ANAPHORIC ISLANDS

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I. Introduction

I shall not attempt to give a serious definition of anaphoric element, a task which presupposes an understanding of this aspect of language which is, in my opinion, not now available. Evidently, however, the interpretation of such elements involves the notion of identity with some other portion of sentential structure. Suffice it to say therefore that I include among anaphoric elements pronouns, both those involving identity of reference and involving identity of sense, pro verb phrases (do so, etc.), pro relative clauses (such), etc. Examples of anaphoric elements are the underlined forms in (1):

(1)a people who have met Max agree that he is a genius
  b Max searched for an immortal wombat but he didn't find one[1]
  c I was looking for a purple wombat but I couldn't find such a wombat
  d Max struck out and Pete did so too
  e prejudice against Catholics makes them furious

One must also no doubt recognize that form of anaphora whose Surface realization is phonetically null, i.e. the result of deletions, as in (2):

(2)a Max wants ___ to become a superman
  b Max robbed a bank but I didn't ___
  c Max is not as rich as Barbara ___
  d ___ scratching oneself in public is vulgar
  e Tony's ranch is bigger than Max's ___

In the present paper I will consider a series of constraints on the occurrence and interpretation of anaphoric elements, constraints which I will suggest can be largely reduced to two and ultimately to one underlying generalization. It will be hypothesized that certain types of linguistic form become what I shall call anaphoric islands, where such an entity is a sentence part which cannot contain an anaphoric element whose antecedent[2] lies outside of the part in question and which cannot contain the antecedent structure for anaphoric elements lying outside.

The data given are entirely from English, in fact, my dialect of English, although it is clear that they have general if not complete cross-dialect validity. The extent to which they are illustrative of true cross-linguistic principles deserves investigation.

In the final section of this discussion I explore briefly some of the implications of the existence of anaphoric islands for the apparatus which linguistic theory must make available for the description of anaphora, a quite open and high controversial matter, as well as some general implications as to the nature and relation of levels of linguistic representation.

II. (Mono-morphemic) Lexical Items

Since the title of this section is clumsy, I shall use lexical item alone exclusively to refer to monomorphemic items. The kind of constraints I am interested in can then be illustrated by the contrast between pairs like those in:

(3)a Max's parents$_{i,j}$ are dead and he deeply misses them$_{i,j}$
b *Max is an orphan and he deeply misses them

Here for the first time I use subscripts to indicate presupposed coreference. In (3)a the pronoun them is interpretable on one reading as anaphorically related to the subject NP of are dead. This is a case of coreferential pronominalization. An orphan is someone whose parents are dead so that the first clauses in (3)a, b are essentially paraphrases; certainly, it is at least true that the first clause of (3)b entails the first clause of (3)a.[3] Consequently, the meaning of orphan involves reference to the parents of an individual. Nonetheless it is clear in (3)b that them cannot be understood as referring to the set of individuals who were Max's parents. Thus it is seen that orphan is an anaphoric island with respect to the interpretation of potentially coreferential pronouns like them.

For ease of discussion it will be useful to have terms designating both the relation of a fixed sentence chunk and some anaphor[4] outside of it, and between a fixed sentence chunk and some potential antecedent outside of it. I will speak of inbound anaphora and outbound anaphora. Inbound anaphora is the relation between a chunk, part of which is interpreted anaphorically, and some antecedent outside of that chunk. Outbound anaphora is the relation between a chunk, part of which is interpreted as antecedent, and some anaphor outside of that chunk. Hence what (3)b shows is that orphan is an anaphoric island with respect to outbound anaphora involving coreferential pronouns as anaphors.

The same property is revealed by kinship terms as in:

(4)a my mother$_i$'s sister$_j$ wanted her$_i$ to live here
b *my (maternal$_i$) aunt$_j$ wanted her$_i$ to live here

Although on one reading an aunt is a mother's sister, aunt in (4)b functions as an anaphoric island for outbound anaphora involving coreferential pronouns. Notice that the claim about (4)b is not that her$_i$ cannot refer to the mother, but rather that it cannot have its antecedent as'part' of aunt. (4)b could be used with her$_i$ referring to the mother if it were part of a discourse in which the antecedent occurred in some other sentence; for instance, if (4)b were preceded

by the sentence:

(5) my mother is sick

The analogous situation can be seen with other lexical kinship terms, uncle, cousin, niece, nephew, etc.

Consider too words like frog, hun, chink, etc., pejoratives referring to individuals who are from France, Germany and China respectively; that is, which include in their meaning the presupposition that the designated individual originates in the particular country. Compare though examples like:

(6)a Max is from France$_i$ and I hope to be able to live there$_i$ soon
b *Max is a lousy frog and I hope I never have to live there

(6)b cannot be understood such that the antecedent of the coreferential anaphor there is the designation of the country France covered by the term frog. These pejoratives, like orphan and the kinship terms, are thus also anaphoric islands with respect to coreferential outbound anaphora.

Take next words like blonde and brunette, which designate individuals whose hair is of a certain color. The hair is, however, unreferrable to by outbound coreferential anaphora:

(7)a Mary has blonde hair$_i$ and the fetishist wants to caress it$_i$ for hours
b *Mary is a blonde and the fetishist wants to caress it for hours
(8)a the girl with blonde hair$_i$ got it$_i$ caught in the fan
b *the blonde got it caught in the fan

As a final example, consider the item bastard on its literal reading. The meaning of this is somewhat variable. To me it means someone whose parents were not married to each other at the time of his conception. Others might have it where the time is time of birth. In any event, the term clearly involves reference both to parents and to a particular point in time. Contrast though the examples of:

(9)a Max's parents$_{i,j}$ weren't married at the time when he was conceived and thus they$_{i,j}$ should be punished
b *Max is a bastard and thus they should be punished
(10)a Max's parents weren't married at the time$_k$ he was conceived and your parents weren't married then$_k$ either
b *Max is a bastard and your parents weren't married then either

Thus with respect to coreferential outbound anaphora neither the parents nor the time point can serve as antecedents for anaphors.

We are safe then in proposing the following regularity:

(A) Lexical items are anaphoric islands with respect to outbound anaphora involving coreferential pronouns

What about the inbound anaphora analogue of (A)? At first, it is hard to imagine what this would be. The concept is a relatively clear one though. Inbound anaphora in such cases would involve a lexical item like grolf which would occur in sentences like:

(11)a the grolf wanted to visit Max
b the grolf wanted to visit Peter

where the meaning of grolf is 'one who has written the biography of ___' such that (11)a refers to Max's biographer, (11)b to Pete's. Lexical items of this sort would thus in effect have incorporated in their meanings pronouns with variable presupposed coreference determined by antecedent nominal structures outside of that lexical item. I have found no items like the hypothetical grolf in English and do not believe any do exist or could exist. One might thus suggest the principle:

(B) Lexical items are anaphoric islands with respect to inbound anaphora involving 'coreferential pronouns'

I have placed the final term in quotes because literally of course no pronouns would occur in the Surface Structure of grolf-type sentences, so the property would only reflect itself indirectly in the semantic interpretations. I have illustrated (B) through a hypothetical noun. But verbs are not, I think, any different. Thus sentences like (12) with respectively the interpretations of (13) are no more English-like than those of (11):

(12)a Max_i visited the one who was going to grolf
b Pete_j visited the one who was going to grolf
(13)a 'Max_i visited the one who was going to write the biography of Max_i'
b 'Pete_j visited the one who was going to write the biography of Pete_j'

