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A non-epistemological approach to knowledge
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"...[K]nowledge is only worthy of that name to the extent that it reduplicates itself. (Lyotard, p.38)"

INTRODUCTION 1.1

We have it on the good word of Lataur and Woolgar that, "...[T]he epistemological qualities of validity or wrongness cannot be separated from sociological notions of decision making (p.121)." I shall take this as my starting point in an effort to elucidate a sociological, or perhaps anthropological, meaning for "knowledge". However, I shall try to make a stronger claim than Lataur and Woolgar would be willing to: I shall claim that any definition of knowledge must be sociological/anthropological. This is a fairly familiar claim by now, which follows as an immediate correlary of the eliminationist's position in recent debates in philosophy of mind about intentionality. Following my claim for a moment, we see that the alternative consequence to finding an anthropological definition of knowledge is to relegate our knowledge-talk to its emotive and rhetorical functions, only. Just as we might (contra Davidson), as anthropologists, not assign any referents to a tribes deity-talk, we might not assign any referents to knowledge-talk. Notice that the dichotomy I've drawn does not commit me to an eliminationist position. I am merely committed that beliefs (of which knowledges are said to be a certain sort) are, if anything, intersubjective-things.

Having just sketched my location, I shall purport that knowledges are assertions which act on the ideological (as a tendency?) in such a way as to unboundedly reduplicate their own assertion (perhaps implicitly). This thesis is, of course, quite meaningless until I have clarified the several terms used in technical senses. My hope in this paper, beyond allowing the comprehension of its thesis, is to demonstrate the plausibility of my assertion in an examination of scientific knowledge (where the literature is most complete). I shall be able to do no more than sketch the sociological status of other domains of knowledge, such as

political, theological, and mythological; though I find these domains no less (and perhaps more) interesting and important.

A MATERIALIST SEMIOTICS 1.2

The framework in which I shall operate might be described as a materialist semiotics. It finds its first major contributor in V. N. Voloshinov, and is continued by such modern post-structuralists as Althusser and Lyotard. The baseline of Voloshinov's thought is a view of all utterances as diachronic events located in concrete socioeconomic contexts. This is an opposition to both what Voloshinov calls abstract objectivism, which includes Ferdinand de Saussure and his langue/parole distinction; and individualistic subjectivism, which is represented, for Voloshinov, by Wilhelm von Humboldt. The latter school might be seen to include existential and hermenutic philosophers of language, as well, perhaps, as Husserl (though with the exception of Husserl, Voloshinov could not have been thinking of these thinkers as representatives of this trend). I shall briefly examine these schools, as criticized by Voloshinov, in order to point toward the necessity of a materialist semiotics.

1.2.1

The abstract objectivists find their starting point in a sharp contrast between the synchronic and diachronic aspects of language. To them, each moment (or cross-section, as Althusser says) is characterized by a complete, and subjectively external, system of language. With Saussure this system of language (langue) is a closed structure, such that each word has a position only in virtue of its contrasts and metonymic connections with other words. We need not be Saussurian to be abstract objectivists, however: a theory of reference could be incorporated into the system, as long as reference (denotation) does not function via intentional meanings (connotation). A causal theory of reference could, for example, be abstract objectivist. Such a theory merely needs take the synchronic language as an objective object, with immanent rules.

The abstract objectivists need to distinguish two degrees of diachrony: that period of time in which a monologue, utterance, or discourse takes place; and that period over which the synchronic structure of language changes. This distinction is perhaps the weakest point of abstract objectivism, but is also necessary to the theory. Within the first period of time, an utterance is merely an instancing of some part of the system of language. No utterance can go beyond the rules of this system, except through error. However, abstract objectivists are faced with the brute fact that over some times, languages do change (concretely: utterances once permitted become disallowed, and vice versa). This leaves one with the impression that changes in language must somehow happen "in between" the utterances themselves. However, abstract objectivists may be able to give an explanation of the institutionalization of "errors". This is related to recent linguists' "wave diffusion theory" of linguistic items¹ (DeCamp 1971, Bickerton 1971, 1975).

1.2.2

The individualistic subjectivist school proceeds in a direction opposite to the abstract objectivists. Voloshinov lays out their tenets according to four basic principles:

1. Language is activity, an unceasing process of creation realized in individual speech acts;
2. The laws of language creativity are the laws of individual psychology;
3. Creativity of language is meaningful creativity, analogous to creative art;
4. Language as a ready-made product, as a stable system (lexicon, grammar, phonetics), is, so to speak, the inert crust, the hardened lava of language creativity, of which linguistics makes an abstract construct in the interests of the practical teaching of language as a ready-made instrument.

(Voloshinov, 1929, p.48)

We see the individualistic subjectivists shifting ground from language to the utterance, but at the same time introducing a radical Cartesian mentalism. We shall accept this concern for the small-scale diachronic process of language, but reject the subjective aspect.

VOLOSHINOV'S SYNTHESIS 1.2.3

Voloshinov tries to find the synthetic position which we have already pointed at, from these antithetical schools. Before approaching the criticism of abstract objectivism, we should clarify the status of La Langue. The objectivist will not claim that the synchronic system of language has material reality, but rather that it is always presented to a subjective consciousness as ontologically real. This is not to make a claim about intersubjective ontological status. Given this bracketting, it still remains to show that, even to a subjective consciousness, language is not presented as an objective system of norms (except perhaps to a linguist engaged in a very particular sort of reflection).

What is first of all presented to a subjective consciousness is not language at all, but rather a concrete situation in which a speaker is engaged. The speaker may wish to have various effects upon her audience (including conveying meanings), but normally the words are only present insofar as they themselves are the meaning. (That is: the situation and intention themselves only come to a subject in the form of language). In the case where we have carefully formulated to ourselves the words to say, prior to saying them: the process we engage in is not the comparison of sentences to normative rules, but rather a comparison with other situations in which we have used or heard used similar sentences. The object of consciousness is always pragmatic, rather than semantic; always the situation of utterance rather than the abstractions of regularity which may follow it.

We may here bring out Voloshinov's sociological conception of psychology. What is located in the psyche itself needs first of all to be located within the socioeconomic relations in which an individual is placed. The first aspect of these relations which a psychologist needs to consider is the individual's relation in speech to other speaking beings². Merely quantitative study suffices to demonstrate the importance of speech in determining persons' psyches. One possible way of viewing inner-speech is as a copy of the structure of outer-speech, but this is a claim which is up to empirical psychologists to accept or reject. Whether or not

inner-speech is necessarily structured in the same way as the outer speech in which a subject is immersed, it is nonetheless clear that the way in which language is "objective" to the subject is in terms of an empirical regularity from his socioeconomic viewpoint. The normative status of rules of language comes, not from the internal structure of language, but from the pragmatic bearing of a subject's speech upon concrete situations.

1.2.4

All that we have so far sketched in criticism of abstract objectivism seems consistent with the claims of individualistic subjectivism: our pragmatic bearing fits well with the unfixed and creative concept of language propounded by the individualistic subjectivists. In fact, the first and fourth principles laid out above are tenets of our materialist semiotics. The third principle brings in the activity of creative art as an analogy for language. This claim may be consistent with ours, depending on the explanation given for art, or may not be: we shall bracket it (if the claim entails speaking beings being firstly aesthetes, I think we should reject the claim).

It is in the second claim: that the laws of language are the laws of individual psychology; which we need to bring criticism against. The understanding which the individualistic subjectivists have of this claim entails there being laws of psychology, which are located inside the individual. These might be the relations of a phenomenology, or of any other intentionalist psychology, but the basic property is of subjectivity. I shall not be able to consider the whole of Voloshinov's criticism of subjective psychology, which is the crux of his book Freudianism, as well as being an important theme of Marxism and the Philosophy of Language; but let us merely notice its naivete in regard to the historicity and contextuality of consciousness. This rejection of subjectivist psychology is found both within Marxism and outside it, for example within positivism. These criticisms are well enough known that I need not repeat them.

Our rejection of the second claim of the individualistics subjectivism runs on the following lines: the laws of language necessarily precede the laws of psychology. It may turn out that the regularities of inner-speech (psychology) reliably copy the regularities of speech in society, but this would be a surprising empirical discovery, not something which we can claim a priori. Where Voloshinov (and myself) differs from many objective psychologists is in his retention of the Sign as a term of psychology. Positivist psychology, such as behaviorism and cognitive science, need to ultimately reduce language to its exclusively physical component. To them, words are merely physical patterns which trigger behavior, either due to our having learned to treat them as signals³ or due to innate dispositions to react to and use words.

1.2.5

Our retention of the Sign, and hence meanings, is neither metaphysical pandering nor a first stage approximation, from which we hope to eventually reduce to physicalist terms. The psychology which we are proposing retains the Sign as a necessary term of the anthropology of which the psychology is part. While Voloshinov may well have agreed with Laplace's hard physical determinism (Laplace 1796)⁴, he would maintain that Chomsky-style innatist grammar and cognitive-science are inadequate to the ultimate psychology (though may be, nonetheless, germane to it). All that these fields can do is explain some human psychological dispositions, they can not explain the psychologies of actual human persons in concrete socioeconomic situations.

SUMMARY 1.2.6

Having set out, in a somewhat scattered fashion, the materialist semiotics in question, let me summarize its tenets:

- 1) Psychology must be an objective science, in which psychological laws find their reality in the laws of society. The socioeconomic realm which firstly determines individuals is language, understood here as a relation among concrete utterances.

This is a position held by Lyotard when he says: "...One is always located at a post through which messages pass. (Lyotard, p.15)"

2) The Sign has an anthropological reality, it is neither a signal nor a mere "useful fiction" in describing physical reality.

3) Language itself has no overarching⁵ reality, it is exactly the sum of actual utterances.

BEHAVIORAL IDEOLOGY AND IDEOLOGY 1.3

I should like to bring in a distinction, also borrowed from Voloshinov, between "behavioral ideology" and "ideology proper" (Voloshinov 1927, p.88; 1929, p.83). The latter is "ideology" in the sense in which Marx himself used it: it is those institutions in a society which are reified out of the socioeconomic base, then gain an independent existence, and semi-autonomous internal laws (Althusser, p.58). These are typically such things as religions, political institutions, and scientific fields. Behavioral ideology is the inner- and outer-speech which permeates our behavior in all its aspects. This more broad behavioral ideology may be thought of, roughly, as a superset of the ideology proper. Still, even this larger domain of the social-totality has a certain degree of autonomy from the laws governing the totality. I shall suggest later on that the course of knowledge-production involves the passage from the behavioral ideology into the ideology proper (or "official ideology"), at least in some realms of knowledge.

RELATIVE AUTONOMY 1.4

An additional bit of background I need to bring in is what Althusser calls "domains of relative autonomy". This concept is, perhaps, first utilized by Marx, in the relation between mode-of-production and the relations-of-production. Each of these is capable of evolution without change in the other (to a limited extent) and follows internal laws of development. It is only in the long run that the relations-of-production follow the mode-of-production, and even then at a distance which varies according to the unique historical particularities of the country in question. This autonomy accounts for the phenomena which Lenin, and later Mao,

- terms "uneven development". Althusser carries this paradigm farther than the traditional orthodoxy has been willing to (though it is an exegetical point beyond my scope whether Marx himself did this, also): he sees all the realms of the social totality as having relative autonomy, including those which have traditionally been called "superstructure".

The realm of primary concern to Althusser and to us is that of ideology. I shall adopt Althusser's thinking here; and carry the paradigm over into the yet more limited case of knowledge. My claim, or perhaps merely assumption, is that knowledge stands to ideology as ideology does to the social-totality. Hence, within the ideological (here including behavioral ideology), knowledge-productive activities have their own governing rules; and those types of speech which count as knowledge tend to have their primary causal efficacy on speech of the same type. This claim is one which I shall adopt only tentatively, though I shall use it as a tool in my analysis. My hope is to show that it is at least plausible for the case of science, which I shall examine in some detail; and for those realms I shall merely touch on. Let me point out in closing this section that my claim of this paragraph is not merely taxonomic for its own sake: if we find a suitable definition of knowledge then bibliometric examination will allow us to empirically determine whether knowledges are, so to speak, parasitic upon themselves.

KNOWLEDGE-PRODUCTION 1.5

I have recently been speaking of "knowledge-production" and the like; this is not accidental, but rather is the result of a paradigm I wish to adopt for the goal of clarifying and elaborating my thesis. Feminists have attempted to draw a distinction between material and social production (to the effect that "women's work", i.e. child-care and "caring-labor", is production on the social realm, rather than the material [Hartmann 1981a, 1981b; Hartsok 1983; Mitchell 1975; Young 1981]). Their concerns are somewhat at cross-purposes to mine, herein; but I would like to use this paradigm to suggest that knowledge (if such a thing turns out to be

conherent to speak of ontologically at all) must be some kind of productive activity on the ideological realm (either in the broad or narrow sense). The result of such a production is clearly not a commodity, as it is of material production; hence "production" is only a metaphor, ultimately.

