

Writing around circularity and self-reference. Published in: R. Golledge, H. Couclelis and P. Gould (Eds.) 1988: A Ground for Common Search. St. Barbara Geographical Press, St. Barbara, p.101-125.

and the past, or that between one human being and the other, all hermeneutic interpretation must presuppose that both sides form a consistent totality, a basic universe of meaning. This may easily be accepted for a text, even for the course of history, but it is very difficult to be identified it in the great cultural and individual plurality of mankind. The universal meaning may lie so close to us, that we cannot see it. We suspect that it lies in the taken-for-granted of our everyday life. ... Did you notice? Low rustle from the edge of dialectical reasoning: what kind of identity is this consistent,

universal totality which the dialectical negation of identity has to presuppose? Let's go on, pretending we have not heard anything ...

There is "an unavoidable hermeneutic component in the sciences of man" (Taylor, 1975, page 178). *Hermeneutic theory*, particularly the enabling role of prejudices and the relativity of the position of the interpreter it emphasizes, bears direct relevance to practical work in human geography: as researchers we may have to learn to listen again. Still, our work is not reproductive, but productive. It is not done with an accurate description of the problem, even if given by experts such as the people concerned, rather than by those undertaking the research. The productivity of our work unfolds in a dialogic process between the two. "The art ... of understanding is not described correctly and sufficiently by saying that one has to learn to put oneself into a foreign horizon. ... It is ... neither empathy of one individuality with the other, nor subordination of the other to one's own criteria, but always a raising to a higher generality which transcends the own particularity as well as that of the others" (Gadamer, 1975, page 287⁴²). The "raising to a higher generality" is what we aim for in the human sciences. The motor of this dialectical movement is the logical contradiction

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between a known and an unknown position, the own particularity, and that of the other. Voom! There it is again: presentiments of the limit of dialectic reasoning: we just stumbled over the identity-relation of logical contradiction in the core of dialectics. Let us clean off the dirt, pretend nothing has happened, and go on a bit further, exploring the position of dialectical logic:

In choosing between existential and logical circularity, dialectical reasoning comes out in favor of the latter, i.e. in favour of self-reference. Nevertheless, it must concede: formal logic determines what self-reference is still looking for: *Identity*.⁴³

And what about the identity of self-reference itself? If we use language to refer to language, or refer to science by means of scientific symbolism, we can never completely represent it. We describe the other/prior self they were without/before the act of referring to "itself". It

is exactly the attempt at defining its identity, by which self-reference undermines the identity it represents and consequently changes in the process. Every act of self-reference either transforms the extension (or intension) of the "self", or even leads to its partial or complete restructuring. This is an opportunity, but at the same time a limitation. Logical circularity limits our knowledge, making every assertion dependent on prior conditions (the well known "Wirkungsgeschichte", and historical conditionality are but one expression of this boundary), and it limits the lasting of our knowledge. Naturally it does not permit a disengaged observer. Knowledge, gained through self-reference, cannot be objective⁴⁴, it is moral. It is in these respects that the limitations of our subjectivity form the source of our ability to know.

The notion of self-reference as an activity - one that characterizes all living matter, birds (biological processes) as

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much as man (biological processes and conscious self- reflection) - radically differs from the lifeless notion of the $A=A$. When this active component finds a way into definitions or inferences in formal logic, it conflicts with existential circularity and predetermined identity. And when the existential circle is broken it is time for change: from the dialectical perspective the process of change becomes visible. I remember seeing something resembling it when looking from conventional logic's point of view: existential stability did not imply that conventional logic is blind to the variation of situations over time. But do not be deceived by the resemblance: for formal logic and conventional mathematics change is discrete. Time is the relationship between two moments. Instead of conceiving of it - like Heraklit, James, Turner, or Bergson - as continuous stream, it captures it as a series of slices, infinitesimally close, perhaps as in the integral, but still discontinuous⁴⁵. Although there are some characteristics they have in common (in both, for example, our knowledge of time is a function of the amount of information available⁴⁶) the *concepts of time* of classical logic and dialectics are fundamentally different.

In dialectical reasoning "everything is seen as in perpetual transition

into something else: it is still itself, ... but it becomes, at the same time, another. The thing is realizing itself through ... successive transformation. It accumulates a history, an experience"(Marchand, 1979, page 2). Time as perpetual transition conflicts with "identity", with the stability of our social systems, particularly with the concept structure of our language. Marx called dialectic thinking "a threat for the bourgeoisie, because it understands every historical form in the flow of its movement, i.e. with respect to its transient side"⁴⁷. Adorno draws our attention to the static concept of the concept: it "is marked by

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archaic features which cross the rational ones; relics of static thinking and a static ideal of understanding in the midst of dynamically activated consciousness. Invariant in relation to the changes in what it captures, it creates a stable order. This is its imminent claim. ... In dialectics, thinking raises objections to the archaisms of its conceptuality. Above all, the concept in itself supposes content, its own form versus that which it contains. Thereby, however, it also supposes the principle of identity: that a fact in itself would be a solid, stable entity... . Identifying thinking objectifies through the logical identity of the concept. Dialectics, according to their subjective side, aim at a thinking which no longer makes its objects stable and remaining constant in themselves; that they are such, experience refutes" (Adorno, 1984, page 156)⁴⁸.