However, although there do not appear to be any examples like grolf, either nominal or verbal, (B) is still not literally correct because of many examples like seduce in sentences likes:

(14)a Max_i seduced Betty
b Pete_j seduced Betty

The meaning of seduce is such that the examples in (14) are roughly representable respectively as in:

(15)a 'Max_i brought it about by persuasion that Betty have sexual relations with Max_i'
b 'Pete_j brought it about by persuasion that Betty have sexual relations with Pete_j'

Consequently, seduce would appear to manifest in its meaning the equivalent of inbound coreferential anaphora. The important

difference between grolf and seduce is clear. This is quite independent of the verbal character of seduce. G. Lakoff has pointed out that the nominal term paranoid behaves just like seduce in this regard. That is, the meanings of (16) are representable roughly as in (17):

(16)a Max_i is a paranoid
b Pete_j is a paranoid
(17)a 'Max_i irrationally thinks people are trying to harm Max_i'
b 'Pete_j irrationally thinks people are trying to harm Pete_j'

The difference between seduce and paranoid on the one hand and grolf, noun or verb, on the other is that in the former examples that NP which can serve as the antecedent for inbound anaphora is one of the NP terms with which the items seduce, paranoid occur in a Surface clause.[5] That is, the antecedent and the lexical item are Clause Mates.[6] Put differently, apparently such inbound anaphora is possible if the antecedent is one of those NP standing in some particular case relation in Fillmore's (1968) sense to the lexical item in question.

Having noted that principle (B) must thus be revised to account for forms like seduce and paranoid, I shall leave it as is for the purposes of the rest of this discussion.

I will not illustrate that the analogues of both (A) and (B) hold for the kind of anaphora involved in the interpretation of Surface occurrences of one, which involves presupposed identity of sense rather than of reference.[7] We may again begin with the term orphan. Observe that in:

(18) Max's parents are dead but those of my boss are alive

ones shows up as those, i.e. there is in some contexts the rule:

(19) the ones ===> those

Contrast then:

(20)a Max's parents are dead but those of my boss are alive
b *Max is an orphan but those of my boss are alive

Here those cannot refer to 'parents' as represented by orphan. The same point is made in those genitive cases where one, ones delete or yield compound forms like mine,[8] as in:

(21)a Max's parents are dead but my parents are alive
b Max's parents are dead but mine are alive
c Max is an orphan but my parents are alive
d *Max is an orphan but mine are alive

Similar restrictions are illustrated in (22)-(24) for both nominal and verbal terms:

(22)a Max's parents weren't married when he was conceived and yours weren't married then either
b *Max is a bastard and yours got married afterward too
(23)a Max hit a double and I hit a double too
b Max hit a double and I hit one too
c Max doubled against the wall and I hit a double too
d *Max doubled and I hit one too[9]
(24)a I got a divorce from Sally and I'll get a divorce from Louise too
b I got a divorce from Sally and I'll get one from Louise too
c I divorced Sally and I'll get a divorce from Louise too
d *I divorced Sally and I'll get one from Louise too

We can then hypothesize that the principle (C) holds:

(C) Lexical items are anaphoric islands with respect to outbound anaphora involving pronominal anaphors whose interpretation is identity of sense[10]

Again it may be asked what is the analogue for (C) with respect to inbound anaphora. Having constructed the analogue for (A) earlier, we can see that it would ban nominal lexical items like flark in sentences such as:

(25)a the boy who owned a flark made fun of Max's gorilla
b the boy who owned a flark made fun of Max's wombat

where the meaning of flark is such that these sentences have respectively the meanings of:

(26)a 'the boy who owned a device for removing the pelt of a gorilla made fun of Max's gorilla'
b 'the boy who owned a device for removing the pelt of a wombat make fun of Max's wombat'

Similarly, it would ban verbal items like pril in sentences of the form:

(27)a the soldier who priled hated churches
b the soldier who priled hated banks

where the meaning of pril is such that (27)a, b have respectively the meanings:

(28)a 'the soldier who blew up churches hated churches'
b 'the soldier who blew up banks hated banks'

I have also found no English lexical items like the hypothetical flark and pril and do not believe any do or can exist. Consequently, I hypothesize:

(D) Lexical items are anaphoric islands with respect to inbound anaphora involving 'pronouns preserving sense'

The reasons for the quotes in (D) are the same as for those in (B).

In view of the fact that it was found that examples like seduce, paranoid are exceptions to the present formulation of principle (B), one might inquire as to whether there are analogous identity of sense counterexamples to (D). It has been suggested to me that the term cannibal in examples like:

(29) that salmon is a cannibal

is such an example. This assumes that the meaning of (29) is given by something like:

(30) 'that salmon eats other salmon'

so that cannibal would involve the meaning 'eat other ones'. However, although at first not unseductive, this analysis of cannibal cannot be right because of the many sentences like:

(31)a Whitey is a cannibal
b that fish is a cannibal
c your mother is a cannibal

for which an analysis involving the meaning of 'other ones' fails completely. (31)a does not mean that Whitey eats other individuals named Whitey; (31)b does not mean that the fish in question eats other fish; (31)c does not mean that your mother eats other mothers. To cover all sentences with cannibal, both those like (29) where the subject of cannibal involves the name of a species, and those like (31) where it does not, it seems clear that cannibal must be assigned a reading which involves reference to the species of the NP asserted to be a cannibal. That is, roughly the meaning of (32) is given by (33)a, or possibly (33)b:

(32) X is a cannibal
(33)a X eats (habitually) other members of his_X species
b X eats (habitually) other members of the same species as his_X

Consequently, cannibal is not a counterexample to (D) parallel to seduce for (B). Rather, like seduce, cannibal is a counterexample to the present formulation of (B). In other words, cannibal involves coreference and not identity of sense. Like seduce, paranoid, however, cannibal is covered by the subgeneralization about clause membership or case relations given earlier.

Finally, to briefly conclude this section on lexical items, let us illustrate that the analogous constraints hold for other anaphoric processes such as those involving the pro-verb phrase do so. Take again seduce:

(34)a Max persuaded Sally to have sexual relations with him but Abe was unable to persuade her to have sexual relations with him
b Max persuaded Sally to have sexual relations with him but Abe was unable to persuade her to do so
c Max seduced Sally but Abe was unable to persuade her to have sexual relations with him
d *Max seduced Sally but Abe was unable to persuade her to do so

Here seduce cannot contain the antecedent for do so. Similarly, consider a verb like glue, which means roughly 'to fasten with glue'. But:

(35)a Max wanted to fasten the boards together with glue but Pete wanted to do so with tape
b *Max wanted to glue the boards together but Pete wanted to do so with tape

Just so, the Surface verb radio means 'to send a message by radio'. Note the contrast however in:

(36)a Max wanted to send a message to the ship by radio but Pete wanted to do so by pigeon
b *Max wanted to radio the ship but Pete wanted to do so by pigeon

Finally, the verb strangle means roughly 'to kill by choking'. But:

(37)a Max wanted to kill the monster by choking him but Pete wanted to do so with poison
b *Max wanted to strangle the monster but Pete wanted to do so with poison

In each case, one sees that do so cannot have its antecedent inside of a verbal item like seduce, glue, radio, strangle. The situation is no different for nominal lexical items:

(38)a after Harry$_i$ forced Betty to have sexual relations with him$_i$, Pete$_j$ said he$_j$ wished he$_j$ had forced her to do so
b *after Harry$_i$'s rape of Betty, Pete$_j$ said he$_j$ wished he$_j$ had forced her to do so

Thus do so cannot have its antecedent inside the nominal item rape. We may then propose the principle:

(E) Lexical items are anaphoric islands with respect to outbound anaphora involving the pro verb phrase do so

The analogue to (E) for inbound anaphora would be:

(F) Lexical items are anaphoric islands with respect to inbound anaphora involving 'pro verb phrases'

To illustrate (F), one must again have recourse to hypothetical lexical items. (F) claims that English contains no elements such as plorb in sentences like:

(39)a the fact that Max plorbed Betty did not convince Pete to kiss her on the lips
b the fact that Max plorbed Betty did not convince Pete to caress her on the lips

where the meaning of plorb is such that these have respectively the meanings:

(40)a 'the fact that Max kissed Betty on the lips did not convince Pete to kiss her on the lips'
b 'the fact that Max caressed Betty on the lips did not convince Pete to caress her on the lips'

That is, (F) bans items like plorb which would mean things like 'to do so on the lips'.

