GRAMMAR CHANGE: ANALOGY

Analogy is a function of the relational aspects of grammar and a mental striving for simplicity or uniformity.

[5.1 Proportional Analogy]   The term 'analogy' is used in many senses, all having to do with some kind of regularity. The earliest linguistic context of the word was the Ancient Greek controversy as to whether language was controlled by regularity or analogy, as against irregularity or anomaly. This controversy itself was an extension of an earlier dispute as to whether the relation between words and their meanings is natural or conventional. These questions gave the impetus to rigorous investigation into language, and by now we have a compromise answer. The nature-analogy position falls within the notion of iconicity, and the convention-anomaly position reflects symbolic aspects. Both forces play a role in the functioning of language, as we have seen (Chapter 1), and we have already observed various aspects of analogy (§§ 1.13, 2.2, 2.8, 2.14-2.16, 3.3, 4.19). A widespread characterization of analogy and sound change is that the *former* involves meaning, the latter, form only. This is valid for most instances, but is by no means absolute. We saw in the principle of phonetization (the rebus principle) a case of analogy that did not involve meaning (§ 2.8), although here, of course, we are not dealing with language directly but with its secondary representation. Nevertheless, meaning can be a factor in sound change, especially grammatical meaning. Further, the regularity of sound change is also analogical: when a sound *x* changes under conditions *y* in a word *A*, it also changes in word *B* under the same conditions.

Although the domains of sound change and analogy overlap to a degree, the latter is predominantly conditioned by morphology and other areas of grammar. A grammar is largely a system of relations, and analogy is a *relation of similarity*. We have already seen a two-term analogy, $A:B$, in the case of *citizen/denizen*, in which two nouns meaning the same thing converged on the formal side (§ 4.19). Well known is the three-term analogy of the geometric mean, $A:B = B:C$, which (in a way) operates in the case of Lapp $hti:\delta = \delta:X$, where the third term is $\delta\delta$ (§§ 10.14, 10.15, 11.15, 13.3). This Lapp analogy is not as perfect relationally as the mathematical formula, but it has the same number of terms. The most famous type of extraphonological change is the analogy of proportionality, $A:B = C:D$ (with four terms). Any system of grammatical description (§ 1.18) can be reduced to analogical terms based on proportional analogy used in each such system, and formal descriptions are based on proportional analogy. In the traditional immediate constituent approach, positive intersentential

analogies were used, giving what *does*, in fact, appear in grammatical constructions. In the transformational approach, the intrasentential relations between deep and surface structure provide the bases for analogies, with the extra dimension of giving information on what *might* appear in grammatical constructions. Readers who are not very well acquainted with formal and grammatical description need only accept the assertion that all these different theoretical frameworks use the same principle of analogy but on different terms and use descriptions that are, in fact, analogical. Thus it is no wonder that analogy operates mainly in the structure of grammar.

Proportional analogy is, of course, diagrammatically iconic, an icon of relation (§§ 1.13-1.15). Language has a general iconic tendency, whereby semantic sameness is reflected also by formal sameness; this force underlies constructions. We often can predict the areas where analogy will enter, if it does enter, by noting such things as formal imbalance in a semantically symmetric situation.

[5.2]   Sometimes a speaker who creates a new analogical form completes the proportion. Children, especially, who have to defend their creations against the conventions of the speech community, resort to this. We have the case of the Danish child who formed a past tense *nak* 'nodded' for the present *nikker* instead of the "correct" weak conjugation form *nikkede*. When corrected, the child responded with the formula *stikker:stak* 'sticks:stuck" = *nikker:nak*; that is,

$$\frac{stikker}{stak} = \frac{nikker}{X} \quad \text{or} \quad \frac{stikker}{nikker} = \frac{stak}{X}$$

In other words, the child referred to an existing pattern by means of an example, as he obviously could not say "why not make the verb a strong one?" or the like. Such shifts in subpatterns have occurred in all Germanic languages (e.g., English *drive:drove = dive:X*, where *X* is *dove*). In Modern English only about one third of the Old English strong verbs remain so; the rest have shifted into the weak class. A proportion given by an English-speaking child is *sing:sang = swing:swang*, where two subtypes of the strong verb are at stake. In these cases, then, one can assume that one word is chosen as a model for a whole class (§ 5.18f), but there are also cases where a single unique paradigm can serve as a model. The Elean Greek word for 'Zeus' was inflected thus: nom. *Zeús*, acc. *Zēn-a*, gen. *Zēn-ós*, and dat. *Zēn-í*. The oblique stem is not inherited, but was built on the old accusative *Zén*. There was only one other noun with a similar oblique stem: *mēn-* 'moon', whose expected nominative would be *meí-s* (which actually occurs in many dialects). But the Elean form is *meís*. Both paradigms shared an oblique stem in *-ēn-* and a nominative in an e-diphthong. Both were unique inflections, and they converged on the model of *Zeús*; that is, *Zēn-: Zeús = mēn-:X*. The formula does not imply that the old form is lost instantaneously when the new one comes about. For a time they occur side by side, until one one is assigned to a clear social or stylistic context, or until one variant is

lost. Thus both *dived* and *dove* still exist, as well as an older *brethren* and a newer *brothers*, with clear stylistic and social differentiation. On the other hand, the original paradigm (sg) *book*, (pl.) *beech* was given a new plural *books*; and after a time the old one was lost. Because the word shifted into the majority pattern, it is easy to give a proportion: *pen:pens = book:X* (see § 5.19). Note that the example is one of principle only, to avoid Middle English complexities of spelling.

[5.3]   Many of the iconic developments we saw in the first three chapters show proportional analogy or at least *can be* described through it. The rebus principle shows this in Sumerian orthography,

meaning	'arrow'	'life'
form	ti	
writing	⇥	

$$\frac{ti}{⇥} = \frac{ti}{X}$$

where the proportion exists between the last two rows and X was solved with a spelling ⇥. This is a case of "spelling spellings" (§§ 2.6, 2.15). The 'past' tenses of *will* and *can* were ME *wolde* and *coude*, in which the *n* had been lost already in OE *cūðe* (< **kunþe*; compare *tooth* < **tanþ*; § 4.16). After the loss of *l* we get (using modern forms)

pronunciation		
spelling		

$$\frac{/wud/}{would} = \frac{/kud/}{X} \qquad \text{or} \qquad \frac{/layt/}{light} = \frac{/di'layt/}{X}$$

and the outputs *could* and *delight*. Similarly,

$$\frac{fate\ (etc.)}{/feyt/} = \frac{ate}{X}$$

where the spelling pronunciation /eyt/. The mechanism of hypercorrect forms produces the spelling pronunciation /eyt/. The mechanism of hypercorrect forms shows the same relation:

Dialect 1		
Dialect 2		

$$\frac{yard}{yard} = \frac{gard}{X} \quad (= \text{Gard}) \qquad \text{God}$$

This is very frequent in all languages. In Sicily medial *ll* had been replaced by apical *dd* (*stella > stidda* 'star'). New immigrants into the area extended the *dd* also into initial position:

Dialect 1		
Dialect 2		

$$\frac{stella}{stidda} = \frac{luna}{X}$$

and we get Hyper-Sicilian *dduna* 'moon', and so on. Such examples could be multiplied by the hundred.