I am not sure if this thinking, "which no longer makes its objects stable" implies a concept of time as radical as that of Bergson. Like Adorno, however, Bergson appeals to experience in his remembrance of passed things , trying to comprehend time without grasping it. Like Adorno, he considers the "consecutive snapshots" as a view of time, which "satisfies the requisites of language, but is a poor and artificial reconstruction of change"(1985, page 26). Movement and change, in his experience, are absolutely indivisible. Change is the basic condition of the universe, and there are no objects of change underlying it. "Change does not require a bearer of change"(1985, page 167)⁴⁹. Except for the objective dialectic of Engels, dialecticians would not assume such a

concept of time to hold for the whole universe⁵⁰.For the development of human consciousness, however, they might, because it is change itself, "the inner laws of motion"(Marchand, 1979, page 251), and not positions which they want to explain. Thus a "spatial concept of time" (Bergson, 1985, page 24), time as

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the succession of adjacent, isolated moments, will be as inadequate as an ahistorical concept in which the "now" can be characterized independently of what happened before, and in which there is "no need to wait" (Bergson, 1985, page 31).

At that moment she looked up from the sheet in front of her: how to write to express change as a flow ... the difficulty of following Marx's writing, changing perspectives through additive contextualization, Harvey describes that⁵¹ ... Santa Barbara discussions about linear descriptions of interwoven structures ... no, this is something else ... well, similar insofar as temporal contexts may be interwoven just like factual contexts ... machetes for thick descriptions come on ... metonymies, meaning moving through written environments ... would even characters move, the "in" up there run away from the "adequate" ... no more locations ... it would be interesting to think about the concept of space associated with Bergson's or the dialectician's concept of time ... what is space and materiality without objects, locations, or moments of stability ... what's the time ... I should have called ... it is impossible to discuss meaningfully concepts of space without simultaneously discussing concepts of time ... just violated this ... I don't remember Sack talking about time in his "concepts of space" ... should check again ... time geographers relate space and time ... but not on a conceptual level ... I may need a footnote here, later ... ⁵² ... Joyce's experiments with stream of consciousness writing ... damned difficult ... how to write to express change as a flow ... water is running out there ... the toilet valve must be stuck again

Compared to dialectic's continuous time, the discrete time of traditional logic rather resembles the pictures on a film: at a projection speed of 15 pictures/sec. man begins to progress⁵³.

But the illusion is destroyed if the projectionist does not pay attention to the V-hold: this photograph comes closest to the aim of taking a photograph of the logical structure of paradoxes. It shows the split in the existential circle of traditional logic. Two successive levels appear simultaneously in our view. In the black intervals between them the quality of the phenomenon changes⁵⁵. The contradiction between the two "assertions" becomes visible. In this picture of the paradox, identity cannot be determined anymore. We have chosen the

E. Muybridge (1884/85):
Chronophotography -
photography of time.⁵⁴

wrong frame, have taken the picture at the wrong moment, have drawn the conclusion at the wrong time, right when Poincaré's soldier ran over to the other regiment. Don't ask *why* he ran!

...writing around circularity and self-reference in geography, my little finger lies on the sheet, preceding the pencil to warn it before it falls down at the end of⁵⁶ the *line*

Paradox writing. Paradoxical writing. Paradoxes occur when activity stumbles over the ties it has set for time. Paradoxes occur when writing, based on conventional discrete logic, describes how it goes beyond the limits of an essay.