The result of this production is a transformation of the ideological-space in which a producer moves. I would suggest that this paradigm is a useful way of looking at the production of all utterances: the social givens (such as the empirically generalized "langue") become equated with the natural realm; the producer/speaker then uses the tools available to her to goal-directedly/pragmatically transform the material into something more useful. In either case we needn't rely on the intentions of the producer, which is one of the strongest points of Marx's original concept of production.

However, this oversteps what is necessary for the thesis, so let us restrict ourselves to those utterances which are to count as knowledge. In keeping with my thesis, there are two directions in which we may proceed. The first is to name "knowledge" those utterances which act so as to reduplicate their own assertion. Perhaps we would add that the end of this reduplication is the institutionalization of these assertions (which belong to the behavioral ideology) into the ideology proper. The second direction is more broad: it counts as "knowledges" all those utterances which are like the ones described above in regard to the structure of the ideological, but some of which do not become institutionalized. A typical example of this may be the case where two "competing" assertions of similar types are produced, at about the same time, by persons with a similar position in the ideological and economic realms, but only one becomes institutionalized. This sort of event probably happens fairly frequently in theology, mythology, science, and elsewhere. One of our intuitions tells us that both assertions should count as knowledge since they were in everyway similar, at the time of utterance. This points in the second direction. A competing intuition says that only the assertion which is accepted in the long run should count as knowledge. This points in the

first direction. I shall remain agnostic on this, but shall deal with the differences further, in the conclusion.

1.5.1

As I probably need not even say, the reduplication of utterances usually has at least as much to do with the location of the speaker, both ideologically and economically, as it does with the structure of the utterance and its location. Knorr-Cetina mentions this point: "Whether a proposed knowledge claim is judged plausible or implausible, interesting, unbelievable or nonsensical, may depend upon who proposed the result, where the work was done, and how it was accomplished. (Knorr-Cetina, p.7)" Our reading of this should emphasize the "who". Knorr-Cetina lays out the main feature we expect to find in any knowledge-production fairly adequately, so we should tentatively look for these in each alleged case of knowledge. That is: we should ask, "Why is the producer in a privileged position?"; "What is it about the method to make it produce knowledges?"; "What is it about where it was done?"; and in addition, "What is it about the assertions structure (syntax, grammar, etc.)...?", and so on.

"SAMENESS" OF UTTERANCES 1.6

The problem of equating utterances with one another is a problem which has been under-rated. I shall not be able to add anything really original to this point, but I shall at least set out a methodology. This is essential, however, as my definition of "knowledge" involves some utterances being duplications of others. This would not present a problem if we could rely on the "propositional content" of utterances. However, this brings us to some intentional/non-material ontological commitments, which are necessary to avoid. Establishing a causal relation between two such utterances must fall short, as we could not distinguish between reactions and reaffirmations. Both might involve reference to the original assertion, but issues of parody and recontextualization make this implausible as an adequate guide.

Two basic methods (and various intermediate ones) present themselves as means of demonstrating an utterance to be a repetition of another one. The first is to rely on the testimony of the group in question. This may be the more naive way, but a necessary step toward producing an ethnography of the group of speakers. A case where this method clearly fails is familiar to philosophers: a school or group of philosophers claim a likeness in their assertions to those of some earlier "great" philosopher. This tactic may be a common one for establishing the legitimacy of knowledge claims (the latter assertion though, never the former).

The other extreme in methodology is to hope to find an identification of utterances solely on the basis of Chomsky-style recursive grammatical transformations. Chomsky himself assumes the presence of a propositional "kernel" which undergoes transformation; but we may consider this mere ontological bricolage. This may well account for a large class of utterance pairs, but many others are surely said to be alike for stylistic, topical, and other non-transformational reasons. An intermediate method would accept testimony on synonyms and metonymic connections, but rely on some sort of transformational connections for the individual utterances. More concretely: the method described here involves accepting the testimony of the group for the smallest pieces of assertions possible, in order to test for the transformational identity of the assertions. For example, we may accept the testimony of the group on the identification of two terms or relations which are not strictly synonymous; but not accept their word as to the identification of the whole assertions. Clearly, our priority is to rely on Chomskian transformations as much as possible, and testimony as little as possible.