Hypercorrect forms show relations between regional and social variation, but the same formal situation may obtain between variants in the same norm. When British English lost the *r* in forms like *better* before pause or another

consonant, variation /beta ~ betar-V/ resulted. This now serves as a model for words with final ə's:

Environment 1		
Environment 2		

$$\frac{beta}{betar} = \frac{ay'dia}{X} \quad \begin{array}{l}\text{(before C)}\\ \text{(before V)}\end{array}$$

and phrases like *the idea-r of it* and *America-r and England* result. After Estonian *k* had been lost medially at the beginning of closed syllables, as in *kasker > kased* 'birches', we get alternation, that is, sg. *kask ~ pl. kased*. Words that originally had a stem-final *s* look now the same in the plural, for example, *kuused* 'firs'. Instead of the expected sg. *kuus* we have *kuusk*, arising from a proportion like the following one:

Environment 1		
Environment 2		

$$\frac{kased}{kask} = \frac{kuused}{X} \quad \begin{array}{l}\text{(nom. pl.)}\\ \text{(nom. sg.)}\end{array}$$

In both English and Estonian, alternation has been extended into words where it did not exist before. Such paradigmatic sets can even create new phonemes. Russian nonstop consonants (continuants) were palatalized before front vowels; when these vowels dropped, there was a split (e.g., *v* vs. *v'*, *r* vs. *r'*, and so on), and both can alternate within paradigms. A stop like *k* was affricated into *č* (*ts*) and later, in some new environments, into *c* (*ts*); this morphophonemic alternation *k ~ č ~ c* remains (compare the Old French outcomes of Latin *k* without paradigmatic alternation: § 4.4). But paradigms in which *v* and *v'* and so on alternate have called into being a new phoneme /K/ for an expected *č*:

1st sg.	rv-ú	vr-ú	tk-ú
2nd sg.	rv'-óš	vr'-óš	tk-óš
	'tear'	'tell lies'	'weave'

Similarly, the instrumental of *kto* 'who' is *k'em*, for an expected *čem*. The form *čem* is found as the instrumental of *čto* 'what'; thus it appears that the *k-* of the animate paradigm was restored (with automatic palatalization before *e*) as an indirect marker of 'animate', while the original form was semantically specialized as 'inanimate'. The analogical origin of *k'* in Russian is clearly revealed by its restriction to position before a morpheme boundary (see § 5.13), at least in native vocabulary, although loans like *k'inó* 'cinema' have extended its distribution into other positions. Here we have extension of an alternation, and, at the same time, leveling of an alternation that would have been much more pronounced if analogy had not occurred.

[5.4]   **Nonproportional Analogy]**   Proportional analogy is only one kind of analogy. Often proportions do not exist, for example, in contamination or analogic lag and anticipation (§ 4.19). The last two types show an important point: the prime area of nonproportional analogy is the sentence or some other juxtaposition. In other words, indexical elements are very important in addition

to iconic ones. Strong evidence against the necessity of proportional analogy were forms where the older shape was just covered over by new material without being replaced in toto. Thus the expected plural of *cow*, "*ki*" [kaɪ], was adapted to the pattern of its antonym *ox* by the addition of the plural marker *n*: [kaɪ-n] *kine*. The old plural still lurks in the word. Similar forms are frequent in the speech of children (e.g., *feets*, or with past tenses like *canned*). Similarly, in German, there are *hielt-e* 'held' and *ging-te* 'went', where the forms have been modified so that the characteristic weak preterite *-te* results. In English the noun *seamster* was already feminine, but one more marker has been piled on, giving *seamstress*, although in this case proportional influence from *mister/mistress* is also possible. The German *Hinde* 'doe' was also feminine, and again the characteristic feminine marker of the language has been attached: *Hindin*. In German the past passive participles have a prefix *ge-* (e.g., *ge-mach-t* 'made'). A verb like *essen* fused *ge-essen* into *gessen*. The resulting form was deviant, as it seemed to lack the syllable *ge-*; it was consequently supplied with it again, giving *ge-gessen*, the current form.

In these cases we have seen the iconic tendency for semantic similarity to be reflected by formal similarity; cases that get out of line are likely to be rehabilitated.

[5.5]   Another distinct case of iconic remodeling is *folk etymology*. The term is quite technical, because it is neither folk nor etymology. It means that unfamiliar shapes are replaced by more familiar ones. Thus the phenomenon is related to contamination, and should perhaps best be called *reinterpretation* or *adaptation*. Loanwords are often subject to this, because they are unanalyzable in the adopting language and have forms unusually long compared with the established morphemes of the language. A word like *asparagus* is rather long for one morpheme in English and gave way to *sparrow grass*, which more or less retains the number of consonants. What is important is that the form is now a compound built up of known elements. There is even a fair amount of semantic justification in that the vegetable is a kind of grass. Similarly, Latin *margarita* 'pearl' was replaced by *mere-grota* in Old English, a perfectly iconic compound in terms of the language, that is, *mere* 'sea' and *grota* 'grain'. English-speaking tourists used to refer to a kind of Finnish brandy called *jaloviina*, literally 'noble liquor', as *yellow wine*. Again the semantics is not completely arbitrary, although the color is not really yellow nor is the drink a wine, but wines and spirits form one semantic field in Western culture. An Indian lady was referring, quite seriously, to Ku Klux Klanners as *scrupulous clowns*, which indeed supplies an amount of topsy-turvy iconicity to the term. And for her the organization was foreign enough to be reinterpreted.

Semantic justification is not a prerequisite, because form is after all independent of meaning. When *cucumber* gives *cow cumber*, or Ojibwa *otchek → wood-chuck*, part of the arbitrary form still remains, but the arbitrary part is shorter and the total seems to fit the rest of the vocabulary better because of the native passport in the first part. A native element that has become obscure is equally

prone for replacement; thus an expected *samblind* 'half blind' (Latin *sēmi-* 'half') has given *sandblind*, where, in some situations, *sand* can be even semantically justified. An often quoted case in which semantics was also affected is ME *schamfast*, which in Old English meant 'modest' (literally 'firm in modesty'). When the form was modified to *shamefaced*, we had a basis for a new meaning 'ashamed'. Proper names and the like that do not have a linguistic meaning put no constraints on the form. The American soldiers of 1918 referred to Château-Thierry as *Shadow Theory*, and in German the Latin name *unguentum Neapolitanum* 'Neapolitan ointment' was made more familiar by *ungwendier Napoleon* (Napoleon turned around). But such drastic formal reinterpretation can also occur with definite meaning. The American soldiers rendered the French phrase *très bien* with *three beans*, retaining the meaning 'very well'. Indeed, reinterpretation is the basis of the literary device of punning.

Reinterpretation need not change the forms that have been reinterpreted at all. When Sturtevant's little son underwent treatment of the ear by irrigation with warm water, the situation made him connect the word *ear* with the first part of *ir-igate*. This was an inductive change (see §9.16), aided by the situation, and falling under contamination and folk etymology at the same time. The change increased iconicity in the vocabulary of this child. But this new analysis did not show anywhere. Only a later change made it visible, when the child took his inductive reanalysis as a basis for a new deductive derivation. When his nose was treated the same way, he used the new relation *ear:irrigate = nose:X*, which gave *nosigate*, and this uncovered the earlier reanalysis. That is, proportional analogy reveals an earlier nonproportional case. Similarly, the child who saw four airplanes and learned that it was a *formation* made the "logical" (iconic) reanalysis *for-mation* (instead of the correct *form-ation*). This surfaced only when he saw two more planes and referred to them as a *twomation*. Again, the initial inductive change surfaced with a regular derivation *four:formation = two:X*. New formations like *food-holic* and *gum-holic* show that *alcoholic* must have first been reanalyzed as having a morpheme *-holic* 'addicted to'. The women's liberation movement has institutionalized folk etymology by trying to replace *history* and *boycott* by *herstory* and *girlcott*.

