HOW TO DO THINGS WITH JUNK: EXAPTATION IN LANGUAGE EVOLUTION

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Eine ... wichtige Eigenschaft aller Lebewesen, die wir bei der Kenntnis der Spielregeln des evolutiven Geschehens ohne weiteres verstehen, ist die große "Konservativität ihrer Strukturen. Durch eine Veränderung der Lebensweise, besonders wenn sie Anpassungen an einen neuen Lebensraum erfordert, können alte Strukturmerkmale sinnlos werden.

--- Konrad Lorenz (1978:23)

1 Exaptation

One of the less rewarding "interdisciplinary" behaviours is lifting theoretical concepts from subjects not our own, and using them in contexts far removed from the originals. Such borrowings often turn from theoretical claims into sloppy metaphors, and lead to a kind of vulgar X-ism, the result of overenthusiastic appropriation with insufficient sense of the subtlety or precise applicability of the original. (Spencer's "Social Darwinism" is a nice example, as is vulgar-Freudian literary analysis or sociology.) Linguistics, being less unique than linguists often think, is no exception. Praguian and neo-Praguian functionalism may be a kind of vulgar Darwinism, erroneously extending the notions of 'adaptation' or 'selection' to the inappropriate domain of language systems --- see (Lass 1980). But every once in a while this kind of transfer seems to work (like Darwin's borrowings from late 18th-century Scottish economic theory); if not through direct substantive applicability, then by focussing on new ways of interpreting old data, or providing a basis for linking disparate phenomena as instances of a (new, putative) "natural kind".
The term "exaptation" comes from evolutionary biology. It was coined by S.J. Gould and E.S. Vrba (1982) as, in their title, "a missing term in the science of form". In a popular summary, Gould (1983:171) writes:

"We wish to restrict the term adaptation only to those structures that evolved for their current utility; those useful structures that arose for other reasons, or for no conventional reason at all, and were then fortuitously available for other changes, we call exaptations. New and important genes that evolved from a repeated copy of an ancestral gene are partial exaptations, for their new usage cannot be the reason for the original duplication."

The reference here is to the presence in the cells of many organisms of large amounts of "redundant DNA" in the form of duplicate genes. Gould and Vrba point out that about a quarter of the genome of fruitflies and humans exists in the form of "middle-repetitive DNA", some genes having up to several hundred copies. They (1982:10f) argue that this surplus DNA is of immense evolutionary importance. It serves as a locus for phenotype-neutral genetic change, which can occur while the original DNA goes about its business. But most important from a theoretical point of view, there's no way it could have evolved (without backwards causation) "for the purpose of" providing such a future reservoir. Its use for such things is, in their terms, an exaptation.

A perhaps clearer macro-level example is the development of feathers by the dinosaur lineage ancestral to birds. Since it now seems that Archaeopteryx was either flightless or a very poor flyer (judging among other things from the architecture of its shoulder-girdle), and yet was fully feathered, it can be argued that feathers originally developed as a thermoregulatory device for warm-blooded proto-birds living in high latitudes, and were later opportunistically capitalized on or coopted for flight -- (Bakker 1975, Ostrom 1979). Exaptation then is the opportunistic cooptation of a feature whose origin is unrelated to its subsequent use.
One of the consequences of this view is that organisms (and I suggest that the same applies to other historically evolved systems, like languages) may in their structure show a certain amount of "bricolage". They are to some extent cobbled together, and the remnants of earlier cobblings can be recobbled into new structures. Konrad Lorenz (1978:25) has a lovely image of an organism growing by evolutionary accretion. It begins like a pioneer's shack, which serves as the nucleus of a grand new structure gradually erected around it. In the course of time the original shack becomes a kind of junkroom, and eventually nearly every room in the growing house gets used for some non-original purpose. We see in an organism "eine Menge Baumerkmale, die Überbleibsel einer 'Anpassung von gestern' sind". A typical exaptation is the redeployment for a new purpose of one of "yesterday's adaptations".

The important methodological point that Gould and Vrba make is that a totally "selectionist" evolutionary theory is constraining and heuristically unproductive. By not insisting on the "utility" of all parts of an organism, but allowing for "nonaptations" (features of no purpose, doing nothing) as well as conventional adaptations, they (1982:13) permit organisms the freedom to evolve: "the path of evolution --- both the constraints and the opportunities --- must be largely set by the size and nature of this pool of potential exaptations".

I want to apply this same kind of thinking to language change. Rather than viewing languages in the classical "structuralist" way as (almost) systems où tout se tient, I would rather see them as Gould (1983:101) suggests we see organisms: "bundles of historical accidents, not perfect and predictable machines". That is, to see language change as "mosaic evolution"; as Gould (ibid.) puts it, "an animal's parts are largely dissociable, thus permitting historical change to proceed".
I suggest that organic exaptation has a linguistic parallel, which may throw some light on the strategies languages use in their development. The idea may allow us to recognize a common strategic thread running through well known but previously not related (or relatable) phenomena. We may already know that X and Y exist; but if we're on the right track we get somewhere interesting by recognizing X and Y as previously unconnected instances of Z. I think there is a reasonably common sort of language change, occurring in many diverse guises, that can insightfully be seen as a kind of exaptation. So, with all the caveats proper to cross-disciplinary transfers, I will use the term, with a certain looseness, to highlight a particular kind of historical development.