III. Derivatives

I use the term derivative in the widest possible way to refer to all those wordlike items composed of multiple morpheme sequences, i.e. to include compounds of all sorts, words including stems plus derivational suffixes and prefixes, etc. In section II I have illustrated that lexical items are anaphoric islands with respect to at least three distinct types of anaphoric process. In this section, I shall argue the same points for derivatives. Since the argument of this section is almost completely parallel to that of section II, I shall be very brief, illustrating in order the validity of the analogues of principles (A)-(F) where derivatives replaces lexical items. Let us refer to these analogues as (A)'-(F)' respectively.

(A)' may be illustrated by way of multimorphemic kinship terms such as grandmother:

(41)a my mother$_i$'s mother$_j$ is quarrelsome but she$_i$ doesn't mind
b *my (maternal$_i$) grandmother$_j$ is quarrelsome but she$_i$ doesn't mind

That is, she$_i$ in (41)b cannot have its antecedent be the 'mother' implied by the meaning of (maternal) grandmother.

Consider next that set of derivatives formed from proper nouns plus the derivational suffix ist, or ite, with the meanings 'followers of', 'supporters of', 'advocates of', etc.:

(42)a followers of McCarthy$_i$ are now puzzled by his$_i$ intentions
b *McCarthy$_i$ites are now puzzled by his$_i$ intentions

Here his$_i$ cannot have as antecedent part of the derivative. Similarly:

(43)a supporters of Murphy$_i$ are agreed that he$_i$ is going to lose
b *Murphy$_i$ists are agreed that he$_i$ is going to lose

The same restriction holds for the suffix ist when used to form derivatives with the meaning 'professional student of', as in:

(44)a those who study Iroquoian$_i$ are convinced it$_i$ is related to Caddoan
b *Iroquoian$_i$ists are convinced it$_i$ is related to Caddoan

Consider next compound derivatives in ed such as long-legged, etc.:

(45)a the girl with long legs$_{i,j}$ wants to insure them$_{i,j}$
b *the long-legged girl wants to insure them
(46)a people with blue eyes$_{i,j}$ should conceal them$_{i,j}$ with dark glasses
b *blue-eyed people should conceal them with dark glasses
(47)a cars with long hoods$_i$ need servants to clean them$_i$
b *long-hooded cars need servants to clean them

That is, in (47)b them cannot refer to hoods, but at best to cars.

Identical characteristics are found with derivatives indicating home region:

(48)a Harry is from New York$_i$ but I wouldn't want to open a store there$_i$
b *Harry is a New Yorker, but I wouldn't want to open a store there$_i$
(49)a when two people from Australia$_i$ entered the room, Max claimed it$_i$ was a rotten country
b *when two Australians$_i$ entered the room, Max claimed it$_i$ was a rotten country

We may thus posit that (A)' holds just as (A). For the analogue to (A)' involving inbound anaphora we do not, as in the case of (B), have to depend on hypothetical forms and claims of nonexistence of made up items with fixed properties. The claim that inbound anaphora with coreferential anaphors is blocked for derivatives is the claim that forms like the following are impossible:

(50)a *McCarthy$_i$ was glad that him$_i$ites were in the majority in the room
b *Iroquoian$_i$ is such an interesting language family that the number of it$_i$ists has been growing rapidly
c *when Murphy$_i$ entered the room all of the him$_i$ists began to applaud
d *when he poked her in the legs$_{i,j}$ the long-them$_{i,j}$ed girl started to scream

We thus see that (B)' apparently holds and unlike (B) it can be formulated with the reference to pronouns not in quotes since it is words containing actual pronouns that (B)' prohibits. (B)' thus claims that in general derivatives are not formed out of anaphoric elements of the coreferential type. There is, as far as I know, only one counterexample to this. English has a large set of compounds, some nominal as self-hatred, self-reliance, some adjectival as self-defeating, self-reliant, based on the anaphor self.[11] Moreover, not only do these compounds make use of the same morphological element, self, as does intraclause coreferential pronominalization, the interpretation of such compounds involves coreference. Thus examples like:

(51)a Harry was self-educated
b this prophecy is self-fulfilling

are essentially paraphrases of sentences of the form:

(52)a Harry educated himself
b this prophecy will fulfill itself

Hence clearly compounds like those in (51) are cases of inbound anaphora with coreferential anaphors of the type banned by (B)'. The striking point is that the self compounds which are exceptions to (B)' have exactly the property of words like seduce, paranoid, cannibal, which are exceptions to (B). That is, in these compounds the antecedent of the anaphor in the compound must be a Clause Mate of the compound. In section IV below I explore in detail the meaning of this correlation between the exceptions to principles (B) and (B)', a correlation which turns out to be a special case of the deeper parallelism between the 'plain' and 'primed' principles.

Next we can turn to the analogues of (C) and (D), that is, to constraints on identity of sense anaphors for nominals and relative clauses. Consider first (C)'. This principle claims that there should exist contrasts like those in:

(53)a Harry was looking for a rack for books but he only found racks for very small ones
b *Harry was looking for a bookrack but he only found racks for very small ones

That is, ones cannot have as its antecedent part of the compound derivative bookrack, as (B)' claims. Similarly in the following examples:

(54)a Max hunts for wild animals but Pete only kills domesticated ones
b *Max is a wild-animal hunter but Pete only kills domesticated ones

(55)a people with long legs don't like people with short ones
b *long-legged people don't like people with short ones
(56)a those who teach classical languages don't appreciate people who deal with modern ones
b *classical language teachers don't appreciate people who deal with modern ones
(57)a Pete killed his brother but I didn't even see my brother
b Pete killed his brother but I didn't even see mine
c Pete committed fratricide but I didn't even see my brother
d *Pete committed fratricide but I didn't even see mine
(58)a sets which have no members are just as well off without {them, any, such}[12]
b *null sets are just as well off without {them, any, such}
(59)a prejudice against Jews makes rich ones donate money
b *antiSemitism makes rich ones donate money

There is thus a very wide range of evidence that the antecedent of an identity of sense anaphor involving one or related elements cannot lie within a derivative, in other words evidence for the validity of (C)'. (D)' claims that there cannot exist derivatives based on the anaphors themselves. That is, it claims that there will exist such contrast as:

(60)a Harry was looking for a rack for magazines and he found a rack for small ones
b *Harry was looking for a rack for magazines and he found a {onerack, suchrack, themrack}
(61)a people with long legs don't like short-legged ones
b *people with long legs don't like {short-oned, short-suched, short-themed} ones
(62)a Pete killed his older brother and I killed my younger one
b *Pete committed fratricide and I committed {onecide, suchcide} too
(63)a whenever he meets an old woman Pete says he hates young ones
b *whenever he meets an old woman Pete says he is a {onehater, themhater}
(64)a students of classical languages despise students of modern ones

(64)b *students of classical languages despise {modern one, modern such, modern them} students

It is evident then that derivatives in English cannot be formed from identity of sense anaphors like such, them, etc., i.e., that (D)' holds.[13] Consequently, inbound identity of sense anaphora is as impossible for derivatives as for lexical items.

