LAYING THE FORMALIST GHOST: AN ANSWER TO THE CHARGE OF SCIENTISM[1]

RICHARD J. WATTS

Universität Zürich

1. *"Scientism" and the rejection of formalism*

One of the problems encountered in teaching modern theoretical linguistics in many university English departments (as indeed in most language departments) is overcoming opposition to the formalism and theory construction that such teaching involves. In many ways the opposition is natural from students who have chosen to follow courses within the humanities. No-one can really blame them for protesting when they find themselves grappling with model construction, hypothetical abstract levels of linguistic description, logical formalism and the like. All of this seems so far away from the tangible reality of learning to use the language adequately, of exploring the culture it represents and thereby expanding one's own cultural horizons.

This basically defensive attitude towards the study of theoretical linguistics, particularly that of the transformational-generative school, appears to be just as strong in most modern language departments as it ever was. It is certainly true that more practically oriented linguistics courses leading to the study of psycho- and sociolinguistics, stylistics and applied linguistics, etc. help to alleviate the problem. But, even so, of these peripheral disciplines only stylistics is usually part and parcel of English department programmes. To reap full benefit from these courses, we still need a knowledge of linguistics,

[1] This paper is a revised version of a lecture given at the combined meeting of the German "Anglistentag" and the Swiss Association of University Teachers of English from September 27–29, 1982. I should like to thank Professor Jacek Fisiak for his suggestions and encouragement. I should also like to thank all those who raised questions. It was largely the hostility the lecture aroused and the glib assumption that generative linguistics is *passé* — how many times have we heard that over the last ten to fifteen years, I wonder—that prompted me to revise it and have it published in the form in which it appears here.

so that, one way or another, a degree of abstraction and formalization is unavoidable.

It is my belief that the opposition towards formalism can be correlated with what Geoffrey Sampson (1979) calls "scientism". Sampson defines "scientism" as "the prejudice which holds that the scientific method applies to all possible subjects of human thought, or ... that matters which cannot be treated by the method of science are somehow unreal or unimportant" (1979:1). According to him, the belief that the "scientific method" can be extended to the study of human nature, in particular human creativity, constitutes a fallacy resulting in the objectionable notion of "social engineering". Human society and social institutions do not, so he maintains, lend themselves to objective formal analysis. They are considerably more complex and require a considerably subtler approach, which will not allow us to work with such concepts as "true" and "false" or "correct" and "incorrect".

One may of course sympathize with his contention that "in recent years it has come to be fairly widely recognized that science has been pushed too far" (1979:2). But this is a rather sweeping statement. One would like to know in what ways science has been pushed too far, which sciences he is referring to and which people have come to recognize this. Does he, for instance, include linguistics among these sciences? In addition, Sampson simply takes for granted that his reader knows what "scientific method" is, merely referring the uninitiated to work by Hayek and Popper, even though the principal argumentation of the book depends on such notions as "scientific method", "scientism" and the "fallacy of scientism".

2. *Chomsky, the social engineer*

The real point of Sampson's book is not to argue against the "fallacy of scientism"; the case against it is taken from the outset as being quite clear. It is rather to uncover and denounce an apparently dangerous "scientistic" wolf in the humanity sheep's clothing, namely Noam Chomsky. Much more dangerous than the belief in social engineering to which scientism leads is the attitude that theories of social engineering are faulty because they lack the dimension of creativity and imagination and that given the development of this dimension, it should indeed be possible to analyze human society and construct explanatory hypotheses. In Sampson's eyes, this attitude is particularly dangerous, since it conveys the impression of anti-scientism whilst in fact arguing scientistically, and it is Noam Chomsky more than any other thinker of our age who is guilty of such subversion.

Chomsky is inevitably at the heart of most of the heated debates on the validity and practical usefulness of generative linguistics (of whatever variety),

so it is only fair to him to assess Sampson's criticism. In the light of the continuing hostility towards formalism, I shall stress certain aspects of Chomsky's thought, which ought to lead to a more humane, even humanistic, approach towards the necessary abstraction and model construction of theoretical linguistics.

Sampson believes that there are direct links between Chomsky's approach to the philosophy of language and his linguistic theories on the one hand and his political writings on the other, but that his view of society and the optimal organization of human institutions cannot be derived *logically* from the guiding principles of his "professional" writings. Sampson then undertakes to prove that the guiding principles in question in fact support another view of social organization along the lines of liberalism and free enterprise. His apparent justification for opening what he chooses to call his "counter-attack" is that "in recent years ... Chomsky has begun to link his politics with his professional activities explicitly" (1979:5). In the 1969 Bertrand Russell lectures at the University of Cambridge Chomsky asks his audience's pardon for introducing the political theme, whereas, according to Sampson, in *Reflections on Language* published six years later he is more explicit and much less diffident.

Over the past fifteen years Chomsky has become a controversial figure beyond the scope of linguistics. His work on political science, the organization of social institutions and, in particular, the role of America in post-war world politics have led many to the conclusion that his political convictions lie to the left of the ideological spectrum.[2] In all probability, however, beginners in linguistics only deal with Chomsky the linguist and are likely to have formed the opinion that he is unashamedly "scientific", or, if one insists, "scientistic", in his approach. To read that Chomsky intends to convey to his audience the impression that he is not "scientistic" while surreptitiously arguing the case for social engineering can easily lead to confusion.

3. *The fallacious "scientistic fallacy"*

It is important to relieve the confusion a little by highlighting a few significant points in Chomsky's linguistic and philosophical writings, in order to suggest ways of overcoming the aversion towards linguistic formalism which help to alleviate the charge of "scientism". In doing so I shall touch upon the philosophical debate between empiricists and rationalists and argue that, while it is certainly useful and stimulating to consider the value of any theory

[2] This might of course inspire them to read Sampson's book, or perhaps to experience a sense of relief that at least one academic has the courage to voice his convictions.

of knowledge within this philosophical framework, we must at all costs avoid unnecessary and unfruitful polemics. For the student of linguistics it is important to note that, although "empiricist" is certainly not an adequate description of Chomsky's thought, the adjective "rationalist" is not entirely appropriate, either. Indeed, Chomsky's own characterization of his ideas as "Cartesian" is also somewhat misleading, since in certain respects they stand in opposition to the ideas of Descartes.

My first point is that, contrary to what Sampson would have us believe, there is no *intended* logical connection between Chomsky's linguistic and philosophical writings on the one hand and his political writings on the other. When asked by Mitsou Ronat to comment on this in *Language and Responsibility*, he makes the following points:

There is no very direct connection between my political activities, writing and others, and the work bearing on language structure, though in some measure they perhaps derive from certain common assumptions and attitudes with regard to basic aspects of human nature (1977: 3).

Obviously both his linguistics and his politics are products of the same mind, and, as Sampson suggests, the result of a particular kind of education. In this respect, perhaps, it is in order to study what Chomsky's "common assumptions and attitudes" are and to try to disprove them, but it is not in order to try to deduce from thisthe logical correctness of a socio-political ideology, whether it is that of libertarian socialism or that of liberal free enterprise. This would indeed mean falling prey to Sampson's "scientistic fallacy". As far as I can judge from Chomsky's writings, he does not undertake such a proof, whereas Sampson (1979) comes very close indeed to doing so and thereby makes himself guilty of committing the error he so condemns.

Chomsky's political writings are more moralistic in tone and content, and are governed by a deep concern for the ways in which human beings within social structures should behave towards one another. One of the themes running through his collection of political essays entitled *Towards a New Cold War* (1982) is that policy decisions are not derived "in the manner of physics, as an objective datum immune to class interest" (1982:93). He concludes the essay "Towards a new cold war", which serves as the title for the collection, with the following remarks:

The drive towards intervention, militarization, authoritarianism, submissiveness to the doctrinal system, and possibly eventual nuclear destruction is the result of human decisions taken within human institutions that do not derive from natural law and can be changed by people who devote themselves to the search for justice and freedom (1982: 215).

We may wish to reject these remarks as mere polemics. But this is not the point. If we do not agree with him, we can always maintain that the human decisions he mentions are essentially correct. His basic argument is that, whatever decisions human beings make and whatever the results, these do not spring from human nature. They do not derive, as he puts it, "from natural law".

It is important to grasp this point. I mentioned earlier that Sampson cites a passage from Chomsky (1975) as evidence for a more overt connection between the latter's political and linguistic writings. On examining the passage in question, we find that Chomsky discusses the link between cognitive faculties and human nature. He suggests that certain socio-political and socio-cultural attitudes are the result of an empiricist view of human nature and argues that a rationalist approach might lead to the conclusion that the decisions we make are not derived from or embedded within a system of natural law.

Let us briefly review his argumentation. He suggests that a philosophy of language and knowledge within a rationalist framework represents a viable alternative to the empiricist-behaviourist approach. The decline of rationalism during the past century may be attributed to the fact that empiricist views of the mind as an entity non-distinct from the body and/or as a non-existent entity which acquires existence only through and from the organism's interaction with the environment have supported a pseudo-Darwinian attitude towards the development of culture and society. Empiricism, so Chomsky argues, tends to support the socio-cultural dominance of Western civilization and has, in this sense at least, become politicized. He bases his argument on the hypothesis, truly Cartesian in spirit, that the innate faculties of the mind, of which the language faculty is one, impose limits on human knowledge. The hypothesis that the language faculty is innate leads to the conclusion that it must fall within the domain of the study of human biology. Thus the language faculty, which enables us to acquire a human language, will impose limits on what abstract structures may underlie a possible human language and thereby on the kinds of language that may be acquired.

The most controversial point in Chomsky's argumentation, of course, concerns the validity of the innateness hypothesis. A great deal has been written on this subject, and I do not intend to discuss it in detail here. However, regardless of my own convictions on this score, I believe that we still need to argue within the framework that Chomsky himself has set. At an earlier point in Chomsky (1975) he states that "there is nothing essentially mysterious about the concept of an abstract cognitive structure, created by an innate faculty of mind, represented in some still-unknown way in the brain, and entering into the system of capacities and dispositions to act and interpret" (1975; 23—4). He conceives of the language faculty as having a neural basis, along the lines of, for example, the organization of vision. In this respect there is no Cartesian dualism between mind and body in Chomsky's reasoning, since the innate faculties of the mind must be determined genetically, in much the same way as the human being's physical appearance. Chomsky's Cartesian rationalism is evident in his method of argumentation. As Jean-

François Revel (1973: 37) has pointed out, "the essential point to understand in Cartesianism is that the totality of the system is based on metaphysics and more precisely on the demonstration of the existence of God." The *a priori* existence of God is necessary for Descartes' argumentation concerning man: in an almost parallel way the *a priori* existence of an innate faculty of language has become necessary for the development of Chomsky's theory of language. One of the weak points in the Cartesian system is Descartes' two attempts to prove by rational argument his intuition concerning the existence of God, which leads him into logical circularity. If Chomsky's arguments in favour of an innate faculty of language can be shown to be weak, illogical, inconsequential or circular, then the hypothesis is weakened and arguments in favour of an empiricist approach to language study as against a rationalist approach are strengthened.

4. *Creativity and cognitive restrictions*

It is perfectly feasible to begin the study of language structure at this point, since varying approaches to linguistics are linked to the stand that a linguistic school of thought takes with regard to the explanation of both first and second language acquisition and the concomitant debate on the innateness hypothesis. The ground has been set by Chomsky, and we must be prepared to test it.

Questions concerning knowledge and the possible nature of the mechanisms by virtue of which we acquire knowledge are surely of crucial significance in setting a framework within which the details of language structure and language use can be studied. They are not merely abstruse philosophical problems with no relation to the description of human nature and human society. The wider biological, psychological and sociological aspects of language can quite easily be approached in this way before one goes on to examine the various models by means of which linguists attempt to describe and account for language structure.

If we take this route to the study of linguistics, we will almost immediately come across two crucial concepts, which I have already touched upon and to which I now return, the concept of creativity and the concept of restrictions on human knowledge. They are the fundamental bone of contention in Sampson (1979) and Sampson (1980).

Sampson accuses Chomsky of capitalizing on the concept of creativity by playing on its positive connotations whilst in fact offering a restricted and impoverished version of it. Sampson defines creativity as follows:

Creativity is the distinctively human capacity of inventing things — of producing things which are novel, not merely in the sense that they did not previously exist, but in the sense they were not previously conceived of.