I will illustrate with two examples from the history of Germanic. They have neither been generally recognized as odd (which on reflection they certainly are), nor as similar (which they can be argued to be). The first involves the redeployment of the morphological exponents of an original aspect opposition as markers of number concord; the second the downgrading of a syntactic contrast to mark the morphophonological properties of certain stem-classes.

A simple abstract case (to be fleshed out in the next section) will illustrate the general principle. Say a language has a grammatical distinction of some sort, which it codes by means of morphology. Then say this distinction is jettisoned, prior to the loss of the morphological material that coded it. This morphology is now, functionally speaking, junk. There are three things that can in principle be done with it:

(i) Dump it entirely.

(ii) Keep it as marginal garbage or nonfunctional/nonexpressive residue ("suppletion", "irregularity").

(iii) Keep it, but instead of relegating it as in (ii),
use it for something else, perhaps equally systematic.

Option (iii) is linguistic exaptation. The point is of course that it is an option. Languages may operate "wastefully", by dumping material that no longer does anything particular, or in a "conservationist" mode, by recycling. This may be a useful parameter for the typology of change.

2 From semantics to concord: the strong verb preterite

One of the great innovations characterizing Germanic is the destruction of the Indo-European aspect system. This was replaced by one based solely on tense-contrast, with no grammaticalized aspects. In crude outline, the IE present remained as the Germanic present, and the two "past" categories, perfect and aorist, merged to form a new, conflated preterite:

(1)  

<table>
<thead>
<tr>
<th>IE</th>
<th>Gmc</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENT</td>
<td>PRESENT</td>
</tr>
<tr>
<td>PERFECT</td>
<td>PRETERITE</td>
</tr>
<tr>
<td>AORIST</td>
<td></td>
</tr>
</tbody>
</table>

In the weak verb, the aorist/perfect merger is not only semantically complete: it also involves dumping of the morphological material that coded both categories. Even the earliest forms, like NWGmc *talgidai* "I carved" (Nøvling Clasp, c. 200 AD: Antonsen 1977:30) show no sign of either IE perfect or aorist morphology. This form for instance shows only a root with inherent o-grade vocalism (*/dolgh-/*: cf. Skr *daláyati* "he splits", L *dol-á-re* "hew", OIC *telgía* "carve" < */taly-ja-/*) --- plus the usual weak preterite machinery of stem + theme-vowel */-i/* + tense-suffix */-d/* + personal ending. At the
beginning of Germanic attestation then the merger and loss of original morphology is complete (on the exponents of the morphology see below). The new suffixal preterite took over the combined semantic ranges of both aorist and perfect (or better, the distal time-deixis underlying them) and instantiated it in a totally novel way.

The strong verbs however were more conservative, and retained --- in a drastically altered capacity --- a major portion of the original contrast-instantiating morphology. To see what happened we have to look back at one important pattern of morphological coding of aspect in Indo-European, viz. ablaut. Many verbs showed a standard pattern in which e-grade of the root coded present, o-grade coded perfect, and zero-grade coded aorist (whatever other material might have been involved). The type could be Greek present indicative active 1 sg \( \lambda \dot{i} \dot{p} \omega \) "I leave", perfect \( \lambda \dot{e} \cdot \lambda \dot{o} \cdot \pi \cdot -\alpha \), aorist \( \dot{e} \cdot \lambda \dot{u} \pi \cdot -\nu \). The stem here is obviously /l_ip/, so that \( /ei/ = e\)-grade, \( /oi/ = o\)-grade, and \( /lip/-/lip/-\) represents zero. That is, "zero" in the sense that the stem-vowel has deleted, and the /-i-/ represents not a "vowel" (morphophonemically) but part of the root.

There is however another common aorist type, which shows lengthened (usually e-) grade, and appears in an important class of Latin perfects which stem from earlier aorists --- see (Buck 1933:par. 413). Examples are present e-grades \( \dot{e}d-\ddot{o} \) "eat", \( v\ddot{e}n-\ddot{i}-\ddot{o} \) "come", \( l\ddot{e}g-\ddot{o} \) "read", perfects \( \ddot{e}d-\ddot{i} \), \( v\ddot{e}n-\ddot{i} \), \( l\ddot{e}g-\ddot{i} \). (These are to be distinguished --- historically --- from secondary lengthenings in velar-final stems with old sigmatic aorists like \( r\ddot{e}x-\ddot{i} < */\text{reg-s-i}:/ \) and stems in /-n/ like \( m\ddot{a}n-s-\ddot{i} < */\text{man-s-i}:/ \), presents \( r\ddot{e}g-\ddot{o} \) "rule", \( m\ddot{a}n-e-\ddot{o} \) "remain".)

