are analogous (partly the same and partly different); thus, in terms of physiological reactions, at least a percentage of human reactions and of experimental animal reactions will be identical" (cf. Salmon, o.c., 70ff.).

The abductive derivation.

That is the assumption or hypothesis.

Bibliogr. sample:

-- *K. Fann, Peirce's Theory of Abduction*, The Hague, 1970 (abduction is that reasoning process that "generates" new insights (concepts, explanations, theories, models));

-- L. Harry, Science and Hypothesis (Historical Essays on Scientific Method), Dordrecht, 1981 (Galilei Descartes, Boyle, Whewell, Reid, Hume, Peirce). To presuppose is to guess qualitatively (while induction probes quantitatively): 'It is called Socrates and it is mortal. What kind of being is it? This riddle form clarifies what induction is.

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Peirce' example:

"These beans are white. Well, all the beans from this bag are white. So these beans are from this bag".

If the induction was uncertain (non-necessary implication), the ab- or also retro.duction is likewise, yes, more uncertain: one does not know, after all, whether "these beans come from this bag"!

Aristotle's example:

"If Socrates is mortal and all humans are mortal, then Socrates is human." One does not know, in this case, whether "Socrates" is not sometimes "a dog. After all, one knows precisely as much as is stated in the antecedentia (premises, the two prepositional phrases). Hence the riddle character of the retroduction. Only if one of the prepositions says that Socrates is human does one know, logically at least, that he is human. After all, a riddle is always a purely logical but often wrongly insinuating question: likewise a hypothesis.

An explanation, whether it is every day or scientific, indicates the wherefore or, if it concerns motives or motives, the why of a given fact. But that explanation, if not tested inductively, is completely uncertain.

Once again summarized: the transformation scheme of derivation types All women ... appearance, beautiful; ... Well, Ornella Muti ... appearance; So, Ornella Nuti is beautiful.

Ornella Muti ...appearance; ... Well, Ornella Muti is beautiful; So all women ... appearance, beautiful ...

> Ornella Muti is beautiful; Well, all women ... appearance, beautiful; So Ornella Muti ... appearance ...

IIBb1b. The non-distributive syllogism.

Strict syllogistic reasoning is purely distributive (quantitatively: de- and induction; qualitatively: ab- or retroduction). However, the non-distributive reasoning schemata remain distributive, but their common property, on which they rely, is more than purely distributive. See pp. 45/ 69 supra for the other structures.

The collective reasoning.

Basis is the coherence between elements (exactly that coherence is their common characteristic. We limit ourselves, for lack of space, to examples.

(a) Synchronous systems as a basis:

A textbook example: (the teacher, on a trip through a park with her class, points to a feather:) "What bird does that feather belong to? (abduction).

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Basic: "All feathers belong to ('cohesion' or 'structural network') the anatomical whole of a bird's body; well, here is a feather; so this feather refers to some bird." Hence the logical question, "Of what (species) of bird, etc." The system concept founds the reasoning.

(b) Diachronic systems as a basis:

"Today is Thursday; therefore the day after tomorrow is Saturday. The 'rule' of reasoning is the diachronic system of the week (So N D W Do V Z - So ...):

If in the fixed weekday context the second day after Thursday is Saturday and (if) today is Thursday, then the day after tomorrow (= second day after today) is Saturday."

Note - Descartes' famous reasoning:

"I think; therefore I am" relies on the system of the self-conscious: the "actual existence" (I am) and the "thinking" always belong to the one person (who is the common characteristic of it).

Corollary: "If thinking and being always go together (in the same person) and I think, then I am also."

An analogous systemic coherence relies on, "Where there is smoke, there is fire" ("If smoke and fire belong to the same system, and (if) somewhere there is smoke, there is also fire.").

One sees that systemic reasoning is usually enthymematic syllogisms (Aristotle's expression for concealed (linguistically) but thought (mentally) parts of the syllogism).

Note -- Archaeology (antiquities) seeks, through (witnessed) remains, fossils, etc., the systems or wholes to which these fragments belonged.

The kinetic reasoning.

The basis is change coherence (essentially diachronic): all elements belonging to the same change have this coherence as a common property. This coherence is expressed in the 'rule' (the universal preposition or premise).

Example: someone wants to meet a friend, who, on a daily basis, goes to work by possibly three routes; the reasoning is based on an interval of three possibilities; at full control, he will line up by each of the three routes (either personally or through intermediaries); the reasoning is based on the following "rule" (universal preposition):

"If my friend's way to work is along only one of the three routes known to me, and (if) he goes to work today, I am sure to find him by paying attention to each of the three possible routes."

Abductive: one does not know along which of the possible trajectories the friend goes to work. One forms a hypothesis (abduction: perhaps he goes along this route; by testing induction, of course).

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It should be noted that when one says, "My friend goes to his work by only three routes," one is formulating a universal preposition, namely, "All the routes to my friend's work belong to (one of) the three routes (which have the common characteristic of being one of the possible routes to the friend's work)."

The diachronic systems are, in fact, all, kinetic structures: if on this medicine in that disease healing follows and (if) here and now this disease is treated with this medicine, then with time (diachronic structure; at the same time causation) in this disease after administration of this medicine healing follows.

All praxeology (action or theory of action) rests on such syllogisms (and the structures founding these syllogisms).

The ontological reasoning.

The basis is the being, syn- and diachronic: the 'being' is the common property of all that is, in any case, 'real' (possible, actual).

The identity principle reads, "what is, is." This is so universal (transcendental) that it is everywhere and always, enthymematic (subsisting) in every reasoning. Thus, e.g., the deduction (or in- and retroduction) 'holds' only if, as a transcendental or omnipresent rule or precept, the identity principle 'holds': 'If what is, is and (if) the deduction (Rg ^ Tp). Rs) 'is' ('something' (not nothing, illusionless), then the deductive is what it is (i.e., 'a valid form of reasoning)!

The contradiction principle is but the negative formulation of the identity principle: "what is not, is not." After all, were it (something), it would "be" (be something) and to this the identity principle applies, which is all-encompassing.

Note.-- Both principles also apply to "so- being" or beingness: "what is so, is so" (what is not so, is not so).

This is so obvious that, even in logistics, it recurs under the form of the tautology ('if a, then a). In everyday life, it is the same way:

'There lies In plume, miss'; whoever denies this will receive as a reaction from the schoolchild something along the lines of: "Don't ye see them? Here she is". Whoever then still denies (the light of the sun) will be told something like, "What is there, is there anyway." All experience is application of the principle of identity (which is only in ignorance or dishonesty either not applicable or not applied. -

The idiographic reasoning.

Basis is the fact that something stands out against the rest of "being" and at the same time is fused with it. We take:

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(i) 'a geographic example

(geography - as well as history - deals with individual-concrete data, at least initially: there is only one city of Ghent in East Flanders; there is only one Adolf Hitler as the XXth e. knows it);- 'Ghent' is

a/ reflexive (material, looping) Ghent itself (the common feature of all that is Ghent itself is that it 'constitutes', makes up, makes 'be' Ghent); here we are talking about complete identity;

b/ analogy (formal, relative) - this refers to incomplete or partial identity, i.e. what resembles Ghent (distributive) and what is related to it (systematic, collective) - cf. proportional and attributive analogy or convergence (p. 55/57, supra): someone sees a friend in New York who, as an American, speaks Ghent dialect well because he is a philologist; in Buenos Aires he meets a native of Ghent who is a native of Ghent. 55/57 supra -): someone sees a friend in New York who, as an American, speaks the Ghent dialect well, because he is a philologist; in Buenos Aires he meets a businessman from Ghent; these two data are also - partly - 'Ghent', but different from Ghent itself (taken reflexively);

Ghent, taken reflexively, is strictly singular, 'einmalig' as the (romantic) Germans say; what is Ghent (distributively: similar or collectively: related to it) is, as an analogue, multiplyable, although connected to the one full Ghent identity (without Ghent in itself, reflexively, there is nothing that is 'Ghent', analogically, possibly the other way around, without the rest of the world and especially without what is 'Ghent' outside of Ghent (analogically), Ghent, in fact at least, does not exist.

