LIFE AS POLY-CONTEXTURALITY[*]

by Gotthard Günther

Kein Lebendiges ist ein Eins,
Immer ist's ein Vieles. (Goethe)

Part I :   The Concept of Contexture

A great epoch of scientific tradition is about to end. It has lasted almost two-and-a-half millennia and philosophers and scientists begin to call it the classical period of science. However, there is not yet a clear conception of what basically characterizes the past scientific tradition and what distinguishes it from the era we are about to enter and which might rightly be called the age of trans-classical science. We shall start our reflections with a short analysis of the fundamental difference between the two. It is possible to trace the distinction between the classical and the trans-classical back to deeply hidden metaphysical assumptions about the nature of this Universe.

Everybody knows that the Greeks were the creators of the classic concept of science, and that this concept was first clearly formulated by Aristotle. The dominating intent of the philosophy of Aristotle is, as he himself insisted, purely methodological. He starts from the sharp Platonic distinction between Being and Thought or between object and subject, and poses the question: How can Thought ever know Being in a rigorous and communicable way? The method is – according to the Aristotelian logic – found to be in the deduction of the particular from the general. The general, however, is something which bridges the cleft between the objectivity of Being and the subjectivity of Thought. Despite their infinite variety the particular things that exist in this Universe have something in common that links them ontologically together and that is their ultimate essence: Being, manifesting itself as objective existence. The realness of the objects is always the same at the bottom, although it appears in infinitely differentiated properties. In short: Being is an undifferentiated all-pervading universality and the many things and appearances in this world are only the more or less particular manifestations of an underlying general substance or essence, which is the same in everything that exists in this world. If we are looking for distinctions we have to move into the realm of the particular. Being-in-general shows no distinctions.

On the other hand, as Aristotle points out, when we think we also try to deal with the relation between the general and the particular by either deducing the particular from the general or by inductively ascending from the particular, to the general. Thus Greek philosophy discovered a common link between subjective Thought and objective Reality. It is the general or – as it is better called in its ontological aspect – the universal. The general is, – qua Being, the ultimate substratum of Reality on which

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everything rests, but at the same time it is the supreme Idea from which all particular thoughts derive.

It follows that we are in possession of something which Leibniz much later called pre-stabilized harmony between our thoughts and Reality. On the one side the general qua Being is the cause of the things and events in this physical world; on the other side the general is the reason from which our ideas and concepts logically follow. The Table I below illustrates this dualism which emerges from the peculiar ambiguity of the general:

Table I

Universal or General	
Being	Thought
Causality	Reason
Thing	Concept
Positive	Negative

It follows, according to Aristotle, that a logical necessity as conceived in the mind of the scientist is the exact image of the objective connection which links Being in general to the particular things in this world and their properties. In other words: Thinking faultlessly will always describe objective Reality in an adequate way. This implies that by following the laws of reason we may accurately postulate the existence of things in this world before we have empirically discovered them. An example in modem physics is the postulation of the existence of elementary particles long before the experimental means are available to demonstrate their reality in a physics lab.

In view of its amazing success in the history of western science, we do not see the slightest reason to quarrel with the Aristotelian theory of epistemology, at least as far as it goes. But this theory – solid as it is within in its own confines – has certain limitations. It has happened again and again in the development of classical science that the latter was confronted with certain phenomena occurring in this world where the answer of the investigating thinker always had to bet that the phenomenon in question could not be explained because of its irrational character. Thus the question arose whether the world we live in is perhaps composed of two antipodal components, one being rational and accurately describable and one irrational and not conceivable by rigorous logical means. It is the characteristic feature of all classic science that the answer to the above question has been emphatically affirmative. Moreover, the source of this irrationality was identified as the subject of cognizance itself. It was pointed out – with some justification that objectivity could not possibly be the source of the irrational; which left only the subject. And since the Aristotelian epistemology required a clear cut distinction within subjectivity between the subject as the carrier or producer of thoughts and the thoughts themselves, it was reasoned that the subject of cognizance could have rational thoughts without being a rational entity itself. To seek the source of irrationality on the side of the subject was quite plausible, because subjects can err and sin but nobody in his right mind would insist that mere objects are capable of sin or error. They just are. In the course of classic tradition the two terms "objective" and "rational" have become practically synonymous.

It is the mark of distinction between the period of classic science and present attempts to establish a concept of trans-classic science that we are nowadays forced to question the theorem of the irrational character of the subject of cognizance. Since Kant´s *Critique of Pure Reason* we know, at least logically, that certain features of subjectivity

can be interpreted in rational terms. And more recently, especially since the advent of cybernetics, it has been demonstrated that certain data that the classic tradition judged to be "spiritual" or "transcendental" can be unmasked as mechanisms. In other words: they are capable of objectivation and technical replication … so they cannot have an irrational root.

However, since we insist that the Aristotelian epistemology is valid as far as it goes, the only way open to us is to ask ourselves whether this basis of knowledge might not be broadened. In order to do so let us go back to the original metaphysical assumption from which Aristotle starts: Everything there is in the Universe shares in the general category of Being. And Being is identically the same in all appearances and varieties of existence. As much as any two things might differ in the predicates or properties that belong to them, they are identical qua Being. Being is the underlying substratum which carries everything and which pervades all there is in exactly the same way. This means: Being per se is – as noted above – in itself totally undifferentiated. It is "symmetrical" having no different properties in different parts of the Universe. The only distinction that can be attributed to it is that it is distinguishable from Nihility or Nothingness. Nothingness and Being are related to each other in such a way that their mutual ontological position is defined by the logical principle of the Tertium Non Datur (TND). Something is or it is not; that is all there is to it in ontology.