The important thing for our purposes is the existence in IE of at least one important pattern of aspect marking in which the present has e-grade of the root, the perfect o-grade, and the aorist either zero or lengthened e-grade:
With this as background, consider the vocalic patterns of the Germanic strong verb classes I-III, here illustrated from Gothic and Old English: PRES = present system (examplified by the infinitive), PRET₁ = preterite 1, 3 sg, PRET₂ = preterite 2 sg and plural —— for the usage and discussion see (Lass & Anderson 1975:ch. I):

Some etymological comment may be useful for perspective. In class I, where Gothic <ei> = /iː/, both Go, OE /iː/ go back regularly to IE */ei/ (Go steiγan, OE stīgan "ascend" = Gr στίγμα). In class II, Go /iu/, OE /eo/ reflect */eu/ (-biudan, beodan Gr πευδο "inquire"). Go /au/, OE /æa/ <œa> continue */au/ (Go aukan, OE eacian "increase" = L augeō); and Gothic /i/ in class III PRES shows a general raising of IE */e/. For PRET₁, Germanic */a/ as in halp and the first elements of the nuclei in bait, baup can represent not only IE */a/ (Go akkrs "field" = L ager) —— but also IE */o/ (Go ahtau "eight" = L octō). On this basis PRES in classes I-III reconstructs with root */e/ and PRET₁ with root */o/: they can be seen easily as continuations of IE present e-grade and perfect o-grade respectively.
Now to PRET$_2$, Germanic /uR/ (where R = nasal or liquid) typically reflects an IE zero-grade */R/: Go wulfs, OE wulf "wolf" $\approx$ */wulfs/ (cf. Skr vrk-á-h). Thus the root /u/ in class III goes back to a syllabic resonant, while the /i/ in class I and the /u/ in class II are residues left by the deletion of the nuclear vowel in /vi/, /Vu/ stems, i.e. bit- is parallel to Gr $\lambda\tau\tau$ , etc.

Now if PRES and PRET$_1$ reconstruct as stemming respectively from IE present and perfect (as far as the sources of their nuclear vowels are concerned), then the zero-grade in PRET$_2$ is unlikely to reflect anything but a zero-grade aorist. Aside from anything else, it's more parsimonious to keep everything in the family. And since there is nothing in Germanic (or IE) historical morphophonology to support an alternation /a/ $\sim$ /u/ (or /o/ $\sim$ Ø) as a primary marker of number, the only reasonable source for the whole vocalic pattern is the old verbal ablaut. (This is of course a handbook commonplace, since the strong verb classes are typically referred to as "Ablautsreihen"; but the argument is rarely if ever made fully explicit.) So behind the class I-III alternations we can see an early Germanic archetype of this kind:

\[
\begin{array}{ccc}
\text{PRES} & \text{PRET}_1 & \text{PRET}_2 \\
\text{I} & -eiC- & -aiC- & -iC- \\
\text{II} & -euC- & -auC- & -uC- \\
\text{III} & -eRC- & -aRC- & -uRC- \\
\end{array}
\]

And this in turn reflects a pre-Germanic archetype:

\[
\begin{array}{ccc}
\text{PRES} & \text{PERFECT} & \text{AORIST} \\
\text{I} & -eiC- & -oiC- & -iC- \\
\text{II} & -euC- & -ouC- & -uC- \\
\text{III} & -eRC- & -oRC- & -RC \\
\end{array}
\]
Class I then is directly equivalent to the old alternation pattern \( \lambda \pi^{-}, \lambda \pi^{-}, \lambda \pi^{-} \), and so on (the labels "I-III" for IE do not of course reflect a "system" of verb classes, but their origin types). The first three classes continue the classic ablaut series */e/~/*/o/~/\( \emptyset \), with later changes leading to the attested stem-shapes.

Classes I-III have roots with a heavy syllable (*/-VVC/, */-VCC/). The situation is slightly different with classes IV-V, which continue a type with a light root syllable. These also show what we can now recognize as an o-grade perfect in PRET\(_1\), but a lengthened e-grade in PRET\(_2\). Given the reasonably unambiguous pairing of perfect/aorist in I-III, and the o-grade perfect in IV-V, this is a straightforward interpretation:

\[
\begin{array}{|c|c|c|}
\hline
\text{PRES} & \text{PRET}_1 & \text{PRET}_2 \\
\hline
\text{IV "bear"} & \text{Go baír-an} & \text{bar} & \text{bêr-um} \\
& \text{OE ber-an} & \text{bær} & \text{bær-on} \\
\text{V "eat"} & \text{Go it-an} & \text{at} & \text{ét-um} \\
& \text{OE et-an} & \text{æt} & \text{æt-on} \\
\hline
\end{array}
\]

Go \( \langle \text{aí} \rangle = [\ell] \), a predictable reflex of */e/ before /r/; Go /e:/, OE /æ:/ continue IE */e:/, as in L \( \text{êd-ī} \), itself an old aorist. We can now add to the archetypes (4-5) the following:

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{GERMANIC} & \text{IE} \\
\text{PRES} & \text{PRET}_1 & \text{PRET}_2 & \text{PRES} & \text{PERF} & \text{AOR} \\
\hline
\text{IV} & -eR- & -aR- & -e:R- & -eR- & -oR- & -e:R- \\
\text{V} & -eC- & -aC- & -e:C- & -eC- & -oC- & -e:C- \\
\hline
\end{array}
\]

The IE-to-Gmc development can be diagrammed as follows (taking class III as an exemplar --- only phonological details will vary from class to class):
The scenario encapsulated here would seem to be:

(i) Loss of the (semantic) opposition perfect vs. aorist.

(ii) Retention of the diluted semantic content 'past' shared by both (i.e. loss of aspect, retention of fundamental time-deixis).

(iii) Retention of the morpho(phono)logical exponents of the old categories perfect and aorist, but divested of their oppositional meaning.

(iv) Redeployment of the now semantically evacuated exponents as a marker of a secondary (concordial) category, number. In effect, re-use of the now "meaningless" old material to bolster an already existing concordial system, but in a quite new way.

After the merger (i), the remnants of the perfect/aorist ablaut system, divorced from the opposition they instantiated, are historical junk. They are pressed into the service of a new linguistic function (which was in fact always coded anyhow, though mainly by suffixes), rather than being dumped altogether. (The dumping of the system comes later, when the redundant vowel-grade + suffix coding of plurality is lost in most Germanic dialects, with retention only of suffix as in German or Dutch, or loss of number marking completely as in English and Afrikaans. Only Icelandic maintains the distinction still, as in class I bíta "bite", PRET₁ beit, PRET₂ bitum, class II bjóða "offer", PRET₁ baði, PRET₂ buðum, etc.)
What is of prime interest here is the conceptual novelty: ablaut in the IE sense was never used for this kind of thing before. Indeed, given its original conditioning factors (syntactic category in some cases, position of accent in others) it never could have been. With the break-up of both the original aspect system and the function of ablaut itself, the old forms were available for cooptation.

3 From syntax to (mostly) morphology: Afrikaans adjectival -e

My second case is not so much one of massive exaptation of an old system as a new and conceptually innovative form of inflection, with no concordial (and virtually no semantic) function. But it is still exaptive, in that the surface exponents of an old contrast (if in a rather degraded form) are retained, and pressed into a quite new service.

All Germanic languages except English show some remnants of the old Germanic adjectival inflection. (English kept something of it until about 1400 --- see (Mustanoja 1960:275ff)). Despite complex local developments, such as a dual declension ("strong" vs. "weak") the principles are more or less those of standard IE adjective inflection: the adjective is an "empty" category, all of whose inflections are concords. The triggers of these concords are syntactic: features of the whole NP such as definiteness or quantification, or features of the head noun, such as (surface) case, number, and gender.

The historical background of the Netherlandic adjective system is obscure. In particular, we have only fragmentary attestation of the declension in the one corpus that could in a way be called "Old Dutch" --- the Old Low Franconian Laws and Psalm translations. The general inflectional principles of the older-style dialects can however be illustrated with OLF examples:
(9) (i) an all - e r o e r t h - o n  [Ps. 18:4]  
    to ALL - f e m e a r t h - w e a k  
    dat fem oblique  
    sg fem  
    "to all the earth"

(ii) fan ho - o n h i m i l - i  [Ps. 18:6]  
    from HIGH - m a s c h e a v e n - m a s c  
    dat masc dat  
    sg sg

(Texts from (Markey 1976).)

By Middle Dutch, the strong/weak adjective distinction had been lost --- see (Van Loey 1970b:269f). The adjective often took its oblique form from the inflected article, and both endingless and inflected forms were used in the same context. We can however extract a generalized paradigm, of this type:

(10)  

    m  n  f  pl  
    NOM -e -e -e -e  
    GEN -(e)s -(e)s -er -er  
    DAT -en -en -er -en  
    ACC -en -e -e -e

Even though both historical weak and strong forms could be used in the same context (des goed-en/goet-s man-s "the good man's"), and there was great messiness and variation, and even though the system (or lack of it) seems quite innovative with respect to earlier Germanic models, it is still --- and this is the vital point --- a morphosyntactically based one. Even in modern Dutch, where the control of adjective inflection is wildly different from anything that was possible in Old or Middle Germanic, the triggers for adjective inflection are still of roughly the same type.
So much for early background. Since the developments in Afrikaans are late (post-17th-century), we will not be concerned in detail with older systems and their decay and alteration, but with the type of late pattern that Afrikaans deviates from, and the nature of that deviance. For 17th-century Dutch, despite an enormous amount of variation, we can extract some fairly clear principles, not unlike those still in operation. The old three-gender system had generally broken down, and collapsed to a two-way opposition "common" vs. neuter, signalled primarily by the definite articles: common de vs. neuter het. Aside from survivals of the old genitive and dative inflections, the adjective was essentially either endingless or in -e. Since the Afrikaans system is built entirely on the contrast Adj-Ø vs. Adj-e, I will restrict my remarks to this.

The primary controls on the presence vs. absence of -e were (a) the gender of the head noun (neuter favoured lack of -e), and (b) the nature of the determiner (if any): indefinite and quantified nouns favoured -e if common and zero if neuter. Definites were (and still are) variables. Preferentially neuters are endingless, and commons take -e, as do (tendentially) plurals of both genders.