(ii) Historical example:

Adolf Hitler is

a/ reflexively understood, the man himself, in himself (materially, full- identically with himself);

b/ understood analogously, all that is Hitlerian either because it resembles it ("That dictator in South America is (like) a second Hitler" or because it is related to it ("A painting made by Hitler is sometimes for sale; the National Socialist movement still lives on, etc.). Here we are talking about what is only partly - or partially-identical with Hitler.

Again, Hitler is singular; that singular reality also "constitutes" the analogous ("hitlerian") data, which, without his volitional reality, are not conceivable;

Conversely, Hitler, taken concretely-factually, is not to be thought apart from what is (analogously to him) 'hitlerian',-yes, not to be thought apart from the whole situation, in which he was able to emerge (the 'rest' is 'complementary' to him).

The originality and authenticity question.

Originality' is the singularity with which something, distinguished from the rest of 'being', is itself, irreducible to anything else, not even to what is analogous to it. Authenticity' denotes the relation of something to that to which it 'belongs': 'Is that painting really 'real'?' means 'Does that painting really belong to the person whose work it is claimed to be?'

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The imitation (which is only 'analogous', or part-identical to the original reality) 'is' not the 'real' thing.

The individual-concrete structure lies behind all such data or questions: the reasoning, which relates to them, is therefore based on a preposition ('rule', Rg) in the following sense: "Since the original should be fully identical with itself and the analogous (including the real) only partially identical with the original, etc., the individual-concrete structure is the basis for the individual-concrete structure.

Two applications.

(i) Marx, in Hegel's line, speaks of the 'Entfremdung' (alienation; better true: dispossession), 'aliénation', of the proletariat: the proletarian is not himself; - this basic concept of the 'Marxist analysis' of reality is understandable only from the individual-concrete structure (being oneself points to one's own 'original' (vol-identical) reality).

(ii) Textualists, today and in the past, distinguish between 'text' and 'context': the correct 'reading' of a text takes into account the (social, cultural, etc.) context in which it was created and in which it circulates; this is 'situative' reading of a text, i.e. taking into account its 'Sitz im leben', the way in which it is situated in life.

Again: the complementation (there is, on the one hand, the text itself (volitional, if "real"); on the other hand, there is the fusion (concreteness) with the rest).

Cf. as an applicative model: *ed., Jesuits and Marxist Analysis*, in *Streven*, 48 (1981): 10 (July), pp. 867/874. Can the Jesuits, as Catholics, isolate Marxist 'analysis', as a method of naming economic-social facts, from the Marxist ideology, which expresses itself in it? Apparently the method has fused with the ideology (concreteness).

The bottom line is this:

(i) if Catholicized, then separate from Marxist (atheist-materialist) ideology;

(ii) if separate from Marxist ideology, still valid? (The Jesuits cannot separate themselves from their own Catholic context without betraying their (religious-social) identity).

Further: can one think of Marx's text as separate from his own time and situation'? (without betraying his 'identity'?).

Note.-- Paralogism is the error of reasoning that one practices unsuspectingly; 'sophistry' is that error of reasoning that one practices cunningly and deliberately (strategically)). One does not confuse "sophistry" with Greek sophistry, which is a cultural movement.

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IIBb2. Non-sylogistic implication theory.

Judgment contains 'an implication: the subject 'implies' the saying (the saying is inherent in the subject). Reasoning contains 'n implication: two prepositional phrases, thought together, 'imply' 'the postphrase (conclusion) as a logical conclusion (the postphrase is inherent in the two prepositional phrases thought together).

Yet one can treat the implication in more than one way.

(a) Implication awareness.

"There must be something wrong with him/ because he would not act as he acts/ if there were not something wrong with him: therefore he acts as he acts/ because there is something wrong with him: He doesn't think anything is wrong with him/ because/ one of the things that is/ wrong with him/ is that he doesn't think anything is wrong with him: therefore, we must help him realize that/ the fact that he doesn't think anything is/ wrong with him/ is one of the things that is/ wrong with him." (*Ron. Laing, Knots* (lit.: Knots), in Dutch translation: *Toestanden*, Meppel/ Borgerhout, 1970).

This obsessive poem makes one feel how a person has no awareness (consciousness is what the Germans like to say) of what concerns him (his situation, which shows itself along detours, from which one makes abductions). In other words, our actions (here) imply things; but for that reason we are not yet aware of them: awareness is a condition for being aware of them.

(b) Pure science as implication awareness.

G. Del Vecchio, Droit et économie, in *Bulletin Européen*, 1962 (Janv.-fév.), pp. 10/12, points out that his 'n friend Luigi Einaudi, eminent economist, claims that the economy is 'a

a/ hypothetical and **b**/ partial science is: the economist does not say to people, 'You should act like this' (which would be ethics and politics), but 'Such and such a way of acting will have such and such economic consequences'.

Behavioral rules in an ethical-political sense are not given by economics; only indications as to the effect or implications of their actions on economics.

In this the professional science resembles the logician: the logician does not say that the prepositions of a reasoning are "true" (that is an epistemological question); he only pronounces on the implication between prepositions and postpositions. In this sense, logic is also \mathbf{a} / a hypothetical and \mathbf{b} / a partial science.

Pure science is applied logic.

Philosophy cannot do this because it thinks both ontologically and individually-concretely (a/ factually and b/ totally).

(b)1. Intelligibility or capability tests.

Science (as well as life) can focus on the preposition(s), on the antecedent of the implication. I. Kant is an illustrious example of this. He termed his conception as 'critical method'.

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= *Caught up in Descartes' view* that our consciousness only mediately, indirectly, grasps reality and, thus, that we only grasp consciousness contents of a purely logical nature (such that the "critical" question, since Descartes' mediatism, arises: "What are these logical consciousness contents worth? Are they merely subjective reflections or do they reflect real reality?");

Caught, therefore, in this logical subjectivism, Kant starts from the inductive subject science of his day par excellence, Galilean mathematical physics (mathematical physical), of which he assumes, without investigation, that it, as inductively acquired knowledge, is 'objective', d.i. true-to-life representation, of 'nature' as the European Enlightenment conceived it, (i.e. as a set of necessary (mathematically formulable) laws, embodied in matter (whether inorganic or organic-living)).

The fact that he assumes without question that mathematical physics is "objective" representation of "nature" (as, since Galileo, physicists (and the illuminators) conceived it), Kant calls "the added postulate" (which is fair).