I shall illustrate the analogues of (E) and (F) for derivatives very briefly. Observe:

(65)a people who smoke really shouldn't do so
b *smokers really shouldn't do so
(66)a people who study Iroquoian sometimes deny they do so
b *Iroquoianists sometimes deny they do so
(67)a people who support McCarthy sometimes deny they do so
b *McCarthyites sometimes deny they do so
(68)a people who carve statues by hand may want to do so by machine
b *people who handcarve statues may want to do so by machine

These examples illustrate that do so cannot have its antecedent inside of a derivative, either nominal or verbal, and hence support (E)'. (F)' claims that there cannot be cases like:

(69)a *people who smoke like other do soers
b *diabetic rapists don't like to go out with other do soists
c *supporters of McCarthy were not fond of do soers of Kennedy
d *people who handcarve pipes compete with those who don't handdo so

Overall then, I feel I have indicated in section III that both inbound and outbound anaphora[14] are forbidden for derivatives in cases of coreferential anaphora (with the one exception type noted), identity of sense anaphora for nominals/relative clauses, and pro verb phrase anaphora, and thus that the situation with derivatives and monomorphemic lexical items is essentially identical. That is, both lexical items and derivatives appear to be anaphoric islands with respect to all of the types of anaphora considered, and I suspect, with respect to all the other types which might be considered. A further collection of evidence relevant to this claim is presented in the Appendix.

IV. Theoretical Implications

Assuming now that both lexical items and derivatives are in general anaphoric islands, one must ask what consequences this

has for the theoretical description of anaphora and in general for the theory of linguistic structure. At first glance, it might seem that the existence of anaphoric islands provides some support for the interpretive or 'Surface Structure' approach to semantic interpretation which has been posited, not very clearly in my opinion, in a number of papers by various authors at MIT over the last year or so, most notably Chomsky, and Jackendoff.[15] Under this view, much if not all anaphora is not to be regarded as a consequence of deletion by transformational rules, as in most previous generative treatments, but rather as a result of interpretive rules operating on late, transformationally derived structures, including the Surface Structure. Concomitant with this view is the assumption that by and large syntactic structure is highly superficial. That is, the gap between 'Deep' and Surface Structures is rather limited. And, in particular, the 'Deep' structure of anaphors is by and large identical to their Surface forms, minor adjustments aside.[16]

Such an approach might be thought to derive support from anaphoric island phenomena since late interpretive principles would automatically not be able to refer to antecedent structures which do not exist, nor to interpret anaphoric elements which are not actually present in late stages of derivations. Thus, for example, if in sentences like:

(70)a *Max is an orphan and we ought to punish them
b *Max is an orphan and mine are dead too

the anaphoric elements them, mine are actually interpreted in terms of structures approximating (70)a, b themselves, the fact that these cannot refer respectively to the parents of Max or to my parents would follow automatically under almost any assumptions about the form which such interpretive principles would take.

At least three sorts of objection are open to such a late, interpretive approach to anaphora, however, just on the basis of data concerning anaphoric islands, that is, independently of any general theoretical objections which might be made. Such an approach is really only attractive for lexical items and not for derivatives. First, it can inherently provide no explanation or general account of the near uniform impossibility of derivatives constructed out of anaphors, as in:

(71)a *himites
b *itrack
c *oneless
d *suchly
e *do soists
f *themsupporters

Any attempt to explain these as a function of principles of word formation independent of anaphora will surely miss the generalization involved in (71) but, even more seriously, would totally fail to observe the parallelism between (71) and the impossibility of lexical items mirroring the properties of (71). That is, it would necessarily miss the parallelism between principles (B) and (B)', (D) and (D)', and (F) and (F)'. I will return to this parallelism in section IV.

Secondly, an interpretive approach to anaphora affords no explanation of why elements inside of derivatives cannot serve as the antecedents of anaphora even though these elements are present as distinct items in the Surface structure. Again it is crucial not only to represent such facts but to account for the parallelism between these restrictions and those for lexical items, that is, for the parallelism between principles (A) and (A)', (C) and (C)', and (E) and (E)'. The interpretive approach offers no basis for this parallelism, which will also be discussed further below in section IV.

Finally, and most crucially, there exists the following objection to an interpretive semantic approach to anaphoric island phenomena. It can be shown, as I will directly indicate, that a grammar must contain apparatus for turning constituents into anaphoric islands. That is, there are certain constituents which must function as, for example, terms in coreference relations, which become anaphoric islands as a result of subsequent transformational happenings. This being the case, Occam's Razor forces one to seek an account of the notion anaphoric island in some way necessarily independent of any interpretive rules of semantics.

The transformational induction of anaphoric islands can be illustrated most clearly through forms that I will refer to as Proper Pseudo-Adjectives (PPA). Occurrances of these are provided by the underlined forms in:

(72)a the American attack on Columbia
b the Markovian solution of that problem
c the Persian application for membership

The term pseudo in my designation of these elements is intended to suggest that they are derived from nonadjectival structures. In fact, I claim that such elements must be derived from nominals (NP) of the type found in (73).

(73)a America's attack on Columbia
b Markoff's solution of that problem
c the application for membership by Persia

What arguments are there for such a claim besides the obvious superficial similarity of structures in (72) and (73) type sentences?

First, if notions of logical grammatical relation play a role in grammar, as is now widely assumed, there is an argument for a nominal derivation of PPA from such relations. That is, just as America's is understood as the Agent of attack in (73)a, American is understood as the Agent of attack in (72)a. Under the nominal derivation of PPA, the technique of specifying such relations which is applicable to structures like (73) automatically carries over to those like (72), regardless of what these techniques are like, given only the assumption that they 'apply' before the rule which turns NP into PPA. If, however, PPA are given a nonnominal derivation, then immediately grammatical theory is commmitted to the existence of special, at least partly unique apparatus for specifying logical relations between PPA and nouns.

A second argument for the nominal derivation of PPA is almost completely parallel to the first, involving, however, selectional restrictions rather than logical relations. The parallelism is expected since facts of selectional restrictions uniformly correspond to or correlate with facts of logical relation. Because of parallels such as those in (74)-(76):

(74)a *America's meeting with Betty Jones
b *the American meeting with Betty Jones
(75)a Britain's realization that the Empire was doomed
b the British realization that the Empire was doomed
(76)a *Britain's seduction of the young virgin
b *the British seduction of the young virgin

the theory of selectional restrictions, no matter how interpreted, must be expanded to include apparatus for expressing PPA-noun restrictions, if such elements have a nonnominal derivation. With a nominal derivation, these restrictions reduce to the NP/-noun restrictions of the type in the a examples of (74)-(76).