[5.6]   Of course such reanalysis and new derivation by children is often ephemeral, but the mechanism is clearly at work. It can, however, become generally accepted by the speech community. English has synchronic ambiguity in cases like *a name* vs. *an aim*, because they can be phonetically alike. In the history of the language, there are cases where such an *n* (either part of the article or other pronouns or the initial of a noun) has been interpreted the wrong way. Old English *efeta* gave ME *evete*, which ends up as NE *eft*. The current normal shape, however, was reanalyzed from *anevete → a-nevete*, giving *newt*. Similarly, Middle English *eke-name* 'additional name' (compare to *eke* out a living) incorporated the *n* from the article, *anekename*, ending up as *nickname*. The Fool calls King Lear *nuncle* (< *mine uncle*), and the pet names of *Edward* and *Oliver* used to be *Ned* and *Nol* (*mine Ed*, and so on). The reverse has happened

to OE *nafugār* → *auger*, *naþron* → *apron* (compare *napery* 'linen' and *napkin*), and also in *udder* from ME *naddere* (compare German *Natter*). In these cases the *n* of the noun has been assigned to the article. In all the cases the reanalysis was not visible in colloquial pronunciation as long as the nouns occurred after the article or possessive pronoun. Only in other (syntactic) environments do we get proof of the reanalysis (*apron*, *nickname*, and so on). Again, another environment bears witness to an inductive change that had occurred earlier elsewhere, with no necessary visible reflexes (see § 9.16).

No proportions need work in such reinterpretations, even though they do in subsequent derivations. Latin had a suffix *-nus* (e.g., *domi-nus* 'master' and *fāgi-nus* 'of beech'). Applied to *ā*- stems, we get forms like *Rōmā-nus* and *silvā-nus* 'forest deity'. At some point these were analyzed as *Rōm-ānus* and *silv-ānus*, because new derivatives were formed with a suffix *-ānus* on stems without *ā*, for example, *mundānus* 'of the world' (*mund-*), *urbānus* 'of the city' (*urb-*), and *montānus* 'of the mountains' (*mont-*). The suffix grew also a variant *-iānus*, and this is still productive in English (into which it was borrowed through a horde of loanwords), for example, *Bloomfieldian* and *Humboldtian*.

[5.7 Interplay Between Sound Change and Analogy] Typical for language change is the constant tug of war between sound change and analogy. Sturtevant phrased this as a paradox: sound change is regular and causes irregularity; analogy is irregular and causes regularity. That is, the mainly regular sound change can pull regular paradigms apart; analogy is generally irregular, in that it does not occur in every case where it could, but when it does, the result is greater regularity in morphology. In the case of morphophonemic conditioning of sound change we have a case of analogy, which is sometimes even regular, and, of course, sound change can be irregular. The paradox is not absolute, but still accurate.

As a first example of how sound change destroys paradigmatic unity, let us look at a Latin instance. For practical simplicity of handling examples, let us confine ourselves to the nominative and genitive singular cases, because these reveal the crux of the matter. A Pre-Latin paradigm (nom. sg.) *deiwos (gen. sg.) *deiwī 'celestial' has a constant stem *deiw-*, and the case endings *-os* and *-ī*, a type that survived into Latin.

1. The diphthong changed into a long close vowel, *ei > *ē, which had no effect on the paradigm as such.
2. Now a *w before *o dropped, making the nominative *dēos.
3. *Dēos is subject to another well-known Latin change: a long vowel is shortened before another vowel; thus *deos.
4. o > u in final syllable.
5. *ē > ĭ and the paradigm should end up as deus/divī (in regularized Latin orthography).

These five changes are regular sound changes in Latin, and they have produced an irregular paradigm, where the stem now alternates between *de-* and *dīr-*. This kind of unique alternation is a situation in which analogy might be expected to restore balance (regularity), as it in fact did, because *deus* and *dīrī do not* belong to the same paradigm in historical Latin. Analogy eliminated the alternation by building complete paradigms to both alternants. The nominative *deus* got a new genitive *deī*, and the genitive *dīrī* received a new nominative *dīus*. Now we have two regular paradigms, *deus/deī* 'god' and *dīus/dīrī* 'god, divine'. This is an eloquent example of Sturtevant's paradox. The situation is parallel to the regeneration power of the planarian worm. When cut in half, its front part grows a new rear end, and vice versa (see § 22.1).

A paradigm need not split in two. Pre-Latin *ekwos 'horse' and *parwos 'little' should give *ekos and *paros (> *ecus, *parus) because of change 2 above, but the corresponding genitives *ekwī and *parwī (there again, of course, representing the rest of the paradigm) prevailed and grew or maintained new nominatives *equus* and *parvus*. The regular outcome is shown in the adverb *parum* 'too little', which was no longer connected with the paradigm of *parvus*. Such offshoots provide clear evidence for analogical interference. Another case is *sekwondos > *sekondos > *secundus* 'second', developing regularly by the sound laws after the word had been cut off from the paradigm of *sequī* 'to follow', which retained its [kw] in every position. English *sword* has also lost its *w* in this position, and so should have *swore*, but it was restored/maintained after the present *swear*. In Latin nouns the majority of the oblique stem generally wins out, but in the third declension noun *wōk-s (gen.), *wōkw-is (gen.) the alternation *wōk-/*wōkw- is eliminated in favor of the nominative *wōk-*: *vōx* [ks]/*vōcis*, 'voice', the consonantal *w*, *wōkws. On the other hand (nom.) *yekor (gen.) *yekwinis 'liver' has also adopted the nominatival *k*: *iecur/iecinoris*, as well as the *-or-* from the nominative. This is a clear case where proportional analogy is impossible but nominative.

English shows clearly the irregularity of the direction of analogical leveling in the strong verb, where Old English had different vowels in the preterite singular and plural:

INFINITIVE	PRET.SG.	PRET.PL.	P.P.	
bītan	bāt	biton	biten	'bite'
rīdan	rād	ridon	riden	'ride'

The corresponding Modern English paradigms, like those of the weak verbs, have just one form for the preterite. Alternation has been eliminated both ways: in *bite* ~ *bit*, the plural vocalism prevails, in *ride* ~ *rode*, the singular, although there is also an archaic *rid* (see § 10.7).

[5.8]   The following Old English paradigms (two representative forms have been chosen—the minimum number, of course) gave Middle English:

	OE			ME	
nom. sg.	stæf	sceadu	mæd	stæf, schade	mede
(pl.)	stavas	(obl.) sceadwe	mædwe	staves, schadwe	medwe

In the OE paradigm of *stæf* the nominative singular has a closed syllable (i.e., it ends in a consonant), but the first syllable is open in the plural (*stavas*). The syllable structure is reversed in *sceadu* (open)/*sceadwe* (closed), and in *mæd* the root syllable is the same throughout the paradigm, a closed syllable but with a long vowel. In the last case we have the same vocalic developments as in *hǣlan* and *hǣlþ*, that is, shortening before two consonants (§ 4.8)—*mead* exactly like *heal* /iy/ and *meadow* like *health* /e/. This, of course, is the Modern English result, but the short /e/ in *meadow* still shows the fact that the *w* was contiguous to *d* in Middle English. in ME *stæf* and *schade* we have a reverse development, equally regular: the lengthening of short vowels in open syllables. This effects the plural of *stæf* and the nominative of *schade*, giving us *stāves* and *schāde*. With the great vowel shift we get Modern English shapes *staff/staves* /steyvz/ and *shade/shadow* /šeyd ~ šædow/. Now regular English sound changes have produced the above forms as well as *mead/meadow*. All started from uniform Old English vocalism and ended up as regular alternations, because such vowel alternations occur in hundreds of English vocabulary items. But exactly as in the Latin case of *deus/divus* the paired English forms do not belong together any more in Modern English, except perhaps for *stæf/staves* (to a degree). The resulting vowel alternations occur in different word classes, for example, adjective-verb *same/sanity*, adjective-verb *clean/cleanse*, and noun-verb *grass/graze*, *glass/glaze*, and *breath/breathe*, but not within the same word. As in Latin the variants have split into two words, and the missing parts have been supplied analogically, that is, diagrammatically according to the regular patterns (rules) of the language: *staff/staffs* (new), *stave* (new)/*staves* (compare *cloth/clothes*), *mead/meads* (new), *meadow* (new)/*meadows*, *shade/shades* (new), *shadow* (new)/*shadows* (see § 7.9). As in Latin, semantic differentiation accompanies the formal split; it is, in fact, a prerequisite of the survival of both forms (compare *Indian/Injun*, § 2.14). Normally, only the oblique stem survives, for example, in those words that had the *w* in Old English: *yellow* (*geolu*), *fallow* (*fealu*), *callow* (*calu*), and *arrow* (*earh*). The oblique stem survived also in *thimble* (§§ 4.11, 4.12); today, when hardly any inflection is left, the nominative singular has a strong position (e.g., /owðz/ being replaced by /owðs/ *oaths* after the singular *oath* /θ/; see §§ 10.16, 11.6). Formal vowel alternation survives in some nouns only if the short-vowel variant occurs in fossilized derivatives (*seam/seamstress*, *goose/gosling*) or compounds (*crane/cranberry, vine/vineyard, house/husband*) which are independent words (not productive outputs of the "normal" rules of the language). Actually *seamstress* is now generally /siymstrəs/, an obvious analogical, partially productive form in relation to *sempstress*. The

original root vocalism is often better preserved in family names as in *Webster/weave* and *Baxter/bake*.

[5.9]   We saw above how Estonian *k* alternates with nothing (at the beginning of a closed syllable; § 5.3). In intervocalic position this stop is written with *g*, and the alternation is exemplified by the inf. *piiga-ma* next to the 1st pers. sg. *pōa-n* 'shear, cut (hair)'. Similarly, *d* alternates with nothing (among other things), as in *laadi-ma/lae-n* 'load (gun)' and *haudu-ma/hau-n* 'brood, hatch'. The alternation here is just one small aspect of the consonant gradation, which was originally determined by the phonetic shape of the word (closed and open syllables). This state of affairs is well preserved in Finnish (§§ 10.12, 10.13), but Estonian has eliminated alternation on a large scale. In some cases the *g* (and so on) has been generalized through an entire paradigm or through part of it (e.g., the present); in others, the lack of the stop (nothing) has been generalized. And in part of the vocabulary, alternation remains. This lack of exact goals is typical of the irregularity of analogical change, and we saw in the *kausk* case that alternation can be extended even to items that did not have it (§ 5.3). Thus analogy levels out alternations by two means at the same time, either by generalizing one of the variants or by creating new cases of an existing alternation. The situation is very similar to the tug of war between the various classes of English strong verbs and the weak verbs (e.g., *dove/dive*). But the old and new forms can both ultimately survive, if semantic difference is attached to them. All three Estonian verbs mentioned developed analogical presents without alternation, the leveling being in favor of the stop alternant. The new analogical forms *piiga-n* 'cheat, swindle', *laadi-n* 'load (freight)', and *haudu-n* 'be hatched, stew' coexist with the old ones because of the semantic differentiation, even though the infinitives remain the same. (Actually the semantic differences are not that clear for all speakers. There is a strong tendency for the new forms to be generalized in both meanings.) Compare the English verb *hang*, which has tolerated both a strong (*hung*) and a weak (*hanged*) inflection because of a similar semantic difference, as well as the English examples above (i.e., *sunk/sunken, burnt/burned; shade/shadow*, and so on).

[5.10   Analogy and Regularity]   It is now clear that morphophonemic conditioning of sound change eliminates paradigmatic alternation by means of analogy (§ 4.27). It can be written in the form of a sound change when it is overwhelmingly regular, that is, when it occurs all through the phonology of a particular morphological or grammatical subsection. In the German case we saw that related forms that were outside the paradigms did not undergo the changes (*zek, ap*). This is exactly parallel to forms like *parum, secundus*, and *seamstress*, which remained true to the sound changes and were left behind by the analogical levelings (§§ 5.7, 5.8). Both morphophonemic conditioning of sound change and analogical change were triggered by alternation within paradigms.

Morphophonemic conditioning of sound change is not necessarily the only

kind of analogy that is regular. The regularity of change is the ultimate result. While in progress, a change is not notably regular, because it spreads at different times in different environments and speakers. When analogy levels out all exceptions to a particular alternation, the result is perfect regularity, and it is difficult to know whether we are dealing with sound change or analogy. In this sense morphophonemic conditioning of sound change is both sound change and analogy. This is also the case of Estonian consonant alternations, which are eliminated here, extended there. In Lapp, however, the alternations have been extended to every word (§§ 10.14, 13.3), and the result is perfect regularity.

[5.11   Relative Chronology in the Operation of Sound Change and Analogy]
Linguists have usually assumed that a sound change takes place in peace, and when it has sufficiently eroded morphological machinery, analogy comes to the rescue. Often this is true enough, as in the cases of Latin *deus/divus* and English *shade/shadow*, and a particularly illustrative example can be quoted from Spanish. In Old Spanish the sequence *dl* was metathesized into *ld* in certain noninherited Latin words. Thus *titulu(m)* > *tilde*, *modulu(m)* > *molde* 'mold', and *capitulu(m)* > *cabildo* 'chapter (church division)', in which the Latin forms show the original order of the dental stop plus *l*, and of course the Latin *u* was syncopated before the metathesis. Also, a sequence of the imperative *d* and a pronominal *l* underwent the same metathesis, *dad-los* > *daldos* 'give them' and *cantad-lu* > *cantalda* 'sing it', and the pronominal *n* had the same fate, *dad-nos* > *dandos* 'give us'. Such metathesized forms remained current up to the classical period. This shows clearly that meaning and form are independent of each other, since the meaning remained the same and was not involved in the reshuffling of forms. Ultimately, however, the iconic basis of language, a preference for parallelism (one-to-one relation) between meaning and form, prevailed. The principle 'same meaning, same shape (imperative -*d*, pronouns *los, la, nos*)' extended to the surface disparity -*l-d-os*, and so on, and such forms as *daldos* were reestablished.

Here then, sound change had destroyed the iconic order of sounds and morphemes (syntagmatic arrangements), and analogy restored the earlier fit. In this sense morphophonemic conditioning of sound change is both sound change and analogy.

[5.12]   Greek has a general sound law whereby intervocalic *s* drops out. In most dialects *s* is the sign for future, thus (with verbs in the 1st pers. sg.), as is shown on the top of the next page.

The futures in group A are as expected, as *s* is not intervocalic here. Group B, however, violates the law *VsV* > *VV*; but linguists have assumed that, in fact, the *s* was lost in these futures also, giving **liō* and **poiéō*. If these forms had remained, they would have undergone a change whereby vowels are shortened before other vowels, and would have ended up homophonous with the presents.

| PRESENT		FUTURE	
trép-ō	'turn'	trép-s-ō	A. root ends in consonant
deík-nū-mi	'point'	deík-s-ō	
lú-ō	'loosen'	lú-s-ō	B. root ends in vowel
poié-ō	'do'	poié-s-ō	
mén-ō	'remain'	men-é-ō	C. root ends in nasal or liquid
stél-lō	'send'	stel-é-ō	

This was the destructive force of regular sound change, and analogy from the consonant stems had to be invoked to reintroduce the characteristic *s* of the future, that is, *trépō:trépsō* = *lúō:X*, where *X* gives *lúsō* (a vowel before this *s* is automatically lengthened). But we have no direct evidence of an *s*-less stage in group B, and it has been suggested that the facts can equally well be covered by grammatical conditioning of sound change, that is, "intervocalic *s* drops, unless it means 'future'" (actually, some other grammatical markers are also included: the aorist, the dative plural). This takes care of group B, but group C shows that everything has not yet been considered. Here, after liquids and nasals, the future morpheme was not *s* alone but *es*, and in this form the *s* was, in fact, lost according to the sound law. The situation is the same as in some of the Baltic Finnic cases (§ 4.24): if a morpheme could afford to lose part of itself, it did, provided that something remained to mark the function. In Greek the surviving *é* distinguishes the future from the present, exactly like -*h* < -*hen* in the Karelian illative. Thus we see that grammatical conditioning of sound change and analogy can be explanations of one and the same thing; this was true of morphophonemic conditioning of sound change as well (§4.21f). What this teaches us is that analogy need not merely scavenge the debris of sound change; it can prevent sound change from happening in tight-knit morphological systems. That is, sometimes morphological iconicity is so strong that sound change does not enter at all, although it may be quite general in those areas where morphology is not directly involved.

[5.13]   The Greek situation was presented first for historical reasons. It is interesting to see how scholars have interpreted it and to note that there is a wide margin for interpretation in historical situations not directly attested. But similar cases can also be observed while they are happening. In Russian the change of unstressed *á* [ə] > *i* after palatal (soft) consonants, for example, *pójás* > *pójis* 'belt', has been a living process for scores of years, although the change has not yet ousted the earlier pronunciation, and both pronunciations still occur. In the 1940s the change *á* > *i* did not enter inflectional suffixes at all, because in these the vowel in question sometimes occurs under stress. Thus we have, for example,

gen.	poľ-á	'field'	vs.	zǐľ-já	'dwelling'
dat.	ustój-ám	'foundations'		krój-ám	'land'
	(compare Greek *lúsō*)			(compare Greek *trépō*)	

We have a preventive analogy for the sound change *ã* > *i* based on the environment (stress) of the inflectional endings which are not subject to the change. The net result of this analogy is that the conditions of the change "palatai consonant plus unstressed *ã*" do not extend over a morpheme boundary in front of inflectional suffixes (see § 5.3). This is how a grammatical limitation of sound change is often analogical in origin, that is, alternation is actually prevented from occurring and not merely leveled out by analogy. Greek *s* showed the same situation: it was not dropped in certain grammatical morphemes, because it was retained in some phonetic environments in any case. The Russian situation has a further history; now the change/process *ã* > *i* has been extended also to inflectional suffixes.

[5.14 **Analogy and the Relation Between Meaning and Form**]   In the case of Estonian -*n* 'I', we apparently have a situation where sound change proceeded to completion before analogy became operative (§ 4.24). Final -*n* was lost in preconsonantal position and preserved before a following vowel. At this stage the change was a purely phonetic one, and it was only then that analogy entered. It reestablished the -*n* in every environment in those dialects where its loss would result in the same shape as the imperative. In the Southern dialects, where no homonymy threatened, the sound change just continued, with the -*n* dropping everywhere. In the Russian and Greek cases (§§ 5.12, 5.13), the driving force was the prevention of variation (difference) within one morpheme, and in Estonian, the prevention of the same form from having two different meanings. But this is actually the same force, prevention/elimination of one-to-many relations between form and meaning:
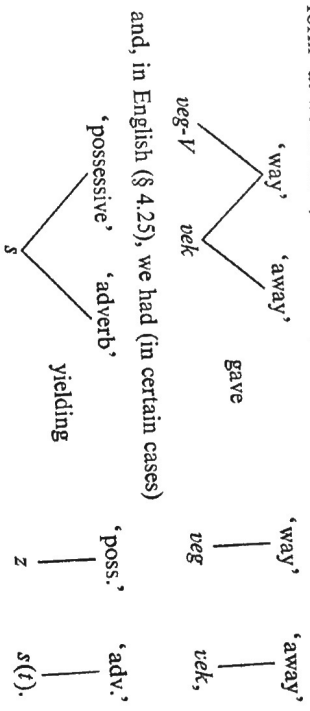
$$\text{meaning}\qquad \text{meaning 1}\quad\text{meaning 2}$$
$$\text{form 1}\quad\text{form 2}\qquad\qquad\text{etc.}$$
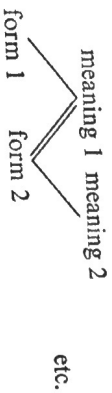
That is, both the ∧ (Russian and Greek, etc.) and ∨ (Estonian) configurations tend to be avoided by the iconic principle whose ideal is 'one meaning, one form'. Of course, all languages do have such configurations, because semology is, after all, independent of morphology. But such disparity is the characteristic breeding ground of analogy. And if analogy comes into operation, it either eliminates the alternation (i.e., establishes |-relations = one to one) or carries the alternation into other parts of the vocabulary or morphology. The important word is *if*, for it must be emphasized that nothing need happen. For example, in English the morpheme -*s*/*s* ~ *z* ~ *iz*/ with variation represents the meanings '3rd pers. sg.', 'possessive', and 'plural'. It can further be a variant of the morphemes *is* and *has*, thereby representing at least two more meanings.