= The critical-transcendental way of thinking, which Kant introduced, proceeds as follows:

(i) the existing (mathematical-physical) professional sciences of his time provide (by 'postulate') valid knowledge concerning 'nature', such is the accomplished fact. From this he designs his mode of implication inquiry, viz. he asks himself:

"Given:

1/ its actual existence and 2/ its postulatoric) logical validity, what are the conditions of possibility for these sciences? "Kant seeks the answer non-metaphysically (as, since Socrates' conceptualist metaphysics,' one had been accustomed to it), viz. by supposing, from everyday, pre-scientific determinations, that:

1/ our knowledge and thinking are objective representations of reality and

2/ that they faithfully represent "an object" independent of our knowing and thinking (i.e., the existing reality, which is the object of our mathematical-physical and day-to-day knowledge and thinking);

Psychologistic (as, since Locke, the founder of the English form of Enlightenment), and Hume, the skeptic, the European intelligentsia had become accustomed to it), namely by investigating the purely psychologistic conceived 'formation' (genesis) of that either day-to-day or mathematical-physical knowledge (which was always, as with Descartes, conceived as a purely subjective-logical content of consciousness (mediatism, therefore));

(ii) no, Kant refused to follow these two (in his eyes) dead-end paths out of the impasse of the critical question: he understands it purely logically, i.e. not from the consultation of history or of 'another form of "empiricism", i.e. experience of facts or situations; but d.m.v. the analysis (since Platon's analytic method (cf. p. 10 above) this has been constant practice) of one's own thought processes, logically understood, of course, and not psychologically (as since the English empiricists, Locke and Hume).

LO. 84.

In other words, the question: "How is (both everyday and especially) mathematicophysical knowledge (and thinking) possible?" is answered by saying: "It is possible because, unconsciously (= 'transcendental', as Kant says), our human mind 'sticks' its own basic concepts ('time', 'space', - 'cause - effect', etc.) onto the (in itself 'formless', i.e. disordered - many 'facts'.) on the (in itself 'formless', i.e. disordered - many) 'facts' as it were (as one sticks a label on a receptacle to indicate its content, logically speaking) and thus makes them come into being themselves or, as Kant likes to say, "Forms" (formalism).

This amounts to a partly introspective method, improved by abductive reasoning from the data of that introspection: introspectively Kant examines his own (and other people's) logically thinking knowledge of 'nature' as a lawful event, expressible in mathematical formulas; abductively Kant concludes, from there, to the existence of 'a-priori or possibility conditions' of that logically thinking knowledge. He puts, meanwhile, 'nature' as a lawful process convertible into mathematical formulas, in brackets (what E. Husserl, the intentional phenomenologist of our century, calls 'ep.ochè', 'Einklammerung' (in brackets)), in order to occupy himself only, with his 'internal logical life'.

Thus, the connection between cause and effect is situated, not in the natural processes themselves, but, as a pre-given ('a-priori') thinking law, in the human mind.

Formalist subjectivism is indeed the right name for that type of thinking and knowing. 'To interpret' is, after all, for Kant: 'from the human constructive enlightened mind, to examine and articulate nature in a logically rigorous way! Cfr. *H. De Vleeschouwer, Grondbeginselen der logica*, Antwerp, 1931, p. 190/192.

Schematic:

If a-priori conditions, then mathematical physical; or:

a-priori conditions). mathematical physical.

In other words, the mathematical physical is inherent in (the) conditions of possibility (present in the knowing-thinking mind of the naturalist) recognized by Kant's subjectivism.

Note.- J.K. Feibleman, Assumptions of Grand Logic, The Hague/Leiden,1978, talks about the praesupposita (presuppositions) of logic (not of the logician), in a 'metaphysical' sense with Aristotle, Faye, Whitehead, Russell. To which we cannot go into here.

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Note.- R. Eisler, Kantlexikon, Hildesheim, 1969, s. 537/541, says that, with Kant, 'transcendent' means: "transcending; reaching beyond mathematical-physical experience and the possibilities present in it"; while 'transcendental' means: "that which pertains to the knowledge of the possibility of a-priori knowledge' as applicable to (mathematical-physical attainable) experience."

(b)2. The hypothetico-deductive method.

Did the possibility-conditions analysis proceed from the afterthought to the presupposition, the hypothetico-deductive analysis proceeds from the presupposition (antecedent) to the afterthought.

Schematic:

(i) a-priori condition test: if nazin, then what prevision? (NZ). VZ);

(ii) Hypothetical-deductive inquiry: if preface, then what afterword? Schematic form: VZ). NZ.

Striking: one derives conclusions first, before returning to the possibility conditions.

(b)2a. As if behavior.

The lemmatic-analytic method is the logical core of the as if behavior (since *H.Vaihinger* (1852/1933), *Die Philosophie des Als-Ob*, famously). Cfr. supra p. 10 (synagogic or conductive concept analysis of Paton). The first step is the 'lêmma' (sumptio, positive assumption):

"Supposedly we, already, know what we, in fact, do not yet (unless abductively) know". The second step is the 'analusis' (dissection): "(Supposing the lemma) what is now inherent in this abducted lemma? Or, "What follows from this, logically speaking?".

Applicative textbook example.

(i) Established fact: Johnny doesn't know his lesson.

(ii) Lemmatic-analytic method:

a/ lemma: "If only Johnny's family had been on a family visit yesterday (then his gap would be understandable, intelligible)?";

b/ analysis: "I can gently ask him out once to know if actually my abduction (inductive) is correct."

One sees: if on family visit, then understandable ignorance; therefore: if inquiring (with affirmative result regarding the 'hypothesis' (or lemma)), then certainty regarding the preposition "If on family visit".

The difference from Kant's introspective-abductive method is striking; the inductive control (on the abduction), on the phenomena themselves, situated outside of consciousness, performed, plays here a decisive role.

(b)2b1. The pragmatic maxim ('maxime').

One of the most remarkable applications of the (lemmatic) analytical method was devised by CS. Peirce (1834/1914); he wrote in 1905: "If a certain prescription (recipe) for an experiment is possible, then a well-defined experience will follow." (If prescription, then well-defined experiment; prescription). well-defined pr.). In other words.

1/ In the prescription, the hypothesis (lemma) is present, result of abduction;

2/ In the well-defined experience, the inductive testing of the hypothesis is present.

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Peirce called this the 'method of investigation'." And "investigation" by the "interpreting community", the interpreting community, as his fellow Royce would say: not the solitary individual alone, but the other, the fellow human being, is involved.

In short: lemma (hypothesis), yet effective (tested for effects) and this in common. We are far from Kant's inner logical life or logical introspective. '*The world in the making*', *Dewey* once said (the world in the making, - understood: by human intervention, here in the form of experiment), is central to Peirce's thinking; not the inner soul life, however logically and/or mathematically-physically conceived.

"Consider what effects with logically thought-out practical scope, we attribute to the object of our understanding in our representation. Then our understanding of those effects is the entire content of our understanding of that object". Thus writes *Peirce, How to Make Our Ideas Clear?*, in *The Popular Science Monthly*, 12 (1878): Jan., pp. 286/302.

In 1903 in French: "Considérez quels sont les effets pratiques, que nous pensons être produits par l'objet de notre conception. La conception de tous ces effets est la conception complète de l'objet".

In its stroppy English, it reads as follows: "Consider what effects that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object". Five times, deliberately by the way, Peirce mentions 'conceivably', 'conceive', 'conception'! He wants to be everything but an anti-intellectualist (for which he is often worn out by people who do not read him carefully).

For Peirce it is about the contents of knowledge and ideas, as (he says it explicitly himself) the middle age scholastics, at least the conceptual realists (see above pages 17/18: essentialism, idealism) understood them. Except for one very decisive point: he is an effectivist; i.e. those ideas or notions, however realistically conceived, are only certain, if they are conceived as a working hypothesis; i.e. one pretends to know that they have objective value and looks at the result of those actions structured according to those ideas. Only then does one know whether there is a dose of reality in them. Until then, they are 'hypotheses' (abductions without deductive and inductive checks on them).