The system was obviously more complex and subtle than this, but the neuter/common and indefinite/definite as well as singular/plural oppositions make the point. The conditioning of -e vs. -Ø is purely morphosyntactic (or lexico-semantic in the case of gender). But even when an "internal" property of a noun (like gender) is involved, it is the syntagmatic environment or "external" environment that determines the shape of attributive adjectives. (Predicate adjectives in any case are endingless.)

In early Afrikaans (Proto-Afrikaans, Kaapse Nederlands, or whatever one wishes to call the language from 1652 to about 1750), the Dutch system collapsed completely, and was replaced by something totally novel. The first stage of this
process was the loss of grammatical gender. The erosion of the *de/het* distinction was already underway in the 17th century, and both *de* and *het* were replaced by the generalized *die* by about 1740. The reorganization of the adjective system to be described below was complete in essence by around 1775 (Raidt 1983:149f).

Now it would seem likely that once the basic trigger of gender was lost, the distribution of *-e* would for a time be close to random. Each adjective "had" a form in zero (the base or predicate-position one), and one in *-e*, and the absence of gender-specification should reasonably allow for either one surfacing in a given context. That is, one might expect indefinite neuters in *-e* like *een kleyn-e stuk* "a little piece", *wit-t-e water* "white water", and zero-ending commons like *een ander plaats* "another place", *een yzer harpoon* "an iron harpoon", alongside the "correct" types *een kleyn N n, een ander-e N c*. And indeed, in the "transition" period between the Dutch and Afrikaans systems this is precisely what we do find. (The "deviant" forms are from (Scholtz 1981:129), which gives an excellent historical overview).

This kind of distribution should, if we go by the example of similar cases like that of Middle English, lead to a stabilization of one or the other form, in *-e* or endingless. Once the primary conditioning factor has gone, we'd expect the exponents of the contrast to go as well --- especially since there is good documentary evidence for a period of extremely messy and "senseless" (i.e. apparently non-deterministic) variation. But this is not what happened. Afrikaans not only did not lose the Adj-Ø/Adj-*e* contrast, it restabilized it and redeployed it in a new and complex (and more rigid) system, at a different grammatical level. The now "baseless" contrast was coopted in the service of a conceptually novel inflectional system, with no real Germanic precedents. In particular, the new
system is nonsyntactic: definiteness, quantification, number, presence or absence of predeterminers, case (and of course gender) play no role.

Following Raidt's basic analysis (but not her (1983:184-6) specific taxonomy), we can describe the new system as follows. First and foremost, the domain for inflection is the particular adjective itself, not its syntactic environment. A given adjective is generally either inflected or uninflected in all attributive contexts.

**Class I: Categorically inflecting**

(i) **Morphologically complex adjectives.** The first dichotomy is based on morphological structure: any polymorphemic adjective (with one major exception --- see below) takes attributive -e. Thus ge-heim "secret", open-baar "public", be-lang-rik "important". The syntax of the NP is irrelevant: thus 'n geheim-e resep "a secret recipe", geheim-e resepte "secret recipes", baie geheim-e resepte "many/very secret recipes", die/hierdie geheim-e resep/-te "the/this/these secret recipe(s)", etc. The only syntactic feature relevant (here as elsewhere) is that inflection occurs only in attributives. Predicate adjectives are endingless, as in die resep/-te is geheim "the recipe(s) is/are secret".

The main exception is also morphologically conditioned. Comparative adjective forms are endingless, regardless of whether the base form inflects or not: 'n geheim-er resep "a more secret recipe", 'n groot boek "a big book"/ 'n groot-er boek "a bigger book". Comparatives in fact fall in with obscured complex adjectives like ander "other", lekker "delicious", which are endingless ("obscured" in the sense that -er is not perceived as a suffix, even if historically it is).
(ii) Morphophonemically complex adjectives. The next cut is between morphophonemically "complex" and "simple" adjectives, i.e. those with variant stem-allomorphy and those without it. Adjectives with only one stem-allomorph are generally endingless (if they do not fall under I, (i). Those with alternants take -e. In fact, as will become obvious, this is rather a chicken-and-egg setup: it's only the preservation of the inflected forms that allows the alternations to persist, since they are all conditioned by final vs. non-final position. The main groups are

(a) Cluster-simplification alternators. Dutch already had a tendency to simplify some foot-final obstruent clusters, as can be seen in vos, os compared to their English cognates "fox", "ox". Afrikaans has carried this further, deleting (inter alia) the stop in any coda-cluster containing a stop and fricative (in either order): thus pos "post" vs. Dutch post, plaas "place" vs. Dutch plaats, and so on. In Afrikaans the deletion takes place only if the cluster is absolutely final in the foot, i.e. if both obstruents involved belong to the coda of the same (strong) syllable. Thus vas "fast", sag "soft", reg "right", "straight", inflected vast-e, sagt-e, regt-e, i.e. /fɛs fɛstə, sɛx sɛxtə/, and so on. The role of syllable-position can be shown as follows (these representations are indifferently either historical or synchronically "underlying", as you wish):

\[
\begin{array}{cccc}
\text{vas} & \text{vaste} & \text{sag} & \text{sagte} \\
\text{Deletion} & \emptyset & \downarrow & \emptyset
\end{array}
\]

In vast-e the /st/ cluster is ambisyllabic, since /st/ is a permissible syllable-initial. In sagt-e the /xt/ is partially split by a syllable boundary since /xt/
is not a legal initial. But in both cases the cluster as a whole is not uniquely in the coda of the first syllable in the disyllabic form. (On the notion of syllabification invoked here see (Lass 1984: para. 10.3.5f), (Anderson & Ewen 1987:par. 2.3).)