Are there paradoxes in dialectical logic as well? The term is not used in this context. Still, remember what we stumbled across. Indications for the limits of dialectical reasoning. Indications for the insufficiency of logical circularity and existential change, even when describing the actions of self-reflecting human beings. Indications for the need of determined identity and stability. They can be found on many grounds. We found them on logical ones. Dialectical movement is driven by conventional logical contradiction. It relies on the existence of an ultimate totality, an universal position resting in itself. It marks the origin as well as the end of this movement. "Since an origin is that which thinking has yet to think and has always to think anew, it is promised to thinking in an ever closer, immediate imminence, which is never fulfilled" (Foucault, 1975, page 400)⁵⁷. Presupposing the existence of such identity, dialectic thinking nevertheless cannot think it. "Only on the basis of something which has begun, men can think what they take to be a beginning" (Foucault, 1975, page 398). So it is that in dialectical thinking, infinite past and infinite future are united. Time closes to a circle. In order to escape, we may turn to conventional logic for help. It is the old conventional logic which made us turn to dialectics. So it turns out. In their mutual dependency conventional logic and dialectical reasoning form a circle. Others saw it long ago: "Speakers of dialectics and conventional logic fail to understand each other. ... Both languages are internally consistent. Yet the consistency of the conventional thinker makes him inconsistent, just as the inconsistency of the dialectician makes him consistent. ... The battle will never have a victor, for

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even though the troops are constantly on the move, they never engage. There can never be reconciliation for compromise leads to everybody's

deprivation. The observer can therefore learn little by watching the troops from the distance. Instead he must strive for ... being audience and performer at the same time. ... It is at that stage that we may finally realize that the drama of the human condition is a play of predicaments in which we are damned if we do and damned if we do not" (Olsson, 1980, page 66 b, 69 b).

Reaching beyond the area of conventional logic as well as beyond the opposed one of dialectics, the human sciences feel the sharp edge separating the two. Is it the scar of modernity?

Well, let me

Notes

¹ It is an increase of speed that cannot be explained simply by increased information or the enlarged horizon we overlook. (See also footnote 47.)

² In principle, this peculiarity is not even dependent on the wide public acceptance of hypotheses. It is already there, in the act of reasoning of a scientist who is, has to be, a member of this public.

³ This distinction was introduced by Reichenbach in order to separate the logical claim for validity from the social and political circumstances of science. It "leads us to a platonistic interpretation of cognitive validity-claims" (Mittelstrass, 1980, 1, page 549). A human geography, reduced to a context of justification, would not be the product of human thinking.

⁴ Theory, in the sense of "*theoria as contemplatio*" (Gould, 1987, page 2) has two meanings: on the one hand it is explanation through identity-relations, i.e. generalization, abstraction, or contextualization (Gregory, 1985, page 387), depending on the respective epistemology/ontology. As such it is, even when describing transformations, rooted in stability. On the other hand - and only the social sciences are two-handed in this respect - theories are stimuli for change, means to promote control, or new understanding of the self and the other. Rooted in existence, they are effective through nourishing on themselves.

My argument for the specific dynamics of theories in the human sciences adds a further aspect to Gould's (1987) inquiry into the different meaning of "theory" in the human- and natural sciences. More than Gould ("... both individuals and societies can deny the template (theory) by their self-reflective capacity and assertion that is constitutive of being human. In this world, *theoria as contemplatio* has no meaning, for if such meaning is carried over unthinkingly from the world of things, it has no capacity to illuminate."(1987, page 2).), I want to emphasize the active role of human beings in making theories "true". (Yes,

"true" in quotation marks to save "knowing winks"(Gould, 1987, page 2), and to distinguish it from truth as *a-letheia!*) If seen in this way, "*theoria as contemplatio*", although not providing absolute answers, may still have meaning for us.

⁵ Cited in Thiel (1972, page 94 and 101). Translated by D.R.

⁶ Verena Meier drew my attention to the difference between the static view of a circle as a perimeter and its conception as the path of a movement closed in itself.

⁷ Equivalent to the distinction between logical and existential dimensions is that between reason and cause. Among the variety of causes Aristotle distinguished (*causa materialis*, *-formalis*, *-finalis*, *-efficiens*), the present meaning of "cause" refers to only one of these, namely the *causa efficiens*. The relation between cause and effect is an existential relation. Reason, on the other hand, is defined as the explanation given in order to justify or prove statements or actions. The relation between reason and consequence is a logical relation.

There are many different concepts of causality. This, however, does not limit the possibility of comparing causal dimension and existential dimension. Calling the existential dimension of change a "*causal dimension*" merely provides it with a direction, and does not further predetermine its nature.

Based on the principle of causality ("*nihil fit sine causa*") there exist a variety of propositions about the relationship between cause (*causa efficiens*) and effect. The positivist's emphasis on regular joint occurrence of two consecutive events (whereby the earlier is called the cause of the latter) is challenged by conceptions of causality used in action theory. (Von Wright (1974, pages 76-80) describes the possibility of a simultaneous occurrence of cause and effect and even that of temporally retro-active causation. He suggests that one should distinguish between cause and effect by comparing their different (theoretical) possibilities of being intentionally influenced.) The Realists propose yet another concept of causation. It is linked to inner necessity or essence. "Harrè argues that to view causal relations as consisting only of temporal precedence and regular succession, is to fail to distinguish

between the meaning of statements asserting such relations, and the kind of evidence upon which they may be based" (Keat and Urry, 1984, page 29).

