1. Introduction

Is theoretical linguistics, and specifically transformational generative grammar, an empirical science? This question, clearly, invites a reply which is either positive or negative. The present paper, however, will argue neither for nor against the empirical status of transformational generative grammar. On a general level it will rather argue that the question of the empirical status of transformational generative grammar is exceedingly complex — a question not to be approached with a cavalier attitude. On a more specific level the present paper will attempt to justify the following thesis:

(1) The question of the empirical status of transformational generative grammar should be denied the status of an "obviously profound" question.

A question is "profound" if its resolution leads to a significant increase in the understanding of the phenomenon or phenomena in question. And, a question is "obviously" profound, if a rational person can hardly deny its profundity. To argue against this background for the thesis (1), thus, is to provide a justification for two inter-related points:

(2) (a) The question of the empirical status of transformational generative grammar is of such a nature that replies to it can be "proper" without, in fact, contributing to our understanding of the intellectual enterprise called "transformational generative grammar".

(b) It is perfectly rational, and not perverse at all, to judge the question under consideration to be non-profound.

It is clear that to defend the thesis (1) and the points (2)(a) and (b) is to play, in the context of the present round-table discussion, the role of devil's advocate.
My discussion of the question of the empirical status of transformational generative grammar will focus on general-linguistic hypotheses. That is, the thesis (1) will be argued with reference to linguistic hypotheses which postulate linguistic universals. A conventional sort of approach to the general question of the empirical status of general-linguistic hypotheses would take as its point of departure the following more specific question:

(3) Which conditions should general-linguistic hypotheses meet in order to be empirical?

To this more specific question a conventional reply would be:

(4) To be empirical general-linguistic hypotheses should be refutable in principle, where "refutable" means 'capable of being shown false'.

This reply would lead, within the conventional sort of approach, to a second, still more specific question:

(5) Which conditions should general-linguistic hypotheses meet to be refutable in principle?

A proper reply to this question would run, within the conventional sort of approach, as follows:

(6) For general-linguistic hypotheses to be refutable in principle
   (a) the content of these hypotheses should be so clear that they have precise test implications;
   (b) there should, in principle, be available "empirical" data with which these test implications may be confronted;
(c) these hypotheses, or the theory within which they are inter-related, should not incorporate devices which protect them from refutation.

Thus, within the conventional sort of approach obscurity in content, unavailability (in principle) of "empirical" data, and availability of protective devices constitute factors which adversely affect the refutability, and thus the empirical status, of general-linguistic hypotheses. To the philosophical basis of the above-sketched conventional approach I return in §7. below.

The argument for the thesis (1) will be developed below by means of two moves. Firstly, I will consider the refutability of general-linguistic hypotheses from the point of view of factor (6)(c) above. That is, I will deal, in the conventional manner, with a number of protective devices whose availability appear to be harmful to the refutability of general-linguistic hypotheses. At this stage of the discussion, protective devices may be characterized as concepts, conceptual distinctions, auxiliary hypotheses, methodological assumptions, etc. by means of which a hypothesis or theory may be made compatible with data that appear to conflict with one or more of the test implications of the hypothesis or theory. Conventionally, data which appear to conflict with test implications of a hypothesis or theory are taken to provide adverse/negative evidence or counter-examples to this hypothesis or theory.

Secondly, I will move on to a higher level of abstraction and take a critical look at my treatment of the devices which appear to protect general-linguistic hypotheses from refutation. That is, I will subject the conventional sort of approach to the question of the empirical status of general-linguistic hypotheses to critical scrutiny. Specifically, the question will be raised of how insightful the conventional sort of discussion of protective devices is.

2. The Structure-Preserving Constraint

The discussion below of the nature of devices which may be used to protect general-linguistic hypotheses from refutation will be illustrated
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primarily with reference to Emonds's Structure-Preserving Constraint. Emonds (1976:5) defines the Structure-Preserving Constraint (henceforth: SPC) as follows:

(7) Major grammatical transformations are either root or structure-preserving operations. (1)

Emonds (1976:2) proposes the SPC as a universal constraint on syntactic transformations: a constraint of the type which specifies that constituents cannot be moved into certain structural configurations. Informally, the SPC forbids a transformation which is neither a local nor a root-transformation to move, copy, or insert a node C into some position where C cannot be otherwise generated by the grammar. (2) Transformational operations which appear, to Emonds (1976:3), "to have the structure-preserving property are (i) the postposing of the subject noun phrase (NP) into a verb-phrase-final prepositional phrase (PP) of the passive construction, (ii) the preposing of the object NP into the subject NP position in the passive, (iii) the 'raising' of various dependent clause NP's into subject or object NP positions of a containing clause, (iv) the extraposition of various S constituents into a VP-final S position, and (v) the transformational movement of various adverbial phrases into positions where other adverbials of the same syntactic category can be generated in deep structure".

Though Emonds's development of the SPC will provide the bulk of the illustrative material for the present discussion, this discussion does not represent an exhaustive or systematic discussion of the refutability of the SPC. (3) Emonds's work on the SPC has been chosen as the primary source of illustrative material for two reasons. Firstly, in my view this work represents, within the strict Chomskyan approach, one of the very best recent attempts at syntactic theory construction. Thus, it is reasonable to expect that what appears to be methodological difficulties in this work will characterize less meritorious work as well. The converse assumption, of course, is far less plausible. Secondly, reference to the SPC is actual in a general way: much of the recent work in syntactic theory is concerned with universal constraints on syn-
tactic transformations. I will supplement the illustrative material drawn from Emonds's work with similar material from Chomsky’s recent writings on syntax.

3. Potential vs. actual counter-examples

For the purpose of developing the remaining part of this discussion, a distinction between potential and actual counter-examples to general-linguistic hypotheses is needed. Let us consider this distinction with reference to what may be called the "standard conception of linguistic universals". The core of this conception is presented in the following two quotations --- the first from Chomsky and Halle’s The sound pattern of English (1968:25, n.12), and the second from Chomsky and Katz’s article "What the linguist is talking about" (1974:360-361):

(8) (a) "In one sense, a general principle counts as a linguistic universal if it is compatible with the facts for all human languages."

(b) "... linguistic universals are principles common to the competence of native speakers of every natural language."

The core of the standard conception of linguistic universals is that a given linguistic principle is a universal only if it is instantiated by every individual human language. A human language that does not instantiate a given linguistic principle P provides a potential counter-example to the general-linguistic hypotheses that P is a linguistic universal.

This point may be illustrated with reference to the SFC. A transformation in the grammar of some particular natural language which is neither a local nor a root transformation, and which, moreover, lacks the property of structure-preservingness would constitute a potential counter-example to the (general-linguistic hypothesis postulating the) SFC. That is, a non-local, non-root transformation which moves, copies or inserts a node C into some position where C cannot be otherwise gene-
rated by the grammar for the language in question would be a potential counter-example to the SPC.

According to Emonds (1976:34ff.), transformations in the grammar of English that permute constituents with NP’s over be are potential counter-examples to the SPC. COMPARATIVE SUBSTITUTION, for example, permutes adjective phrases whose heads are compared by means of more, less, most, least, or as over be with a subject NP in an apparently non-structure-preserving manner. This transformation has played a role in the derivation of the sentences of (9).

(9)  
(a) More important has been the establishment of legal services.  
(b) Just as surprising was his love for clothes.  
(c) Most embarrassing of all was losing my keys.  
(d) No less corrupt was the ward boss.  
(e) Equally difficult would be a solution to Russell’s paradox.

The substitution of an AP for an NP is, as pointed out by Emonds (1976:35), not a structure-preserving operation. Other transformational rules that perform, in the grammar of English, this operation are PARTICIPLE PREPOSING (4) and PP SUBSTITUTION. (5)

By using a protective device of the sort characterized above a linguist can deny a potential counter-example to a general-linguistic hypothesis the status of an actual counter-example to this hypothesis. A protective device makes the test implications of this hypothesis compatible with data which otherwise would have contradicted them. The devices by means of which general-linguistic hypotheses may be protected from refutation belong to a variety of types. Within the limited scope of the present paper, it is impossible to consider more than one of these types. This is the type of protective devices which is based on conceptions of the nature of linguistic universals that differ from the standard conception presented above. (6)
Recall that the core of the standard conception of linguistic universals is that a linguistic principle represents a linguistic universal only if it is instantiated by every individual human language. This conception of linguistic universals constitutes a strong or an absolute one. In the literature on transformational generative grammar one finds at least two conceptions of linguistic universals which are weaker than the standard one:

(10)  (a) A linguistic principle constitutes a linguistic universal even if some individual languages instantiate it partially only.

(b) A linguistic principle constitutes a linguistic universal even if some individual languages do not instantiate it at all.

Let us consider a number of putative protective devices which are based on these weaker conceptions of linguistic universals.

4. Protective devices based on partial instantiation

The conception that linguistic universals may be partially instantiated only in some languages receives various articulations in Emonds's work on the SPC.

4.1. "Breaking universal linguistic constraints"

Emonds (1976:34-35) gives the conception of partial instantiation a first articulation when he considers COMPARATIVE SUBSTITUTION, etc. as potential counter-examples to the SPC:

(11) "In this section, I discuss some constructions that are not so clearly root transformations as those previously discussed. Rather, these constructions throw into relief the possibility of falsification of the structure-preserving hypothesis, and ways in which other syntactic or semantic processes may interrelate with the constraint on transformations I propose. The rules that produce these constructions are not structure-pre-
serving; nonetheless, they SOMETIMES and FOR SOME SPEAKERS ONLY can apply in nonroot S's in normal English speech. In order to retain the hypothesis that non-structure-preserving, nonlocal movement rules must be root transformations (the structure-preserving constraint), I assert that the use of these rules in embedded sentences is ungrammatical in the strict sense, and that the structure-preserving constraint is being broken for purposes of emphasis, clear communication, etc. Since I am not in a position to be able to characterize the conditions under which ungrammatical sentences can be used, my theory, in the only sense that I can make it precise, does not always coincide with judgments of acceptability. However, it is likely that the way to correct it is to study the conditions under which the structure-preserving constraint can be broken, and not to abandon the constraint itself."

The crucial notion in this quotation is that of speakers breaking universal linguistic constraints. A language whose speakers do this partially instantiates a linguistic universal only in the sense that not every rule within the scope of the universal obeys it.

The notion of speakers breaking universal linguistic constraints can be used as a conceptual device for protecting linguistic universals such as the SPC from refutation. This device may be used as follows:

(12) (a) The speakers of an individual language may, under certain conditions, break universal linguistic constraints otherwise obeyed by the language.

(b) COMPARATIVE SUBSTITUTION, etc. are rules of English in the case of which speakers have broken the SPC.

(c) Thus, COMPARATIVE SUBSTITUTION, etc. are not actual counter-examples to the SPC.

As is clear from the quotation (11), Emonds in fact uses the notion 'breaking a universal linguistic constraint' in this way to protect the SPC from the refuting impact of COMPARATIVE SUBSTITUTION, etc. Notice that within the general framework of (12) every universal linguistic constraint may be given this sort of protection.
4.2. "Preserving structure in a weaker sense"

Within the context of Emonds's discussion (1976:111ff.) of COMPLEX NP SHIFT as a potential counter-example to the SPC, the conception of the partial instantiation of linguistic universals receives a second articulation. In Emonds's grammar of English, this transformation relates the (a)-sentences to their respective (b)-counterparts by moving object NP's to the end of the verb phrase if these NP's dominate an S or, in some cases, a PP:

(13) (a) I've sent every letter I ever received to my lawyer.
(b) I've sent to my lawyer every letter I ever received.

(14) (a) They brought the robe I had asked for into my room.
(b) They brought into my room the robe I had asked for.

(15) (a) She presented a plan for redistributing the land before the council.
(b) She presented before the council a plan for redistributing the land.

After the application of COMPLEX NP SHIFT the structure of the (b)-sentences has an aspect which Emonds (1976:111-112) represents as follows:

(16) \[ V \rightarrow PP \rightarrow NP \]

With reference to (16), Emonds (1976:112) points out that "since the sequence V-PP-NP is not generable by the phrase structure rules of English (i.e., since no empty NP is generable after PP's in a VP), this rule is not structure-preserving according to our definition in Chapter I."