Practical:

(i) there are ideas and judgments in which those ideas act as subjects or sayings;

(ii) transformative aspect: transform those judgments into conditional (hypothetical) sentences, the after sentence of which speaks of the effects that follow logically deductively from such ideas and judgments;

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(iii) apply these conditional sentences to human actions of all kinds, at least in principle (self-activity principle: self activity);

(iv) note the result of that application and confront it with the hypothesis, present in the prescription of that act or experiment, to see if it should not be revised either totally or partially.

This effectively-critical (rather than transcendental-critical) method is doubly appropriate:

(i) prescientific, it belongs to the ancient wisdom of all cultures: 'naturam morborum ostendunt curationes' (translated: "The nature (i.e. essence or 'model') of diseases is exposed through their cures") shows that healers and later physicians applied this pragmaticist principle;

Indeed, one often does not know (precisely) which disease a sick person has; one makes all kinds of guesses; the one who, starting from his guess (abduction), applies a method of healing ('curatio') and heals, proves that, negative (cf. K. Popper's criterion), he is not beside it, and, positive, that he can be on it;

Further: Peirce himself, defending himself against the accusation that his maxims expressed a skeptical, indeed materialistic, principle, says that they are "merely an application of the only principle of logic ever recommended by Jesus: 'By their fruits ye shall know them," indeed, Peirce adds that this principle is very narrowly tied to Biblical representations.

Indeed, as already demonstrated in the doctrine of interpretation (DU 27/28), this pragmaticist principle is at the heart of the biblical teaching on the judgment of God (as will be shown in detail in the hierology). Cfr. K.-O. Apel, ed., *Ch. S. Peirce, Schriften* I (*Zur Entstehung des Pragmatismus*), Frankf., 1967, S. 355; as well as S. 339ff.);

(ii)a. Scientifically, this method is called 'the method of applied science' in so far as the subject sciences include 'action'; well, all subject sciences include a form of 'action': mathematics applies its abductions by testing the formulas, which logically derive from them, against mathematical results worked out according to the 'prescription' of abduction; the experimental sciences do this (if necessary with mathematical-logistic and) with more tangible actions of all kinds.

(ii)b. the existential, the dialectic and the pragmatic philosophies involve 'existing', 'praxis' or experimentation while living according to the concepts and judgments of one's own philosophy;--which amounts to the same thing, namely, the application of ideas (utopias) in life shows what they are worth, rather than the boundless discussions about them.

LO. 88.

Bibliogr. sample.

-- J. Dewey, Le développement du pragmatisme américain, in Rev. de Métaphys. et de Morale, 29 (1922): 4 (oct/ déc), pp. 411/ 430;

-- KI. Oehler, Einl., C.S. Peirce, Ueber die Klarheit unserer Gedanken (How to Make Our Ideas Clear), Frankf. a. M, 1968 (biogr.: o.c., s. 153/162; commentary : o.c., s. 97/151).

(b)2b2a. Argumentum ad hominem ('on the man').

This is an application of the immanent sanction (making someone suffer the consequence(s) of his own position: one draws conclusions from his own assertions, which refute those assertions).

If you assert this, then what you refute follows from it". So one turns the thesis of an opponent into a pre-sentence, from which follow sentences. One confronts him with the implications (inheritances) of his own position. Always the lemmatic-analytic (hypothetical-deductive) structure!

This procedure (and the next one, the reductio ad absurdum) belongs to "critical" logic, not in the Kantian sense, but in the ordinary sense of examining arguments or arguments for their value.

Conveniently, we take "a classic example," abused in more than one liberal and atheist textbook of logic against religion under the guise of "pure logic.

One could (see above p. 81, below) also define critical logic as thought-error research (detecting consciously committed sophisms and unconsciously committed paralogisms).

Epikoeros (Lt: Epicurus(-341/-270)), who posited refined hedonism (philosophy of enjoyment) as man's destiny, was

a/ materialist (in the antique sense: in addition to gross substance, he also assumed subtle or rarefied fineness) and

b/ in the religious field both polytheist (he accepted many gods as Demokritos, the atomist, who were alien to man and living in their 'intermundia' (own sphere of life)) and, with regard to the Supreme Being, atheist. One attributes to him the following reasoning:

phrase 1: If God exists, then He is good and omnipotent: either, if God can prevent evil but will not, then He is not good, or, if He will prevent evil but cannot, then He is not omnipotent.

phrase 2: Evil can only exist either if God can prevent evil but will not or if He wants to prevent evil but cannot.

phrase 3: Well, evil exists. Conclusion : So God does not exist.

One sees that the principle of contradiction is applied here (either, or not); that, further, Epikoeros seeks to argue "ad hominem": he turns the religious conception of the Supreme Being into presuppositions, which he plays out against believers in the Nazi sense (i.e., God does not exist).

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Symbol shortened screening. - To make an accumulation of judgments in reasoning transparent, one can rewrite the judgments and their connections:

(1) the negation is - (e.g., -p (red. negate: horizontal dash on p));

the contradiction is w (either-or); the juxtapositive conjunction 'and' is , ; the implication is)..;

(2) the sentences: God exists = p; God is good = q1; God is omnipotent = q2; God can prevent $evil = r_1$; God wants to prevent $evil = r_2$; evil exists = s.--

Thus, we can rewrite the partial sentences:

phrase 1: p). q1 ^ q2 ^ r1 ^ r2 (neg)). q1 (neg) w r2 ^ r1 (neg)). q2

phrase 2: s). r1 ^ r2 (negate) w r2 ^ r1 (negate)

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phrase 3: s
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Conclusion: p (negate).

This style of writing pays attention only to the strictly logical connections, without caring about the truth of the judgments.

Epistemological vetting.

What does it become now, if one examines the truth of the claims from a religious standpoint.

Religious argument 'ad hominem'.

We take the God-denier by his word and lay bare the implications: Evil exists. Well, like everything else, evil too has its 'sufficient reason or ground (in the form of 'an explanation: 'a cause, 'a responsible; -- all this principle is at work in epikoereïc reasoning, by the way).

Since, now, God does not exist, He cannot possibly be the sufficient reason or ground of evil. Thus, in the atheistic hypothesis, the fact of evil can only find its explanation outside God, i.e. in the universe itself. And this is its overall (i.e., the necessary and sufficient) reason for existence. God, therefore, does not qualify.--This is precisely what the Godbeliever claims!

Religious ambiguity critique.

Epikoeros does not see ready in the "God/creation" dichotomy.

Unconsciously, he assumes the "authoritarian" God, i.e., that God who does not tolerate healthy autonomy beside Himself. Therefore, he conceives God's goodness and omnipotence simplistically: he reasons as if God would not or could not even tolerate the fact of evil.

God-believing man, on the other hand, realizes the autonomy or self-sufficiency of creation:

(i) the non-free creation is in its way independent with respect to it; it has its own laws (when a stone, sufficiently heavy, falls on another, it crushes it, e.g.);

(ii) the free creation still possesses, in addition, the capacity to act knowingly and willingly (and, among other things, to cause evil; which we see around us, yes, in us, every day).

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Consequence: God is not complicit in physical or ethico-political evil: God, if He wishes to respect the autonomy of nature and man (their own constitution), does not 'wish' to prevent evil, in so far as it is inherent in the autonomy of His creation; for the same reason He also 'cannot' prevent evil. Yet this is not a violation of His goodness or omnipotence, if these are correctly (non-simplistically) understood.