No matter which concept of causality one has in mind; all of them are characterized by an asymmetrical relationship between cause and effect. This excludes a circular influence of one element upon itself via the other.

⁸ The first axiom of conventional, traditional, formal logic is that of identity (for all A: $A=A$), the second one prohibits contradiction (for all A: $A/\neg A$), the third axiom is that of the excluded middle (for all A: $A=B$ or $A/\neg B$). They are supplemented and completed by a fourth axiom, that of sufficient reason (which states that everything has a reason for being as it is, or, more precisely, that the trinity of the former axioms is sufficient for logical reasoning.)

These axioms, reaching back to Aristotle, and partly reformulated by Leibnitz, provide the basis for a theory of concepts (axiom of identity), for a theory of assertion (Schlußtheorie) (axiom of contradiction), for a theory of inference (axiom of the excluded middle), and for a theory of method (axiom of sufficient reason). See Günther, 1976.

The derived $(\neg A)\neg A=A$, the principle "*duplex negatio affirmat*" is also called "the stability principle". Marchand (1979, page 248) discusses it, citing examples from the field of human geography.

⁹ For a general analysis of the different meanings of "is" see Wittgenstein (1962, § 558). For a discussion of the function of the equality sign in logical reasoning in the human sciences see Olsson (1980, pages 21b-36b and 64b-69b).

¹⁰ In his paper on Hintikka's logic (1986 b), Olsson writes about the social conventions inherent in the seemingly absolute rules of deductive reasoning. Emphasizing the moment of persuasion and rethoric in the core of such reasoning, he concludes in a way my argument similar to my argument: "Hintikka's performative readings of Descartes come to my mind as well, for there are 'thought-acts' just as there are 'speech acts'."

¹¹ The notion of the paradox cannot be defined more precisely. The appeal to intuition in the "apparently correct" is characteristic. The notion furthermore covers a variety of phenomena ranging from antinomies or paradoxes in a formal logical systems to pseudo-antinomies or paradoxes in other systems, i.e. the ordinary language. (See also: Kutschera, 1964, page 41)

¹² It is impossible to describe precisely Russell's set-theory paradox in ordinary language notation. Nevertheless, this rough translation is supposed to give a general impression: a set consists of elements that share at least one characteristic. Examples are the set of all geographers, or the set of all words of the English language. While in the latter example, the English word "set" can itself be an element of the class it encloses, this is impossible in the former. The English word "set" cannot be an element of the set of all geographers. As a next step, one can form the set of all the sets that can contain themselves as an element (the set of English words would be an element of this set), and call it "E". Equally one can form a set "NE" out of all sets that cannot contain themselves as an element. Since the two are exhaustive, every set has to be either an element of "E", or of "NE", and naturally this both holds for "E" and "NE". Now the stage is set for the paradox of sets: If "NE"

contains itself as an element of itself, then it is not an element of itself. If, on the other hand, "NE" does not contain itself as an element of itself, then it is an element of itself.

¹³ Here I refer to the four different schools of mathematics that emerged out of the fundamental crisis brought about by the occurrence of antinomies: the set-theoretical school (represented eg. by the Bourbaki group), Logicism (Whitehead, Russell), Intuitionism (Brouwer), and Formalism (Hilbert). (See eg. Heitsch, 1976, Breger, 1982.) According to Thiel (1972, page 128) this fundamental crisis was still unsettled sixty years after its beginning. It was suppressed by the pragmatic output of topologists, number-theorists, probability-theorists, functional-analysts, or algebraic-theorists.

Moreover it is interesting to note that Brouwer, in his efforts to reconstruct mathematics fundamentally after the

collapse caused by the appearance of paradoxes, suggested conceiving of mathematics as an *activity*, rather than a stable formal system. He clearly distinguished between the secondary formal expression of mathematics and the primary creative action, the process of doing mathematics.

¹⁴ Hierarchy is a combination of distinction and directionality : (V.Meier, personal conversation).

¹⁵ In fact Russell published two different /"theories of types" of which the later one, the so called "branched theory of types" specified the former more closely (Thiel, 1972, page 99ff.).