Thirdly, if PPA do not have a nominal derivation, a special statement of syntactic restrictions will be required to handle facts like those in:

(77)a the invasion of America by France
b France's invasion of America
c the French invasion of America
d *the French invasion of America by Portugal
e *France's French invasion of America

That is, the PPA French in such cases is in complementary distribution with the genitive NP/by phrase NP, that is, with the Agent NP. Under the proposal of nominal derivation, this is an automatic consequence.

Fourthly, there is an extremely powerful set of arguments for the nominal derivation of PPA based on the rule which deletes

complement sentence subject NP under conditions of coreference of these subjects to NP in a 'higher' construction (cf. Postal (to appear a). In a large class of cases, the 'higher' NP must be the subject of the immediately dominating clause, as in:

(78)a Harry attempted to jump fifty feet
b Harry wanted to jump fifty feet
c Harry wished to jump fifty feet

In nominalization cases such as (79), the deleted complement subject must be a coreferent of the genitive NP standing before the nominalized noun.[17]

(79)a America's attempt to attack Cuba at night
b Persia's refusal to surrender to Gabon
c Russia's belief in subverting unfriendly governments

However, in cases like:

(80)a the American attempt to attack Cuba at night
b the Persian refusal to surrender to Gabon
c the Russian belief in subverting unfriendly governments

the deleted complement subject is understood as a coreferent of the PPA. Under the proposal that PPA derive from genitive NP, the facts in (80) reduce automatically to whatever principles are operative in (79), with the hopeful possibility of further reduction to the subject-subject condition operative in sentences like (78), if nominalizations are sententially derived. At any rate, under the nominal derivation of PPA the condition of coreference remains one between NP. If, however, PPA have a nonnominal derivation, then the conditions on complement subject erasure in examples like (80) must be expanded in an ad hoc way to take account of complement subject coreference with PPA. There would be two ad hoc features here. First, adjectives must be allowed to participate in coreference relations. Secondly, some special principle would allow coreference between a complement subject and a particular PPA.

To clinch the fact that complement subject deletion with a PPA antecedent really follows the exact same constraints as deletion with a genitive NP antecedent, which is in turn fully parallel to deletion in full sentences, one need only consider triples of examples like those in (81)-(83):

(81)a America promised Germany to attack Russia
b America's promise to Germany to attack Russia
c the American promise to Germany to attack Russia
(82)a America requested Germany to attack Russia
b America's request to Germany to attack Russia
c the American request to Germany to attack Russia.

(83)a America wished Germany to attack Russia
b America's wish for Germany to attack Russia
c the American wish for Germany to attack Russia

The point is that in all of the examples of (81) the deleted subject is understood as a coreferent of the Agent, America(n); in all of the examples of (82) the deleted subject is understood as a coreferent of the indirect object, Germany; and in the examples of (83) there is no deletion. The parallelism of behavior of PPA to genitive or by phrase NP in nominalizations and to subject NP in sentences with complements is thus essentially complete as far as the conditions, still not understood incidentally,[18] which determine which element controls the deletion of complement subjects under coreference.

Fifthly, and lastly, there is an argument type for the nominal derivation of PPA parallel to that just given. It concerns what Perlmutter (1968) has called Deep Structure Constraints. The point is that some verbs, like attempt, require their complement sentences to have a subject NP coreferential with their own subject. But exactly analogous constraints carry over to Agent NP in nominalizations and to PPA, as illustrated in (84)-(85):

(84)a America attempted to determine the Vietnamese government
b America's attempt to determine the Vietnamese government
c the American attempt to determine the Vietnamese government

(85)a *America attempted for Portugal to determine the Vietnamese government
b *America's attempt for Portugal to determine the Vietnamese government
c *the American attempt for Portugal to determine the Vietnamese government

Under the proposal of nominal derivation for PPA the constraints in the nominalization cases automatically carry over to PPA constructions. Nonnominal derivation of PPA must necessarily require new, ad hoc apparatus to describe the coreference constraints in the PPA examples as restrictions between NP and nonNP.

I think the five argument types[19] just sketched indicate overwhelmingly that PPA[20] do indeed have an origin from underlying NP. This is crucial for the subject of this paper because of the fact, which I will now illustrate, that PPA are anaphoric islands, a property predicted for them by principles (A)'-(F)', given their derivative nature. I illustrate for a variety of types of outbound anaphora in (86)-(92) and for inbound anaphora in (93):

(86)a France$_i$'s invasion of Algeria proved it$_i$[21] was a peace-loving country

(86)b *the French$_i$ invasion of Algeria proved it$_i$ was a peace-loving country

(87)a America$_i$'s constant justification of itself$_i$ (herself$_i$) is disgusting
b *the constant American$_i$ justification of itself$_i$ (herself$_i$) is disgusting

(88)a America$_i$'s proposal to the U.N. reveals $\left\{\begin{matrix}\text{its}_i\\ \text{her}_i\end{matrix}\right\}$ rigid position
b *the American$_i$ proposal to the U.N. reveals $\left\{\begin{matrix}\text{its}_i\\ \text{her}_i\end{matrix}\right\}$ rigid

(89)a her$_i$ rigid position on meatball imports was revealed by America$_i$'s proposal
b *her$_i$ rigid position on meatball imports was revealed by the American$_i$ proposal

(90)a her$_i$ enemies were pleased by America$_i$'s invasion of Vietnam
b *her$_i$ enemies were pleased by the American$_i$ invasion of Vietnam

(91)a those who hate her$_i$ were pleased by America$_i$'s invasion of Vietnam
b *those who hate her$_i$ were pleased by the American$_i$ invasion of Vietnam

(92)a America and Russia's struggle with $\left\{\begin{matrix}\text{each other}\\ \text{one another}\end{matrix}\right\}$
b *the $\left\{\begin{matrix}\text{American and Russian}\\ \text{Russo-American}\end{matrix}\right\}$ struggle with one another

(93)a *America$_i$ praised the it$_i$an invasion of China
b *the her$_i$an attack on Persia proves that America$_i$ is warlike
c *Spain$_i$'s ambassador defended the it$_i$ish attack on Gibraltar
d *Markoff$_i$ claimed his$_i$ discovery was due to his$_i$ian brilliance

Let me now sum up what has been shown so far in this discussion of PPA:

(94)a that PPA have a nominal derivation
b that those NP which become PPA are marked for coreference before this, a fact proved by their partaking as antecedents in the rule of complement subject deletion
c Surface Structure PPA are anaphoric islands

The implications are clear. The transformational part of the grammar, that which derives Surface Structures from more abstract representations, must have both the power to form PPA out of NP and 'simultaneously' as it were to mark certain structures as being anaphoric islands. That is, since pairs like:

(95)a America's attempt to attack Persia
b the American attempt to attack Persia

have essentially identical underlying structures, the rule of complement subject deletion, which depends on an anaphoric connection between a complement subject pronoun and a particular antecedent[22] must apply in the derivation of sentences like (95)b before the underlying NP is turned into a PPA, with concomitant establishment of the form as an anaphoric island.

In view of the fact that the power to determine anaphoric islands must be assigned to the Surface Structure generating part of the grammar, it is pointless and redundant to attempt to account for anaphoric islands in terms of any notions based on late interpretive principles of semantics. Consequently, while at first glance, lexical anaphoric island phenomena might seem to provide some basis for late interpretive approaches to the semantics of anaphora, more serious investigation shows that this is not the case. Moreover, examples like (95) reveal more than that interpretive approaches are not supported. In fact, they are extremely damaging counterexamples. For such examples show that anaphoric relations must exist very early in derivations, only to be later blocked by the mapping of NP into PPA. If anaphora were truly a function of late interpretive principles, such cases would be impossible.