COMPLEX NP SHIFT, thus, appears to be a potential counter-example to the SPC. Let us consider in outline the steps taken by Emonds (1976:112) to deny this rule the status of an actual counter-example to the SPC:
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(17) "... it does not seem to be an accident that the condition on complex NP shift is that the NP dominate an S or a PP, and that the NP in question is moved to the S or PP position at the end of the VP. In more general terms what seems to be happening is the following: Ordinarily a transformational operation that substitutes a constituent B for a constituent A is structure-preserving if and only if B and A are of the same category. But complex NP shift is a transformational operation that may substitute a constituent B (an NP) for a constituent A (an empty PP or S in VP-final position) whenever B dominates A.

Thus we must weaken somewhat the structure-preserving constraint to allow for this variation on it, but we should weaken it under as restrictive a condition as possible. One such condition would be the requirement that this weakening of the structure-preserving constraint can take place only if A is a rightmost or leftmost constituent of an S.

In fact there is good evidence that this is nearly the correct version of the condition under which rules are required to preserve structure only in a weaker sense ..."

Note that the notion 'to preserve structure only in a weaker sense' is crucial to these quoted remarks of Emonds's. Within the present discussion a rule which obeys a weaker version of a universal linguistic constraint only is a rule which only partially instantiates the constraint.

The idea that a universal linguistic constraint may apply either in a strong or a weak(er) sense forms the basis of a second putative device for protecting the SPC from refutation. This device may be used as follows to protect the SPC from potential counter-examples such as COMPLEX NP SHIFT:

(18) (a) Universal linguistic constraints may apply either in a strong or a weak(er) sense to the rules of individual languages.

(b) COMPLEX NP SHIFT is a rule of English to which the SPC applies in a weaker sense/preserves structure in a weaker sense only.

(c) Thus, COMPLEX NP SHIFT is not an actual counter-example to the SPC.
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The SPC, of course, is not the only general-linguistic constraint which may apply either in a strong or a weak(er) sense to the rules of particular grammars. That is, within the general framework of (18) a larger class of general-linguistic hypotheses may be protected from adverse evidence. This point may be illustrated with reference to Chomsky's autonomy thesis.

Chomsky (1975:177-178) draws a distinction between a "(fairly) strong" and a "weaker" or "parameterized" version of this general-linguistic thesis:

(19) "One might formulate a 'thesis of autonomy of formal grammar' of varying degrees of strength. As in the case of the question of independence of grammar, discussed a moment ago, we might construct a linguistic theory in which formal grammar is independent in its structure but 'open' at certain designated points with respect to the full range of semantic primitives. The problem, then, will be to determine the specific ways in which semantic information enters into the determination of a formal grammar. If a fairly strong thesis of autonomy in this sense proves correct, we will proceed to supplement it with a theory of the interconnection of semantic and formal grammatical structures, much as in the case of the study of grammar in relation to fact and belief. The theory of linguistic form may still be a theory with significant internal structure, but it will be constructed with 'semantic parameters'. The actual choice of formal grammar will be determined by fixing these parameters. Suppose that the parameterized theory includes parts of the dictionary, and suppose further that the semantic parameters can be localized to the dictionary. Then questions of fact and belief may also enter into the choice of grammar at this point, consistent with the parameterized autonomy thesis. Note that the significant question with regard to the autonomy thesis may not be a question of 'yes' or 'no', but rather of 'more' or 'less' or more correctly, 'where' and 'how much'."

Within the framework of Chomsky's distinction between a "strong" and a "parameterized" version of the autonomy thesis, potential counter-examples to this thesis may be viewed as merely indicating the limitations of the degree to which the language in question instantiates the principle postulated by the thesis. Thereby this distinction acquires the status of a device protecting the autonomy thesis from adverse evidence.
4.3. The "general idea" of a linguistic universal

We come now to the third articulation which the conception of the partial instantiation of linguistic universals receives in Emonds's work. This happens within the context of Emonds's discussion (1976:6) of the status of a potential counter-example to the SPC which has been suggested by Saib. As presented by Emonds (1976:6-7), this counter-example takes on the form of a movement rule in Classical Arabic. The rule applies only in subordinate clauses introduced by annahu. It moves an NP from the right of the verb to the left of the verb in cases where the NP is not adjacent to the verb. According to Saib, Classical Arabic is characterized on the level of deep structure by an order of constituents in which the verb comes first. This implies that there is no NP to the left of the verb into which the rule under consideration can move the NP. Since this rule is not a local transformation, it appears to violate the SPC, thereby becoming a potential counter-example to this constraint.

It is interesting to consider the manner in which Emonds (1976:6) handles this potential counter-example to the SPC:

(20) "At first glance, when one compares the preceding formulation of the structure-preserving constraint to some rather obvious grammatical processes in languages other than English, it appears that the constraint is seriously inadequate. However, it seems likely to me that the constraint can be generalized in certain ways so that the general idea of the constraint remains intact. I will discuss two types of such inadequacies and suggest ways in which the structure-preserving constraint might be revised in order to account for these cases.

The most general form of the structure-preserving constraint may contain language-specific variables other than the set of phrase structure or base rules, so that the preceding statement of the constraint would be in fact a special case of a more general formal universal.

In particular, in some languages where movement transformations are more freely applicable in certain embedded clauses, a somewhat larger class of nodes may play the role that root S's play in English and French."

Emonds (1976:7) goes on to suggest that it may be that in Classical Arabic certain complement S's, namely those introduced by annahu, can play the role of root S's.
From the point of view of the refutability of general-linguistic hypotheses, the quotation (20) is interesting in two general respects. Firstly, it contains the suggestion that a distinction should be drawn between, on the one hand, the "general idea" of a linguistic universal and, on the other hand, what may be called the "peripheral aspect(s)/component(s)" of a linguistic universal. Secondly, the quotation (20) provides for the possibility that different individual languages may instantiate the peripheral aspect(s) of linguistic universals differently. Thereby each of these languages instantiates the full universal only partially.

This articulation of the notion of partial instantiation may be used as follows to protect a linguistic universal such as the SPC from adverse evidence:

(21) (a) A linguistic universal comprises a "general idea" and one or more peripheral components.
(b) Individual languages may instantiate the peripheral component(s) of a linguistic universal differently.
(c) The concept 'root (sentence)' is a peripheral component of the SPC.
(d) Classical Arabic instantiates the concept 'root (sentence)' in a language-specific manner.
(e) The above-mentioned movement rule of Classical Arabic which is apparently not structure-preserving applies to the language-specific class of root sentences of the language.
(f) Thus, this movement rule does not constitute an actual counter-example to the SPC.

Obviously, the SPC is not the only linguistic universal which may be protected in this manner from negative evidence. This point may be illustrated with reference to Chomsky's $\tilde{X}$- convention.
Consider the following insightful comment which Chomsky (1972b: 53) offers on the universal status of the $X$-convention:

\[ \text{(22)} \quad \ldots \text{it can be expected that the base rules for any language will contain language-specific modifications to the general pattern.} \]

The expression "the general pattern" in this quotation refers to the language-independent schema associated with major categories. Jackendoff (1974:11) represents this schema as follows:

\[ \text{(23)} \]

Of course, for a language to modify a linguistic universal in a language-specific manner is for the language to instantiate the universal partially only.

Selkirk is another Chomskyan linguist who appears to allow for language-specific modifications to the $X$-convention. Thus, she (1975: 753) points out that:

\[ \text{(24)} \quad \text{"Chomsky's postulation of a formalism designed to permit the schematization of the rules generating these categories ... embodies the claim that such a parallelism is significant and, in some sense, inherent in language."} \]

The significant expression in this quotation is the qualification "in some sense". This qualification provides for the possibility of the partial instantiation of the $X$-convention by individual languages.
5. **Protective devices based on non-instantiation**

This brings us to the conception that a linguistic principle may constitute a linguistic universal in spite of the fact that some individual languages do not instantiate it at all. Let us consider two of the articulations which this conception of linguistic universals has received in the work of Chomsky and his associates.

5.1. "Relative" vs. "absolute interpretation" of linguistic universals

At the basis of the first articulation of the non-instantiation conception is Chomsky's distinction between a "relative" and an "absolute interpretation" of linguistic universals. Chomsky (1973:235-236) explicates the content of this distinction as follows:

(25) "Notice that the condition (3) [i.e., the A-over-A principle --- R.P.B.] does not establish an absolute prohibition against transformations that extract a phrase of type A from a more inclusive phrase of type A. Rather, it states that if a transformational rule is nonspecific with respect to the configuration defined, it will be interpreted in such a way as to satisfy the condition. Thus it would be possible to formulate a (more complex) rule with a structural condition imposing the factorization indicated by --- in (4); such a rule might extract Bill, Mary, and the race, respectively. Alternatively, one might interpret the A-over-A constraint as legislating against any rule that extracts a phrase of type A from a more inclusive phrase A. The former interpretation, which in effect takes the A-over-A Condition to be an integral part of the evaluation measure, is perhaps more natural..."

In contrast, we interpret the Complementizer Substitution Universal (2) as imposing an absolute restriction against rules that move an item to the right to a COMP position. But the A-over-A principle, rather than legislating against the existence of certain rules, permits an ambiguous and unspecific formulation of such rules as Passive, constraining their application in a specific way. The logic of this approach is essentially that of the theory of markedness."

Chomsky (1976:8) refers to his view of the universal status of constraints such as the A-over-A principle as "a relative interpretation". (10)

By contrast, he calls his view of the universal status of linguistic
principles such as the Complementizer Substitution Universal "an absolute interpretation". It is now clear that what has been called "the standard conception of linguistic universals" is identical to Chomsky's "absolute interpretation" of linguistic universals.

It seems to me that Chomsky's distinction between an "absolute" and a "relative interpretation" of linguistic universals allows, in principle, for two forms of non-instantiation of linguistic universals by individual languages. The first is a limited form of non-instantiation, and is related to Emonds's first articulation of the notion of partial instantiation. In terms of this limited form of non-instantiation only some of the rules of a language within the scope of a universal linguistic constraint obey it. The rules which are within the scope of this universal constraint but which fail to obey it, however, do not have the status of actual counter-examples to the constraint. These "disobedient" rules are simply "less highly valued" or "more costly" than the rules which do obey the universal constraint. A language is "marked" to the extent that it incorporates such "costly" rules.

By means of the distinction under consideration a universal linguistic constraint such as the SPC may be protected in the following manner from such potential counter-examples as the English rule of COMPARATIVE SUBSTITUTION:

(26) (a) A distinction should be drawn between an "absolute" and a "relative interpretation" of universal linguistic constraints.

(b) The SPC is, within the framework of this distinction, a "relative" linguistic universal.

(c) The non-instantiation of the SPC by COMPARATIVE SUBSTITUTION makes this rule "less highly valued/more costly".

(d) Thus, the non-instantiation of the SPC by COMPARATIVE SUBSTITUTION does not constitute an actual counter-example to the SPC.

The line of argument of (26) is, of course, available for the protection of any "relative" linguistic universal from adverse evidence.
We now come to the stronger form of non-instantiation provided for by Chomsky's distinction between an "absolute" and a "relative interpretation" of linguistic universals. This stronger form of non-instantiation creates the possibility for a given linguistic principle to be a linguistic universal even though there are individual languages which do not instantiate it at all. Suppose, for example, that it is found that a given language has no rules which obey the SPC. This language may then still be denied the status of a source of actual counter-examples to the SPC. In terms of the "relative interpretation" of linguistic universals, this language would merely be "very highly marked".

That Chomsky does, in fact, allow for this strong form of non-instantiation of linguistic universals is clear from, among other things, the way in which he (1975b:114) operates with a notion of 'choice':

(27) "The theory of grammar makes a variety of devices available, and languages may differ as to their choice among them."

The choice of a language not to use a given linguistic universal is, within the framework of the present discussion, an instance of the strong form of the non-instantiation of this universal.

The idea of individual languages "choosing" linguistic universals goes back, at least, to Chomsky and Halle's work on the theory of phonology. Consider, for example, their (1968:178) view of the universal status of the processes of assimilation and dissimilation:

(28) "Observe that by permitting variables in the formulation of rules, we in effect commit ourselves to the view that assimilation and dissimilation are not merely a matter of fortuitous coincidence of almost identical rules, but are, rather, linguistic universals --- that is, processes available to all languages though not necessarily used in all."

The significant idea in this quotation, of course, is that a linguistic principle may be a linguistic universal despite the fact some individual languages do not "use" it all. In this context, "non-use" is equivalent to the strong form of non-instantiation.
5.2. "Vacuous application" of linguistic universals

The view that linguistic universals need not be instantiated by all individual languages receives, in the work of Chomsky, a second articulation in terms of a notion of 'vacuous application'. This is clear from the following remarks by Chomsky (1975c:2) on the nature of linguistic universals:

(29) "We will therefore be particularly interested in properties of attained linguistic competence that are vastly underdetermined by available experience in general, but that nevertheless hold of the linguistic competence attained by any normal speaker of a given language, and in fact by all speakers of all languages (perhaps vacuously in some cases) on the natural assumption of uniformity across the species."

The view that linguistic universals may "hold vacuously" can be traced back to Chomsky and Halle's work on phonological theory as well. Thus, they (1968:25, note 2) allow for the possibility that

(30) "... the transformational cycle might apply vacuously in a certain language, in particular if the language has very shallow surface structure. Thus a highly agglutinative language might be expected to offer little or no support for the principle of the transformational cycle, at least within the bounds of a word. This, if true would be entirely irrelevant to the status of this principle as a linguistic universal."

To say that a linguistic universal "holds" or "applies vacuously" in a given language, clearly, is to say that the universal is not instantiated by this language at all.

Chomsky and Halle's final remark in the quotation (30) is quite revealing: it indicates how the notion of "vacuous application" may be used to protect linguistic universals from potential counter-examples. Specifically, a language in which a linguistic universal "applies vacuously" does not provide an actual counter-example to the general -linguistic hypothesis that postulates the universal.
6. Appraisal of the protective devices

The discussion so far has been couched in neutral terms. That is, a number of putative devices for the protection of general-linguistic hypotheses have been described in a non-evaluative manner. The conventional sort of approach to the use of such devices, however, goes a step further. Within this approach a distinction is drawn between objectional and non-objectional protective devices. The former devices are considered harmful to the refutability of the hypotheses or theories protected by them. The latter devices are taken to be harmless in this sense. A protective device is conventionally considered objectionable if it can be used to make claims which are obscure, ad hoc, or not independently testable. Such claims are, conventionally, called "ad hoc (auxiliary) hypotheses". By contrast, a protective device in terms of which claims may be made that are clear, non-ad hoc, and independently testable is considered non-objectionable. The claims made in terms of such non-objectionable protective devices are assigned the status of "(non-ad hoc) auxiliary hypotheses".

Let us then, in keeping with the conventional approach, try to establish whether the protective devices outlined in §§4-5 are objectionable or non-objectionable. This may be done by raising a series of diagnostic questions about the conceptual basis of each device. Since these questions are self-explanatory, it is not necessary to comment separately on each individual question.

To begin with, consider the protective device central to which is Emonds's notion 'breaking universal linguistic constraints'. As regards the conceptual basis of this device questions such as the following arise: Which universal linguistic constraints can/cannot be broken? Is it possible to delimit in a principled manner the class of universal linguistic constraints that can be broken? What are the conditions under which universal linguistic constraints can/cannot be broken? Can these conditions be characterized in a principled manner? Is it possible to predict for an arbitrary universal linguistic constraint that it will/will not be broken under given conditions? Under which circumstances will Emonds be willing to abandon the general claim that universal constraints can be broken?
Concerning the second protective device --- the one based on Emonds's notion 'preserving structure in a weaker sense' --- questions such as the following may be asked: What is the weakest sense in which structure can be preserved without the SPC being non-instantiated by transformational rules? Why should the condition proposed by Emonds on the weakening of the SPC be accepted as non-ad hoc? What are the other (possible) conditions under which the SPC may be weakened? Is it possible to predict other potential weakenings of the SPC? Which other universal linguistic constraints can be weakened? Is it possible to delimit the class of universal linguistic constraints which can be weakened in a principled manner? What would count as an actual counter-example to the weakened version of the SPC? Under which conditions would Emonds be willing to give up his claim that universal linguistic constraints such as the SPC can be weakened? Notice that an analogous range of questions may be raised in regard to Chomsky's distinction between a "strong" and a "parameterized" version of the autonomy thesis.

This brings us to the third protective device discussed above in relation to the SPC: the one which has at its basis Emonds's distinction between the "general idea" and the peripheral component(s) of the SPC. In connection with the conceptual basis of this device questions such as the following arise: Is there a principled manner of assigning certain aspects of a linguistic universal the status of "peripheral components" and of assigning other aspects the status of "general ideas"? To which universal linguistic constraints does this distinction apply? Can the class of linguistic universals to which the distinction applies be defined in a non-ad hoc manner? How much of the content of a universal linguistic constraint may be considered peripheral? Under which conditions would Emonds give up the claim that a distinction may be drawn between the "general idea" and the peripheral component of the SPC (or any other universal linguistic constraint)? Which embedded clauses can, for principled reasons, not be reanalyzed as root 8's? What are these reasons?

Chomsky's related notion of 'language-specific modifications to the general pattern (= linguistic universals)' invites a similar range of questions. For example: Which general/universal aspects of natural language can/cannot undergo language-specific modifications? Can these
two classes of universals be delimited in a principled manner? Which (types of) language-specific modifications to linguistic universals are possible/impossible? To what extent may a language modify a linguistic universal without ceasing to instantiate it? What (sorts of) data would have the status of actual counter-examples to a claim to the effect that the language L has modified the linguistic universal U without having ceased to instantiate U? Under which circumstances would Chomsky be willing to give up his view that linguistic universals can undergo language-specific modifications?

At the basis of the fourth protective device considered above lay Chomsky's distinction between an "absolute" and a "relative interpretation" of linguistic universals (specifically universal constraints on syntactic transformations). In connection with this distinction questions such as the following may be asked: To which (classes of) linguistic universals does this distinction apply? Is it possible to give a principled characterization of the (classes of) linguistic universals to which the distinction in question applies? Can the class of "relative universals" be defined in a non-ad hoc manner? What would count as an actual counter-example to the claim that a given linguistic universal, say the A-over-A principle, constitutes a "relative universal"? What would count as an actual counter-example to the claim that a given rule is "costly" or "less highly valued"? What would count as an actual counter-example to the claim that a given language is marked in a particular respect? How many languages should fully instantiate a linguistic principle before this principle may be assigned the status of a linguistic universal? If only one language instantiates a given linguistic principle, on which grounds can then be argued against the claim that this linguistic principle is a linguistic universal and that all the languages which do not instantiate it are marked in this respect? How highly marked can a language be before it fails to qualify as a human language? Under which circumstances would Chomsky be willing to give up the distinction between an "absolute" and a "relative interpretation" of linguistic universals?

Chomsky's related notion of 'languages choosing/using linguistic universals' gives rise to similar questions. Thus: Which linguistic universals must a language choose in order to be a human language? What would count as an actual counter-example to the claim that a given lin-
guistic principle which has not been chosen by a particular language has in fact been available as a linguistic universal to this language?

The fifth protective device that we considered above had as its conceptual basis Chomsky's notion of 'vacuous application'. This notion invites questions such as the following: Can every linguistic universal "apply vacuously" to individual languages? If not, is it possible to draw a principled distinction between linguistic universals which can and linguistic universals which cannot "apply vacuously" to individual languages? Under which circumstances would Chomsky be willing to give up this notion of 'vacuous application'?

The literature in which the protective devices in question has been found does not contain explicit and systematic answers to the questions listed above. In the spirit of the conventional approach to protective devices, three inter-related conclusions may be drawn from the absence of such replies. These conclusions concern the methodological status of the claims --- claims such as (12), (18), (21), (26) --- which the adoption of these devices make possible:

(31) (a) These claims are obscure in regard to content.
(b) These claims are ad hoc: their sole function is the protection of general-linguistic hypotheses from refutation.
(c) These claims do not yield independent predictions or test implications which may, in turn, be contradicted by actual counter-examples.

In short, the claims allowed by the protective devices under consideration are obscure, ad hoc, and not independently testable.

Within the conventional approach a further conclusion --- based on the conclusions (31)(a)-(c) --- may be drawn:

(32) The general-linguistic hypotheses protected by means of these objectionable devices are not refutable in principle.
And, from this conclusion an ultimate conclusion may be drawn:

(33) Transformational generative grammar should be denied the status of an empirical science.

The all-important question, now, concerns the acceptability of the conclusions (31)-(33). If these conclusions may be seriously questioned, they clearly are uninsightful, revealing nothing of the nature of the intellectual enterprise called "transformational generative grammar". So, let us look into the matter of the acceptability of the conclusions stated above.

7. Appraisal of the conventional approach

The conventional approach to the methodological status of protective devices is based on various assumptions which have not been explicitly presented in the preceding sections. Fundamental among these assumptions are the following two:

(34) (a) The distinction drawn between objectionable and non-objectionable protective devices in terms of the notions 'obscure', 'ad hoc', and 'independently testable' is both non-obscure and non-arbitrary.

(b) Refutability is the hallmark of scientific rationality.

Now, both of these assumptions are questionable. Moreover, both of these assumptions have generated additional assumptions which, though less fundamental, are not less questionable.

Before considering the assumptions (34)(a) and (b) separately, their origin should be clarified. I can claim credit for neither of these assumptions. Both, in fact, are theses of Popper's. And, the so-called conventional approach to protective devices is nothing but an informal version of Popper's approach to these devices. But let us consider the two assumptions of (34) separately.
7.1. Objectionable vs. non-objectionable protective devices

As regards the assumption (34)(a): the distinction drawn between objectionable and non-objectionable protective devices in terms of the notions 'obscure', 'ad hoc', and 'independently testable' is out and out Popperian. Specifically, this distinction represents the views of Popper as these are summarized in, for example, his "Replies to my critics" (1974: especially pp.983-987). Thus, to Popper (1974:986), a "conjecture" or "auxiliary hypothesis" is

\[ (35) \text{"... 'ad hoc' if it is introduced ... to explain a particular difficulty, but if ... it cannot be tested independently."} \]

It is to these ad hoc hypotheses that he (1974:983) assigns the status of "evasive tactics in the face of refutations", "conventionalist strategies [or twists]" or (after Hans Albert) "immunizing tactics or strategems".

The problem now is that Popper's characterization (35) of ad hoc hypotheses is highly problematical, as has been shown by various philosophers of science. Thus, for example, Hempel (1966:30) has shown that "there is, in fact, no precise [i.e., logical, R.P.B.] criterion for ad hoc hypotheses".\(^{(11)}\) And, Grünbaum (1976c:342-347) argues convincingly that Popper's attempt to characterize the notion 'ad hoc hypothesis' in terms of a concept 'degrees of falsifiability' fails as well. Thus, counter to the assumption (34)(c), it is not so that the crucial notions 'ad hoc' and 'independently testable' are, from a logical or epistemological point of view, non-obscure.

It is therefore not surprising to find in the philosophical literature various theories of ad hoc hypotheses which have been proposed as alternatives to the Popperian one stated as (35) above. These alternatives include, among others,
(36) (a) Hempel's (1966:30) theory which attempts to explain the notion of an independent consequence in terms of the pragmatic concept of an independent observational consequence;

(b) Grünbaum's (1976c:33ff.) approach which proceeds from three historically relevant senses of ad hoc such that these senses differ in regard to logical strength;

(c) Lakatos's (1970:124, 125, 175) theory within which a distinction between three concepts of ad hocness is drawn with reference to the notions 'progressive' and 'degenerating problem-shift';

(d) Schaffner's (1974:67-73) Bayesian theory;

(e) Leplin's (1975:331) theory within which a condition of non-fundamentality is invoked as a universal condition for ad hocness;

(f) Laudan's (1977:ch.III) theory within which a notion of reduced problem-solving effectiveness is central to the characterization of ad hoc hypotheses.

This list of alternative theories of what ad hoc hypotheses are is not exhaustive. The debate about the potentialities and limitations of the various alternative theories continues. At present it is, in fact, impossible to judge which one of the rival theories has the best chance of survival. But in §6 Popper's theory of ad hoc hypotheses was adopted, without argument, as the basis for appraising the devices protecting general-linguistic hypotheses from refutation. Consequently, it is simply not so --- as is stated in the assumption (34)(a) --- that the distinction between objectionable and non-objectionable protective devices in terms of the notions 'obscure', 'ad hoc', and 'independently testable' is non-arbitrary.

Thus, we see that both on the point of non-obscurity and the point of non-arbitrariness the assumption (34)(a) is questionable. Consequently, the conclusion of (31) that the analyzed protective devices are obscure, ad hoc, and not independently testable have a basis which is
not only infirm but which, moreover, is probably inappropriate for the use to which it has been put. In short, it is not at all clear that the protective devices outlined in §§4-5 and appraised in §6 are, in fact, objectionable ones. From this follows that the conclusion, (32), that general-linguistic hypotheses are not refutable in principle lacks a solid basis. And this, in turn, implies that the conclusion, (33), that transformational generative grammar should be denied the status of an empirical science is more than highly tentative.

It is difficult to overemphasize the complexity of the problem of finding a satisfactory basis for characterizing the notion 'ad hoc (auxiliary) hypothesis'. For, it is not only necessary to decide in the case of individual auxiliary hypotheses whether or not they are ad hoc. It is, moreover, necessary to decide in the case of (auxiliary) hypotheses which appear to be ad hoc whether they are hopelessly ad hoc or whether they are "redeemably" ad hoc. The history of empirical science provides --- as shown, for example, by Agassi (1975b) --- numerous instances of auxiliary hypotheses which appeared at first to be, in some sense, clearly ad hoc, but which later on became testable, and even well-confirmed, hypotheses. A paradigm case --- discussed by Agassi (1975b:192), Grünbaum (1976c:330) and Leplin (1975:337ff.) --- is the physical hypothesis which postulates the existence of neutrinos. An inadequate theory of ad hoc hypotheses would have warranted the rejection of this hypothesis --- and of many other fruitful scientific hypotheses --- as "non-empirical". This rejection would, obviously, have impeded the growth of scientific knowledge.

7.2. Overemphasizing refutability?

This brings us to the second assumption, (34)(b), which was fundamental to the appraisal in §6 of the devices by means of which general-linguistic hypotheses may be protected from refutation. Recall that this assumption assigns to refutability the status of hallmark of scientific rationality. It is clear that, if this assumption were questionable, then the question of the empirical status of a scientific theory would lose much, if not all, of its apparent profundity. Moreover, if this
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assumption were questionable, then criticizing a hypothesis or theory for being non-refutable would cease to be a destructive criticism. And, under these circumstances, the search for ad hoc hypotheses, protective devices, or immunizing stratagems would lose much of its interest.

An obvious question, then, presents itself: Is or isn't refutability the hallmark of scientific rationality? The answer is: Yes, within the framework of Popper's falsificationist methodology, refutability certainly has this status. But, it should immediately be added that Popper's falsificationist methodology constitutes but one of the alternative theories of scientific rationality. As shown, for example, by Lakatos (1971:92ff.), there are at least three alternatives to Popper's falsificationist methodology: inductivism, conventionalism, and the methodology of research programmes. And, within none of the latter methodological theories refutability has the status of hallmark of scientific rationality.

What is even more important: Popper's falsificationist methodology has been subjected to severe criticism. His falsificationist theory has been incisively criticized from both a philosophical and a historical point of view. The philosophical criticisms --- such as those by Grünbaum (1976a, b, c, d) --- are intended to show that Popper's theory suffers from fundamental defects of a logical and epistemological sort. The present paper will not go into these philosophical criticisms. (12) The historical criticisms of Popper's methodological theory are intended to show that, when interpreted as a historiographical theory, the history of science does not bear out the fundamental theses of this theory.

Lakatos (1971), one of the most outspoken critics of Popper's falsificationist methodology, in fact claims that the history of science "falsifies" Popper's theory of scientific rationality. In particular, Lakatos (1971:11) argues that Popper's "demarcation criterion" should be rejected because it is inconsistent with the "basic appraisals of the scientific elite". Within the context of our study, this means that Popper's assumption that refutability is the hallmark of scientific rationality is refuted by counter-examples from the history of science.
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This point, as it bears on the use of protective devices, is explicated as follows by Lakatos (1971:112):

(37) "... in large research programmes there are always known anomalies: normally the researcher puts them aside and follows the positive heuristic of the programme. In general he rivets his attention on the positive heuristic rather than on the distracting anomalies, and hopes that the 'recalcitrant instances' will be turned into confirming instances as the programme progresses. On Popper's terms the greatest scientists in these situations used forbidden gambits, ad hoc stratagems: instead of regarding Mercury's anomalous perihelion as a falsification of the Newtonian theory of our planetary system and thus as a reason for its rejection, most physicists shelved it as a problematic instance to be solved at some later stage --- or offered ad hoc solutions. This methodological attitude of treating as (mere) anomalies what Popper would regard as (dramatic) counter-examples is commonly accepted by the best scientists. Some of the research programmes now held in highest esteem by the scientific community progressed in an ocean of anomalies. That in their choice of problems the greatest scientists 'uncritically' ignore anomalies (and that they isolate them with the help of ad hoc stratagems) offers, at least on our metacriterion, a further falsification of Popper's methodology. He cannot interpret as rational some most important patterns in the growth of science."(13)

Observations of this sort on the history of science, of course, are not unique to Lakatos. Scholars such as Kuhn (e.g., 1970) and Feyerabend (e.g., 1970) have been making similar observations for quite a time.

It should be clear now that the assumption (34)(b), that refutability is the hallmark of scientific rationality, is highly questionable. On the one hand, this assumption is central to only one of the rival theories of scientific rationality, viz. Popper's falsificationist methodology. On the other hand, construed as a hypothesis about the history or growth of science the assumption in question appears to be refuted by numerous counter-examples.

How, then, does all of this bear on the conventional approach which we have adopted to the question of the empirical status of transformational generative grammar? I think that the discussion above has provided ample justification for the thesis formulated as (1) in the intro-
duction to this paper. Recall that this thesis asserted that the question of the empirical status of transformational generative grammar should be denied the status of an "obviously profound" question. It is now clear that this question is profound within the framework of a falsificationist theory of scientific rationality alone. And, as the most sophisticated version of such a theory, Popper's methodological theory appears to suffer from grave defects. Consequently, within the framework of this theory one can pursue the question of the empirical status of a scientific theory such as transformational generative grammar without gaining deeper insight into the nature of (linguistic) science. Thus, it is not perverse at all to deny the question of the empirical status of transformational generative grammar the epithet "obviously profound".