Poincaré drew an even more radical conclusion from the appearance of antinomies: he challenged the concept of infinity used in mathematics, particularly in set theory. By classifying phenomena into categories permitting vicious circularity, i.e. by forming impredicative definitions, he argues, one is adding one element to the elements of the set. Such classification may lead to the infinite extension of this totality. To him, the concept of "set" only makes sense if it is conceived either as a finite totality, or as an actually existent infinity. Antinomies, then, point to the impossibility of the existence of such actual infinity. Therefore he thinks that it must have been an ontological misconception that has led to the formation of antinomies. Poincaré suggested thinking of infinity as a potentiality instead, as a possibility of infinitely continuing to add one to every number. Thereby he supported the institutionalist's view of mathematics and shared their rejection of the logical principle "*tertium non datur*" (of two mutually exclusive statements one must be true) for such potentially infinite sets.

¹⁶ Conventional thinking defines by reference to a higher order level (eg. by *genus proximum et differentia specifica*, or by a level of

operational instructions), i.e. through more general concepts, statements about statements, actions explaining actions. (If we believe that the number of concepts, assertions, or actions is infinite, this becomes more than just a practical necessity.)

¹⁷ Russell (1908), quoted in Thiel, 1972, page 101.

¹⁸ In the last paragraph of his introduction to Wittgenstein's *Tractatus* Russell wrote: "These difficulties suggest the possibility

that every language, as Mr. Wittgenstein says, has a structure about which one cannot make statements in this language itself. But there could be another language, dealing with the structure of the former one, having a structure itself. And it could be that the hierarchy of languages is infinite." (Translated by D.R.)

¹⁹ For various types of systems, analyses have pointed out the limits they respectively face in their attempt at describing themselves by means of their own symbolism: Wittgenstein defined the general limit of the sayable. Tarsky that of empirical assertions, Russell the limits for the definition of sets according to Cantor's system, Gödel the limits of decidability in axiomatic systems (used to derive mathematics from logic) like that of Russell and Whitehead and thereby the limits to Hilbert's program of proving the consistency and completeness of this system by means of (a smaller part of) its own methods. Based on Gödel's work, Church limited decidability in classical mathematical logic. A. Turing revealed the existence of ineluctable limits in even the most powerful computers one can think of. (For a more detailed description see Hofstadter, 1979.)

²⁰ Wittgenstein (1982) 5.634

²¹ Olsson (1980, page 27e)

²² This is how, as I understand it, our thinking can move beyond objectivism and relativism, and transcend the burden of this damned dualism. (For a brief summary of the arguments in favor of its transcendence see Gregory, 1985).

²³ Giddens (1984, pages 95, 179)

²⁴ Descombes, 1981, page 176. F. Kafka repeatedly thematized the paradox "*exterritoriality*" of individual human beings in a (social) world they helped construct. In his notebook he wrote: "Im Kampf zwischen dir und der Welt sekundiere der Welt. Man darf niemanden betrügen, auch nicht die Welt um ihren Sieg." (quoted in Hoffer, 1986, page 148).

²⁵ Naturally all these levels are related. Still, it is interesting to see, that the pluralismdiscussion in German speaking and Anglo-american geography focused on different levels when talking about plurality: while Anglo-american geography was interested in the plurality of

philosophical approaches, German speaking geographers concentrated on the plurality of perspectives the central concept of "Erdoberfläche" (and later also "sozialräumliche Organisation" was looked at). Hard (1973) describes this difference.

²⁶ Berry (1980, page 45) in his presidential address, delivered at the AAG meeting in Louisville 1980.

²⁷ These arguments often have very concrete consequences for young geographers. (I feel obliged to write this because I it does not hold for me.)

Apart from this it is questionable if, from a pragmatological point of view, a multifaceted discipline would not have a better stance in a multifaceted society (Weichhart, 1987). Also, more fundamentally, it is not evident at all why the need for generalization to increase the "visibility" of geography from the distance should have anything to do with inner homogeneity and discipline.

²⁸ For a brief discussion of the forms of criticism possible in a pluralistic discipline see e.g. D. Reichert, 1987 a.

²⁹ Here we are right in the midst of inquiries about the relationship between power and knowledge, there, where Olsson (1985) asks: "Is the power in the authority of the author or in the auditing of the audience? Or is power at the same time everywhere and nowhere, always erosive yet in every glance, every touch, every mouthful?"

³⁰ Foucault (1974), but see also Dreyfus and Rabinow (1983, pages 174ff.). For an assessment in relation to research in geography see e.g. Driver, 1985.

³¹ I use the term "modernity" in the way Foucault (1974) does when describing the epistemological space that began with the Kantian turn.

Insofar as the society or era Baudrillard describes is living Nihilism in its most consequent form, it has not gone beyond modernity. In so far as Baudrillard, through the very project of his writing, so stimulatingly contradicts its content, neither has he.