In the same way, while at first glance the existence of lexical anaphoric islands seems to provide serious difficulties for an approach to the lexicon like that suggested in so-called generative semantics, as being developed by Bach, Lakoff, McCawley and others,[23] and in particular to throw doubt on the conception of the lexicon advanced in such papers as McCawley (1968a) and Morgan (1968), this is not really the case. In this view, unlike more traditional statements of transformational theory, lexical items are inserted into structural trees after the application of many transformations. Lexical material is therefore seen as essentially a realization of various derived constituents. This means that, for example, forms like:

(96)a orphan
b nonmature individual whose parents are dead

will have essentially identical underlying structures. Consequently, the fact that 'parents' are referrable to in the latter but not in the former is a real problem. But as PPA show, this is not a unique difficulty. The fact that some constituents turn into anaphoric islands in the course of derivations is a general problem to be solved. PPA show that constituents become anaphoric islands, that is, that this property is not determined by the deepest underlying structures. Consequently, it is not an ad hoc move

for generative semantics to claim that orphan becomes such. And the principles which are involved in the specification of anaphoric islands seem to be quite general, that is, derivatives and lexical items are anaphoric islands.

One can conclude then that the existence of anaphoric islands is by no means a serious obstacle to the establishment of the truth of generative semantic claims about the role of the lexicon. Moreover, not only are the facts of anaphoric islands not in conflict with the approach of generative semantics, there is derivable from such facts a very powerful argument in favor of this approach. This argument depends on the parallelism between principles (A) and (A)', (B) and (B)', etc. noted earlier. Given an ordinary view of the lexicon in which lexical morphemes are essentially primitive and inserted pretransformationally, we were forced to state two separate series of principles, one for morphemes, one for derivatives. But, under the approach of generative semantics, this distinction is a highly superficial one. In general, morphemes will be inserted in trees in positions which are transformationally derived constituents, and in fact derived constituents which are derivatives.

Let us illustrate this point. Consider such superficially nonparallel forms as:

(97)a wombatmeat
b pork

Under the generative semantic approach, these will have underlying, semantic representations schematically representable as:[24]

(98)a [MEAT] from [WOMBAT]
b [MEAT] from [PIG]

and both of these representations will undergo a rule of compound formation yielding:

(99)a [WOMBAT] [MEAT]
b [PIG] [MEAT]

At this point lexical insertion takes place. In the case of the derivative of (97)a, individual morphemes wombat and meat are substituted for the semantic components of the derived structure (99)a. But in the derivation of (97)b, the morpheme pork is substituted for the entire derived structure (99)b.[25] What this means then is that in effect under the generative semantic view there is no distinction between derivatives and single morpheme lexical items other than how much of a derived constituent is replaced by a single phonological morpheme. Consequently, under this approach we can dispense entirely with the principles (A), (B), ... (F), etc., reducing them to the series which refers to derivatives. This requires the claim that the boundaries of anaphoric islands

are defined at a point before (probably just before) lexical insertion takes place, i.e. at a point where (97)a, b have parallel representations as in (99). The principle making such representations as (99) anaphoric islands will then predict uniformly the impossibility of:

(100)a *the best wombatmeat comes from young ones
b *the best pork comes from young ones

That is, the generative semantic claim that (97)a, b have parallel derivations as in (98), (99) explains the parallelism in examples like (100), more generally, explains the previously unaccounted for parallelism between the paired principles (A), (A)', etc.

As crucial evidence for this point, one need only recall now the fact that both principles (B) and (B)' had exceptions: seduce, paranoid, cannibal, in the former case, self compounds in the latter. We observed without comment that both types of exception were covered by a general principle. Namely, the antecedent of the anaphoric element had to be a Clause Mate of the element which (B), (B)' (wrongly) predicted to be an island. That is, given sentences like:

(101)a Mike$_i$ said that Pete$_j$ had been selfeducated
b Mike$_i$ said that Pete$_j$ had seduced Mary

we must understand the antecedent of self as Pete$_j$ and we must interpret seduce in such a way that it is Pete$_j$ not Mike$_i$ which designates the individual who had sexual relations with Mary. Under the generative semantic approach, this will follow from a single principle excepting derivatives from being anaphoric islands for coreferential elements in the case of Clause Mates or the like since at the point just before lexical insertion seduce will have a structure something like:

(102) [SELF] [CAUSE] [SEXUAL RELATIONS] by [PERSUASION]

In short, the generative semantic conception of the role of the lexicon provides the basis for explaining why the semantic interpretation of words like seduce follows the syntactic principle which determines the possible antecedents for self compounds like self-educated.[26]

I conclude then that on the basis of present information anaphoric island phenomena, in particular, the parallelism in behavior of single morphemes and multimorpheme derivatives, appears to provide considerable support for the generative semantic view of the way the lexicon enters into the derivation of sentences. That is, these phenomena support the idea that there are pre-lexical transformations and the view that lexical items substitute for transformationally derived constituents.

On the basis of the above discussion, one must conclude that the principle determining the boundaries of anaphoric islands is defined over derived constituents which are derivatives. This makes it very important to emphasize that no precise account has been given here of this notion. There is, however, an obvious relation between the notion of derivative in the sense needed to specify the scope of anaphoric islands and the traditional notion of word, or independently pronounceable subsequence of a sentence. That is, each of the anaphoric islands illustrated has in fact been a word in a relatively clear sense.

One might then wish to say that anaphora is in general blocked for parts of derived constituents that become words. However, this is clearly not adequate as such. For it to be true, it would have to be the case that derivative and word were equivalent notions extensionally. But this is not the case. Derivative must refer to only a subportion of word structure. Thus traditionally one distinguishes an 'inner' or central portion of word formation concerned with well-formed stems, basic (roots) and derived (with derivational affixes), and well-formed stem compounds, together with an 'outer' layer of word formation involving inflection. But clearly just this division of word structure is relevant for anaphoric island phenomena. Thus observe that one can refer to the element inside of a genitive element:

(103)a John$_i$'s book is making him$_i$ rich
b your lies will destroy you

Similarly, in constructions with do so the tense of the antecedent is irrelevant:

(104)a Harry killed himself but I won't do so
b Max voted yesterday but I will do so today

Consequently, a proper account of derivative from the point of view of anaphoric island scope will apparently have to appeal to something like the traditional inflection-derivation distinction. Perhaps some extension or generalization of this accounts for the marginal combinations of anaphoric elements with particle-like elements in such cases as:

(105)a I met John in 1939 and thereafter was a changed man
b go to the palace and arrest everyone therein

Clearly, in these there is respectively related anaphorically to 1939 and palace, that is, it is a coreferential anaphor of time/-place. I have at the moment nothing to offer in the way of an account suitable for distinguishing cases, tenses, prepositions, etc. from those elements whose presence in a word does turn it into an anaphoric island.

To conclude, I would like to note that the term island is not at all original. Rather this notion entered linguistic work in the studies of J.R. Ross (1967). He was led in his dissertation to designate certain formally defined subportions of syntactic structure as islands in the attempt to specify the scope of variables in the statement of rules of constituent reordering and feature marking.[27] In a way, I have taken his notion and simply metaphorically extended it, and there is not a precise, literal relation between island in Ross's sense and that of the present paper.