Conclusion: the atheist as Epikoeros suffers from "triple blindness.

(i) he does not see the healthy independence of creation (and omits them in his reasoning).

(ii) he confuses God's share (co-responsibility) with the creaturely share in evil (and shifts the creaturely to the divine);

(iii) yes, he turns things upside down: what is not of God, he attributes to God(and turns the negation into an affirmation).

Religious Statement.

What the atheist like Epikoeros especially fails to see is what the Bible calls the judgment of God: God uses the self-sufficiency of creation to, ultimately, order the immanent sanction (i.e., the result in creation itself of good and evil) according to strict justice (cybernetic structure of creation: a deviation is followed - sooner or later - by a restoration).

This insight is the core of theo.dicee (i.e., that part of the theory of God, which discusses the relationship between God and creaturely evil).

Note -- The "ontological" (understand: purely introspective) argument of S. Anselmus (1033/1109) regarding the existence of God:

(i) I think the idea of "the perfect being";

(ii) the idea of "perfect being" implies the possession of all perfections;

(iii) one perfection among all is actual existence (reason : existence is more perfect than non-existence);

(iv) if God possesses all perfections, then also that one, existence; thus God exists.

The whole question is: does an idea in my consciousness always correspond to reality? In other words, without the test of experience (in which, inductively, one experiences God as both perfect and real) this 'deductive reasoning' (as it is called) is only an abduction (hypothesis, waiting for confirmation).

Further question: is existence always better ('more perfect') than non-existence? The existence of evil, for example, is certainly not more perfect than its non-existence!

(b)2b2b1. *Reductio ad absurdum* (proof from the absurd).

Another form of immanent sanction, logically speaking, is the proof from the absurd (contradictory). One assumes that there exists a view of the opposite nature (a countermodel, say logicians today) which satisfies the data of the problem but not what is asked (i.e. what must be proved).

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Then, as if from the preface, one deduces the conclusion that such an opposite mode of seeing cannot exist without contradiction (the counter-model leads to incongruity). From this one concludes to the falsity of the hypothesis. And, immediately, to the truth of its opposite (principle: of two contradictory propositions S_1 and S_2 , if S_2 is false, then S_1 is true). In fact, this is proving by a roundabout way (indirect proof).

(b) 2b2b2. The methodical doubt.

Until now, it was assumed that, in the case of not knowing, one still "knew" (lemma, hypothesis in the affirmative sense or methodical certainty). Now we reverse: although one knows, one pretends not to know (methodical doubt), in order, from that, to expose the implications: if I doubt (methodically), what follows?

The later academics (Platonists) from the second Academy (Arkesilaos (-314/-240) and the third Academy (Karneades (-214/-129) systematized the methodical doubt that Socrates (and in his line, Platon and Aristotle) had already practiced (in their struggle against Protosophism): "I am, inwardly, certain. Yet suppose I doubt, what then?".

The Church Fathers (Patristics) S. Gregorios of Nyssa (335/394), in the East, and S. Augustine of Tagaste (354/430), in the West, - adopted this methodical doubt in their theological and philosophical thinking.

R. Descartes (1596/1650) made methodical doubt famous in his "*doute méthodique*," which he employed - against the skeptics, who, according to his claim, said that "nothing is certain": "If I doubt, then I think (i.e., I have, introspectively experienced, an inner consciousness). If I think, then I am. However, if I think and, at once, am, then there is certainty.

Consequence: absolute doubt refutes itself; in order to affirm it, I must (ultimately) deny it (which is an incongruity). Indeed, if 'everything' is uncertain, then something is certain, namely, that 'everything is uncertain'!

CS Peirce heavily criticizes "methodical doubt.

At least as a real experience: if it is to be more than a rhetorical artifice used to make an impression, it must be based on real contradiction or contradiction between two, provisionally, unmistakable data. - This applies incidentally to all as if - behavior, when it is not logically rigorously articulated.

Note.-- Both the proof from the absurd and the methodical doubt depart from a countermodel, which, methodically or provisionally (as if-behavior) is assumed, as presupposition with consequences.

Conclusion: the implication, syllogistic or non-sylogistic, explains:
1/ about full identity (elements)
2/ expose partial identities (= similarities, correlations).

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(b)3. The mathematical and logical implication.

Logic is neither mathematics nor logistics. Yet both are thoroughly logical activities. Yes, they are, logically speaking, refinements, which we now very briefly situate within the framework of logic.

(b)3a. The mathematical implication. Bibliogr. sample:

-- A. Warusfel, Les mathématiques modernes, Paris, 1969 (contemporary mathematics has made a "great leap forward" in that

a/ the euclidean axiomatic method, in its improved form, and

(b/ the theory of collections gave her a new language);

-- A. N. Whitehead, Mathematics basis of exact thought, Antwerp, 1965 (Eng.: An Introduction to Mathematics, London, 1961);

-- O. Teller, Vademecum of mathematics (A survey of foundations and basic formulas, logically and conveniently arranged), Utr./Antw., 1965;

-- *C. Van der Linden, Modern Mathematics*, Utrecht/Antw., 1975-4 (i.e., sets, relations and functions, representations; mathematics and logic; linear algebra, algebraic structures; geometries, with emphasis on the abstract structures).

Applicable models.

The mathematician rewrites what is commonplace into sets of symbols; in this way he creates an exact language, i.e., a language that does not allow for misunderstandings (if one follows its rules of language).

A few models make this clearer.

(i) *Circumstantial*: "If something is greater than something else, then the latter is smaller than the former". This unwieldy and mathematically-exactly little 'operational' (usable) sentence that is 'n application of the distributive structure (u is greater than p and p is greater than s, which in turn, is greater than n), becomes symbol-calculatingly clear: a > b) b < a (if a is greater than b, then b is less than a).

Profit: this expression has the universal applicability of the vernacular sentence (which maximizes its operability, i.e. its usefulness in formulas and operations), but it is amenable to arithmetic operations (the actual operability).

Which is evidenced by the operation that replaces the abstract letters (letter arithmetic) with numbers (number arithmetic): e.g. 4>3). 3<4.

(ii) Questionnaire calculation:

Jan gave the fifth of his marbles to Pete and kept twenty himself. How many did he have at first'?

Rewrites:

a/ if Jan gave a subset (p) (1/5) and left a second subset (p') (20 elements), how many (which universal set (u)) did he have before? (Again, the distributive structure);

b/ if p + p' = u, then 1/5 + x/5 = 5/5 (any fraction equal to 1 is 'a possible universal set); well, 5 - 1 = 4; so x = 4; introducing the fractions and its operations is 'a further rewriting;

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In fact, there is an enthymeme (substandard syllogism) at work here: (Rule = axiom). Every whole (univ. set) is equal to x.1/x or x/x;

(appl. = model:) well, x here is equal to 5;

(Res:) so the whole - u - is 5/5.

Note.-- Every fraction, if equal to 1, is a universal set. The most common model of that rule is 100% (rewritten: 100/100).