Again, we see how grammatical conditioning of sound change is structurally parallel to analogy or the iconic tendency in that it also breaks up or forestalls these one-to-many relations between form and meaning. We have a ∨-relation in those instances where a case form represents also some adverbial element, and we have at least two meanings for one form. When change does not touch
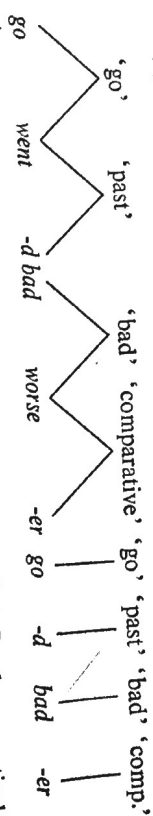
the adverbs, the meanings get forms of their own (e.g., *once* vs. *one's*, § 4.25). And as for straightening out the ∧-relation, we have seen that morphophonemic conditioning of sound change is this kind of analogy. If the ∧-relation is based on suppletion, we have simple analogy (e.g., *go*/*went* → *go*/*goed*). Sound change can produce suppletion, for example, Latin *oculus*/*oculi* 'eye/eyes' gives French *œil*/*yeux* [œy]/[yø]. When morphophonemic rules get restricted (out of productivity) original alternation can change into a kind of suppletion: *sil*/*seat*, *heal*/ *hot*, *cook*/*kitchen*, *ten*/-*teen*, or for some speakers, even cases like *opaque*/*opacity* (§§ 5.8, 6.21, 6.24 7.13, 10.7–10.9, 17.5, 18.17). The stronger the suppletive element, the more probable is the occurrence of analogy.

Throughout this chapter we have seen this tendency of 'one meaning, one form' at work. Thus, in Yiddish (§ 4.27),

$$\text{'way'}\quad\text{'away'}\qquad\qquad\text{'way'}\quad\text{'away'}$$
$$\text{veg-V}\quad\text{vek}\qquad\qquad\text{veg}\quad\text{vek,}$$
$$\text{gave}$$

and, in English (§ 4.25), we had (in certain cases)

$$\text{'possessive'}\quad\text{'adverb'}\qquad\text{'poss.'}\quad\text{'adv.'}$$
$$s\qquad\qquad\text{yielding}\qquad z\qquad\quad s(t).$$

In both cases the end result was two linguistic signs with one-to-one correspondence (|-relation) between form and meaning. Meaning is decisive here; two meanings develop two linguistic signs. This is the regularity principle of analogy, which restores what sound change and syntactic combinations had diversified. Similarly, the irregular alternations *go*/*went* and *bad*/*worse* are often straightened out (by children) as

$$\text{'go'}\quad\text{'past'}\quad\text{'bad'}\quad\text{'comparative'}\qquad\text{'go' 'past' 'bad' 'comp.'}$$
$$\text{go}\quad\text{went}\quad\text{-d bad}\quad\text{worse}\qquad\text{-er go}\quad\text{-d bad}\quad\text{-er}$$

(Again, this notation shows the simplification visually.) In these particular cases the results (*goed*, *badder*) have not been generally accepted, because the frequency of occurrence upholds the tradition, but in countless cases it has, for example, *book*/*beech* → *book*/*books* (§ 5.7). It was recognized early that there is a strong correlation between analogy and frequency. A typical phrasing of this principle would be that irregular (strong) forms stand outside the general rules and have to be specially learned, thus burdening the memory; analogy is, therefore, successful where memory fails; that is, infrequent forms are prone to be changed first. This principle is generally valid, however it may be worded. We have seen that the conflicts between sound change and grammatical analogy

often result in sound changes that are grammatically limited or sound changes belonging to certain grammatical categories and not the general sound pattern of the language. Or in other words, a sound of certain grammatical morphological value may resist sound laws. Grammatical conditioning of sound change and analogy are very much two sides of the same coin.

[5.15 **The Status of Old and Innovating Forms**] When changes leave behind old forms without ousting them completely, there is a universal tendency for the innovating form to carry the primary semantic functioning of the old linguistic sign. The old form is pushed aside for some peripheral or secondary meaning. Most of the cases we have seen are clearly of this type, and it does not matter whether the driving force is sound change or analogy. Thus:

	OLD FORM: SECONDARY FUNCTION	NEW FORM: PRIMARY FUNCTION	
	I	II	
adverb	*rāùgin* 'asunder'	gen. *rāùgi* 'hole'	Lapp (§ 4.24)
	once	gen. *one's*	English (§ 4.25)
	vek 'away'	nom. *veg, vēk* 'way'	German (§ 4.27)
	parum 'too little'	acc. *parum* 'small'	Latin (§ 5.7)
compound	*cran*(berry)	crane	English (§ 5.8)
	hus(band), *hus*(sy)	house	English (§ 5.8)
	shep(herd)	sheep	English (see § 4.8)
	maan(ee) 'highway'	gen. *maa* 'earth'	Estonian (§ 4.24)
plural	*brethren*	brothers	English (§ 5.2)
	kine	cows	English (§ 5.4)

In every case the second column shows the regular, productive, stylistically or syntactically unrestricted (unmarked) form. The situation is different when a paradigm splits in two, because then there is a possibility that functions which earlier shared a form can become independent signs (e.g., *deus/dīvus, shade/shadow*, and so on), but even here one offshoot may become stylistically restricted, for example, *mead/meadow*, where the innovating oblique-stem form *meadow* carries the "normal" functions of the word.

[5.16 **Analogy and Syntax**] We have seen how analogy works both in phonology and morphology under semantic constraints. But syntax also has been clearly involved both in sound change and analogy, for example, in the form of adverbs and predicatives, and both mechanisms also change syntax. Often they do this together. Greek had, for instance, the following forms in its verbal paradigms:

	1ST SG.	3RD SG.	INFINITIVE
'want'	*thél-ō*	*thél-ei*	*thél-ein*
'write'	*gráph-ō*	*gráph-ei*	*gráph-ein*

The endings have been separated from the root by the hyphen. The infinitive occurred in phrases like *thélō gráphein* 'I want to write' and *thélei gráphein* 'he wants to write'. Then the final *-n* of the infinitive dropped and its outer shape became identical with the third singular: *thélō *gráphei, thélei gráphei*. The former expression is "formally poor" for the meaning 'I want to write', because it can also be interpreted 'I want, he writes' (V-relation). And the same applies to all the other persons as well, except for the third singular *thélei gráphei*. At some point this sequence was reinterpreted as the 3rd sg. twice 'he wants, he writes' with the same 'he', that is, 'he wants to write' in a new form. As the reinterpretation of *formation* it would not show overtly here; this was an inductive change, which did not alter the outer shape produced by the sound change. The reinterpretation surfaced in the other persons; for example, *thélei gráphei* = *thélō* X, where the end result is *thélō gráphō* 'I want to write' (formally also the 1st sg. twice). This deductive analogy restores the diagrammatic relation between person and the corresponding form. Ultimately, the infinitive in Greek was lost altogether. (The change shows also that infinitives are indeed underlying sentences, or finite verbs; when sound change interfered with them they easily reverted back to their basic form. We ignore here the subsequent modification whereby the particle 'that' became obligatory, thus in Modern Greek: *thélō ná gráphō* [literally] 'I want that I write'.)

[5.17] Finnish once had an accusative in *-m* in the singular, whereas in the plural the accusative was homophonous to the nominative. A selection of the paradigm would be (with modern orthography)

	NOM.	ACC.	GEN.	
sg.	*poika*	*poja-m*	*poja-n*	'boy'
pl.	*poja-t*	*poja-t*	*poik-ien*	

Also the 1st sg. ending was *-m*. A sentence like 'I see the boy go' went *nāe-m poja-m menevä-m* (written here in a hybrid orthography where only the endings reflect the earlier sounds). The last word *menevä(m)* is a participle of the verb 'to go', and because it is an attribute to *pojan*, it agrees in case and number with it; that is, 'I see the boy, the going one' = 'I see the boy going'. The corresponding plural object can be formed with cases given: *nāe-n poja-t menevä-t* 'I see the boys go'. A sound change *-m > -n* produced new endings: *nāen pojan menevän*. The acc. sg. became homophonous with the gen. sg. (there was no such merger in the verbal 1st sg. ending). As in the Greek example, sound change made two forms identical, here *pojan* and *menevän* (both acc. and gen.). Note that, to start with, *pojan* is the head and *menevän* an adjective attribute to it. At some point the form *pojan* was reinterpreted as a genitive, and consequently as an attribute to the following *menevän*, which therewith became the head to the genitive attribute. Again, such reinterpretation is not reflected in the forms themselves; they remain *pojan menevän* (compare *thélei gráphei*), although

the literal analysis is now '(the) going of the boy'. The new analysis is proved by the plural, because there the accusative and the genitive are different, and the original, unambiguous phrase has been replaced by the equally unambiguous *näen poikien menerän* 'I see the boys go'. *Menerän* is now, unmistakably, an uninflected head with the attribute *poikien* in the genitive plural (see § 9.16f.).

[5.18 Analogy and Speech Production]   In the survey of the various types of analogical changes, two ways of classifying them were occasionally referred to: leveling and extension. When differences between two (related) forms are reduced or eliminated, we have *leveling*. When a form or an alternation is carried into a new environment, we have *extension*. All the examples we have seen represent one of the cases or both. For example, the differences between the originally unrelated linguistic signs *ear* and *irrigate* were partially leveled by a new semantic identification and recutting *irr-igate*. The part *-igate* was then subsequently extended to *nosigate*. The morphemes *-ism* and *-able* were borrowed into English as parts of hundreds of loanwords (e.g., *humanism* and *usable*). These endings have been extended to native stems or roots (e.g. *token-ism* and *think-able*). Extension is similar to borrowing in that a form is lifted from one environment into another, though, in borrowing, the source environment is in a different language, dialect, or even idiolect, whereas, in extension, it is within the same grammar in another grammatical environment or in another part of the vocabulary (lexicon). The parallelism with borrowing has even led to calling extension *borrowing from within* (the same grammar).

New analogical (deductive) forms are, by necessity, tied to speech production; that is, a speaker must utter them according to his grammatical machinery. The creation of such forms is independent of their subsequent fate, because they may or may not become the new norms. One of the most mystifying characteristics of human language is its productivity (§ 1.28). This is connected with man's innate ability to learn a language. Such a capacity manifests itself very early in the child's apprenticeship in speaking, as he can and does easily go beyond the sentences he has heard. Each utterance is either a parroting or a new creation. From the data he has been exposed to, the child is able to abstract regular patterns or rules; he then extends his use of these into areas that are novel to him, and maybe even to other speakers. Thus one aspect of extension of forms or patterns is clearly a function of the use of the grammar, that is, speech production.

Grammar is somehow internalized in the brain and is not directly observable except for its product, the actual utterances. Of course it is a two-way affair, as the regular patterns have to be abstracted from the utterances. But once they have been established, they need not be reinforced by concrete instances. If we heard a new English adjective *glump*, we would be automatically able to form the comparative and superlative *glumper*, *glumpest* without referring to another concrete instance like *damper*, *dampest*. If it were a noun, its plural would be *glumps*, if a personal name, a genitive *Glump's* would follow. And a

verb would go *he glumps*, *he glumped*, and so on. These forms have now been created by frequent productive patterns. Such patterns tend to prevail over unproductive types. Instead of the unique *good/better*, the speaker may lapse into a comparative *gooder*, or instead of an irregular weak *brought*, he may come out with *bringed*. Adults usually quickly correct themselves, whereas children tend to make an effort to stay with these. Only such irregularities as *good/better* and *bad/worse* have to be learned form by form, otherwise the patterns are enough. Thus in highly inflected languages, speakers do not in every case store hundreds of different forms for each word but create any form they need according to the patterns at their disposal (see § 18.17). Many forms are created afresh for each occurrence rather than repeated from memory. This is even more true in syntax than in morphology, because we speak and hear more different sentences than different words. Language is one manifestation of the innate faculty of analogizing, shown clearly by children even before they have acquired language.

[5.19]   As was already mentioned, grammatical patterns are not directly observable; only the surface forms produced by them are. To talk about formal systems like the grammatical speech-production mechanism, one has to use analogy (see § 5.1). Analogy is a type of reasoning that plays an important part in all scientific thought. An analogy is a resemblance between the relationship of things rather than between the things themselves (a relation of similarity; §§ 1.13, 1.14, 5.1). Analogy is particularly valuable in suggesting clues and hypotheses, and in helping us comprehend and treat phenomena and occurrences we cannot see. Grammar is exactly such a phenomenon. Proportional analogy supplies a handy model for the regular patterns. Careful linguists have always made it clear that speakers themselves need not use the proportion; rather, it is a linguist's way of describing the action of the speaker. Further, the proportion itself is, in any case, just a crude shorthand notation for what has gone on in the process of speech production. When the speakers themselves give a proportion like *sing:sang = swing:swang* (§ 5.1), they imply that the same process which gives *sing/sang* could (and can) also produce *swing/swang*. One should note that for all its limitations, proportional analogy is the only model that is spontaneously formulated by speakers themselves and thus has greater psychological reality than any other model—even if some other model might be expressive of some deeper psychological reality of which the speakers are unaware. It is easy to give a proportion when we wish to exemplify a productive process, but it does *not* mean that one needs a concrete instance like *pen:pens* every time a new plural is formed, as in *book:books* (§ 5.2). The proportion means only that whatever pattern or process produced *pens* is also responsible for *books*. That is, we do not suppose that the actually occurring surface shapes *pen*, *pens*, and *book* are creators of *books*, but that the invisible underlying relations are the same grammatical machinery that has produced many other such forms.

[5.20] Because the productivity of language can be described analogically, linguists speak of analogic *creation*, or simply *creation*. The relational side of proportional analogy has invoked another name, *relative* analogy. Productivity involves extension of items in connection with the regular patterns of the grammar, and this is in effect creation, indispensable in speech activity (which might be called reified grammar). We have spoken so far of regular patterns or processes, and analogy, in fact, means regularity (§ 5.1), that is, rulegovernedness (Latin *regula* → English *rule*). It has already been mentioned that the constructional rules of a language handle symbols exactly as an algebra (§§ 1.13, 1.14). We have come full circle now, for analogy is one form of iconicity, and so are the rules of a language. Much work has been done in making hypotheses about language, and we now know more about the possibilities of writing grammars and their rules. This knowledge is reflected in terminology, too, in that one now speaks of rules rather than patterns, though 'pattern' can still mean a collection of rules. Because the term 'analogy' was meant to cover patterns, alias rules, it has become superfluous for many linguists. The underlying notions of productivity or creation have been raised into a more central position, and, even here, there is a change of vocabulary: 'create' has been replaced by the almost perfectly synonymous 'generate', since both terms mean basically 'produce, bring into being, originate'. The connotations are now different and depend on the different theoretical frameworks, but the original substance is very much the same. If by analogy and creation, unobserved grammatical processes used to be described indirectly (with the use of surface forms), today one tries to go directly to the described processes themselves, with rules and generation (generativeness). This is the crux of the different connotations; difference in emphasis has created different terminology as well. Today, grammars and linguistics are more explicitly generative, even those varieties not directly connected with the generative-transformational school.