It is obvious that the alternative between Being and Nothingness is the absolute widest that our thinking may conceive and we shall call, from now on, a domain which is characterized by an absolutely uniform background and whose limits are determined by an absolutely generalized TND an ontological contexture or contexturality. The role that the TND plays with regard to the concept of a contexture indicates that the structure of such a domain can be exhaustively described by a two-valued logic. At this junction it is important to remember that the TND which encompasses the domain must be the most general that is conceivable because a two-valued logic implies an infinity of TND´s involving partial negations. If we e.g. pose the alternative "the defendant is guilty or not guilty", then we encounter also a TND of sorts. But the range of terms is rather limited because it extends only to juridical concepts, and it should be pointed out that such a TND does not constitute a genuine contexturality. We make a sharp distinction between the familiar term "context" and "contexture". If we speak in every day language of context we do not imply a universal TND the generality of which cannot be surpassed but we make this very implication when we speak of contexture or contexturality.

We are now ready to see the deep ontological assumption which lies behind the epistemology of Aristotle. It can be formulated as follows: the Universe is, logically speaking, "mono-contextural". Everything there is belongs to the universal contexture of objective Being. And what does not belong to it is just Nothingness.

From all this follows that every logical operation we can perform is confined to the contexturality in which it originates. It is trivial to add that no logical operation can start in Nothingness or continue there. But also, if we count numbers this process of counting, i.e., the sequence of numbers, is *confined to the contexturality in which it originates*. You cannot cross the borderline between Being and Nothingness and still continue your process of counting.

Such arguments are obvious. However, what is by no means self-evident is that we have to consider Nihility or Nothingness also as an "ontological" contexture. The difficulty is

that, if we insist on describing Nothingness as a contexture, we have to borrow our terms from Being, and doing so we discover we have only repeated our description of the contexturality of Being [1]. Nevertheless, the domain of Nothingness has proved extremely useful in the history of human thought. Whenever it was assumed that Reality harbored a rational as well as an irrational component the contexture of Nothingness served as the ontological location for everything that did not seem to be rationally conceivable. It also served as the ontological locus into which the observer of the world could be placed because it became very soon evident in the history of logic and of epistemology that the classic pattern of thinking with its concomitant mono-contextural ontology offered no place for the observer of the world or the thinking subject because it would have been absurd to assume that the subject of *cognizing* belonged in the contexture of that which was *cognized*. On the other hand, since that which was cognizable on principle constituted the possible range of world experience, there was no place for the subject inside the world. Thus human thought unavoidably projected a transcendent domain beyond all Being, and Nihility served as a very convenient vehicle for such projection. The most outstanding historical example of such a projection is the "negative theology" of Dionysius Areopagita.

The ontological domain of Being – i.e. our first contexturality – had its range of objects generated by the TND (in the field of partial negations) and if there ever existed any agreement in the history of logic, then it was this: that such a logical principle could not generate the ontological conditions for the existence of a thinking subject. The relation of the cognizing subject to its range of objects is always one of discontexturality [2]. Of course, this argument should also have been valid for the contexturality of Nothingness, but by transposing this contexture into a supernatural Beyond, the mysterious Nihility was exempted from such rigorous demands.

The first thinkers who broke consistently with the Aristotelian assumption of the mono-contexturality of this world were the transcendental-speculative idealists Kant, Fichte, Hegel and Schelling. It was especially Hegel who pointed out (although in a different terminology) that Reality must have a poly-contextural structure; and that it is impossible to bring two different contexturalities into an immediate confrontation. This lies behind the provoking statement in the first part of his "Science of Logic" (Wissenschaft der Logik) that Being is Nothingness and Nothingness is Being, and that they cannot be distinguished in their immediacy (Unmittelbarkeit) [3]. He then continued to demonstrate that there is one basic category which cannot be harbored either in the contexture of Being (which represents a static IS) or in the contexture of Nothingness. This is the category of Process or Becoming (Werden). By showing how Becoming has a component of Being as well as Nihility, he unwittingly laid ground to a theory of "poly-contexturality". Because, if we want to establish such a theory, we should not assume that all contexturalities can be linked together in the way a geographical map shows one country bordering on the next in a two-dimensional order. If the contexturality of Becoming overlaps, so to speak, the contexture of Being as well as of Nothingness, and the contexture of Becoming in its turn may be overlapped by a fourth contexture which extends beyond the confines of the first three, we will obtain a multi-leveled structure of extreme logical complexity.

Hegel´s logic further shows that if a plurality of contextures is introduced one cannot stop with three. In fact, one has to postulate a potential infinity of them. If one believes Hegel and there are most convincing arguments that one should – then *each world datum in the contexturality* of *Being should be considered an intersection* of *an unlimited number of contextures*. Table II with its seeming chaos of straight lines crossing each other at all possible angles may illustrate what is meant. Each contexture is logically finite insofar as its structure is confined to two values. But their respective ranges are

Table II

infinite because one can generate, within the respective domain, a potential infinity of natural numbers. We have indicated the logical finiteness of the different contextures by having them represented by lines no longer than 2 inches.
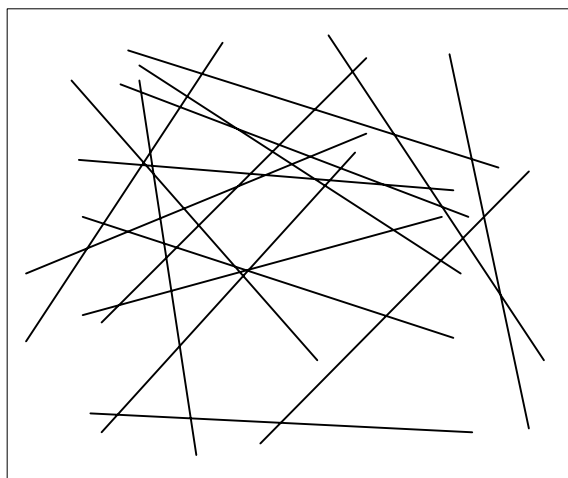
In Table II our contextures are arbitrarily chosen and what they represent seems to be a rather chaotic jungle. However, we insist that there is no such thing as chaos in Reality. In fact, we may say that Reality and Order are synonymous terms. If something is, it must have order and if it appears as chaos it only means that we have not yet found the code which unravels the seeming chaos and shows us the hidden order in the imbroglio.

There is no doubt that this Universe we live in displays an enormous amount of contextures in a bewildering arrangement. Since we have defined a contexture, by reference to the TND, as a domain the boundaries of which cannot be crossed by processes taking place within the range of the domain, we are forced to assume that all psychic spaces of living organisms – constitute closed contextures. It is self-evident that the process of thinking taking place within one person cannot be continued into the psychic space of a second person. My thoughts, as mental events, are only mine and nobody else´s. A second person may produce the very same thoughts; but they are his and can never be mine.

The concept of contexturality illustrates the age-old logical distinction between identity and sameness. If I count 1, 2, 3, 4, … and so does my neighbor, then the numbers we both count are the same. However, insofar as these numbers have their existence only in the counting process, they are not identical because the two counting procedures can be clearly distinguished as having different origins in two separate organic systems. In other words: in the situation described above the sequence 1, 2, 3, 4, … turns up in two separate contextures. And no matter how far I count there is no number high enough to permit me to cross over to the psychic space of my neighbor.

But what we say about ourselves and our neighbors is equally valid for every animal as far as it has a consciousness, and this alone shows that the number of closed contexturalities which crisscross this Universe is enormous.

On the other hand, if we speak about the Universe as a whole, the very term uni-verse suggest that all contexturalities somehow form a unit, the unit of contextural existence

and co-existence. We shall call such a unit a compound-contexturality. In other words: the confusing lines of Table II must form, in their relations to each other, an order which constitutes a unity. Part II of our analysis shall show how such an order or unity can be detected.

Part II : Contexture and Proto-Structure

We have insisted that a contexturality is a logical domain of a strictly two-valued structure and its range is determined by using the TND as an operator such that the generality of the alternative which the TND produces cannot be surpassed. In other words: if we consider the Universe as a compound-contexture it must be composed of an innumerable number of two-valued structural regions which partly parallel each other or partly penetrate each other since, as we pointed out, each observable entity in this Universe must be considered an intersection of an unlimited number of two-valued contextures. This suggests the following idea: If we consider such a point of intersection as belonging only to one contexture, the point can only be occupied (consecutively) by two values. If we consider it as belonging to two contextures, the point will still only be able to be occupied by two values but they may now belong to two different contextures. This means: one value may belong to one and the other value to the other contexture … provided the contextures intersect at the place which is occupied by the value.

In Part I we introduced the distinction between sameness and identity. The two-valuedness in each contexture is the same as the two-valuedness in any other contexture. But this does not mean that – let us say – the positive value in contexture A is *identical* with the positive value in contexture B. But as the identity of the "same" value changes with reference to different contextures, we may – although we insist that our Universe displays in each contexture a strictly two-valued structure – introduce a system of many-valuedness with regard to the identity problem. Such a system of many-valuedness will *not* constitute a many-valued logic which we may use as a vehicle for our thinking. It will *not* describe the Laws of Thought as produced by a human consciousness. It cannot be done because, according to what we have previously said, the psychic space in which thought processes evolve constitutes a closed contexturality and is, as such, strictly two-valued. But the projected system of many-valuedness will form what we shall call an ontological grid which determines the relations of the various contextures to each other.

It will be our next task to construct the most elementary form of such a grid. We must start, of course, with a one-valued system and there is little to say about it because it can only be represented by a single symbol and no operator is as yet available to manipulate it. Moreover, if by some miraculous method we could manipulate it, this would entail transforming our symbol into a different one but since no second symbol is available the only manipulation which might be conceivable would make our symbol disappear. In order to obtain a system capable of positive manipulation, we must turn to a two-valued system, which – trivial to say – requires two values *and* two places to put them in. This leads to $2^2 = 4$ possible combinations of the available values, as shown below:

$$\text{T F T F}$$
$$\text{T F F T}$$

where T means, in classic logic, "true" and F "false." However, since we insist on distinguishing places from values which can be put into places we have a means to tell bare structure from the value configurations which may occupy it. We shall use for empty place structures the small letters of the alphabet and it is obvious that the letter sequence $\begin{matrix} a \\ a \end{matrix}$ represents $\begin{matrix} T \\ T \end{matrix}$ as well as $\begin{matrix} F \\ F \end{matrix}$ and that $\begin{matrix} a \\ b \end{matrix}$ stands for $\begin{matrix} T \\ F \end{matrix}$ and also for $\begin{matrix} F \\ T \end{matrix}$. If we proceed to a three-valued-system – which means, of course, adding one more value and one additional place – we obtain $3^3 = 27$ value configurations which shall be reduced in the same manner. Thus we obtain the following place structure:

$$a\ a\ a\ b\ a$$
$$a\ a\ b\ a\ b$$
$$a\ b\ a\ a\ c$$

So far, so good. But since we are intent on reducing our structures to the barest possible minimum, we shall now stipulate – a stipulation not yet necessary in the case of two-valued logic – that the position of a place symbol in a given symbol sequence shall be irrelevant. This enables us to reduce the 5 vertical sequences above to 3. So we get the following result:

$$a\ a\ a$$
$$a\ a\ b$$
$$a\ b\ c$$

We shall, for convenience´s sake, always start with the letter a on top and introduce b only after our store of a´s is exhausted. And c will follow when there are no more b´s available to put them above it, and so on.

Our next step leads us to a system with four values and four places. Here the number of comparable value configurations increases to $4^4 = 256$. In order to reduce this amount to a size comparable to the previous place structures, we add another stipulaton which was necessary neither in the case of the two nor the three-valued system. We shall make the condition that, in addition to the former restrictions, only the symbol for the first place (a) may be repeated in a single vertical column. This leads to the following drastic reduction. First step:

$$a\ a\ a\ a\ a\ a\ a\ a\ a\ a\ a\ a\ a\ a$$
$$a\ a\ a\ a\ a\ b\ b\ b\ b\ b\ b\ b\ b\ b$$
$$a\ a\ b\ b\ b\ a\ a\ a\ b\ b\ b\ c\ c\ c\ c$$
$$a\ b\ a\ b\ c\ a\ b\ c\ a\ b\ c\ a\ b\ c\ d$$

If we then ignore that the position of our letters is relevant, we obtain (as a second step) the further reduction to

$$a\ a\ a\ a\ a$$
$$a\ a\ a\ a\ b$$
$$a\ a\ b\ b\ c$$
$$a\ b\ b\ c\ d$$

However, since we will permit only one place symbol to be iterated, we have to eliminate the central vertical column and we obtain as the final result

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a a a a
a a a b
a a b c
a b c d
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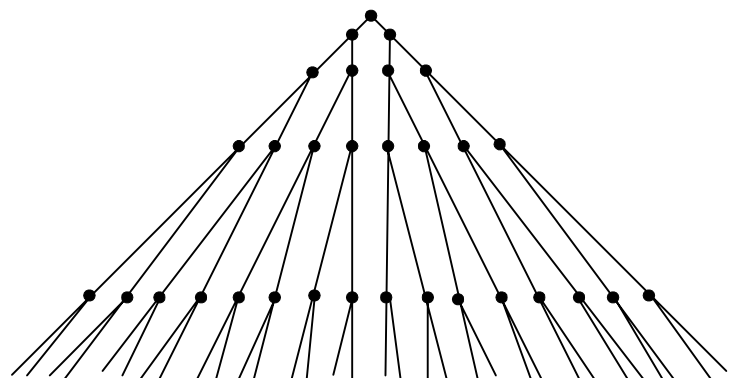
Table III

If we proceed to a five-value system no further reductional stipulations are necessary to obtain the bare minimum structure; and this goes too for all further increases in values and places. Thus we obtain a kind of pyramid with a single place on top and an ever broadening base at the bottom. For every value added the base increases its width by one vertical column as shown in Table III.
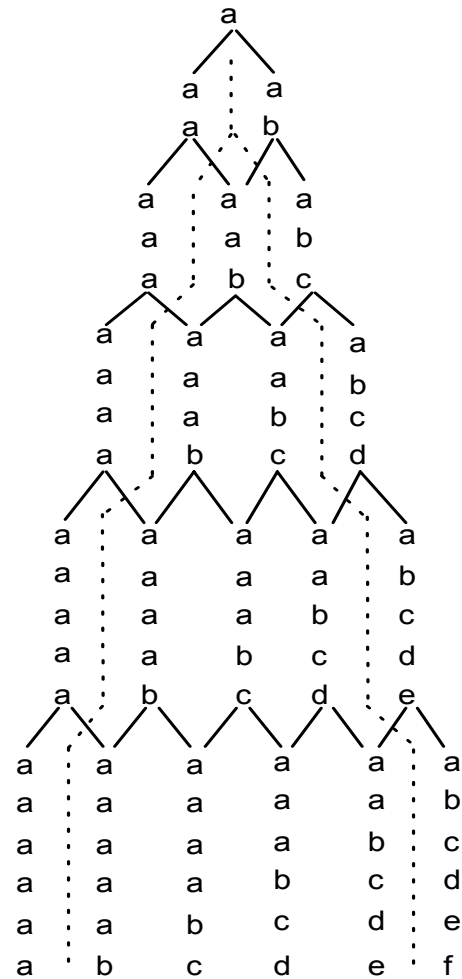
This table displays the most elementary structural configuration for places corresponding up to 6 values. We have connected by continuous lines the vertical columns of ever increasing length according to a rule which shall be explained further on. We have also drawn dotted lines which separate the letter sequences at the extreme left and the extreme right from what there is between them. These value sequences, where on the left side the place symbol never changes and on the right side no letter is ever repeated in a given vertical sequence, have logical characteristics which set the commonly apart from all the other sequences. The letter arrangement in Table III was, in former publications of the author, called "proto-structure" and we shall use this term from now on.

The proto-structure gives the appearance of rather trivial structural characteristics. But it contains, as we shall soon see, at least one essential feature which is anything but trivial. We shall describe it in contrast to another pyramid which stems from the days of Plato and which describes the relation between the genus proximum and the differentiae specificae in a classic two-valued logic. This pyramid starts at the top with the most general term (the Platonic Idea) and

Table III (proto-structure):

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                        a
                    a       a
                    a       b

                a       a       a
                a       a       b
                a       b       c

            a       a       a       a
            a       a       a       b
            a       a       b       c
            a       b       c       d

        a       a       a       a       a
        a       a       a       a       b
        a       a       a       b       c
        a       a       b       c       d
        a       b       c       d       e

    a       a       a       a       a       a
    a       a       a       a       a       b
    a       a       a       a       b       c
    a       a       a       b       c       d
    a       a       b       c       d       e
    a       b       c       d       e       f
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Table IV

Table IV

reaches down from there to the more and more particular and would have, at the bottom, the set of all irreducible individuals – a logical goal which, of course, can never be obtained since the pyramid is as bottomless as the one of proto-structure.

Table IV shows this pyramid and we see at once that it illustrates a famous metaphysical principle as pronounced in antiquity. It is contained in the terse Platonic statement ὁδὸς ἄνω κάτω μία (the way up and down is one). If we want to trace the track from one single point below to the top of the Platonic pyramid, we notice that there is one and only one way to do it. And if we want to return from the top to the very same particular point, there is no other road but to retrace our original steps.

What this pyramid depicts is the structural pattern of an absolute hierarchy where all elements are linked by a common measure. This assumption that the universal dominantes the particular and that the relation between the two is totally non-ambiguous has governed all ontological reflections as well as specific mathematical and logical endeavours for more than two millennia. We may add now, after what was said in Part I, that this order will always be valid and unimpeachable, provided we restrict ourselves to a closed contexturality.

If we now compare the Platonic pyramid with the pyramid of proto-structure in Table III, we are in for a considerable surprise. We shall notice that the ancient metaphysical thesis, that the way up and the way down are identical, holds only for the symbol sequences on the extreme left and the extreme right, located outside the dotted lines. In both of these cases there is only one way to go from the bottom to the top and the very same way to descend from the top to the bottom. For all the other sequences, however, this principle is invalid. We shall illustrate this with the way the sequence a a b issues from the sequences a a and a b. We have an equal right to say that our three-place sequence is derived from a a by adding b to it; but we might as well say that a a b emerges from a b by repeating the a. This means that for all the symbol sequences inside the dotted lines there are various ways from the bottom to the top and vice versa. And going down to the very same place we have the choice of taking the same way we came up but we might as well, within the given limits of the structure, choose a different route. This is the meaning of the connecting lines between the letter columns. They indicate the possible choices for ascending or descending between the top and base of the pyramid.

This possibility of choice is very significant because it shows that we may also use the pyramid of proto-structure as a Platonic pyramid. It goes without saying that by doing so we forfeit theoretical possibilities which might be otherwise available.

Here we come to an important point in the theory of trans-classic contextures. Since the advent of the so-called many-valued logics, conservative logicians have insisted again and again that there is no need to go beyond two-valued logic and that every aspect of the Universe wherever we look displays a two-valued structure [5]. This is perfectly true and we are the last to deny it. But the argument misses the point. Wherever we extricate any two data from this world, we will find that they share in a common contexture and that their relations can be described by a two-valued logic. This test will never fail us. But since we pointed out that every ontological datum of the world must be considered an intersection of an infinite number of contextures, the fact that – any two data we choose to describe in their common two-valued relations belong to one contexture does not exclude that the very same data may also – apart from the

contexturality chosen for our description – belong separately to additional and different contexturalities. Our first datum may, e.g., be an intersection of the contexturalities α, β, γ, λ and the second may be intersected by the contextures β, δ, κ, π it. What we insist on, however, is that any two world data we choose to compare have at least one contexture in common. They may share in more but it is impossible that there is no contextural linkage between them at all. If that were the case then one of the two data would be "not of this world ".

Another way to put it is that for any two data which share a given contexture there will always be a third datum that is excluded from it. This is the meaning of Hegel's insistence in the face of the TND that there is a Third.—

When we compare the Platonic pyramid of the relations of the genus proximum, and the differentiae specificae with Table III, our comparison will not be complete unless we draw attention to a second difference – apart from the violation of the $\delta\delta\delta\varsigma\ \ddot{\alpha}\nu\omega\ \varkappa\acute{\alpha}\tau\omega\ \mu\acute{\iota}\alpha$ tenet by proto-structure – between the two pyramids. In the Platonic order of concepts only the very first bifurcation of the pyramidal structure may be interpreted as a total negation between positive and negative in general. Since the number of values represent a simple duality all the way down to the bottom of the pyramid, all subsequent bifurcations lead to partial negations. This is why a logic based on the principle of value duality has to stay within a single contexture and cannot cross its boundaries. The pyramid of proto-structure, on the other hand, does not deal with partial negations at all. Its ever widening scope is produced by the acquisition of – new values and consequently adds new contextures in addition to the first on top which it shares with classic logic, if we just make a general comparison. However, since any value (and its total negation) may be chosen as an ontological departing point for a two-valued system, we may consider the pyramid of protostructure as an ontological grid which describes the mutual positions of single contextures.

Furthermore: since classic logic recognizes only a single contexture the relation of concepts to numbers remains, notwithstanding the work of Kurt Gödel, rather undefined. What Gödel has demonstrated is that logic is capable of arithmetization. But his arithmetization concerns only the extensional domain of logic and bypasses those intensional relations where dialectical principles come into play. However, if we proceed from a single contexture to poly-contextural structures by increasing the number of total negations, a much closer connection between concept and number is established. We shall take the first step in this direction by attaching numbers to our proto-structural grid. This will give us the opportunity to discuss in Part III some of the aspects of a poly-contextural ontology and its logical consequences.

Part III : Platonic Hierarchy and Contextural Heterarchy

When we developed a pyramid of proto-structure we did so by adding with every step down one new place for value occupancy. This was done in a twofold way: we either repeated the original symbol or we added a new symbol. We shall from now on call the first method of increase "iteration" and the second "accretion." The symbol sequences outside the dotted lines are, as Table III shows, fully iterative on the left side and on the right side fully accretive. What is inside the dotted lines, is partly iterative and partly accretive with changing ratios between iteration and accretion. It is now very simple to attach numerical values to each of these symbol sequences by counting the number of

symbols that make up the length of a sequence and by counting the number of accretions it contains. Our first symbol "a" will be counted as the first accretion, and by putting the number for the length of the sequence first and for the degree of accretion second, and separating both numbers by a colon, we obtain for $\begin{smallmatrix}a\\a\end{smallmatrix}$ the numerical expression 2:1 and for $\begin{smallmatrix}a\\b\end{smallmatrix}$ consequently 2:2.
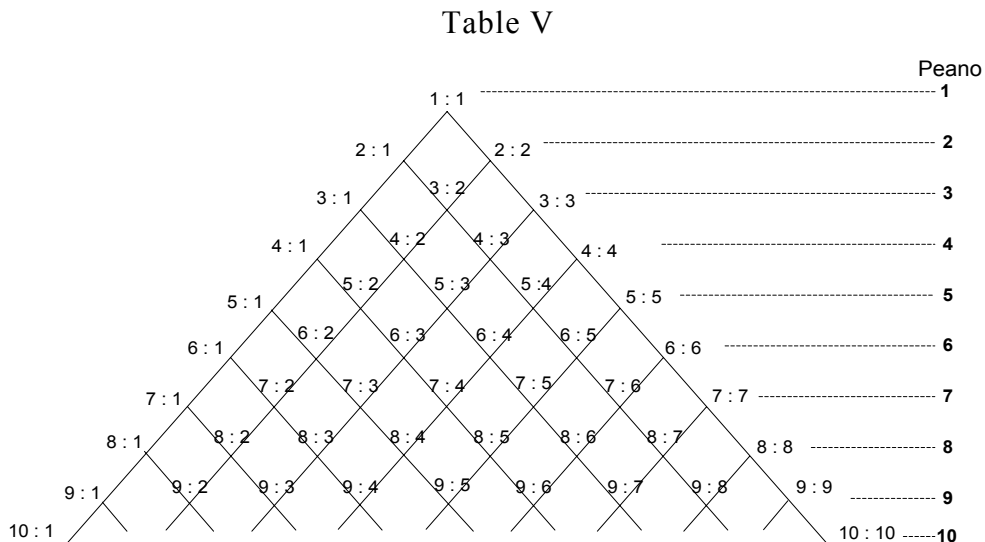
Table V

Table V shows this numerical pattern up to 10 places. On the right side we have written the familiar sequence of natural numbers as defined by the axioms of Peano and which represent the antique tenet that the way of counting up and counting down is one and the same. Within the pyramid we have again separated the numerical sequences at the extreme right and the extreme left by dotted lines from what is inside the pyramid. There is only one way to go from 1:1 to 10:1 and back. There is also only one way to do this between 1:1 and 10:10 However, if we want to count from 1:1 to – let us say – 10:5, there are already 126 ways to choose from. These choices increase very rapidly and, if we would proceed to the number Of 20:11, the ways we could count from 1:1 on would amount to 184756 different sequences. The increase of choices for any n : m can be derived from the formula

$$\binom{n}{m} = \frac{n!}{(n-m)!\,m!}$$

In other words: we can read them off the table of binomial coefficients.

In order to use proto-structure as an ontological grid for contextures we shall project the Platonic pyramid in various ways onto proto- structure, as will be demonstrated by the following 3 Tables. In Table VI we have superimposed the Platonic pyramid in such a way onto proto-structure that the apex of the two-valued pyramid coincides with 1:1 Proto-structure is indicated by dotted lines and we notice that the dichotomies of classic logic only start from certain intersections of the protostructural grid which are separated by increasing intervals determined by the squares of natural numbers. It seems that this relation between logical dichotomy and the squares of natural numbers was already discovered in the Platonic academy and some scholars ascribe it to Plato himself.
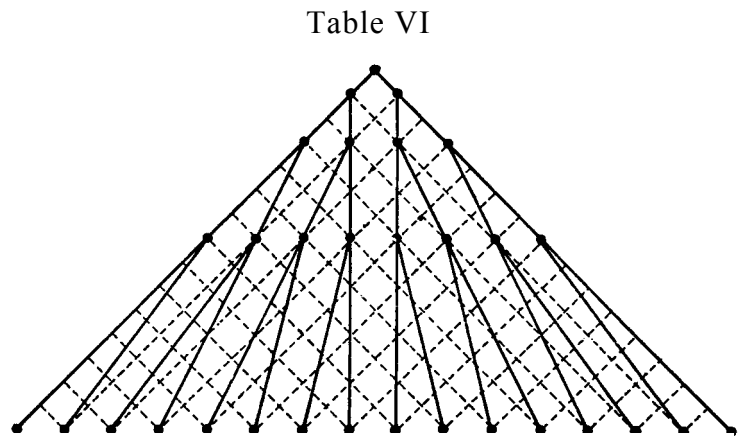
Table VI

On the next Table VII we have moved the apex of the Platonic pyramid one step down, and we have taken the left side of the bifurcation at the top so that the apex is now located at point 2:1 of our proto-structural grid. But we have also put into the same grid a second Platonic pyramid starting at 15:11 to illustrate our point further that this grid encompasses an infinite variety of two-valued contextures. 15:11 is, of course, quite arbitrary as a starting point, and we might as well have used any other intersection of the dotted lines.
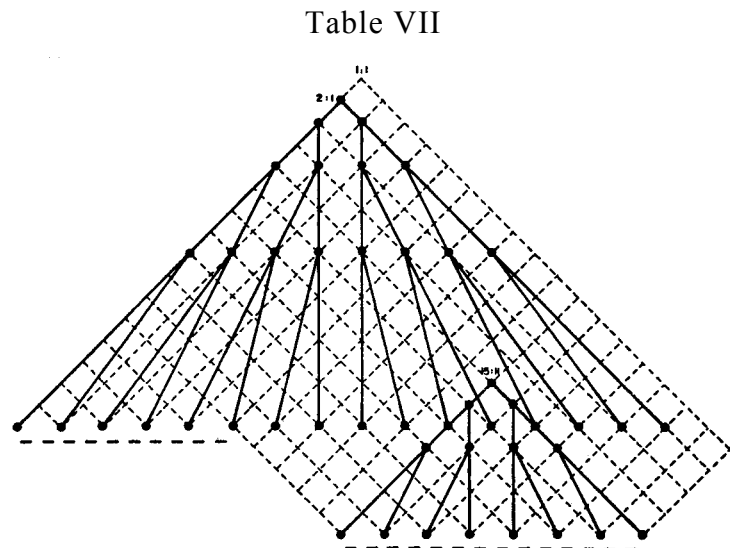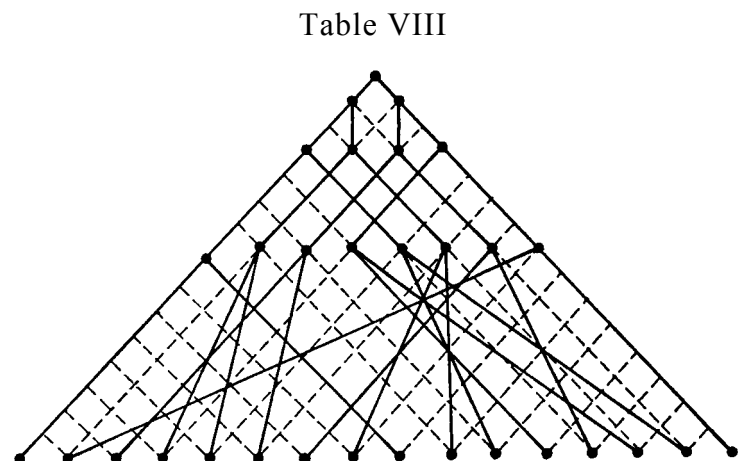
Table VII

Table VIII finally, was drawn to remove the prejudice that a Platonic pyramid, if projected against the background of protostructure, must necessarily have a symmetrical

Table VIII

shape. In Table VIII we have moved the apex of the two-valued pyramid back to 1:1 And for the first two steps down we have repeated the previous pattern. For the next step down (from 8:1 to 8:8) we have still adhered to symmetry but made the lines of the dichotomies cross each other. From the eighth level of proto-structure down to level 16 we have abandoned the principle of symmetry and drawn our bisecting lines indicating two-valued dichotomies in quite an irregular manner. This was done to show that what is logically relevant in the Platonic pyramid apart from the principle of duality is only the tenet ὁδὸς ἄνω κάτω μία. Since one can go only from one heavy dot to the next on the levels 1, 2, 8, 16 and cannot change straight lines at any intersection in between, the principle that the way up and the way down is one is still preserved, and that is all that matters. Our configuration of the heavy continuous lines still represents the Platonic pyramid although the eye may have difficulties recognizing it as such. Our nonsymmetrical Platonic pyramid still constitutes an absolute hierarchy in a world where everything has a common ontic measure. But having a common ontic measure is only a different expression for saying that everything belongs to the same contexture.

Since we have demonstrated the origin of proto-structure we know that our grid determines only the relative positions of individual contextures to each other in a Universe where only one ontological datum (or one symbol) is permitted to be iterated. In case we discover that this does not yield a sufficient number of contextures, we may proceed to a more elaborate grid by stipulating that a second, a third, a fourth and finally any symbol may be iterated. If we still stick to the requirement that the placement of the symbol is irrelevant, we obtain a configuration which we have called (in a different publication) deutero-structure [6]. By again projecting contextures – but this time onto deutero-structure – we obtain richer relations between the single contextural domains and, of course, even more contextures. However, since Science is insatiable in its demand for precision in details, in the next step we may require that even the placement of a single symbol in an individual sequence may be relevant with regard to the relative positions of contextures to each other. This leads to a third and ultimate grid which the author has formerly called trito-structure.

So far we have dealt with radically formalistic techniques. But since our exploration of the world will always face the problem of the opposition between pure form and matter in the sense of content of the form, we can deal with this problem in the following way: First let us remember that we obtained proto-, deutero-, and trito-structure by dealing only with empty places from which value occupancy had been removed. The letters a b c d … in Table III signify nothing but empty places which can be arranged according to certain rules. This remains so in deutero- and trito-structure. But after having reached this maximum of structural configurations, we may reintroduce values into these configurations of empty places as their contents. Relative to the empty place the actual value which is inserted is something entirely contingent. In other words: the relation between place and occupying value corresponds to the distinction between form and matter.

However, this essay is not the proper place to follow this trend of thought any further. In fact, it cannot be fully discussed unless the relation between pure form and number is further developed. According to Plato, numbers occupy an intermediate place between the empyrean realm of Ideas and the empirical world of our sense. If this doctrine is true – and so far it has not been refuted – then it is impossible to apply trans-classic

(many-valued) logic directly to our physical world. It can only be done through the mediation of numbers.

Epilogue

What remains to be discussed is the significance of the concept of contexturality to the phenomenon of Life. It has been an ancient belief that Life, Soul or Subjectivity are phenomena which have no ontological grounding in our physical Universe. If we are to believe Socrates in the Dialogue "Phaidon" the Soul stems from a transcendent world and has strayed into this mundane world only to return after death into the unfathomable Beyond. If we divest this idea of its mythological connotations, there remains an abstract pattern of thinking which, properly modified, will have to be recognized as valid. We shall formulate it as follows: Between the inanimate phenomena of this Universe and the phenomenon of Life or Subjectivity there exists a logical break of contexture. If we speak of Life, Consciousness, Soul, Thought or Will we refer to an as yet unexplored property of the Universe which we shall call its discontexturality. What classic science has investigated so far is a subjectless Universe; and a subjectless Universe presents us with a rigorously mono-contextural structure. The property of discontexturality has no place in it. But when early Man discovered that this Universe also harbored the phenomenon of animated matter there was no other way to explain it but to say that Man had not only to deal with the forces of this World but in addition with trans-cosmic powers that broke into this World from an unapproachable Beyond. When the world religions speak of Heaven, or Hell they refer, in fact, to the phenomenon of discontexturality. But since every higher religion is coupled with the unshakeable belief that this earthly realm is mono-contextural, discontexturality automatically assumed the function of the borderline between physical reality and a spiritual Beyond.

On the other hand, the turn from classic to trans-classic thinking means that the mono-contextural concept of Reality is abandoned and replaced by a poly-contextural theory of Existence which makes room for the phenomenon of Life within this Universe. In a poly-contextural Universe we do not have to consider Life as an element totally alien to inanimate matter, because matter in itself already contains the seeds of Life in its dialectical contraposition of Being and Nihility.

It is, of course, still valid – up to a point – to consider the "material" substratum of this world as mono-contextural (naive materialism). But it will be necessary to consider all living organism as poly-contextural structures.

For the classic tradition there is a complete break between Life and Death. It is theoretically, although not practically, possible to fix the moment of Death as the time when the Soul departs from the body. From the poly-contextural aspect of a living body this is on principle impossible, because Death means only a gradual decrease of the discontexturality of Matter.

We are beginning to learn that the discontexturality of a human body, e.g., is enormous; the numbers of contextures that are involved are superastronomical. And since the phenomenon of discontexturality also involves the relation of an organic system to its environment it is quite legitimate to say that something may be alive relative to one environment and dead relative to another – an assumption that would be absurd if we

defined Death as the departure of a unit Soul from inert matter it had previously animated but has ceased to inhabit.

One final word regarding the "secularization" inherent in the concept of discontexturality: when we say that the immanence of earthly existence is separated by a metaphysical abyss from the transcendence of Heaven and Eternity we imply, first, that "Being" in our physical world is not the same as the "Being" of Heaven or Hell. In other words: there is an ontological difference between the two, as all great world religions have insisted. Second, we postulate that all our subjective stirrings as perception, feeling, willing, and thinking will break down at the barrier between the Here and There.

The Beyond is only conceivable as a mysterium of which we may know only by divine Revelation.

It should be kept in mind that, if we postulate a polycontextural Universe, the barriers of discontexturality which now cut through this empirical world, have lost nothing of their intransigency by being multiplied. But just the same the situation is different. Since the classic tradition permits only one discontexturality, i.e., that between the so-called physical and the so-called spiritual there can be no such thing as linking two elementary contextures into a compound contexture, for this would require a minimum of three contextures. One of the three would have to mediate between the other two. In other words: we would be provided with a contexture describing the phenomenon of discontexturality. This is the point where dialectic logic starts.

The point is reflected in theology in the statement that the almighty God rules Heaven *and* Earth. In order to give credence to this claim theologians have dogmatized that the Divine has to be understood as a Trinity – a dogma which again is capable of secularization. However, as soon as we admit the possibility of a trinitarian compound structure, the gates are open for the acceptance of compound contexturalities embodying an infinite sequence of higher complexities.

Notes and References

1. In order to clarify the mutual positions of Being and Nothingness it might be said that they are distinguishable as domains but indistinguishable with regard to their range.
2. See G. Günther, "Cybernetic, Ontology and Transjunctional Operations" in Self-Organizing Systems 1962, M. C. Yovits, G. T. Jacobi, and G. Goldstein (eds.), Spartan Books, Washington, D. C, p. 313-392. There the discontexturality of a value is established by its having a rejection function.
3. Hegel, Cf. "Wissenschaft der Logik", WWIII, Meiner (ed.), 66-67, 1923.
4. G. Günther, G. "Natural Numbers in Trans-classic Systems", BCL Report No. 3-4, AFOSR 68-139-1, AFOSR 70-1865, Department of Electrical Engineering, Engineering Experiment Station, University of Illinois, Urbana, 42 pp. (1970)
5. It is significant that such recent handbook of Logic like Norman L. Thomas "Modern Logic", first published in 1966, refers to many-valued logic only in a footnote (P. 92) Of two (!) lines. (Publ. Dames & Nobel, New York, fifth printing, 1970)
6. See again BCL Report – No. 3.4 (Nov. :1, 197o) and G. Günther, "Time, Timeless Logic and Self-Referential Systems" in Annals of the New York Academy of Sciences, 138, p. 396-406, (1967)