The objection may be raised that in the preceding discussion only one of the aspects of the question of the empirical status of transformational generative grammar has been considered: the aspect of protection. The point of this objection would be that the discussion of the other aspects of this question --- for example, the availability of "empirical" data --- may be philosophically less hazardous and more insightful. The reply to this point takes on the form of a simple question: Are there good reasons for this optimistic expectation?

8. A word of consolation

The preceding sections have developed an argument for the "non-profundity" thesis of (1). Perhaps it is not superfluous to point out that in these sections I have NOT argued for a number of theses which may appear to be (vaguely) related to the "non-profundity" thesis. Specifically, no attempt has been made to justify the following theses:

(38) (a) Refutability should play no role at all in scientific rationality.

(b) It is completely pointless to pursue the question of the empirical status of transformational generative grammar.

As regards the latter thesis, I will briefly present one reason why it is not completely pointless to pursue the question under consideration.
Leading generative grammarians have repeatedly claimed that transformational generative grammar does have the status of an empirical science. Nowhere has this claim been made more clearly than in Chomsky and Halle's *The sound pattern of English* (1968:ix):

(39) "One of the best reasons for presenting a theory of a particular language in the precise form of a generative grammar, or for presenting a hypothesis concerning general linguistic theory in very explicit terms, is that only such precise and explicit formulation can lead to the discovery of serious inadequacies and to an understanding of how they can be remedied. In contrast, a system of transcription or terminology, a list of examples, or a rearrangement of the data in a corpus is not 'refutable' by evidence (apart from inadvertence --- errors that are on the level of proofreading mistakes). It is for just this reason that such exercises are of very limited interest for linguistics as a field of rational inquiry."

Claims such as these by generative grammarians provide a reason for pursuing the question of the empirical status of transformational generative grammar. For, against the background of the preceding discussion, these claims are problematic in one of two senses, neither of which is uninteresting.

On the one hand, a problem arises if one is willing to accept the conventional, falsificationist, approach to protection. This is the problem of how generative grammarians could claim their field to be an empirical science and, simultaneously, take extensive measures to immunize general-linguistic hypotheses against refutation. On the other hand, a problem arises if one questions the appropriateness and insightfulness of the conventional, falsificationist, approach to protection. This is the problem of why generative grammarians would want transformational generative grammar to make refutable claims if refutability were the hallmark of scientific rationality within the framework of a probably defective methodological theory alone. Both the former and the latter problem appear to me to warrant a cautious and self-critical inquiry into the question of the empirical status of transformational generative grammar. I hope that this is a word of
consolation for all those scholars who have been disappointed by the conclusion that the question of the empirical status of transformational generative grammar is not an "obviously profound" question.
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FOOTNOTES

* Paper presented at the Round-Table Discussion of "Linguistics as an empirical science", XIIth International Congress of Linguists, Vienna, 29th August - 2nd September 1977. I would like to thank Ray Theron for improving the formulation of this paper.

1. Emonds (1976:70, n.4; 193, n.14) proposes various modifications to the SPC. None of these modifications, however, need to be considered at this point of the discussion.

2. Emonds furnishes the following definitions for the theoretical terms local transformation, root-transformation, and root sentence:

"A transformation or a transformational operation that affects only an input sequence of a single nonphrase node C and of one adjacent constituent C' that is specified without a variable, such that the operation is not subject to any condition exterior to C and C', is called a 'local transformation' (or a local transformational operation)." (1976:4).

"A transformation (or a transformational operation, in case of a transformation performing several operations) that moves, copies, or inserts a node C into a position in which C is immediately dominated by a root S in derived structure is a 'root transformation' (or a root transformational operation)." (1976:3).

"A root S ('sentence') is an S that is not dominated by a node other than S." (1976:2).

3. For such a discussion cf. Sinclair in preparation.

4. By means of PARTICIPLE PREPOSING, Emonds (1976:36) derives English sentences such as Speaking at today's lunch will be our local congressman., Taking tickets at the door was a person I had previously roomed with., Examined today and found in good health was our nation's chief executive., Taking turns, as usual, were his two sisters.

5. PP SUBSTITUTION is, within Emonds's (1976:37) grammar of English, the rule by means of which sentences such as In each hallway is (hangs, has long stood) a large poster of Lincoln., Among the guests were (sat) John and his family., and On the porch is a large wicker couch. are derived.
6. For some discussion of other types of devices that have been used to protect general-linguistic hypotheses from adverse evidence cf. Botha 1971:§5.2.3., and Botha in preparation.

7. For a more detailed discussion of the devices by means of which Chomsky's autonomy thesis may be protected against refutation cf. Botha in preparation.

8. Not only "true Chomskyans" operate with a notion of 'language-specific modifications to linguistic universals'. A related notion is involved in Perlmutter and Postal's principle of "line drawing" and in Keenan and Comrie's principle of "the accessibility hierarchy". For references cf. Postal 1976:169.

9. In this quotation, (3) refers to the following formulation of the A-over-A principle by Chomsky (1973:235):

"If a transformation applies to a structure of the form
\[ \varepsilon \ldots [A \ldots] \ldots \]
where \( \varepsilon \) is a cyclic node, then it must be so interpreted as to apply to the maximal phrase of the type A"

By means of (4) Chomsky (1973:235) denotes the following factorized strings:

(a) John and-Bill-saw-Mary
(b) The man who saw-Mary-bought-the book
(c) John's winning-the race-surprised-me

Finally, Chomsky (1973:234) formulates the Complementizer Substitution Universal (2) as follows:

"Only languages with clause-initial COMP permit a COMP-substitution transformation."

10. Chomsky's "relative interpretation" of linguistic universals may be traced back to Chapter 9 of The sound pattern of English where the outlines of a markedness theory of phonology are presented.


13. In the footnotes to this quote Lakatos presents bibliographical information which is irrelevant to the present discussion.
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