The word 'things' here is deliberately vague, since human inventions fall into very diverse categories — a crucial aspect of the notion of creativity is that one cannot predict beforehand the nature of its products. (1979: 42). He takes the essential feature of science to be prediction, whereas the principal defining feature of creativity is that creative acts cannot be predicted, but only described after the event. Chomsky's notion of creativity, on the other hand, is closely related to rule-governed activity. In terms of language, the possibility of generating new combinations of structures is taken to be the principal criterion for the creative aspect of language use. The structures themselves, however, will always remain the same, although they will of course vary and develop through time in the course of language change. The rules governing these structures, then, are given, so that it will always be possible to predict potential linguistic utterances. Creative acts, however, are not always predictable, and they can be seen as creative and evaluated as to their use to humanity only after the event. Thus, for Sampson, the creation of new things is not analogous to the creation of new utterances, the latter being a restricted subset of the "things" he mentions.

It is of course obvious that novel linguistic utterances are subject to the constraints of a system of rules and in this respect we cannot claim that they are totally unpredictable. But it is equally true that we cannot predict *in what ways* a future linguistic utterance or set of utterances will be innovative. New words and phrases, new texts and text-types can only be considered as new creations with the benefit of hindsight. They, too, may not have been previously conceived of. The difference between the creative acts which engender them and those that Sampson mentions is that the former are often unconscious acts, whereas the latter are largely conscious. In addition, the degree to which we are prepared to consider the creation of a novel thing as a truly creative act will often depend on the value it has for the social group in which it is invented. This is also the case with linguistic innovations. Chomsky once suggested that creative acts, whether linguistic or non-linguistic, are established as such with reference to what he called "an additional property of aesthetic or intellectual excellence" (1974: 29), and with reference to language the aesthetic dimension is particularly important.

He has repeatedly referred to the "creative aspect of language use" and has warned against equating the formal recursive property of grammars with what he understands by "creativity". The ability to be innovative in language, however, is crucially dependent on the recursiveness of linguistic structure. It presupposes, in other words, a framework of rules. This is equally true of the products emerging from the type of creative acts that Sampson envisages. He takes as an example the invention of envelopes with transparent windows. Clearly, it was impossible to predict that precisely this innovation would emerge, but its conception depended crucially on an already existent set of

factors concerning envelopes, the postal service, the need for greater efficiency in office work, etc., which might be expressible as a set of underlying rules. Whatever is invented is invented within the framework of what already exists and the constraints governing what exists.

Once we admit this, it is a minor step to consider the types of rules which govern human behaviour and to investigate whether they will admit of any underlying universality. For Chomsky, biologically determined cognitive capacities such as the language faculty, although they may display great complexity, are subject to what he calls "special design", setting limits to the knowledge that can be acquired. An empiricist might object that if cognitive capacities were thus constrained, unbounded creativity would not be possible and subsequent limits would have to be postulated for the evolutionary process. This is in effect the essence of Sampson's argument. However, postulating constraints on mental faculties does not mean that the possibilities of innovation within the framework of those constraints are not limitless. Jacob Bronowski was an avowed opponent of Chomsky's rationalist approach to the study of language, yet after discussing the fascinating discoveries made in connection with the mechanism of human vision, he has this to say:

It may seem very smart that the eye is ready-wired to see straight boundaries or curved boundaries, contrasts of light, and so on. But you must also realize that every machine of this sort always pays a price for the things it can do very cleverly — namely, by not being able to do other things. And one of the other things that the eye is not able to do is to look at nature with a fresh, open vision as if it were not looking for straight edges and contrasts of colour. Exactly because search mechanisms for these things are built into the eye, we are constantly deceived about the nature of the outside world because we interpret it in terms of the built-in search mechanism (1978:17—18).

If Bronowski is willing to accept that there is a "built-in search mechanism" which constrains what the human eye is able to "see", why should he reject a similar "built-in mechanism" to account for language acquisition? Perhaps because the former has been established as an empirical fact, whereas the latter remains a hypothesis. Yet there is a large body of evidence to support the postulate of an innate language faculty. At all events, if Bronowski, as an avowed empiricist, can argue in this way, it would seem to me that the conflict between empiricist and rationalist concepts of the mind is an unnecessary red herring.

5. *The need for formalism*

Returning to theories of language, let us take Chomsky's concept of Universal Grammar as a further illustration. If we consider the number of formal mathematical structures which can be used for recursive semiotic coding

systems, we discover that human language makes use of a restricted subset of these structures. Other structures, which are perfectly feasible for automatic processing, simply lie outside the range of what the human brain can process in terms of language. Yet we can of course conceive of those other structures and, what is more, put them to use. There must therefore be a "special design" for the language faculty, a universal set of constraints on the type of structures that may occur in the grammar of any human language. Chomsky calls this set of constraints Universal Grammar, which is perhaps a rather unfortunate term. It is not meant to be understood as a real grammar, but rather as a "theory of grammars, a kind of metatheory of schematism for grammar" (1977: 183). Determining the ways in which the language faculty is stored in the brain and transferred from generation to generation is a biological rather than a linguistic problem, one that is still shrouded in mystery. The linguistic problem is to postulate from the data available what the metatheory for human language might be.

In studying the structure of any language, or languages, we must have an ultimate purpose. This may be to increase future language teachers' awareness of the underlying complexities of their subject. It may be to improve the efficiency of automatic speech synthesis and machine translation. It may be to gain an understanding of language development, both ontogenetic and phylogenetic, so that we can explain the phenomenon of language varieties. The list of practical goals could be expanded almost indefinitely. Whatever our goals are, however, I cannot see how we can avoid taking a stand on the nature of language in general.

In what ways does language open up creative possibilities? How do the exigencies of language use within a social framework place constraints on this creativity? How is language acquired and what might be the contributions to language acquisition both of the mind, including its non-linguistic capacities, and of the socio-cultural environment? What are the peripheral features of the languages under investigation that distinguish them from other languages with the same core grammar determined by the metatheory of Universal Grammar? These and countless other questions can be asked. Some will be easier to answer than others, and in trying to answer them we may frequently run off the rails. But they are all fascinating questions, and they are all intimately bound up with the problems of knowledge and human nature, in interpreting which we will be led to construct models. A good model must be precise and logically consistent. It must be based on sound empirical evidence and derive from a clear overall hypothesis. In short, it must be stringent and scrutable. But it is only a model, and if it truly possesses the feature of scrutability, it will always be vulnerable to alteration, adaptation, even outright rejection. Students' abhorrence of abstraction and formalism can only be dispelled if we can convince them of the necessity of constructing models, by conveying

this insight to them. Linguistics need not lead to Sampson's "scientistic fallacy".

I do not wish to advocate that students should only be confronted with a theory of generative grammar such as Chomsky and his followers are at present developing. Firstly, there are several different variations within generative linguistics, and, secondly, there are just as many non-generative approaches to the study of language, all of which are worth considering. But I do wish to maintain that the sort of attack on Chomsky's work mounted by Sampson merely exacerbates the polemics and does little to help students to relate to the subject and to overcome the odium of formalism.

Chomsky the linguist is deeply concerned with questions relating to the human mind, human nature and the inhumanity of many of the socio-political decisions consciously taken by men and women in positions of power and responsibility. Such a concern will generally be of interest to young people studying the nature of language, so that whatever we think of Chomsky, whether we brand him as rationalist, Cartesian, etc. or not, we still have a unique opportunity of teaching linguistics by following his lead and placing our subject within a more comprehensive framework. No-one is thereby obliged to become a generative linguist.

REFERENCES

Bronowski, J. 1978. *The origins of knowledge and imagination*. New Haven and London: Yale University Press.

Chomsky, N. 1971. *Problems of knowledge and freedom. The Russell Lectures*. London: Collins/Fontana.

Chomsky, N. 1974. "Dialogue with Noam Chomsky". In Parret, H. (ed.). 1974.

Chomsky, N. 1975. *Reflections on language*. New York: Pantheon.

Chomsky, N. 1979. *Language and responsibility*. Hassocks: The Harvester Press. Original title: *Dialogues avec Mitsou Ronat*. 1977.

Chomsky, N. 1982. *Towards a new Cold War. Essays on the current crisis and how we got there*. New York: Pantheon.

Descartes, R. 1637. *Discours de la méthode*. Edited by Jean-Marie Beyssade. 1973. Paris: Livres de Poche.

Parret, H. (ed.). 1974. *Discussing language*. The Hague: Mouton.

Revel, J. -F. 1973. "Descartes inutile et incertain". In Beyssade, J. M. (ed.). 1973. 7–86.

Sampson, G. 1979. *Liberty and language*. Oxford: Oxford University Press.

Sampson, G. 1980. *Making sense*. Oxford: Oxford University Press.