The "rule of three" is the introduction of the diastema or interval (see above p. 57). We indicate, now, in the following scheme, the rewrites, which lead from the vernacular to the mathematically operational language:

Distrib. str: (u,p,s,n): u s p (=y)	Fractional number: (general); x/x 1/x y/x	Fractional number: (private): 100/100 (100%) 1/100(1%) y/100(y%)	Application: (even more private) 25 1/25 = 5 (if y = 4:) $4/25$
universal not operational (mathematical	universally operational (algebraic)	universal (yet less) operationally arithmetic)	private Operational (arithmetic)
logical model universal)	mathematical: t universal models letter calculus ('number calculus	two regulatory or pure or mixed with ')	mathematical: private model (= applicative) numerical account

One sees that miniaturization (see higher pp. 26, 57) and infinitesimalization increase as one enlarges the numbers that replace x/x: 1/1, 10/10, 100/100, 1000/1000, etc. allow, increasingly, accuracy (hence the enormous application in exact science)

Conclusion: along two sides, modern mathematics has become 'powerful':

a/ along the universal side (by letter calculus: algebra, by using letters in its symbol calculus, is more universal than arithmetic); apparently x/x is more universal than e.g. 5/5;

b/ along the miniaturization side (by increasing the fractional numbers x/x to their number value, the differences within the interval between n (zero) and u (all; total set) become smaller and smaller and, as a measurement tool, more refined).

Ad a/ Whitehead, o.c., 11, gives examples: "Instead of saying that 2 + 3 = 3 + 2, we generalize in algebra and say that for all the numbers x and y it holds that x + y = y + x.

Similarly: instead of saying that 3 > 2, we generalize and say that for all numbers x there exist some numbers y such that $y > x^{"}$. He gives further examples of this.

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The major mathematical structures.

-- J. Piaget, Le structuralisme, Paris, 1968, pp. 17/32 (Les structures mathématiques et logiques), talks about the "structures mères" (basic structures):

a/ the order structures (network str.), applicable to the subsets of a set or to a group and its subgroups;

b/ the topological structures, supported by proximity, continuity and limit (limit); **c**/ the typical algebraic structures with the prototype being the group structure.

For the first two, we refer to the distributive structure (see above p. 40v.: the distribution or spreading of one or more common properties 'orders' the elements) and to the topological structure (see above p. 61); a word about the group structure, because of its far-reaching scope in symbol arithmetic. *D. Nauta, Logic and Model*, Bussum, 1970, p. 80vv, says that the algebraic group structure can be described as follows:

(i) a set of elements (ii) to which an operator (arithmetic: +, x (-, :) and set theory: ^ v (and, and/or)) applies such that each dyad or pair of those elements, as a result of the operation, again yields an element of that 'group' (set defined by that operator). So e.g. 2 + 3 = 5 (the operator '+' maps the pair '2, 3' to 5, which is also 'a number or symbol belonging to the 'group').

The summative (+) and multiplicative (x) operations can reduce to the original elements of the group by reversing them (-, :): 5 - 3 = 2. There is also 'a neutral element, which, if the operator is applied to it, does not create a new element of the group: a x 1 = a; 1 + 0 = 1.

Logically speaking, this boils down to this: there are mainly two kinds of indentities and multiplicities, which makes this algebraic structure possible:

a/ the totality identity: each operation gives 'a new element of the same group;

b/ the element identity: operation with the neutral element leaves it identically with itself (unchanged (n + 0 = n); even there is the associative operation, which covers 'neutral' aspects: (n + m) + 1 = n + (m + 1), indicating unchangedness in change.

Implicitness.

O. Willmann, Abrisz der Phil., Wien, 1959, S. 137, points out that the mathematical task and question solution is 'an application of the lemmatic-analytic method (see p. 85 supra: "If Jan gave 1/5 of his 'marbles to Pete and had 20 left over, how many (= unknown) did he have before?". The lemmatic beginning consists in replacing 'how many' with e.g. x or h, to pretend that we already knew that sought (unknown). As a result, the analysis stands or falls on the lemma (or as known unknown sought).

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M. Cantor, Vorlesungen über Geschichte der Mathematik, II, 1892, and, in his wake, *O. Willmann, Gesch. d. Id.*, III, 1907², S. 46/ 69 (*Einflusz des Pythagoreïsmus auf Mathematik und Astronomie*) show us the historical emergence of the (lemmatic) analytic method in Western European mathematics from what Platon once taught concerning the methodical investigation of ideas (see above pp. 9/12).

(i) Detecting (abduction - inductive - deductive) unknowns in mathematical equations (e.g., $r=^2 x+^2 y^2$, which defines 'n circle),

(ii) the theory of functions, which, instead of the ordinary unknown-in-comparison (or structure), traces the variable or changeable, insofar as this variable serves as the 'measure' (norm) of the change of the mathematical 'complex' (expressible in equations) (to trace the identical in the non-identical or variable),

(iii) the analytic method, since Fermat and Descartes, which, starting from the Cartesian coordinates (x-axis x y-axis), by checking the distance of the points of more than one curve (line), investigated and traced (abductively - inductively - deductively) the fixed (= identic) relation (not substantialistically, i.e. with entities considered separately, but relative, i.e. with those same entities in their relations to each other),

(iv) the infinitesimal calculus, which lemmatically analyzes the miniaturization of 'n interval,

(v) later, all other branches of Western European mathematics apply the letter calculus of *François Viète* (Vieta: + 1603): in his *In artem analyticam isagoge*, viz. this genius mathematician starts from Platon's lemmatic-analytic study of ideas: indeed, Platon's idea is the universal collection of all difficult concrete-individual models of it ('the' horse or 'horsemanship' collects all possible actual horses);

On the other hand, the arithmetic number (e.g., five horses) is 'n too private a case (model) of the universal number of possible horses to arrive at general laws on the matter;

Consequence: Viète shifted, between the universal idea (total collection), on the one hand, and, on the other, the private number, the letter: "Its a + b is general just like the idea 'sum' and yet operationally object like 3 + 4." (O. Willmann, o.c., 49).

This kind of symbol calculation is called Viète 'logistica speciosa' (i.e. calculation with species (the Latin word for idea or universal collection). The present theory of sets is implicit in the title itself, but only platonicists recognize its structuralism.

The geometries

C. Van der Linden, Modern Mathematics, pp. 143/165, shows how

(i) the introduction of set theory and (ii) the introduction of structure research into it (if one knows structures, one can

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one 'calculates', i.e. builds up symbol series on the basis of series laws, with other 'objects' ('elements') than numbers: "On the contrary, calculating with 'other' objects has turned out to be of fundamental importance in all kinds of sciences: physics, chemistry, - astronomy, biology, economics, business administration, sociology.

As examples of such objects, only vectors and matrices are mentioned here." (o.c., 114). In the spirit of the economy principle of the mid-century philosopher Pierre d'Auriol (+1322; Petrus Aureolus), "one examines that one structure without paying attention to the concrete objects that exhibit this structure." (o.c., 1/14).

Indeed, all kinds of data ('objects', - in geometry: configurations of elements (see above pp. 34/39) all show an identiic structure: they can therefore be studied from that one structure (collective coherence; cf. pp. 45/54 supra) lemmatically-analytically.

The distinction between existential and "pure" (analytical) space.

Especially since *D. Hilbert* (1862/1943), *Grundlagen der Geometrie* (1899) the radical distinction between lived and mathematical 'space' has become clearer. Existentially", life-space is "euclidean", i.e. three-dimensional (length, width, height); but, seen from a purely configurational point of view, instead of three dimensions, one can introduce four (Lobachefsky, Riemann etc.) or more. But we cannot go into this.

Note.-- N. Mesjak, Algebra in first classes of elementary school?, in *The New Guide* (09/10.11.1963), writes that, in School No. 125 at Novosibirsk (Siberia), the students of the first class learn the fundamentals of algebra in arithmetic class:

"We hear a little girl say, 'In this equation, x equals 2' ". In the highest classes, the ll. are introduced to the fundamentals of differential and integral calculus, the simple concepts of mathematical logic (logistics), programming and even the theory of large numbers.