(b) Auslautverhärtung alternators. As a typical continental West Germanic language, Dutch shares with German and has bequeathed to Afrikaans a medieval rule of final obstruent devoicing: both the categorical effect of the rule on surface phonotactics, and a set of morphophonemic alternations involving it. Typical alternating cases are \textit{blind} /ˈblɪnd/ "blind", inflected \textit{blind-e} /ˈblɪndə/, \textit{hart} /ˈhɑrt/ "hard, loud, quick", inflected \textit{hard-e} /ˈhɑrdə/, \textit{doof} /ˈdʊaf/ "deaf", inflected \textit{dowe} /ˈdʊəvə/ (cf. non-alternating \textit{hart} /ˈhɑrt/ "heart", pl. \textit{hart-e} /ˈhɑrta/). The representations here are "surface phonemic" in the simplest sense, not "underlying". Afrikaans spelling apparently vacillates, as we can see from "morphophonemic" \textit{hard/hard-e} vs. "phonemic" \textit{doof/dowe}.

(c) Medial syncope alternators. In Dutch, and to a larger extent Afrikaans, single consonants (preferentially /d/ and /x/ < /ɣ/) tend to delete medially in the foot (i.e. when they are not exhaustively in the coda of the strong syllable, but form an ambisyllabic "interlude"). Examples are \textit{weer} "again" (cf. G \textit{wieder}), \textit{voël} "bird" (cf. Dutch \textit{vogel}). This syncope produces alternations in adjectives that retain final -\textit{e}: \textit{droog} /ˈdrɔəx/ "dry", inflected \textit{droë} /ˈdrʊə/; \textit{doed} /ˈdʊət/ "dead", inflected \textit{dowi-e} /ˈdʊəja/. Syncope-pated /d/ usually leaves a palatalized residue /j/ behind it (so also \textit{goed} "good", inflected \textit{goei-e}), but there are a few cases where it doesn't, as in \textit{ouer} "older" (cf. Dutch \textit{ouder}).
Some items in this group tend to behave like class I, with their syncopated forms lexicalized as new attributives without -e. Raidt (1983:145) cites dooi 'dead' and occasionally vroe /fru/ "early" (unsyncopated vroeg /frux/) as colloquial variants.

There are a few other items that do not belong specifically to these classes, but show stem-alternants: a typical example is nuut /nyt/ "new", inflected nuw-e /nyva/.

Taking this group as a whole, it is interesting to note, as a theoretical sidelight, that we have here a clear case of linguistic change acting to maximize allomorphy, in the most straightforward possible way. It would have been so "easy" to drop the forms in -e (as was in fact done with so many other adjectives). It is curious that in a language that has done so much radical hatchet-work on its paradigmatic structure (losing all its verb inflections for person and number, for instance), the simplification (or "simplification") of the adjective declension should have resulted in the preservation of a host of minority paradigm-types.

Class II: Categorically non-inflecting

The bulk of these are monosyllabic, ending in obstruents like diep /dip/ "deep", los /los/ "loose", vowels like blou /bləu/ "blue", sonorants alone like geel /xeal/ "yellow", or sonorants in clusters with other consonants like dronk /droŋk/ "drunk". A few of these noninflecting adjectives are polysyllabic, either in -er like ander, lekker (see above), or comparatives. Though Raidt gives a detailed structural survey of this class, it is really necessary only to specify two features: morphologically simplex (non-comparative) and having only one stem form. Class II is thus a residual "elsewhere" category, by and large.
There are a few adjectives (mostly in -el) that do not fit comfortably into either class, but display the exaptive strategy in an interesting way. In these, two related meanings may be differentially coded by presence or absence of -e. A good example is enkel "single". In collocation with man "man" it can have two senses, signalled by inflection: "n enkel man "an unmarried man" vs. "n enkel-e man "a solitary man". (Thanks to Melinda Sinclair for this example.) This is a marginal exaptation for semantic purposes, which is not very widespread. Other -el adjectives seem to vary without semantic consequences, though the conditions are obscure. It does however seem that -el rather favours -e overall. Raidt's (1983:145) judgement that it is "fast unmöglich, etwas Bestimmtes ... zu sagen" is a reasonable provisional one. It may be that -el is optionally perceivable as a kind of pseudo-suffix, which would allow /ɛŋkal/ to be interpreted as either enkel or enk-el (on the model of the nominal -(s)el that appears in words like stelsel "system", mengsel "mixture" --- cf. stel "set, suite" or as verb "place, adjust", meng "alloy, blend, mix").

So the rules controlling -e (categorical or variable) crucially involve the following:

(a) morphological structure (simple vs. complex);
(b) paradigm structure (alternating vs. non-alternating);
(c) lexico-phonological idiosyncracies like -er disallowing -e regardless of morphology; doublets like those for enkel.

This throws into relief the conceptual novelty (unique as far as I know in Germanic): all the information controlling addition or non-addition of -e is internal to the adjective itself as a word-form or to its morphophonemic paradigm.9

In the earlier (syntactically based) inflectional system, the information controlling suffixation was essentially syn-
tagmatic: nature of determiner, features of head noun, etc. The exaptation here is the "internalization" or "introjection" into the adjective itself of the inflectional triggers, using the inherited, formerly syntactically controlled -e purely "locally", as a marker of adjective class. Globally, one could say that the inflectional locus has shifted from the syntax to the lexicon. (Assuming, that is, that morpho-phonemic alternations are lexically coded, not produced synchronically by "abstract" derivations. On an abstract analysis, class I adjectives would still exert lexical control, but for the alternators this would be in terms of "underlying" properties, not paradigmatic ones.)

The exaptive scenario here begins with the loss of gender. When common and neuter nouns are no longer distinguished, the -e was first exapted as nearly exclusively a marker of plurality in the head noun. In the 15th century, partly as a consequence of the generalized loss of final /ə/ (which did not happen in Dutch or Afrikaans), the -e was lost, and the adjective became invariable. English is thus "wasteful" with respect to this piece of inherited structure, Afrikaans is "conservationist" --- see par. 1.10

4 Epilogue: the joys of idleness

The patterns of change discussed here display an important property of evolving systems (not only linguistic ones): useless or idle structure has the fullest freedom to change, because alteration in it has a minimal effect on the useful stuff. Major innovations often begin not in the front line, but where their substrates are doing little if any work. (They also often do not --- but this is simply a fact about nondeterministic systems.) Historical junk, in any case, may be one of the back doors through which structural change gets into systems, by idle material getting re-employed.
Most importantly, however, mere "uselessness" is not itself either a determinate precursor of exaptive change or --- conversely --- a precursor of loss. Historical relics can persist, even through long periods of "senseless" variation. And it is impossible to predict, solely on the basis of such idleness or inutility, that anything at all will happen. (That such predictions can be made if we get the right theory is an endemic delusion of historical linguists --- see the arguments in (Lass 1980:chs. 2-3).) Examples of the persistence of idle and nonexapted structure are easy to come by. One is the -s ending of the English present indicative singular. In the course of its evolution, English has lost all the non-tense morphology of the verb except this suffix. It now has none of the "informative" concordial function that verb suffixes had in earlier times (actually, before it was -s, while it was still -th), when English had a freer word-order than it does now, and subject pronouns were not obligatorily expressed. This relic inflection not only has no "communicative" function in the sense of actually serving to underwrite the parsing of potentially ambiguous structures; it is a systemic excrescence. (Other languages with similar excrescences or asymmetries may clean them up. Afrikaans did by losing all its verb morphology, and Swedish and Danish did by extending one ending --- originally that of the present 2 sg --- to the whole paradigm.) We might note however that the -s ending can be exapted for socio-linguistic purposes, as an indexical marker of "vernacularity" in some dialects, where it is extended to all person/number forms --- see (Cheshire 1982:ch. 4) on this use in nonstandard Reading English.

We should in fact not be surprised at the retention of historical junk over long periods. Despite neo-Praguian claims, e.g. by Martinet (1955:49ff) --- see (Lass 1980:91ff) --- that there is a kind of "expense of energy" in the maintenance of oppositions that predisposes to loss of items with
low functional load, there is really no evidence whatever that linguistic systems have "thermodynamic" properties of this kind. It doesn't take any "energy" (even the metaphor is inept) to maintain historical residues, no matter how useless they may be at a given moment. The zero option is to do nothing at all with them, and they do no harm just lying there. The enormous redundancy of linguistic systems may be a function not just of communicative efficiency (the greater the redundancy, the more chance of overcoming the effects of channel noise). Indeed much of the redundancy we find may have no teleology behind it, but is simply the product of historical inertia. Nonaptations persist because there's no particular problem in keeping them, and there may even be "work" to do in getting rid of them. If these nonaptations or adaptations fallen into desuetude can be later exapted for something else, well and good. But there is no particular reason either to do this or not to. Like so much else, this is a matter of the "creative" freedom available to historically evolved systems, precisely because of their complexity and innate conservatism. As Lorenz (1978:25) remarks in his discussion of the junkroom-in-the-mansion alluded to in par. 1, one of the reasons that ancient material persists is that it's very hard to dismantle a house while you're still living in it:

"Die als solche erkennbaren historischen Reste bleiben schon deshalb erhalten, weil der Bau nie ganz abgerissen und neu geplant werden konnte: Das war gerade deshalb unmöglich, weil er dauernd bewohnt und intensiv benützt wurde."

