Modern German and Old English strong verbs: two ways of running Ablaut.

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Preliminaries

[1] Ablaut / apophony : a (non-exhaustive) phenomenological survey:

verb: rgt (imper. 2S) ifgt (pres. 3MS)

mubi: rgt (perf. stem) rjgt (imperf. stem)

sum: yjgt (past 3MS) ygtajng-n-asl (pres. 3MS) mgt... ygtajng (aug. past)

cl: kggt (act. perf.) ygtajng (aug. past)

bhr: ygtajng (aug. past)

ge: xgsr (adj. S/Masc)

gta: gtsr (adj. SFem.)

gem: tchgt (pres. 1S)

gen: tchgt (pres. 1S)

[1] alternative views:

the nature of the vowels involved in the related forms in [1] can be conceived as
a) lexically determined
b) lexically determined in the basis only, but predictable in all derivated forms.

[2] general program:

show that Ablaut or apophony [= unconditioned vocalic alternations] in languages obey
one invariant regularity. That is Ablaut phenomena are not encoded in the lexicon [2a],
but are predictable [2b]. This implies:

a) to show that all apophonic systems obey the same regularity
b) to account for the differences observed in the various apophonic systems

[3] purpose of the present talk:

a) point out the unique regularity observed by apophonic systems in languages as
different as class. arabic and modern german
b) account for the differences observed in the way of running general apophony in
two parallel apophonic systems ["strong" verbs] of cognate languages:
1. NHG = New High German
2. OE = Old English.

NOTA: our analysis of apophonic systems is intended to be strictly synchronic.

B - Apophonic theory: Classical Arabic (CA), (Guerssel/Lowenstamm 1994)

(5)

maximally simple vocalic system in CA:

i  ii   uu

a aa

(6)

Form I (for the other forms, cf. