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# Social Ontologies and Logical Typing: Ideas for a Critique of Social Sciences, Politics and Ideology[1]

*E. Wamba–dia–Wamba**

**Introduction.**

In studying human communities and societies, how and where do we draw the line while categorizing their components? How do we grasp what connects these components to each other and how communities and societies connect with their invironments? "The ontology of a theoretical discourse is that primary structure set of kinds of entity in terms of which explanations can be given in that discourse" (Stephen Gaukroger, 1978, p. 39). Generally speaking, ontology has an impact on how we know something. The separation or dichotomy between epistemology and ontology is actually based on certain ontological assumptions.

All theoretical discourses have an explanatory structure; and all explanatory structures have an ontology and a domain of evidence. Social ontologies are primary structured sets of kinds of entity in terms of which explanations regarding society are given in discourses on society. Social ontologies – atomism, organicism, pure multiplicity, aggregationalism, structurism, holism, etc. are arrived at through a conscious or unconscious kind of *logical typing*. Of course, some social ontologies are better than others, explanatory structures bases on better ontologies are more powerful.

The presuppositions on which logical typing is based may be revealed by certain difficulties: *paradoxes* (para = beyond; doxa = belief) in mathematics and logics; *double binds* in psychiatry and *strange loops* in artificial intelligence, for example.

The need to examine carefully the presuppositions of logical typing or of how we draw demarcation lines in our everyday life activities came through the confrontation with those difficulties. These are not just games; they can be very deadly. If society acts as if the Darwinian line of evolution were true that evolution takes place not on the basis of the species and its environment', society may destroy itself by destroying its environment. A specie that destroys its environment, destroys itself. The correct demarcation line should be the species–plus–its–environment and not the species against its environment as unit of evolution. The basic question I am trying to draw attention to is: how do social sciences, politics and ideology draw their demarcation lines? How do they name the things – and their connections– theydeal with? What are the assumptions underlining their "logical typing"?

**Paradoxes, Double Binds and Strange Loops**

Awareness of the importance of 'logical typing' emerged in logic and mathematics while mathematicians, metamathematicians and logicians were dealing with paradoxes, standing on the way, against the attempts to make mathematics and logics consistent (e.g. the programme of reducing mathematics to logics, etc) and

1. A summary of a lecture given to Dar es Salaam philosophical club 1988.

* Professor, History Department, University of Dar es Salaam.

free from contradictions. The discovery of double binds (= specific paradoxes in pathological communication in the family, where some family members, usually parents, unconsciously collaborate in driving another family member crazy – and come to depend for their own relationship on the presence of their 'mad or bad' victim – cum–scape–goat) in psychiatry revealed that paradoxes are not just in logic and mathematics but in real life situations as well. Strange loops (Douglas R. Hafstadter, 1979) in artificial intelligence or music drew attention to the limitations of 'logical typing' as a solution to paradoxes.

**(a) Paradoxes: Examples.**

**($a_i$) In analytical or formal logic**

Various formulations of the Liar paradox:

Epimenides' paradox: a Cretan called Epimenides supposedly has said that all cretans are always liars. If a liar is someone who always says what is false, then if what Epimenides said is true, it is false, then true.....

"All Cretans are liars"
Sharper versions:
" I am lying"
" This statement is false"
" This sentence is false"
" The next sentence is false. The previous sentence is true"

A paradox is a statement which rudely violates the usually assumed dichotomy of statements into true and false, because if you tentatively think it is true, then it immediately backfires on you and makes you think it is false. Once you have decided it is false, a similar backfiring returns you to the idea that it must be true – leading to a digital or discontinuous oscillation afinitum.

In analytical logic, time and change play no role. Ordinary communication takes place in irreversible and infinitely variable human time, where future goals direct – but do not determine – present actions. " I am lying" is rarely a paradox. " Okay, I am lying" is not a self–referential statement outside time. It is a communication, after the fact, about one or more actual instances of lying. " I have been lying for 3 hours" (Anthony Wilden, 1987).

**($a_{ii}$) Examples of Paradoxes–cum–double Binds.**

" You ought to love me"
" I want you to dominate me" (a wife to a passive husband)
" You should enjoy playing with children, just like other fathers"
" Don't be so obedient" (parents to child)
" You know that you are free to go, dear; don't mind if I start crying"
" Be spontaneous"
" Do not read this sign".

Many of these double binds produce continuous (analog) or discontinuous oscillations.



**(b) Handling of Paradoxes.**

In philosophy of logic (+ metalogic/metamathematics), paradoxes have been classified, for reason of different treatment, into 2 categories: the set–theoretical and the semantic paradoxes

**Examples:**

| **Set–theoretical** | **Semantic** |
|---|---|
| Russel's paradox<br>Cantor's paradox<br>Burali–Forti's paradox<br>(essentially involve: a 'set'<br>or E relationship or<br>'ordinal number' relationship)<br>(Susan Haack, 1978) | Liar paradox and variants<br>(essentially involve<br>'false', 'false of'<br>definable – meanings) |

Paradoxes were known (at least some) long before, but, they began to be of serious philosophical concern after Bertrand Russel's discovery of his paradox. Frege (1848–1925) had reduced arithmetic to sentence calculus, predicate calculus, and set theory. Russel, however, showed that his paradox (the set of all sets which are not member of themselves is a member of itself if and only if it is not a member of itself). was actually a theorem of Frege's system, which was, therefore, inconsistent. Russel's paradox operates as a key constraint on attempts to devise consistent set theories; the Liar paradox, similary, operates as a key constraint on attempts to devise consistent semantic theories. (Anton Dumitriu, 1977. vol. IV).

**"Solutions" to the Paradoxes.**

B. Russel (1872–1970) thought that all paradoxes arose as the result of one fallacy, from violations of *"vicious circle principle."* To handle paradoxes, in logic, two solutions were required: a formal solution which must indicate which apparently unexceptionable premises or principle of inference must be disallowed; and a *philosophical solution* which must supply an explanation of why that premise or principle is, despite appearances, exceptionable. Before Russel's solution, other proposed certain solutions such as *the banning of self–reference* which turned out to be too broad and too narrow at the same–time. Self–reference does not affect sentence like "This sentence is in English" and self–reference is not involved in the paradox." "The next sentence is false." "The previous sentence is true". Some have denied that the utterance like the Liar sentence is a statement and have concluded that it is inappropriate for it to have a truth value. Grounds given to support the claim have not been convincing.

**Bertrand Russel's Solution** (Susan Haack, 1978)

Without going into technicalities (Anders Wedberg, 1984, vol. 3), Russel's solution involves two parts; the *theory of types* and *the vicious circle principle*. In reference to the requirement mentioned above for handling paradoxes, the theory of types constitutes a *formal solution* and the vicious circle principle a *philosophical solution*.

The theory of types is divided into 2 parts: the simple theory of types and the ramified theory of types. The simple theory of types requires that the universe of discourse be

divided into a hierarchy: individuals (type 0), sets of individuals (type 1), sets of sets of individuals (type 2),....etc. Correspondingly subscripts variables with a type index, so that $x_o$ ranges over type O, $X_1$ ranges over type 1, .. etc . The formation rules are then restricted in such a way that a formula of the form 'XEY' is well formed only if the type index of y is one higher than that of X. So in particular, '$X_n = X_n$ (self−reference) is ill formed, and the property of not being a member of itself essential to Russel's paradox, cannot be expressed.

The ramified theory of types imposes a hierarchy of orders of 'propositions' (closed sentences) and 'propositional functions' (open sentences), and the restriction that no proposition (propositional function) can be 'about', i.e. contain a quantifier ranging over, propositions (propositional functions) of the same or higher order as itself.

This is a theory of the abolition of strange loops − as Douglas R. Hafstadter calls it −; while it successfuly rids set theory of its paradoxes, it does so at the cost of introducing an *artificial seeming hierarchy,* and of disallowing the formation of certain kinds of sets. While this may be acceptable with logics, situations, as we shall see, of real social hierarchies (of power relations, for example) may not be so easily dealt with. The theory however, calls attention to the conceptual care needed to deal with hierarchies.

The vicious circle principle (is defined by H. Poincare (1854−1912) this way. "Whatever) involves *all* of a collection must not be one of the collection', or conversely, if, provided a certain collection had a total, it would have members only definable in terms of that total, then the said collection has no total'. (Footnote: I mean that statements about *all* its members are nonsense). Russel used this same definition (S. Haack, 1978).

Other logicians and philosophers proposed other theories for handling paradoxes. Gilbert Ryle proposed the banning of the 'liar's vicious self−dependence'; Kripke proposed a theory of the so−called groundedness based on the assumption that paradoxical sentences have no truth−value. Another interesting theory, for our purpose, was develoed by Alfred Tarski (1901 − ); *the hierarchy of languages.* It is built on the following specifications: the object language, O dealing with individuals or objects; the metalanguage, M, which contains (a) means of referring to expressions of O and (b) the predicate 'true−in−O' and 'false−in−O; the meta−−metalanguage, M', which contains (a) means of referring to expressions of M and (b) the predicates 'true−in−M' and 'false−in−M'; the meta−meta−metalanguage, M', etc.

In this hierarchy of languages, truth for a given level is always expressed by a predicate of the next level, the Liar sentence, for example, can appear only in the harmless form, 'This sentence is false− in−0', which must itself be a sentence of M, and hence cannot be true−in−0, and is simply false instead of paradoxical.

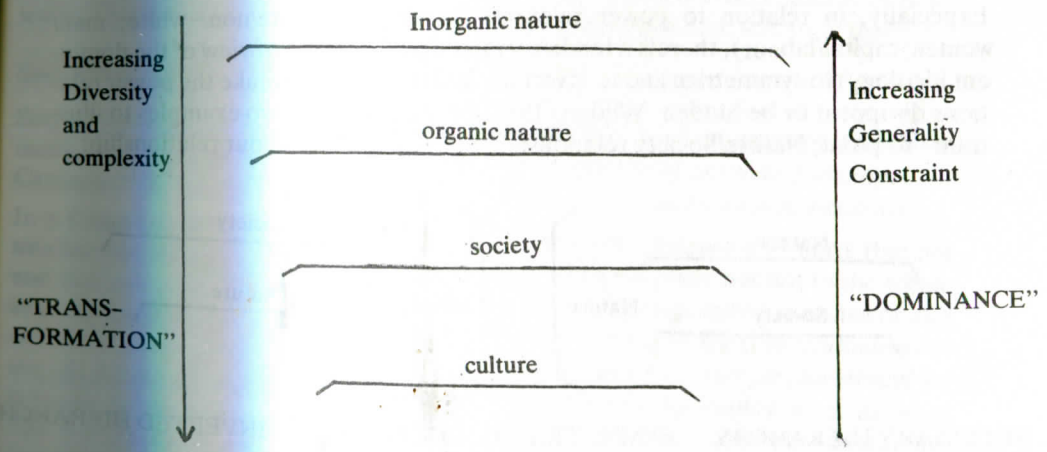
Criticisms have been against the "artificiality" of this hierarchy, of languages. Using the statement, "All of Nixon's utterances about watergate are false", it has been asserted that this sentence − in line with the doctrine of the hierarchy of languages − to have sense must be assigned to the next level above the highest level of any of Nixon's utterances about watergate. How should one determine the hierarchy of those utterances? It has been concluded that this is not the way we speak and use the language everyday.



**Dependent Hierarchies**

The attempts, briefly described above, to formally deal with paradoxes, were part of the ambitious programme of some mathematicians (e.g. David Hilbert), metamathematicians and logicians to construct complete and consistent (contradiction free) formal languages or systems. The fact that this programme has failed, is important. Kurt Gödel, for example, succeded systematizing the justification of that failure. He proved that it is impossible to prove that in a formal system, assumed to be non−contradictory that it is indeed non−contradictory. In other words, if a system is non−contradictory, then it is impossible in that system to prove the non−contradictory character of the system. Reality thus exceeds (transcends) every formalism (A. Badiou, 1983).

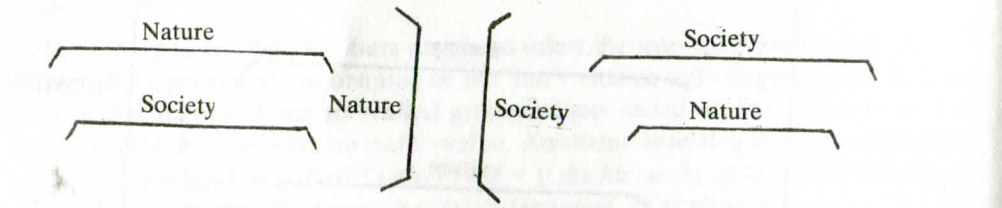
Paradoxes and double binds, revealing an important aspect of reality, may not completely be eliminated. Attempts to eliminate them in their very systematic failure, revealed one important aspect of reality: its character of being organized in dependant hierarchies linking various orders of complexity. These are distinct from each other but not separate from each other. Here is an examples of 'dependent hierarchies'.



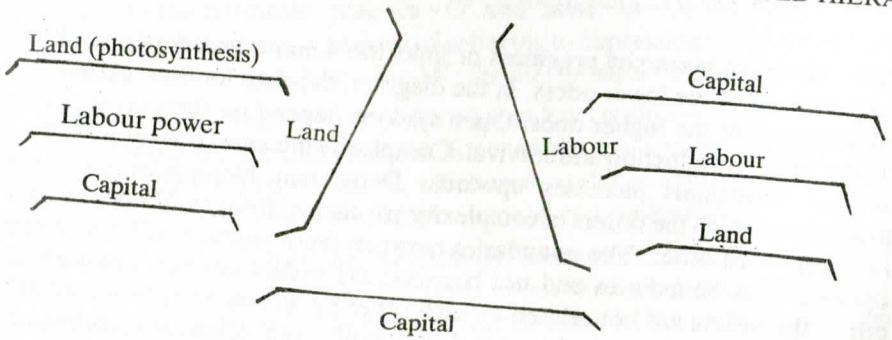

This dependent hierarchy organizes or links the 4 major orders of complexity: the open systems of the lower oders, in the diagram, depends for their existence on the environment of the higher ones. Open systems depend on their environments for production, reproduction and survival. Complexity increases downwards; the generality of constraints increases upwards. Dependent hierarchies are structured totalities in which the orders of complexity are distinct from each other but not separate from each other. The boundaries between them (culture, society, nature) are open−system boundaries and not barriers; the orders are not 'opposed' to each other, the orders are not related to each other by 'either/or' relations of exlusion. Every person, for example, is a complex of 'both−and' relationship between all the 4 orders of complexity (inorganic nature, organic nature, society and culture). The often heard notion' man against nature' is a harmful and useless ideological directive.

The scientific challenge, while trying to produce theories (theoretical knowledge) concerning these dependent hierarchies, is how to characterize these and formalize these into ontologies of the theoretical discourse. Anthony Wilden (1987), after a very insightful analysis, has formulated what he calls the Extinction Rule which helps us decide on whether a dependent hierarchy is one or not. The rule would deal both with the 'artificiality' of some results of logical typing (chain of being', etc.) and self–reference connoting separation of an order of complexity from the hierarchy. (The position of a level or order, in the hierarchy) can be the result of *necessity* or of *theory*. Society depends on nature for its survival; the extinction of the life–sustaining activities of nature (as in the case of the entropic disorder of pollution) will lead to the extinction of society. But, if human society becomes extinct, nature simply takes over where humans left off. Nature therefore belongs at the top of this dependent hierarchy. The extinction rule, thus, states: To test for the orientation of a dependent hierarchy, mentally abolish each level (or order of complexity) in turn, and note which other level(s) or orders(s), will necessarily become extinct if it becomes extinct. A dependant hierarchy is a complex of 'both – and' distinctions between levels of reality (Wilden, 1978b, pp. 250–3. 276–8); it is completely inexplicable from the perspective of the 'either/'or and one–dimensional analytic logic.

Expecially, in relation to power relations hierarchies (white/non–white; man/women;capital/labour), thereis a tendency ideologically (point of view of the dominant ideology) to symmetrize and to invert the levels or orders to make the power relations disappear or be hidden. Wilden (1987, pp. 33–34) uses two examples to illustrate this point; Nature/Society relationship and capital/land/labour relationship:




NECESSARY HIERARCHY SYMMETRIZED HIERARCHY INVERTED HIERARCHY




NECESSARY HIERARCHY SYMMETRIZED HIERARCHY INVERTED HIERARCHY



The actual and long term dependant hierarchy between the orders is the necessary hierarchy: land (standing for photosynthesis) is the environment and the source of labour power (creativity), and labour power is the environment and the source of capital (tools, means of production). In this necessary hierarchy, the three orders of complexity are both–and distinctions between levels, and this system displays long–range survial value.

Ideologically or politically due to commodity fetishism making commodities become exchangeable – the hierarchy is symmetrized into the "three factors of production" in which the three levels of reality seem to be either/or, interchangeable, and conflicting oppositions at a single level. This reflects the ideological basis of bourgeois Economics.

Due the present and short–term power relations of the capitalist economic system, dominated by capitalists, the real dependent hierarchy is inverted. Here the three structural orders form either/or, antagonistic contradictions between Levels. Capital directs labour to exploit land. (For details see A. Wilden, 1987 a, b).

As can be seen from the above brief account, vigilance on how logical typing is done while constructing the ontological element of theories involving dependent hierarchies is crucial to avoid symmetrization or inversion exploited ideologically or politically. This is one way ideological and political values penetrate scientific theories.

## Social Ontologies

Society itself is, of course, a real dependent/hierarchy. Various attempts have been made to conceptualize the structure of society: let me briefly examine 3 attempts, the Cartesian structue, the Hegelian structure and the Marxian dialectical structure.

In a Cartesian structure, wholes are understood to be composed of parts that are smaller than the whole, that are homogeneous with each other but not to the whole and that pre–exist the whole. The orders or levels of complexity are either/or and interchangeable. This is the ontology assumed by methodological individualism or certain forms of structuralism (Banarism). Levi–strauss, for example, has described the relationship between the 'raw' and the 'cooked' as an opposition when in fact it is not an opposition at a single level, but a distinction between levels in a hierarchy. The real hierarchy between 'raw food' and 'cooked food' is dependent hierarchy: 'cooked' depends on 'raw' in the same way that society depends on nature. If 'cooked' disappears, 'raw' continues to exist, it is not 'raw' that disappears when 'cooked' disappears.

In a Hegelian structure of expressive totality (Althusser's terminology), the whole structures the parts. Each part expresses the totality that determines it. As demonstrated by I. Gerstein (1988), the confusions in the use of concept such as mode of production and social formation in social theories are based on assumptions of either Hegelian or Cartesian structures. Mode of production is sometime said to be simply a type of social formation – thus two words are used to describe the same thing. Between the totality and its determinations (or parts, moments), in a Hegelian structure, exists a relationship of expressive causality: each determination is necessary for the totality to manifest itself, but each determination is simultaneously partial as it does not express the whole totality completely.

Because of the type of dependent hierarchy society is, Marx's method requires that, to represent or conceptualize it, we distinguish three instances: economic, political and ideological. It is important to grasp correctly the links between those instances and the three levels (economic, political and ideological) of social reality. These levels differentiate themselves (assume their relative autonomy) from one another historically. The formation of states, for example, brought to the fore the relative autonomization of the political level, commodity explosive development and industrial forms of production and exchange revealed the importance of the economic level; and we are becoming increasingly aware that the remaining elements of the social activity—generally classified under diverse and changing headings – present a profound unity and constitute the ideological level.

The levels are historically determined differentiations (and distinctions) and thus always relative – which are inscribed inside social reality. The instances are appropriate procedures of inquiry for the representation of social reality. It is the real process of differentiation of levels within societies which revealed the fact that instances are appropriate procedures of inquiry for social reality. Political economy, as a theoretical instance, emerged from the process of capitalist development which led to an increased relative autonomization of the economic level.

An instance does not denote a level of social reality, but only an aspect of its representation. It refers to capacities proper to diverse types of inquiry through which social reality is grasped. Each instance corresponds to a process of inquiry. The same social reality is grasped through several of those processes i.e. through several instances. The three instances, required by Marx's method, are all three indispensible to grasp societal reality; but, they are not exclusive of other types of inquiry.

Activities of men and women in society necessarily include production which is indispensible to ensure their survival. The economic instance is thus centered around production. Such activities also comprise the organization of their collectivity; the political instance aims at grasping that element. And finaly, activities of women and men in society involve a representation of the world in which they live; the ideological instance helps graps such a representation.

Each instance is encompassing; it aims at grasping the whole society, and not just one of its levels, through the partial angle of one of the three fundamental activities (production, organization of the collectivity and representation). Each of three instances, therefore, provides a systematic but partial representation of the social structure. They all respectively characterize society as an economic formation, as a political formation and as an ideological formation.

The unity of articulation of those instances is conceptualized through the action of over–determinations, the expressions of the articulated unity of the practice of women/men in its different aspects. It is through this type of analysis, that what connects various soial elements and what makes them distinct from each other can be grasped.

Marx proposed a conception of dialectical structure characterized by mutual codetermination of parts and wholes. These types of structures (structured totalities) are self–determining in the sense that parts determine wholes, while at the same time wholes determine parts. No temporal significance or implication is assumed. As totalities composed of parts which are themselves structured wholes, composed of their own elements, which are themseles structures, etc. This theoretical construction is needed to avoid the dangers of reductionism and essentialism. The problem posed by the self–determined character of totalities – the vicious circle problem – is resolved with the concept of a structure in dominance – well discussed by L. Althusser (1969, 1970). The problem posed by the hierarchical character of the structure is resolved by the thesis that every concept must be transformed at each stages of the theoretical construction (Marx's transformation problem).

Marx did not complete his social theory. Only the theoretical construction of the capitalist economic structure was more or less rigorously dealt with in his *Capital*. Here is the theoretical construction of the social dependent hierarchical structure according to Marx.

| |
|---|
| Mode of Production = RELATIONS OF PRODUCTION (+) Forces of production<br>Economic structure = MODE OF PRODUCTION (+) Circulation |
| Social Formation = ECONOMIC STRUCTURE (+) Political structure (+)<br>Ideological structure |

Capitalized Terms refer to dominant element: e.g. a mode of production is a structure articulating relations of production and forces of production under the domination of relations of production. – – – – – – indicate limits of what Marx's Capital achieved.
(+) –– articulation sign.

Political structure and ideological structure and their articulation to each other and to the economic structure were not rigorously theorized.

| |
|---|
| Mode of Production = RELATIONS OF PRODUCTION (+) Forces of production |
| Economic structure = MODE OF PRODUCTION (+) Circulation (exchange) |
| Social Formation = ECONOMIC STRUCTURE (+) Political structure +<br>Ideological structure |

Since value cannot be observed directly, neither can surplus value nor the variant forms of surplus value (relative, absolute). Only the 'transformed' form of surplus value – profit – can be observed

Capitalist Economic structure.

| Dominant Form of Profit. | Economic structure variant. |
|---|---|
| Profit of enterprise | Industrial capitalism |
| Rent | Rentier capitalism |
| Taxes | State capitalism |
| Interest | Financial capitalism |
| Development levy (a form of tax) | State capaitalism |

For details I. Gerstein (1988 a, b).

It is clear even in dealing only with economic structure, that no theory related to one element can provide a correct and appropriate explanation of a society as a whole. Reductionism and essentialism prevalent in explanations in social sciences are based on Hegelian or Cartesian ontological assumptions. Their underlining logical typing, thus, violates – pening up possibilities of symmetrization and inversion of the levels of complexity – the integrity of social reality as a dependent hierarchy, i.e. a structure in dominance in which parts and wholes are mutually determined.

From the point of view of the history of ideas (philosophy) the problematic of logical typing brings us to the question of being and the one/may (Plato's Paramenides). Speculations on that question eventually led to the formulation of the so–called the great chain of being, the chain that connects everything. *This is how, for example Saint Augustine formulated the issue:*

> Plotinus the Platonist proves by means of the blossoms and leaves that from the supreme God, whose beauty is invisible and ineffable, Providence reaches down to the things of earth here below. He points out that these frail and mortal objects could not be endowed with a beauty so immaculate and so exquisitely wrought, did they not issue the Divinity which endlessly pervades with its invisible and unchanging beauty all things. *(The City of God* quoted in G. Bateson, 1979. p. 2).

And the whole chain could be viewed as follows.


Rule:
The 'more perfect' can never be generated by the 'less perfect'

The world is/was timelessly created upon deductive logic

'Logical typing' or the hierarchic structure of thought is reflecting (or in line with) the hierarchic structure of the great chain of being. This conception of how everything is connected (where so we draw the line) dominated thinking until 'transformism' started emerging through natural sciences and reversing the great chain upside down. J. B. Lamarck's *Philosophie Zoologique* (1809) insisted that mind was immanent in living creatures and could determine their transformations and thus went against the notion that the perfect must always precede the imperfect. Lamarck proposed a theory of 'transformism' which started from infusionia (protozoa) and marched upward to man and women. This was still a chain: the unity of epistemology was retained despite the shift in emphasis from transcendent Logos to the immanent mind (G. Bateson, 1976,pp,18–21).

Hegel (1770–1831), to replace the chain of Being, argued against the notion that the one created the whole/many/Being in favour of the notion that the whole is the history of the one. Multiplicity is the result of the time necessary for the Concept (Logos) to unfold completely. (Alain Badiou, 1982). The Real is the Rational and nothing/Being (environment/figure,place/force) contradiction is viewed as the motive force of the movement of reality.

With Marx, Lenin, etc. reality will be viewed as a system of contradictions. With the theory of different types of contradictions Mao introduced hierarchy into epistemology. How/where do we draw the line to name and classify different types of contradictions–including the possibility of their trasference?

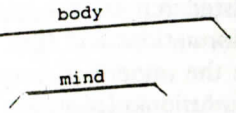
For philosophers of 'metaphysical de–construction' and the cult of difference, essentially Heideggerians and 'nihilists', there is no one/being, only multiplicities exist and this implied the call for a break of the traditional figure of the link (connection) fitting all things together. Of course, hostile to mathematical pursuits linked to technology and viewed as interference (closure), they cannot see that set theory for example from Cantor to Godel/Cohen, offers the most rigorous treatment of all possible relations of multiplicities – from the concept of set as pure multiplicity (A. Badiou, 1989). Certain mathematical discoveries are real events of thought and as such have "knowledge effect" outside of the mathematical realm. These events of thought open up general crises which make of mathematics the focal and sensible area of vast systems of theoretical contradictions. Some events may have long–term effects, beyond whatever mathematical question they settle. For example: the crisis of irrational numbers in Ancient World, the emergence of differential calculus in the C 17th and C 18th, the discovery of the possibility of non–Euclidian geometries at the beginning of the C 19th, the epistemological obstacle posed by paradoxes in the set theory at the end of the C 19th, K. Godel's theorem in the C 20th, etc. And, most often than not, the 'knowledge effect' implied by these discoveries and events is hardly felt in 'social science's, politics and ideologies.

These are but, few speculative ideas generated by some considerations on issues posed by 'logical typing' and by trying to fit things together in a more rational way. I hope they can generate some discussion among colleagues.

Annex 1 1

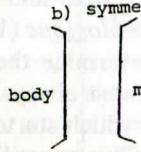
## SOME EXAMPLES OF DEPENDENT HIERARCHIES

1 a)



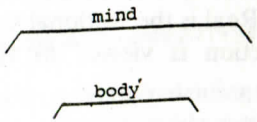

The body is the environment for the mind.

b) symmetrized into:



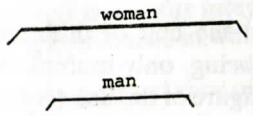

" the body as opposed to the mind" implying that opposition is a binary, single-level, two sided and symmetrical relationship.

c) inverted into:



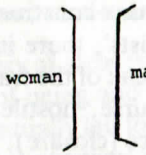

the mind is the environment for the body.

2 a) hierarchy of power relations




the woman is the environment of the man.

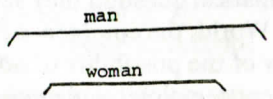
b) symmetrized by feminists into:




" man as opposed to woman"

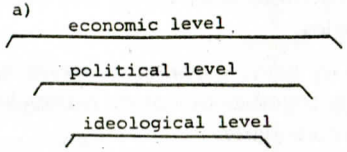
Symmetrization = an imaginary operation (often used in ideology and politics) which, by neutralizing a real hierarchy, prepares the way to turn it upside down.

c) inverted into:

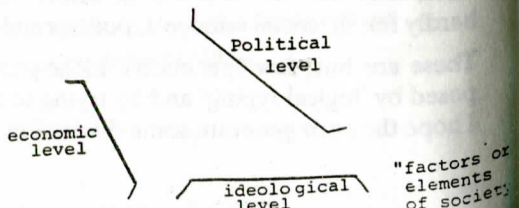


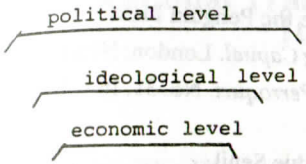

" the man is the environment for the woman"

3 a)

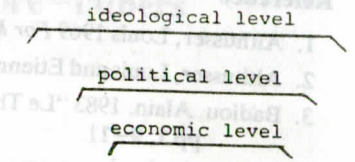



more or less marxist conception.



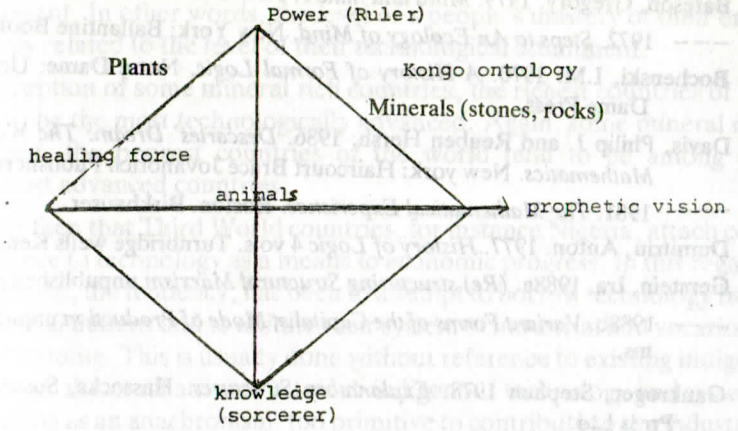




more or less Weberian etc.




Anthropological problemati

4

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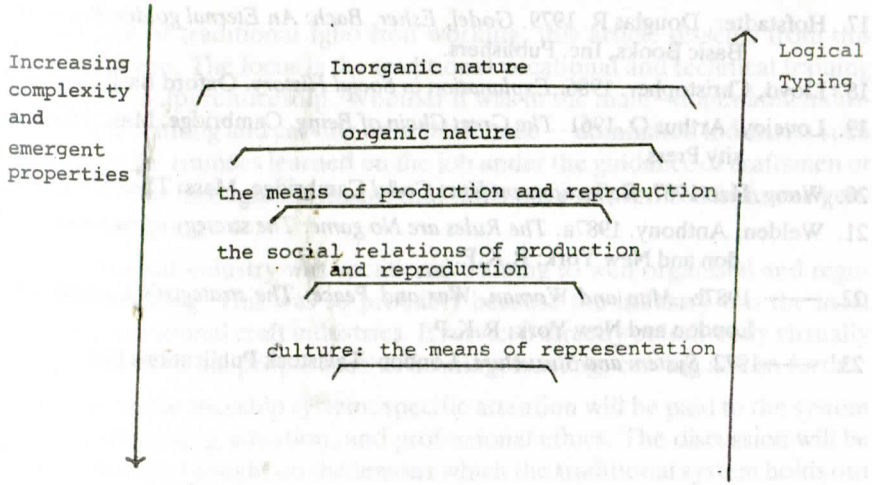


The lower the complexity of any level or order in a dependent hierarchy, the higher (more general, more abstract, more inclusive) is its logical type. The logical typing of each level in the diagram is distinct from that of the others, but they are all of the same family of logical types. The organism and the individual are part of another family of types. A. Wilden (1987 b).

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# Vocational Tranining of Our Fore–fathers – Its Lessons Today

*O. Njoku**

**Introduction.**

In accounting for The Wealth and The Poverty of Nations, development experts accord priority to technology. Technology has enabled man to master his environment more effectively than would have been possible. The more advanced the technology available to a people, the more capable they are of managing and exploiting their environment. In other words, the level of a people's mastery of their environment is directly related to the level of their technological attainment.

Thus with the exception of some mineral rich countries, the richest countries of the world tend also to be the most technologically advanced. Again, some mineral rich countries excepted, the poorest countries of the world tend to be among the technologically least advanced countries.

It is not surprising then that Third World countries, for instance Nigeria, attach considerable importance to technology as a means to economic progress. In this regard, as in the Nigerian case, the tendency, has been to attempt to borrow technology from the western industrial nations and to imitate their system of industrial and vocational organisation and training. This is usually done without reference to existing indigenous systems. Indeed, the usual attitude is to dub indigenous technology and systems of vocational training as an anachronism, too primitive to contribute to the industrial progress of the nation.[1]

Using the example of traditional Igbo iron working, this article dissents from this established stereotype. The focus is the traditional vocational and technical training of the Igbo based on apprenticeship. Whether it was in the male–dominated industries such as blacksmithing and carving or in the female – dominated industries such as pottery and textile, trainees learned on the job under the guidance of craftsmen or crafts–women. It was through this means that skills were transmitted from one generation to the succeeding one.

In no other traditional industry was vocational training so well organised and regulated as in iron working. This was so probably because the industry was the most important of the traditional craft industries. It serviced directly or indirectly virtually all other occupations of the people such as farming, hunting, carving and so forth.

In examining the apprenticeship system, specific attention will be paid to the system of recruitment, training, graduation, and professional ethics. The discussion will be rounded off with some thought on the lessons which the traditional system holds out to vocational training and organisation in Nigeria today. It will be suggested that though the tools employed by precolonial Igbo metalcraftsmen were simple and crude, in terms of the exacting training standard, master–apprentice relationship, professional discipline and ethics, the traditional system has important contributions

* Lecturer, Department of History, University of Nigeria.