EXPANDED THESIS 1.7

In concluding this part, let me restate my thesis, bringing out the framework of my above discussion:

- 1) The creation of knowledge is productive transformation upon the ideological realm.

- 2) The result of this production is an ideological realm restructured so as to promote the assertion of the knowledge in question.
- 3) The production of knowledge is a material activity which occurs in the physical world, not in some Cartesian mental realm.
- 4) Assertions which are knowledges have some structure and location within the ideological which distinguishes them from other assertions.

Secondary proposals:

- 5) Knowledges have relative autonomy within the ideological
- 6) The process of knowledge-production is a move of assertions from behavioral ideology into ideology proper; this move is accompanied by the assertions becoming unsaid, yet assumed.

THE CASE FROM SCIENCE 2.1

In this section I shall discuss a particular instance of knowledge: science. At least since the logical positivists it has been this domain which has most frequently been given credit for producing knowledge. It is not merely because of any epistemological weight which the positivists have mustered for the sciences that they are particularly worth examining. Sciences are worth examining because they have been accepted by relatively wide segments of speakers (for various sociological reasons) as an area to which we should assign knowledges; for some speakers, as the only area. As anthropologists, our use of local words must at least have similar range of use as the natives' usage (the natives here being ourselves). Hence it seems particularly poignant to examine knowledge-production in science. More mundane reasons also present themselves for doing this: it is the "hard" sciences to which the social sciences and humanities have directed the most attention concerning knowledge-production.

We should keep in mind, however, that "Knowledge is not the same as science, especially in its contemporary form; and science, far from successfully obscuring the problem of its legitimacy, cannot avoid raising it with all of its implications, which are no less sociopolitical than epistemological. (Lyotard, p.18)" That is: whatever it is that situates knowledge at science will have to be found in the structure of science, not that of knowledge; further, this structure must be able to

occur, at least in principle, in realms outside science. This leaves us a danger of becoming either so broad in our characterization of science as to include any other activity as knowledge-productive, or so narrow as to exclude everything else (and perhaps even parts of science itself).

LABORATORY LIFE 2.1.1

The specific guide I shall use is Latour and Woolgar's descriptions in Laboratory Life of a neuroendocrinology lab. Again, the danger exists of becoming too broad or too narrow in our description of the activity of the laboratory activity. I will try to guess periodically at what parts of the description can be transferred whole to other sciences and knowledge-productions, but the final say must come in further research similar to Latour and Woolgar's. The result of such research will be neither a sound affirmation nor a rejection of my thesis, but will undoubtedly provide grounds for rational revision and rephrasing of the thesis. Ultimately, such research could lead to a rejection of my thesis; though this rejection would not demand a return to epistemology, but rather an abandonment of "knowledge" from our anthropological vocabulary.

MY CLAIMS 2.2

2.2.1

Let us turn first to my third claim (p.11). The third claim states that knowledge-production is a material activity, rather than a "mental" activity. We should be home free on this claim if we found that scientists themselves gave corroboration of our claim. However, this is not unequivocally the case; rather the scientists often make epistemological and ontological assumptions. Knorr-Cetina says, "The language of scientists contains innumerable references to what is or is not true. (Knorr-Cetina, p.4)" This clearly seems to suppose the propositional content of knowledges, and hint towards the role of apprehension in them. However, Knorr-Cetina continues, "...[T]heir usage in no way differs from our own everyday use of the term in a variety of pragmatic and rhetorical functions which do not have

much to do with the epistemological concept of truth. (*Ibid*)" This fortunately points us away from a naive acceptance of our informants' testimony, insofar as we already have grounds for doubting the role of ontology in rhetoric. We have yet to examine the actual activity of scientists, so I shall now turn towards that.

2.2.2

While starting this discussion, let me repeat my first claim: that knowledge is productive transformation. Let my discussion function as an evaluation of this claim as well as the third one. Latour and Woolgar give us a description of the laboratory as divided into two main sections: "the office" and "the bench". The ~ activity of the bench is (synoptically) concerned with the production of documents to be transferred to the office. Here I use "production" in its literal sense. The technicians (who work in the bench) use technological machinery as a means to put labor into the transformation of raw (or lower stage) materials into certain sorts of documents. Slightly more exactly, we may say that the raw materials are divided into those which are literally transformed (the paper and ink of the inscription device) and those which act as tools for the production of the inscriptions (i.e., the tissue samples).