Vl. Kogan, School for (mathematical) geniuses, ibid., 28.09.1963, had already pointed out the existence of the first secondary School of Physics and Mathematics (M. Lavrentjef 's proposal) in Siberia. In the discussion clubs e.g. the boys and girls argue about quantum theory, cybernetics, higher mathematics, modern algebra, formalized logic (logistics), number theory, geometry, hydrodynamics. Attention: the ll. spend no more than five hours a day in class (emphasis on independent work)!

One can ask the question:

(i) whether the soul life of these elementary and middle schoolers can handle this without later damage and

(ii) how they manage this. In any case: they are interested in what was covered in these pages.

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(b) **3b**. *The logistic implication*.

Bibliographic Sample:

The number of publications is incalculably large in the world's languages; therefore, a few titles:

(i) *Historical*:

-- J.M. Bochenski, Logik, Munich/Freiburg i.Br., 1956, 640 S. (both a history and an introduction to logistics);

-- H. Scholz, Esquisse d'une histoire de la logique, Paris, 1968 (Dt: Abrisz der Geschichte der Logik, 1931¹, 1959²;

-- *Th. Kotarbinski, Leçons sur l'histoire de la logique*, Paris, 1964 ("a handbook that introduces historically to logics, written by an excellent logician and philosopher of the Polish School");

-- *H. Claeys, Overview of the evolution of logical theories from antiquity to the present,* Leuven, 1974 (esp. from p. 155vv. (The New Classical Logic))

(ii) systematic:

a/ -- *E. Boucqué, Boole's algebras,* Ghent, 1968 (esp. p. 64vv. (*The classical logic of judgment and the Boole'se two-element algebra*);

b/ -- R. Blanché, Introduction à la logique contemporaine, Paris, 1957;

-- A. Tarski, Introduction à la logique, Paris, 1971 (inl. to the branches (judgment logics, class logics, relations logics) of formalized logic and its deductive method; second part: applications to mathematical theorizing);

Also, two good Dutch introductions:

-- *H. Freudenthal, Exact Logic*, Haarlem, 1961 (sets and representations,- propositions (= judgments, subject - predicate,- 'formal' (understand: 'formalized') logic, language and meta - language (i.e. lateral speech or language over language))

-- *D. van Dalen, Formal Logic (An Informal Introduction)*, Amsterdam/ Utrecht, 1971 (esp. 'n introduction to the two basic languages of logic (and mathematics), namely propositional or judgmental logic and predicate or class logic (also called function calculus);

c/ model theoretical:

-- *D. Nauta, Logic and model*, Bussum, 1970, esp. p. 106vv.: **a**/ propositional logic, **b**/ predicate logic (p. 143vv.)..;

-- K. Bertels/ D. Nauta, Inleiding tot het modelbecept, Bussum, 1969 (esp. p. 92/99 (Formal (versta: formalized) logic: model language of models), in D. Nauta, Logica en model, it is said that the so-called. second stage of logics, the metalogical, begins with L. Löwenheim, Ueber Möglichkeiten im Relativkalkül, 1915 (therein the 'Löwenheim theorem', which is the first thorough result of logical model theory, is proved (o.c., 23);

d/ applicative:

R. Feys, Results and possibilities of formalized logic, in *Tijdschr. v. Fil.*, 12 (1950): 2, pp. 227/244; *D. Nauta, Logic and Model*, p. 25, notes that the applied phase fully kicks in with the second half of the 1950s and, indeed, in mathematics, linguistics, as well as computer science (and engineering), "a stormy development" can be observed.

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Yet even beyond that, the applicable or applicative value of logistics becomes apparent.

One example: J.M. Bochenski, O.P., The Logic of Religion, New York, 1965 (this logician first talks about the general relationship between logics and religion; then he fixes on the religious speech of language ("religious discourse"), which he discusses syntactically and semantically, and, finally, dwells on the justification types ("justifica-tion of religious discourse") of that religious speech;

One note : religion is much more than religious language; therefore, the logic of religion is much more than logistics of "religious discourse" (as people now like to say)).

The stages of logistics.

The extension of Fr. Viète's principle to describe and treat real things and processes, first, by numbers (as the middle ages (numerosa) did before him, and, then, by letters (speciosa), is extended, in the XIXth century, to judgments, reasonings (and the concepts incorporated in them):

a/ the 'logical algebra' is the first stage (1847: both G. Boole (1815/1864) and A. de Morgan (1806/1878) found this stage;-- B. Peirce (1809/1880) and E. Schroeder (1841/1902) later develop 'a class and judgment algebra in an analogous sense;

b/ The actual logistics come, end XIX th e., of the ground, as *G. Frege* (1848/1925) (1879: *Begriffschrift o.a.*) and *G. Peano* (1858/1932) (1895+: *Formulaire de mathématiques*: formalization of the whole of mathematics) re-found logical algebra; - their work is crowned by the monumental work of *A.Whitehead* (1861/1947) and *B. Russell* (1872/1970), *Principia Mathematica* (1910/1913) (among other things, immediately, in a 'logicist' sense, the whole field of mathematics is formalized with it; also *D. Hilbert* (*Grundlagen der Mathematik*, I, 1932 (II, 1939), with his 'theory of proof' (metatheory) works in the same sense;

c/ The metalogy is elaborated, from 1915 (L. Löwenheim), by Löwenheim, Skolem (1920), Herbrand (1928), Tarski (1930), Gödel (1930+), Henkin (1947), Cohen (1963).

Logistics.

Semasiological note:

'Logistics' also has a military meaning; - so *Vice Admiral G.C. Dyer, Naval Logistics*, Annapolis (Maryland), 1960-1, says that logistics is "the total process by which the resources of 'a nation - material and human - are mobilized and directed to the performance of military tasks"; - this means

1/ the general or political ('grand strategy') strategy (the 'Realpolitik' of the macchiavellists) and the 'operational' strategy (on the theater of war itself) and

2/ tactics (optimization on the battlefield itself) is aided by logistics, which provides the combat resources, personnel and equipment.

LO. 99

(i) The order 'actual things'/'numbers'/'letters' (or other symbols of a universal nature) is decisive.

Everyday experience, the professional sciences (the empirical and the experimental first and foremost) deal with 'real things'; they create 'lemmata' by working with numbers (arithmetic); -- but listen: algebra introduces letters and other abstract symbols, generalizes thereby, but A. N. Whitehead complains that traditional algebra has been too much of a 'solution of equations'; e.g. in x = y + z the x (unknown) gets too much (replacing the indefinite variable) emphasis; consequently: the structures remain hidden.

(ii) The structural approach.

"According to recent modern views, one can

a/ characterize mathematics as the science that investigates structures (or, rather: systems) (...);

b/ the 'logic' (understand: logics) as the science that investigates the 'formal' (understand: formalized) description of all possible structures;

c/ the metamathematics as the science that investigates the relations between the two. - The structures that satisfy 'a given 'formal' description are called 'models' of that description." (*D. Nauta, Logic and Model*, p. 40).

In other words, in mathematics one does not encounter, through numbers, letters and other symbols, all possible, but only typically mathematical structures (of actual things and processes).

(iii) The order of the sciences

It can thus be described as follows:

"Logic (understand: logics) is (...) to be regarded as the doctrine of the description of all possible structures. 'Collection', 'representation' and other standard concepts are presupposed in every description and therefore belong to logic".