However, it is perhaps worth pointing out that, at least with respect to reordering transformations, parts of words are islands in Ross's sense just as they are anaphoric islands. Hence there are, for example, no sentences in English of the paired question-answer type in:

(106)a *what is John a super?
b John is a superman
(107)a *what is John a surgeon?
b John is a brainsurgeon
(108)a *what was John's argument less?
b John's argument was pointless

It could of course be said that man, brain, point in compounds like superman, brainsurgeon, pointless are simply not NP and hence not subject to wh-movements. While no doubt true,[28] this may well miss the deeper point that there are in English (other languages?) no rules with effects parallel to those in (106)-(108). That is, there do not appear to be movement rules which move things out of derived constituents of the sort which become words. There may well be therefore a further Rossian movement constraint whose scope is in part at least defined by the notion word. If so, then perhaps Ross's islands and anaphoric islands may be related through more than metaphor.

V. Appendix

In this section, I provide a more or less random collection of further examples illustrating the scope of anaphoric island phenomena.

(1)a Max is a fool and Pete is one too
b *Max is foolish and Pete is oneish too
(2)a Max doesn't like foolish jokes and I don't like such jokes either
b *Max doesn't like foolishness and I don't like suchness either
(3)a Pete is an idiot and Harry is one too
b *Pete is idiotic and Harry is oneic too

(4)a Harry was looking for someone who wasn't a fink but I was looking for one
b *Harry was looking for a nonfink but I was looking for one (i.e. one ≠ fink)
(5)a tall persons who don't write columns get along with short ones (= 'persons', or 'persons who don't write columns')
b *tall noncolumnists get along with short ones (i.e. ≠ persons)
(6)a Max roots for the Yankees and Harry roots for them too
b *Max is a Yankee fan and Harry is a them fan too
c *Max is a Yankee fan but I am against them
(7)a people from Ireland are glad to live there
b *Irish people are glad to live there
(8)a people who support Castro$_i$ don't believe he$_i$ is a monster
b *proCastro$_i$ people don't believe he$_i$ is a monster
(9)a Max is for conservation of our national fluids and I am for it too
b *Max is a conservationist but I am against it
(10)a the station owned by the public$_i$ is being mismanaged by them$_i$
b *the public$_i$ly owned station is being mismanaged by them$_i$
(11)a the newspaper owned by the family$_i$ is supporting them$_i$
b *the family$_i$ owned newspaper is supporting them$_i$
(12)a Max spoke in a lucid fashion and Pete spoke in such a fashion too
b *Max spoke lucidly and Pete spoke suchly too
c *Max spoke lucidly and Pete spoke in such a way too
(13)a support of that by the government$_i$ is necessary because only it$_i$ has the money
b *governmental support is necessary because only it has the money
(14)a speed of a computation is more important than the cost of it
b computational speed is more important than {computational cost / *ital cost}
(15)a Max's argument had no point but Pete's did have one
b *Max's argument was pointless but Pete's did have one
c *Max's argument was pointless and Pete's was oneless too
(16)a the study of religion$_i$ shows that it$_i$ is dying
b *religious study shows it is dying
(17)a attacks on birth control by religion have outnumbered attacks by it on sex orgies
b *religious attacks on birth control have outnumbered itious attacks on sex orgies
(18)a groups opposed to the war$_i$ fought with groups who favor it$_i$
b *antiwar groups fought with proit groups

(19)a Jordan is an arid country and Turkey is such a country too
b *Jordan is a semi-arid country and Turkey is a semi-such country too
(20)a Pete is a superstar and Joe is one too
b *Pete is a superstar but Joe is not a superone
(21)a balls made of steel are more expensive than rods made of it
b *steel balls are more expensive than { it rods / *rods made of it }
(22)a refrigerators cooled with water are heavier than fans cooled with { it / such (stuff) }
b *water-cooled refrigerators are heavier than { such / it } cooled fans
(23)a pelts from sheep can be used to keep them warm
b *sheep pelts can be used to keep them warm
(24)a hunters of animals tend to like them
b *animal hunters tend to like them
c *poachers tend to like them
(25)a Jones gave a counterargument to my argument
b *Jones gave a counterargument to mine
(26)a Harry buys economic studies and Pete buys such studies too
b *Harry buys socioeconomic studies and Pete buys socio-such studies too
(27)a Harry solicits for prostitutes and Pete arrests them
b *Harry is a pimp and Pete arrests them
(28) *Mary is promiscuous and Joan does so frequently too
(29)a when John's heart stopped they removed it
b when John had a heart attack they removed { his heart / *it }
(30)a Tim sucks his thumb and Bill sucks his too
b *Tim is a thumbsucker but Bill only licks his
(31)a Joan's husband$_i$ is dead because I shot him$_i$
b *Joan is a widow because I shot him

Footnotes

[1]Actually, claiming that one is an anaphoric element is, I believe, incorrect. Rather, I claim that one examples like (1)b are simply special cases of the pro relative clause such as in (1)c. We get such a book, such a communist, but not *such a one. That is, in the latter underlying form such is deleted with subsequent automatic strengthening of the article to one, deletion of the empty pronoun stem one itself (for the strengthening, deletion facts cf. Perlmutter (to appear)). This set of facts showing how such reduces is the strongest argument known to me for the transformational derivation of Surface nouns from underlying

restrictive relative clauses as suggested in Bach (1968). For development of this argument cf Postal (to appear b).

For ease of presentation, I maintain throughout the distortion that one in sentences like (1)b represents a special process of identity of sense pronominalization.

[2]The antecedent of an anaphoric element is of course that structure whose interpretation the anaphoric element is in some sense identical with. There is of course no implication that the antecedent precedes the anaphoric element in the pronunciation of the sentence.

[3]Presumably, orphan implies in addition immaturity of the individual in question.

[4]This happy equivalent of anaphoric element is due to Edes (1968).

[5]Probably this reference to Surface clause is wrong. What is really meant is some level relatively close to Surface structure yet preceding all sorts of very late rules which rip things out of clauses, i.e. topicalizations, etc. I think some notion of Shallow Structure can be defined having possibly such properties as being post cyclical, post (most) lexical, pre stylistic movements, appropriate for idiom definition. It would be the level of Shallow Structure where, for example, it could truly be said that English has SVO word order, etc.

[6]This term is due to Postal (1968). Elements are Clause Mates if they command each other in Langacker's (to appear) sense, that is, if they share all clause memberships.

[7]Notice, however, that identity of sense involves identity of all those references which are part of the sense. Hence in an example like:
(i) I was looking for a singer who loved Max$_i$ but I couldn't find one
one is interpreted in such a way that it involves reference to the same individual referred to by the nominal Max$_i$, not for example to some other person named Max.

[8]As further indication of the correctness of the remarks in footnote 1, we observe here that it will be shown below that by and large anaphors do not form compounds. Footnote 1 shows that words like mine are not true counterexamples to this claim.

[9]The relation between verbs like double and nouns like double is of course not clear. In many cases, there may be no nonhistorical relation. However, in this particular case I suspect that they are related by a pre-lexical rule of Noun Incorporation which operates schematically like:

Noun Incorporation
(i) [HIT] a [DOUBLE] ==========⇒ [[DOUBLE][HIT]] a
Deletion
[DOUBLE] ========⇒
Lexical Insertion
(ii) [[DOUBLE][HIT]] ==========⇒ double

A similar analysis involving pre lexical Noun Incorporation is, I suspect, relevant for words like patricide, kick (foot strike) and many others.