The activity in the office is to take the inscriptions produced in the bench and combine them with other documents imported to the lab, according to certain skilled operations. The two sorts of documents brought to the office do not act as materials which are themselves transformed, but are rather guidelines for producing yet more documents (if you like, the unprocessed documents act as sorts of partial molds for the finished ones). This relation of the earlier product to the later one being one of guidance rather than of providing physical material has already strongly suggested the ideological character of the transformation involved. Notice that even in a standard factory we can easily make this distinction between the ideological transformations carried out by the managers, and the material transformations carried out by the workers. The managers regulate the social

environment of the factory, but do not themselves carry out any material transformation.

This much of the picture sketched by Latour and Woolgar seems to be consistent with the activity of other scientific labs, and to a lesser degree with the activities of researchers in humanities fields; though again, I stand in need of empirical corroboration.

However, we have not really established that what the scientists (specifically, the "Doctors") do is ideological transformation, except insofar as they direct the activity of the technicians. This direction is trivial though, when we are examining the status of knowledge in the laboratory. As Lyotard says, "If the division between decision makers and executors exists in the scientific community (and it does), it is a fact of the socioeconomic system and not of the pragmatics of science itself. (Lyotard, p.64)" Surely, the knowledge is said to lay in the articles which are eventually produced and sent off, rather than in the social arrangement of the laboratory itself. We shall have to look at the broader relations that the final documents (articles) have to the social space in which the whole of the laboratory is embedded.

2.2.3

In order to explain this broader social space I shall bring in two additional matters. The first is a consideration of my second claim (p.11): that the result of knowledge-production is an ideological realm restructured so as to promote the assertion of the original knowledge. This will set a difference between knowledge and the more mundane ideological transformation involved in management. The second matter is an introduction to a social space which is less readily generalizable than the comments we have thus far made about the laboratory. It concerns the transformation of assertion types.

ASSERTION TYPES 2.2.4

Latour and Woolgar (p.75) divide the assertions present in the articles which are produced in the laboratory into five types. Let me note in passing that we need not invoke proposition content in order to pick out assertions from other strings of characters or phonemes, but can decide them on the basis of syntax and location within discourses. This is important lest we slip back into propositional knowledges. The assertion types identified by Latour and Woolgar range from presuppose statements (type 5), through speculations (type 1). The range in the middle is characterized by varying degrees of modality.

All of these assertion types appear both within final articles and in the verbal exchanges of scientists (or at least the particular group of neuroendocrinologists). It can also be established that some of these assertions are transformed through repetition from type 1 to type 4, and type 5. The factual basis of this can be found in citations within the journals common to the group of scientists (neuroendocrinologists in this case). Since type 5 assertions are, by nature, unstated, we need to verbally ask the scientists to explain their presuppositions to establish that an assertion has become type 5. This is a point where we become dependent on the testimony of our studied group; but it seems unlikely that terribly much deception (deliberate or unconscious) should be involved in this aspect of testimony.

2.2.5

The definition which I shall give for knowledge, at least in the case of these neuroendocrinologists, is "the assertions which move from type 1 to type 5 status (as a tendency?)". The behavior of the scientists, in fact, seems to follow a rational regularity such that all assertions originate as type 1 assertions. I would like to go further to suggest that another stage is available which even more clearly suggests knowledge status of assertions. This stage is the reification of assertion into material tools. The justification of the use of a certain instrument by scientists (though it is rarely ever said) is that the instrument represents the

principles of past knowledge. I suggest that we would find that this "past knowledge" has already travelled the course from type 1 to type 5 assertion, before the instrument was designed or built. This reification, which only happens to some type 5 assertions, is probably the final stage through which a scientific knowledge can pass.

I hope that the above paragraphs have made plausible my claims one through three. I have tried to show that those discourse which are traditionally called "knowledges" produced by scientists, have been materially produced; that this production transformed the ideological space in which they occurred; and that the nature of this transformation was such as to reduplicate the original assertion. This is not entirely what I have shown, however. If we trust that assertions do travel the path from type 1 to type 5, then we see that at a certain point reduplication stops. Hence in this case it might be more reasonable to speak of a course of reduplication through which assertions pass, rather than unbounded reduplication.

2.2.6

The conclusion I have just drawn is nearly the same as my tentative sixth claim: that knowledge-production is a move from behavioral ideology into ideology proper. That is: discourses which start as personnel ones lose their author and become institutional. This is what has happened to an assertion which is no longer asserted by individual scientists, but rather is accepted by all, though unsaid, or perhaps materially implicit in a physical tools.