In Chapter 6, we shall look at change through linguistic rules. Let us note here that the terms 'analogy, extension, regularity, productivity, creation, generation, and iconicity' overlap to a great degree. Different scholars give to these terms slightly different meanings, but overlapping is still pervasive. Note that iconicity is a more general concept than proportional analogy or rules. Various nonproportional cases show that the driving force is the tendency of 'like meaning, like form'. The driving force of iconicity resides in the linguistic sign as well as in the rules of the grammar. The importance of meaning is obvious, because grammars do not exist per se, but to convey meaning.

[5.21] Finally, a short *historical note* is in order. Almost a century ago, there was controversy about the existence of analogy, and the situation was very much the same as today. It was not the *phenomenon*, but the *term* 'analogy', that was objectionable to many. The objections gradually provoked explicit psychological notions as better explanations for this phenomenon. Even the Neogrammarians stated clearly that analogy was due to a psychological process, which took place prior to the materialization of the sound by the vocal organs.

The proportions were supposed to mirror this process only retroactively, of course. There was no obvious terminology available for speaking about what went on in the brain, and linguists had to resort to hinting or alluding to various psychological associations. An important concept in this connection was *Sprachgefühl*, the language user's implicit knowledge of his language, also referred to as 'the inner language', in contrast to the actual surface form which had to be used in the proportions as substitutes or mirrors of it. One claim was that there is no analogy, because *Sprachgefühl* and memory (see § 5.14) are enough to explain these phenomena. Indeed, but proportional analogy was an attempt to make the process explicit. Today, however, the somewhat vague notion of *Sprachgefühl* has been developed into a more explicit notion of the speaker's *competence*. This is described largely through rules, and we have come back to what was said earlier (e.g., § 5.20). All these ways of looking at the problem revolve around the same substance. One can very roughly characterize the situation by noting that concentration on surface forms in linguistic description dominated American linguistics from the 1920s through the 1950s; this theoretical stance derived from the point of view which, among other things, preferred the use of analogy in talking about the invisible. Now linguistics has turned back to *Sprachgefühl* as a direct object of study. But the notion of analogy (i.e., regularity) is essential for both approaches, no matter what formal mechanism of description we use (§ 5.1) nor what we call it. Analogy is indispensable in scientific discourse—though this does not mean that it would automatically lead to correct results.

The higher, more general principle of 'one meaning, one form' is as old as European linguistics. It has been referred to, among other things, as the principle of optimality (Humboldt), or univocability (Vendryes), and as the canon of singularity (Ogden and Richards). M. Bréal named the two underlying forces separately: the law of specialization $(\wedge > l)$ and the law of differentiation $(\wedge > l, l)$. The principle operates in, for example, nonproportional analogy, contamination, and folk etymology, where proportional analogy or rules are inadequate. It has always been known that this principle is a tendency only, like so much in human behavior and biology that is not susceptible to rigorous formulation. No one has ever implied that it actually would lead language to a point where every meaning would have its own form, or total one-to-one correlation between form and meaning. The 'one meaning, one form' principle was also connected early with psychological factors, which "aim to eliminate purposeless variety" (Wheeler); we have seen how both leveling and extension comply with this. In the case of leveling the principle is obvious, but in extension the purpose is less so; it can be interpreted as the spelling out of a formal distinction eliminated through the loss of an earlier marker (§§ 5.10, 10.14, 13.3), so that the variety is no longer purposeless. In accordance with this terminology, the Pre-English umlaut alternation in *mūs/*mȳs-i was purposeless, but was no longer so once it carried the singular/plural distinction in Old English *mūs/mȳs*. In German, umlaut plurals have been extended to a substantial part of the nouns; that is, this variety is made "purposeful" use of. In Modern

English, however, the umlaut plurals have become a tiny minority in relation to the s-plurals. They are purposeless in this sense, and a natural target for analogical realignment to the s-class (§ 5.14).

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General: Wheeler 1887, Hermann 1931, Trnka 1968, Kuryłowicz 1945–1949, Mańczak 1958, Hoenigswald 1955, Leed 1970, Dinneen 1968, Lyons 1968, Leed 1970; **5.2** Jespersen 1964, Hermann 1931, Sturtevant 1947; **5.3** Wartburg 1969; **5.4** Thumb and Marbe 1901, Esper 1966; **5.5** Sturtevant 1947; **5.10** Sturtevant 1947, Kiparsky 1965, Bolinger 1968; **5.11** Malmberg 1963b; **5.12** Sturtevant 1947; **5.13** Jakobson 1949; **5.14** Bréal 1964, Vendryes 1925; **5.15** Kuryłowicz 1945–1949; **5.16** Havers 1931, Wartburg 1969, Bolinger 1968; **5.17** E. Itkonen 1966; **5.18** Lindroth 1937, Sturtevant 1947, R. Hall 1964, Bolinger 1968; **5.19** Beveridge 1950; **5.21** Wheeler 1887, Bréal 1964, Vendryes 1925, Ogden and Richards 1923.

CHAPTER 6

RULE CHANGE

Sound change and analogy are restated under one unified convention of notation which emphasizes the inner invisible parts of language and grammar. Such a notation deals with before–after relations and may skip the actual history altogether, as well as psychological reality.

[6.1 Relative Chronology]   We know that every language is a product of history, an end point in a series of changes of the kind that we have seen in the two preceding chapters. All changes occur in absolute historical order, whether we can observe them or not. Thus any two changes in a language have occurred one after the other, in partial overlap (i.e., one change begins before another has ended), or simultaneously (complete overlap). Although change can perhaps be abrupt in the grammar of the innovator (how abrupt it is depends on the scoring mechanism adopted), it is often very slow in getting established as a new norm in the speech community; and thus partial overlap occurs easily. When the output of one change is the input of another, we can establish *relative chronology* between them, even when we cannot tell their exact dates. The establishment of relative chronology between changes has been one of the prime goals of historical linguistics as well as of internal reconstruction (Chapter 12). Of course, when there is no such interference between two changes, relative order cannot be established without direct historical attestation. For example, if we knew only Old English and Modern English (and nothing in between), we could not establish the relative chronology of the changes (1) dental *d* > alveolar *d* (§ 4.1) and (2) *ȳ* > (*i* >) *ai* (§§ 4.5, 4.22), because they take place in different parts of the phonology. We would not have record of any intermediate stages either, but our experience would certainly make us doubt a direct leap from *ȳ* to *ai*. As it happens, we know roughly how the process went (§ 4.8). Similarly, even if we knew only Latin and Modern French, we would still have to assume the intermediary stages of *k* > *tš* > *š* and *k* > *ts* > *s* (§§ 4.4, 4.15, 5.3) on the basis of our knowledge acquired elsewhere (from other languages). Thus our historical presentations often skip intermediate stages, and contain free order between changes, owing to historical ignorance. The actual historical sequence is necessarily absolute; our presentation, largely random.

[6.2]   In favorable cases we have enough interference to posit relative chronology. Before the English vowel shift occurred, two other changes had to have taken place: shortening of certain long vowels (§ 4.8) and lengthening