³² It is quoted by Gadamer, 1975, pages 325/326. I translated it from the German original: ..."dass die Vernunft indem sie eine Grenze ziehe und die Erscheinung vom Ding an sich unterscheide, diesen Unterschied in Wahrheit als ihren

eigenen erweise. Sie gelange damit keineswegs an eine Grenze ihrer selbst, sondern sei vielmehr ganz bei sich selbst, indem sie diese Grenze setze. Denn das heisse, dass sie sie auch schon überschritten habe."

³³ Adorno suggests solving the problem of final reason by retreating from the realm of thought to that of the body. The negativity of

physical pain would lay behind our intentions. "Die vermeintlichen Grundtatsachen unseres Bewusstseins sind ein anderes als bloss solche. In der Dimension von Lust und Unlust ragt Körperliches in sie hinein. Aller Schmerz und alle Negativität, Motor des dialektischen Gedankens, sind vielfach vermittelt, manchmal unkenntlich gewordene Gestalt von Physischem, so wie alles Glück auf sinnliche Erfüllung abzielt und es ihm seine Objektivität abgewinnt. ... In der Erkenntnis überlebt (das somatische Moment) als deren Unruhe, das sie in Bewegung bringt und in ihrem Fortgang unbesänftigt reproduziert; unglückliches Bewusstsein ist keine verblendete Eitelkeit des Geistes, sondern ihm inhärent, die einzige authentische Würde, die er in der Trennung vom Leib empfing. Sie erinnert ihn, negativ, an seinen leibhaften Aspekt; allein dass er dessen fähig ist, verleiht ihm Hoffnung..."(1984, pages 202/203).

Recourse to-, or primacy of the body is a central theme in Nietzsche's writings (and not least through him in contemporary French philosophy (Descombes, 1981): "Put briefly: perhaps the entire revolution of the spirit is a question of the body; ... Our lust for knowledge of nature is a means through which the body desires to perfect itself..." (Orig.: "Kurz gesagt: es handelt sich vielleicht bei der ganzen Entwicklung des Geistes nur um den Leib; ... Unsere Gier nach Erkenntnis der Natur ist ein Mittel, wodurch der Leib sich vervollkommen will...") (Nietzsche, 1964, page 676). See also: Levin, 1985.

³⁴ Olsson, 1986 b., page 5

³⁵ A *ceteris paribus* ("other things being equal") assumption usually is made when describing the dependency of (social) phenomena on certain variables (e.g. by means of a regression

equation). It implies that the simultaneous effects other variables have on the phenomenon remain the same.

Compared to this, the stability assumption made in the logic of conventional reasoning does not refer to the structure of influences of variables, but to the definition of the variables and phenomena themselves, that is to their conceptualisation.

³⁶ The relationship between logic and metaphysics was already discussed by Russell and Whitehead in the "*Principia Mathematica*". In their explanation of the occurrence of antinomies, they returned to the ontological basis of this logic, to the problem of universals. They argued that it is mistaken to make the platonic assumption that abstract constructs such as classes or concepts exist independently of a superior level of human thinking. The platonic world is broader e area classical logic is able to cover (Kutschera, 1964). Its domain is limited to entities

which can be constructed according to certain principles of hierarchical distinction.

³⁷ Günther, 1976, page 54. Reflection on this double reflection, reflection on the reflection on this double reflection, and its continuation *ad infinitum* does not increase the extent of our self-consciousness. "Because thinking cannot transcend its self-consciousness, further reflection can only keep repeating this realm of consciousness, and no element of this infinite row of consecutive iterations may extend it"(Günther, 1976, page 54).Furthermore this infinite regression inhibits any self-definition of the subject.

Günther suggests a possibility of bridging this quicksand by a third level of reflection. This level promises a possibility for an extension of human consciousness, and for an absolute self-definition of man, one that cannot be subjected to infinite reflective iteration. Human existence "is the infinite depth of self-consciousness"(1976, page 57).The fundamental basis of this level of reflection is the impossibility of a basis itself. (The third level that Günther describes is not new. It is the level on which the existentialists and many others find refuge What is new in Günthers work is that he tries to describe this level in terms of axioms.)

Günther argues that this third level of reflection is solid enough to found his "meontic logic", the logic of non-being, of a reflective consciousness that exceeds, and therefore forms, the being which is given to it. It is a logic of change. The axioms Günther defines for this logic are sketches of the skeleton of Hegelian dialectics.

This is all very promising. I only wish I could understand how Günther can separate form and content of knowledge to claim that the self-definition of consciousness as an infinite sequence of reflections is not reflection itself.

³⁸ Stegmüller (1975, pages 147-220) gives a summary of the systems of many valued logic as well as of other logical systems, eg. temporal logic, modal logic, or normative logic (deontic logic).

For the use of alternative logical systems in human geography see: Gale (1972), or Olsson (1980).

³⁹ Beautifully machanistic metaphor! Never. Mind. Suffices.