With luck, however, you can redecorate.
1. The term "evolution" in this paper is not used in the vulgar progressivist sense of (directional) change with increasing "fitness". The evolution of a system is simply its story over time, normally the product of variation and differential survival of variants. In this sense parallels between organic and linguistic change seem fair. This paper owes a large (impersonal) debt to the writings of Stephen Jay Gould who, though a paleontologist and not a linguist, is pre-eminently a historian and has an eye for the kind of problems and ideas that make historiography worthwhile. Closer to home, I am grateful to Roy Pheiffer for advice and assistance on matters Netherlandistic, and to Rudie Botha and Melinda Sinclair for comment and discussion.

2. Earlier scholars tried, often desperately, to derive the whole of the strong preterite from the IE perfect. For technical discussion and the standard arguments for the role of the aorist, as well as a good survey of the earlier literature, see (Prokosch 1938:56f). Whether the IE aspect system as I give it is "original" or a secondary development is not germane. If the kind of system that shows up in Greek, say, is a late development, the loss of aspect in Germanic is loss of a secondary opposition, part of a cyclic pattern of loss and restoration of aspect --- see (Lass 1987:ch. 6).

3. I omit the strong verb classes VI and VII, as their historical root structure (probably with a laryngeal) does not allow the old patterns to surface clearly. Both classes show the same (long) vocalism in PRET₁/ PRET₂, which makes them historically uninformative.
for our purposes, just like the weak verbs. A typical case is Class VI “bake”, OE PRES bacan, PRET₁ bőc, PRET₂ bőcon, where both length and quality distinctions have been lost. This could in fact be referred to an old pattern */bʰeg-, bʰog-/, etc., but the arguments are too complex to go into here --- see (Lass & Anderson 1975:49ff) where we try to resurrect the laryngeal as a synchronic abstract segment.

4. The redeployment of morphology after a category breakdown does not of course have to be systematically exaptive. When the IE nominal ablaut deteriorated, there was in certain declensions a near-random redistribution of formerly conditioned vowel grades, often on a lexeme-by-lexeme basis. So for instance the word “tooth” in Germanic shows both o-grades (OE tōp < */tanθ-/*donθ-/, OHG zand, OIC tʊnnr) and zero-grades (Gothic tunþus < */tunθ-/*dnt-/). For discussion of this problem see (Lass 1986).

5. The strong declension had a rich paradigm, the adjective carrying some marking for case, number and gender (cf. modern German gut, gut-er, gut-es, gut-em, gut-en, etc.). This tended to appear in collocations with no pre-adjectival determiner, or where the determiner itself was inflectionally ambiguous. The endings largely derive from nominal or pronominal case/number suffixes (e.g. G -es for masc/neuter genitive sg). The weak declension was much less highly differentiated, and borrowed its morphology from the weak (n-stem) nouns (cf. German des gut-en Mann-es, dem gut-en Mann). This was used most often where the concordial or categorial information was carried by the determiner, and the adjective inflection mainly marked the contrast nominative vs. oblique. The intricacies of this distinction, which varied enormously from dialect to dialect, will not concern us here.
6. There are a few other fragments as well: one famous West Flemish sentence in an 11th-century English MS (Schönfeld 1932) and a handful of others (Sanders 1972). Old Low Franconian (9th-10th centuries) is the only substantial evidence for a "Proto-Netherlandic" ancestor of the cluster of textual traditions arising in the late 12th century and conventionally called Middle Dutch --- see (Van Loey 1970a:xxxix ff), (Raidt 1980:chs. 3-4). This complex cluster, with its not entirely clear antecedents, is the ancestor of the equally complex and heterogeneous "17th-century Dutch" that formed the input to Afrikaans.

7. It is hard to specify exactly what the Afrikaans input was like, since there were many regional and social varieties of the not-yet-standardized 17th-century Netherlandic complex involved. There is at this stage little point in trying to reconstruct a fully systematized Early Modern Dutch morphology in general. I give below only enough details to make the main points. Modern standard Dutch shows an essentially cognate and conservative system. For the Afrikaans input see (Raidt 1983). Other two-way systems of Adj-Ø vs. Adj-e can be seen in Frisian and Yiddish.

8. The modern system is essentially the same: zero vs. -e except for relics of old datives and genitives in lexicalized expressions and archaizing styles --- see (Rijpma & Scheuringa 1969:par. 117).

9. The structure of a paradigm may serve as a trigger for or brake on change. E.g., one of the major constraints on final /ə/ deletion in Yiddish nouns was the pluralization class they belonged to. Most nouns with final /ə/ lost it in late medieval times (e.g. harts "heart", cf. OE heorte, G Herze). The main exceptions
were those nouns belonging to the s-plural class (so kâčke "duck" < Pol kacza, pl kačke-s). Other retained /a/ were (parts of) morphologically non-root material, e.g. in the diminutive suffix -ele (ges-ele "little street"). For details see (Lass 1978).

10. The variation in some -el adjectives with respect to -e may suggest that Afrikaans will in time go the way of English, and level all adjectives to zero-inflection. Aside from noun plurals, the adjectival -e is the only productive inflexional category in Afrikaans (unless you count the ge- prefix on past tense verbs, which always cooccurs with an auxiliary).
Lass, 59

REFERENCES