"The more abstract, i.e., universal, mathematics becomes, however, in its modern structural approach, ...) the closer it becomes to logic." "Mathematics must therefore be seen as a bridging science between logic which has become universal - 'which no longer says anything about anything' - and the professional sciences" (o. c., 46). Since logics is only a vocational science elaboration of logic (in the traditional-versionary sense), the order is: logic (conversational)/ logics (artful)/ mathematics/ vocational science.

(iv) Formalization of logic.

From the conversational to the formalized logic (logistics), one passes through three stages:

a. introduction of symbolic (algebraic) notation: e.g. a whole series of universals (general concepts) is recorded in language signs.

LO. 100

(a) 1a. The functors

(conjunctions, modifiers, connectives, logical connections):

conjunctor (logical product): p ^ q (p and q simultaneously) (Lukasiewicz: Apq); this rewritten complex is called the 'conjugate';

disjunctor (logical sum): -

a/ *the inclusive* (inclusive, alternative, divisive) disjunctor: p v q (p and/or q; in Latin: 'vel'; at least one of the two at a time) (Lukasiewicz: Dpq);

b/ *the exclusive* (exclusive, strict, dilemmatic) conjunctor: p w q (either p or q; in Latin: 'aut'; only one at a time of the two); this expression is called the 'disju-gaat['] (of p and q e.g.); expression of contradiction;

Implicator (consequence, inference, inference) : p). q; also: p q \rightarrow (if p, then q; implies q, q is inherent in p) (Lukasiewicz : Cpq); this set of symbols is called the 'implicate' of p and q;

Bi-implicator (equivalence, equivalence, mutual implication: p = q; also p = q also: p).(q (if p, then q and vice versa; if, and only if p, then q) the 'bi-implicate; '

Negator (negator) : -p; or still: p (dash on the p) (not p) (Lukasiewicz: Np). - Sometimes incompatibility is used: p : q (p incompatible with q).

(a)1b. The quantors (distributive counting): Ax (for all x); Ex (for one x); Sx (for some x).

(a)2. Basic concepts:

Constants (a, b, c, etc.) and variables (x, y, z; p, q, r, etc.); properties, relations (e.g., xBy or B(x,y): the relation between x and y); full sentences (propositions, often denoted by p, q, r, etc.), true/false (w, -w), as well as derivable, logical consequence, proof(s), argumentation); up to there some typical logical concepts;

Collective Theory Concepts:

Kls (class), e. (or still: E (epsilon)) (belongs to: the subclass S e. Z (Z = universal class)), - (equals), = (or still =/ : does not equal), etc.

b1. The above symbols are axiomatized:

'n List of well-chosen 'first formulas' (axiomata, postulates, primitive theorems) is drawn up;-- this serves to ground the systemic character, i.e. the exposition must be coherent, cohesive.

a/ *Internally:* the axiomata must be mutually independent (irreducible to each other and yet functional (interrelated); they should be mutually 'consistent' (not contradicting each other, contradiction-free) and 'complete' (i.e. necessary and sufficient to make all the properties to be proved derivable).

LO. 101.

b/*External:* The "power" of the "system"(i.e., the propositions built on those axiomata in its coherence) is "strong" if the number of axiomata is large, and "weak", if it is small (closed/open character).

Applicative model

(*D. Nauta, Logic and Model*, p. 130vv.): In propositional or judgmental calculus (judgment) in the form of a deductive theory.

1. *Primitive terms*: - (negate), (→implicate).

2. Primitive theorems (= axiomata)

(i): $p(\rightarrow q p \rightarrow)$ (ii): $p(\rightarrow q \rightarrow r) : :: \rightarrow (p \rightarrow q) (\rightarrow p r \rightarrow)$: (iii): $(p(neg) p \rightarrow (neg)) \rightarrow (p q \rightarrow)$

Note -- The letters p, q, r denote sentences (judgments) (e.g., It is raining today, etc.), but lemmatically, i.e., one does not know them, but pretends to know them. With these letters, which mean sentences, one 'calculates' (and here first axiomatically, i.e. one posits axiomata, from which one can make derivations, i.e. the ordinary theoremata or propositions).

Applicative model (C.-I. Lewis, La logique et la méthode mathématique, in Rev. de Mét. et de Mor., 29 (1922): 4, pp. 458/460): 'In number theory, as the above-mentioned Peano formulated it (in its simplest form, incidentally)

As an aside, CS Peirce, On the logic of Number, in American Journal of Mathematics, 1881, also committed, for the first time, 'a strictly axiomatic construction of the concept of number (at least "finite" number) - :

1. Primitive concepts:

in addition to the more general basic notions mentioned above, the following typical mathematical categories: No (number; S), o (zero), a+ (successor of a in the series of numbers: 1+=2; 2+=3); -- further, the operation signs: + (inverse: -; summative operation) and x (multi-plicative operation; inverse : :)

1a. *Relations* (= *definitions*):

a. summative:

a e. No). A + 0 = a (if a belongs to the kind of 'number (i.e. is a number), then the sum of a and 0 is equal to a;- neutral number); a,b e. No). a + (b+) = (a+b) + (if a and b are numbers, then the successor of a, added to the successor of b, is equal to the successor of (a+b), their sum viz;)

b. multiplicative.

No). a x o = o (if a belongs to the type 'number', then the product of a with o is equal to o);

a,b e. No). a x (b+1) = (a x b) + a (if a and b are numbers, then the product of a with (b+1) is equal to the sum of the product of a with b and a);

Note: Since b + = B + 1, one can also replace (b+1) with b+, but here this would make it unclear.

LO. 102.

2. Axiomata:

(1) No e. cls ("number" is a generic name, class);

(2) o e. No (zero is a number);

(3) a e. No). a+ e. No (if a is 'an element of the set of numbers, then also the successor of a) (cfr. p. 94 supra (group structure));

(4) S e. cls ^ o e. S ^ a e. S). A + e. S (if S belongs to the kind of 'class' i.e. is 'n' class, and o belongs to S and a belongs to S, then the successor of a belongs to S); -- this initial theorem or axiom is called the 'mathematical induction', viz. every number belongs to S, if, at least S is such that, in S, every property proper to o and which can be extended from every number a until its successor is ipso facto also proper to all numbers; i.e. take a sample in the classes, take out S : if S is such as described, then S is the set of numbers: (the whole expression)). No, ==S.

(5) a,b e. No $^{a+} = b+$). A = b (if a and b are numbers and the successors of a and b are equal, then a is equal to b);

(6) a e. No). a + = 0 (if a is 'n element of the class'number', then the successor of a is not equal to 0).

Note -- The "power" of these axiomata, separately and necessarily sufficient, extends over the natural integers.

For example, if one wants to work with negative numbers (analysis companies), then one should introduce the corresponding axioms: e.g. -a e. No (the negate of a is element of the set 'number' (is 'n number).

b1a. With these premises (axiomata) comes a set of deduction rules, by which all other propositions are derivable, viz. the laws in particular.

b2 To all this belong formal rules of operation or syntax such that one can formulate well-formed formulas (of which the laws of logic are a part (subclass)), and do so in such a way that 'completeness' is exercised (reliable system).

Conclusion. - 1/ The symbols, 2/ The axiomata with the rules of deduction and operation or derivation make up a formal language system, a kind of empty but universal artificial language, which avoids the inaccuracies of the ordinary or common language (exact language).

The formal language system is such that both the computer, if properly programmed, and the human, if trained in a learning process to manipulate artificial language, can use it with equal fluency.

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