KNOWLEDGE AND IDEOLOGY 2.3

Finally in this part I shall discuss the place of knowledge within ideology, which will bring us to my fourth and fifth claims. At times within the literature I have looked at, knowledge has been directly influenced by economic factors. Despite Baudrillard's subsumption of the economic into the ideological, this leads to some doubt about the relative autonomy of knowledge, and even its location within the

ideological. I shall do three things in this section: firstly I shall sketch Latour and Woolgar's theory of "credit"; secondly I shall discuss knowledge as a function of the economic realm; and lastly I shall discuss knowledge in relation to the ideological realm.

2.3.1

Latour and Woolgar distinguish the two senses of "credit", recognition/reward versus credibility, by analogy with the distinction between consumption capital and investment capital. Their scientists, like the capitalist to whom they are compared, are interested in credit for the sake of renewing credit itself, not for the sake of personal benefits. Credit as credibility is gained by producing knowledges, in just the sense in which I have been speaking of it. A scientist who has produced an assertion which runs the path from type 1 to type 5 is granted certain measures of credit. Interestingly, this credit is of both types: said scientist is both given praise and awards which would seem to fall into the category of recognition, and is given new means to produce knowledges, such as grants, appointments, etc. However, even here this distinction falls apart. Those forms of credit which would *prima facie* seem to be forms of recognition become entries in the scientist's "*curriculum vitae*", which is a sort of note of credibility. As is the case for capital, credit has no internal division, but only different uses.

2.3.2

The economic elements of knowledge-production cannot be ignored. Even if we are able to maintain that knowledge has a sphere of relative autonomy, we are barred from claiming that knowledge can operate in a vacuum. It has been claimed that knowledges, in fact, fairly directly mirror the relations of the economy; as Lyotard says: "The games of scientific language become the games of the rich, in which whoever is wealthiest has the best chance of being right. An equation between wealth, efficiency, and truth is thus established. (Lyotard, p.45)" One might continue that, at least in Capitalist and Feudal societies, this equation is not

limited to science, but extends to realms of theology, politics, and all the "humanistic" knowledge which is learnt in private (and more recently "public") universities. Our hope is to acknowledge some of the economic factors of knowledges, and yet avoid a vulgar materialist's economic determination. We shall try to spell this out in terms of the interaction and relative autonomy of the economic and ideological. Let us, however, confine our examination to a specific example within science.

Latour and Woolgar describe the time just before the efforts to construct the fact that "TRF is Pyro-Glu-His-Pro-NH₂." Certainly no one could have said what this fact would be before it was constructed, but enough constraints had been successfully instituted as to the construction of a fact within this scientific program to bring this field of knowledge down to economics. In particular, certain knowledge had already been successfully produced as to what laboratory techniques would satisfy the social constraints of the production of this type of knowledge.

Latour and Woolgar quote anonymously:

"...[B]ecause I knew what we were competing against in this country [USA] in terms of money, scale of work...and there were no ways we could achieve parity, if you like, in England at the time."

We see that in this concrete case, wealth becomes the necessary requisite to the production of knowledge, and hence for the gain of credit. This suggests that even that requisite to knowledge-production, namely credibility, which seemed at first to be purely ideological, is tied to the economic. But now let us turn to those situations of knowledge which seem to be strictly ideological.

2.3.3

If we can accept my model of scientific knowledge as a class of assertions which move from type 1 to type 5, then Latour and Woolgar speak directly to the ideological location of knowledges. The cycle of credibility described above is certainly part of the ideological location of knowledges. That is: only speakers

with a certain measure of credibility can make assertions which become knowledges. Some similar structure may exist in other domains, though many differences certainly exist (science and prophecy require different credentials). Let me examine the structure of ideology in the production of one particular fact.

In the creation of the fact about the structure of TRF (mentioned above), two major groups were competing for precedence in the creation of a knowledge: these are the laboratories headed by Guillemin and by Schally. A consistent pattern of citation occurred in the articles of these two groups: the Schally group cited their own articles and the articles of the Guillemin group equally frequently, while the Guillemin group cited their own articles with much greater frequency than those of the Schally group. Furthermore, the Schally group's citations of the Guillemin group's articles generally followed a pattern of elaboration upon the original assertions. The Guillemin group, to the contrary, cited the Schally group primarily in the form of criticizing the assertions of the latter. Initially one might claim that this difference is due to the epistemological status of each group's assertions. However, this is contradicted by an examination of the actual series of articles.