⁴⁰ The hermeneutic circle actually is a spiral. It is the trace of a continuous movement of interpretation between an understanding of the parts determining the consequent understanding of the whole, which in turn leads to a new understanding of the parts... . For describing the hermeneutic circle in more detail one has to draw a distinction between the circle as an expression of the method of understanding (Schleiermacher) and hermeneutic circularity and understanding as an

existential characteristic of human being (Heidegger, Gadamer). See: Gadamer, (1975, pages 164 and 277), Habermas, (1973, page 214), or Bernstein, (1983, p.131 ff).

⁴¹ There are significant differences between the hermeneutic theories of Schleiermacher, and Gadamer with respect to the truth-status understanding can demand, and the object understanding can aim for. These differences stem from Gadamer's emphasis on the relative position of an interpreter. Like the texts or actions he/she interprets, the activity of interpretation itself is not independent of its historical (social, political) context. The interpreter does not have a solid ground from which to judge the specificity of a text's or action's relation

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to its object, i.e. its truth or adequacy. All he/she can do is increase the understanding of the object of the text or action by adding its perspective to the one the interpreter had him-/herself. This, if I understand correctly, is what Gadamer means by extending ones horizon, or by "raising to a higher generality" in the quote given below.

It has two consequences: with respect to the object, understanding is aiming at, it means, that it cannot address it directly, but only via the way in which it is understood by someone else. Understanding is second-order understanding. "Das Ziel aller Verständigung und alles Verstehens ist ein Einverständnis in der Sache"(1975, page 276). ("The aim of all communication and understanding is an agreement about the object."). With respect to the truth status understanding can demand, it implies that the interpreter cannot claim to have a final, absolute knowledge of the second-order object. "Die Ausschöpfung des wahren Sinns aber ist ... ein unendlicher Prozeß"(1975, page 282). ("But completing the true meaning ... is an infinite process.")

By drawing these conclusions from the "Wirkungsgeschichtlichkeit" of human being, Gadamer transcends the position of the hermeneutic of German Romanticism.

(What I still do not understand is how "historisches Bewußtsein der eigenen Gegenwart" (self-consciousness about our present historical context), which is the precondition for the crucial openness an interpreter has to preserve towards a text or action (to notice possible contradictions), can be reached under conditions of living in the context of "Wirkungsgeschichte". I trust that the answer can be found in the rich source of "Wahrheit und Methode".)

⁴² Translated from the german original: "... die Kunst des ... Verstehens ist nicht dadurch richtig und zureichend beschrieben, daß man lerne, sich in fremde Horizonte zu versetzen. ... Es ... ist weder

Einfühlung einer Individualität in eine andere, noch auch Unterwerfung des anderen unter die eigenen Massstäbe, sondern immer die Erhebung zu einer höheren Allgemeinheit,

die nicht nur die eigene Polarität, sondern auch die des anderen überwindet" (Gadamer, 1975, page 287).

⁴³ "Who is man? The one who must create what he would be." (Heidegger, quoted in Levin, 1985, page 7.)

⁴⁴ For a brief summary of the different meanings of "objective" see eg. Reichert(1987 b.).

⁴⁵ The terms "continuous" and "discrete" (or "discontinuous") are examples of the numerous spatial metaphors we use when talking about time. Here I want to use two characteristics to distinguish them; characteristics of the process of change, and characteristics of the units of meaning they form. A discrete process, then, is a consecutive series of isolated moments whereby each one can be defined or explained as an independent unit. A continuous process, on the other hand, is an unbroken movement, which cannot be split into isolated elements, because each moment could be defined and explained by its relations to other moments.

This double criterion may permit a distinction between a discrete process consisting of infinitesimally small steps (a line consisting of points with infinitesimally small extension) and a continuous process.

⁴⁶ Writing about discrete time, Couclelis (1982, page 123) describes "urban time as a function of information". "Whatever the metaphysical essence of time may be, in the present context (urban system models) its flow can only be detected through the changes observed from one attribute sheet (here a table of attributes characterizing urban man) in a time series to the next." Since time is equivalent to a relation between attributes , and each attribute added to the table "greatly increases the variety of distinguishable states and, therefore, the probability of observing some change somewhere in the system, ... merely by adding information, we precipitate change." It is important to note the difference Couclelis draws between the *concept* of change, and the kind of *evidence* upon which change may be detected.

⁴⁷ Marx, *Grundrisse*, quoted in Hubig, (1978, page 112).. Translated from the german text: Die Dialektik ist "dem Bürgertum ein Greuel, weil sie ... jede gewordene Form im

Flüsse der Bewegung, also nach ihrer vergänglichen Seite hin auffasst".