[10] For the distortion in the word pronominal in (C) cf. footnote 1.

[11] An interesting analysis of these compounds is provided by Chapin (1967).

[12] I am not at all sure of how to describe these alternations, which may or may not have associated semantic contrasts. The key point is the contrast between a and b type examples. It is interesting to note the alternation between them, typically used as a marker of coreference, and such, typically a marker of identity of sense. This makes sense in these generic cases since with a generic NP the sense completely determines the reference. This fact seems to be mirrored in the grammatical behavior. Note that many sentences with them are in this regard ambiguous, for instance:
(i) prejudice against Catholics makes them furious
This seems to mean among other things either that Catholics react with fury when personally suffering prejudice, or when other Catholics suffer this. In one sense then, them is a coreferential marker, whose antecedent is a variable NP, i.e. it functions as in sentences like:
(ii) few Catholics now believe they are immortal
In another sense, it is an identity of sense anaphor whose antecedent is not a variable NP ranging over individual Catholics who are members of a set, but whose antecedent is a description defining the collective membership of the set itself. On the latter reading, them functions as a variant of the pedantic such.

[13] A possible exception to this generalization may be seen in the compound so-called, where so seems to function as a pro proper noun:
(i) Pigface was so-called because of his nose
(ii) Tiny Tim was so-called because of his size
These seem related to the highly pedantic and formal:
(iii) Pigface was called such because of his nose
(iv) Tiny Tim was called such because of his size
I note without further comment that in this case the antecedent of

the anaphor is a Clause Mate of the compound containing it. Perhaps then principle (D)' must be modified along the lines of the suggested modification of (B)'.

I note further that the occurrence of so-called in examples like:
(v) facists were so-called because of their fasces
(vi) machine guns are so-called because they fire automatically
indicate that the antecedents contain proper nouns, a startling conclusion given the usual way of thinking about 'common' nouns. I conclude that in these generic NP common nouns function in part at least as the names of sets. This leads naturally in the direction of a much more abstract analysis of NP than now conceived of, and is not without implications for pure semantic analysis as well. For further discussion cf. Postal (to appear b).

[14] It is important to ask why violations of inbound anaphora constraints with derivatives are so much worse than violations of outbound anaphora constraints with derivatives or than violations of either inbound or outbound anaphora constraints with lexical items. The reason is, I think, that violations of the former necessarily yield ill-constructed words in the Surface Structure, while violations of the latter principles do not. It is a general fact about language, I believe, that violations of grammatical structure which yield wrongly put together words are always more serious, more immediately rejectable than those involving word combinations, semantic violations, etc. Hence the differences referred to at the beginning of this footnote seem in accord with the general situation.

[15] Cf. Chomsky (to appear b), Jackendoff (1968a, 1968b, 1968c) and for a particularly unfortunate discussion of pronominalization Dougherty (1968).

[16] Where by 'minor adjustments' I refer to operations like that described in (19) above.

[17] This fact is a counterargument to Chomsky's (to appear a) claim that such nominalizations are not transformationally derived. Given Chomsky's position, no general account of which NP controls complement subject deletion will be possible.

[18] For some discussion of these conditions with special attention to the relation between such pairs as:
(i)a I told John to dive off
b I said to John 'you dive off'
(ii)a I promised John to dive off
b I said to John: 'I will dive off'
cf. Postal (to appear a).

[19]No doubt one could construct certain purely semantic arguments as well. But in view of the strength of the arguments already given and the difficulty of providing enough agreed upon basis for a semantic argument, I will forego this addition, which would be based on the lack of correlation between syntactic NP and semantic terms under the nonnominal derivation of PPA.

[20]I have utilized in this discussion pseudo-adjectives which for the most part are based on underlying political unity names. It should be observed, however, that pseudo-adjectives of quite parallel nature are also derivable from other types of sources. In particular, they are derivable from generic NP, plural in the case of count nouns. Thus examples like:
(i) the American attack on Bill
(ii) the Bulgarian revolt
may be derived not only from underlying structures containing the names of the countries America and Bulgaria, but also from generic NP referring to sets of individuals who are American or Bulgarian. That is, underlying (i), (ii) there is also:
(iii) the attack on Bill by Americans
(iv) the revolt by Bulgarians
Notice, for instance, that the revolt referred to in (ii) might have taken place on the moon or Pluto and might have involved Bulgarian mercenaries in the Portuguese army.

On the face of it, the formation of pseudo-adjectives from either proper names of political units, proper names of individuals (Markovian) or generic NP, seems to provide a disjunctive, nonnatural basis. However, there is a generalization. Namely, pseudo-adjectives are apparently formed out of proper nouns, and the occurrence of generic NP is just further support for the point made in footnote 13 that generic NP involve the names of sets.

Some further examples of pseudo-adjective formation include:
(v)a attempts by scholars to uncover the causes
b scholarly attempts to uncover the causes
(vi)a studies by sociologists
b sociological studies

Finally, there are pseudo-adjectives which have underlying NP that can appear in no other way, including royal pointed out to me by J. R. Ross:
(vii) the royal attempt to suppress parliament

[21]There is, of course, a variation in whether country names take as pronouns inanimate it, or feminine forms. However, in my dialect at least, there is the curious restriction that while her can serve this purpose, she never can. All sentences

where she would have to occur as the anaphor are ill-formed.
(i) America$_i$ claimed that Japan attacked her$_i$
(ii) *America$_i$ claimed she$_i$ had been attacked by Japan
(iii) America$_i$ claimed the U. N. knew her$_i$ to have been attacked by Vietnam

[22]For demonstration of the role of coreferential anaphora in this deletion cf. Postal (to appear a).

[23]The relevant papers now include Bach (1968), Gruber (1967), Green (1969), Lakoff (1968, 1969, to appear), McCawley (1967, 1968a, 1968b, 1968c, 1968d, 1969, to appear).

[24]Where bracketed, capitalized inscriptions designate (schematically) semantic elements.

[25]There is an interesting restriction visible here, namely, one can form compounds with meat where the first element is the name of an animal type only if American culture does not sanction the eating of that animal. Thus:
(i) wombatmeat
(ii) dogmeat
(iii) alligator meat
(iv) horsemeat
(v) *pigmeat
(vi) *sheepmeat
(vii) *chicken meat
(viii) *turkeymeat
(ix) *deermeat
Just how a grammar should represent a generalization of this type is to say the least unclear. Such a generalization is reminiscent in type of that suggested by Whorf (1945:9) for determining the plural of types of fish.

[26]We have treated here the adjectival self compounds. In treating the nominal compounds, self-education, etc. we can note that their anaphoric properties are exactly like those of nominalizations like seduction. That is, given:
(i) Max$_i$'s description of Pete$_j$'s seduction of Louise
(ii) Max$_i$'s description of Pete$_j$'s (process of) self-education
we know that the antecedent of self is Pete$_j$ in (ii) and that it was Pete$_j$ which designates the individual who had sexual relations with Louise.

[27]It now seems clear to me that these constraints have nothing to do with variables but are what Lakoff (to appear) refers to as derivational constraints, that is, restrictions on the sequences of trees which can occur in a well-formed sentential derivation.

[28] Observe, however, that in incredulity contexts with special intonation one finds:
(i) John saw a superwhat
but never:
(ii) *what did John see a super
since the latter involves movement of an element out of a potential word structure. Compare:
(iii) John saw what
(iv) what did John see

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