In 1966 the Schally group produced a series of assertions which were substantially the same as the eventually constituted fact. However, the Guillemin group made criticism of these claims, largely on the basis of the amount of credibility which was appropriate to grant to the Schally group. As a result of this, the Schally group abandoned its own program, until three years later when the Guillemin group started making assertions which were essentially identical with the ones made by the Schally group earlier. Shortly after this, these assertions were corroborated, and now have knowledge status.

The point of this discussion is not to cast doubt on the epistemological honesty of these scientists, as we think that this sort of situation is one often repeated in the sciences, and elsewhere; and of necessity, not due to systematic epistemological dishonesty. What we should notice is that the two rounds of

assertion of essentially the same "fact" had different origins within the ideological space, and that this is the only possible way to account for why one and not the other could create a knowledge. The explanation for the asymmetric polymorphism of the ideological realm seems to be the scientists' commitment to a symboloci ontology of "credit". Candidacy for knowledge is a strictly ideological creation (perhaps economic), even if epistemological criteria choose among a narrow class of claims.

2.3.4

Let me now try to place my fourth and fifth claims within the above descriptions. The fourth is: knowledges have a location and structure to distinguish them from other assertions; the fifth: knowledges have relative autonomy. For both of these I will make a modification as to localize knowledges. That is: knowledges within a field have a particular location, and relative autonomy. The location may, however, well differ field to field; and knowledges within a field have no more relation to knowledges outside the field than to many aspects of the ideological. Within the sciences knowledges are distinguished by the credibility of the author, and by type 1 structure at their inception. The relative autonomy is in virtue of assertions' evaluations being expressed always in terms of the same sort of synthesis of documents which originally produced the assertion. That is: arguments from a wider cultural context are rarely leveled against scientific assertions, but only ones based on documents produced from laboratory inscription devices and documents in other articles of the same journals. Within other localities of knowledge we need look for other aspects of ideological location and autonomy, but hopefully the claims are made plausible for the scientific realm.

2.3.5

How can we cast out the autonomy and location of knowledges in light of the comments made about economic causation above? These above observations threaten to make knowledges into economic rather than ideological phenomena. We shall try to

resolve this problem by creating a partial separation between "location" and "autonomy". That is: "location" is a descriptive notion, which when used of knowledges may well involve naming economic facts. In our above example, naming this location may involve the description involving "laboratories commanding X degree of wealth". However, these economic descriptions are at best necessary, not sufficient, for situations which create knowledges. It is here that we shall introduce the relative autonomy of knowledges. The laws which are autonomous within knowledge-production are the laws of actual causation of knowledge, rather than those of background conditions. We may think of this distinction by an analogy the with difference between Aristotle's formal cause and efficient cause. If economic elements (such as laboratory funding) can be compared to the formal cause of knowledge-production, then ideological element (such as citation and credit) can be compared with the efficient cause.

Location is hence cast as a relation of a "part" to the structure of the social-totality, or some domain of relative autonomy within it. The relations here are those of whole/part causality. The laws within the autonomous realms, to the contrary, are relations of discrete entities to one another. In our description of scientific knowledge-production, the important discrete entities include assertions and credibility. These (and other) "objects" have effects on the objects "reassertions", "citations", and of course "credibility".

1. The wave diffusion theory claims that introduced linguistic items (such as a novel pronunciation of a word) have a locality of origin, and then spread geographically along routes of interaction. Various such items each develop their own radii, such that any given regional dialect is determined by the intersection of various radii.
2. My use of the term "speaking being" is stylized after Lacan, who sees this as the first and essential nature of persons.
3. A signal is an object or kind which stands for something outside it and of an unlike nature. However, unlike a sign, a signal has a fixed connection to the world outside it, which does not change with its grammatical context. In Saussure's framework we may think of a signal as an object which has conventional relations to the outside world, while signs have such a relation to the system of signs. Words may function as signals (as for example, a shout of "Help!"), but this is only a narrow and specialized domain of their use.
4. Laplace's speculation that from a knowledge of the position and velocity of every particle in the universe we could have perfect prediction and retrospection, is what I am thinking of here.
5. Voloshinov draws a metaphor that if to the individualistic subjectivists language is a flowing stream, Saussure sees it as a rainbow, arching over the stream.