⁴⁸ From the german original: Der Begriff hat "als solcher archaische Züge, die mit den rationalen sich überkreuzen; Relikte statischen Denkens und eines statischen Erkenntnisideals inmitten von

dynamisiertem Bewusstsein. Der immanente Anspruch des Begriffes ist seine Ordnung schaffende Invarianz gegenüber dem Wechsel des unter ihm Befassten. ... In Dialektik erhebt Denken Einspruch gegen die Archaismen seiner Begrifflichkeit. Der Begriff an sich hypostasiert vor allem Inhalt, seine eigene Form gegenüber den Inhalten. Damit aber schon das Identitätsprinzip: dass ein Sachverhalt an sich, als Festes, Beständiges, sei. ... Identifizierendes Denken vergegenständlicht durch die logische Identität des Begriffs. Dialektik läuft, ihrer subjektiven Seite nach, darauf hinaus, so zu denken, dass nicht länger die Form des Denkens seine Gegenstände zu unveränderlichem, in sich selber gleichbleibenden macht; dass sie das seien, widerlegt Erfahrung". Translator D.R.

⁴⁹ "Die Veränderung hat keinen Träger nötig". Our contrary, conventional distinction between bearer of change and change itself may be a product of our Indo-european languages. Whorf (1963) describes other languages, e.g. that of the Nootka Indians, which do not distinguish between substantives and verbs and seem to see the world as a continuous interrelation of processes.

⁵⁰ The similarities between the Bergsonian and the dialectic concept of continuous time should not lead us to ignore other significant differences: dialecticians, no matter from which branch of dialectics, probably would have difficulties sharing Bergson's emphasis on intuition (eg. 1975, page 44), or the definition and distinction of metaphysics and science (eg. 1985, page 55) he makes.

⁵¹ Harvey, (1982, page XV).

⁵² Buttimer's critique of time geography (eg. 1984, page 78) may be understood as suggesting that a different conception of time and space may be more adequate when trying to represent the self-reflective capacity of human beings.

It also would be interesting to analyse the tensions between Giddens's theory of structuration and the time-geographic concepts he seeks to incorporate in this theory (Gregson, 1986) in respect: could the tensions result from an incompatibility of the space/time concepts of Hägerstrand and the space/time concepts implied in Giddens definition of the acting subject?

⁵³ These photographs by Eadweard Muybridge were taken in 1884/1885. His motion studies as well as those of E.J. Marey had a strong impact on the work of Taylor and Gilbreth on the scientific management of factory work and housework (published from 1895 onwards). Kern (1983) describes the significant equivalence between Muybridge's and Taylor's work on the dissection of time, the art-works

of the Cubists (and subsequently the Vienna school of Kinetism), and the beginning of the cinema shortly after the turn of the century. (At the same time Russell and Poincaré worked on type-theoretical distinctions to prevent the logical paradoxes.) In making time visible and controllable, the techno-logic of mechanization, discrete formal logic underlies all these expressions, even the views of the world that were discussed by the public: Kern (1983, page 115 quotes a journal article from the Paris of 1912: " 'Does everything go by jerks?' ... All processes in the universe might occur by means of a series of infinitesimally small jerks rather than continuously. ... The nature might therefore be 'one vast cinematograph'." In such a world Charlie Chaplin and Adolf Hitler are equally real.

⁵⁴ "The locomotive illusion will be regarded as the true way of seeing just as the optical illusion is regarded as true life. 'Movie is 24 x truth per second', the director Jean Luc Godard says. E.J. Maray's chrono-photographic machine only reached 16 x truth per second" (Virilio, 1986, page 57).

⁵⁵ The movie director, A.Kluge (1985, pages 105/106) comments on the relationship between movie-technique and time, particularly on the black intervals between the pictures on a film. "Cinema projection is based on an exposure time of 1/48 th of a second, followed by a dark period of transportation. On the average the cinema is dark for half of the time. The eye looks

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outside for 1/48th and inside for 1/48th. ... The effect neither lies in the first picture, nor in the next, but is based on an after-effect, ideally an unseen picture. It is the difference, the intermission in a flow of information,... that leads to this effect. What is the ultimate ideal in the history of movie-making is the production of invisible pictures." (Translator D.R.)

⁵⁶ Modified after Beckett, 1976, page 284.

⁵⁷ Foucault wrote this when describing the doubles of modernity. Although he does not make it explicit, these doubles are closely related to circularity. The quote is translated from the German text: "...da der Ursprung das wird, was das Denken noch zu denken hat und stets von neuem zu denken hat, würde er dem Denken in einem stets näheren, unmittelbaren, jedoch nie erfüllten Bewusstsein verheissen"(1974, page 400).

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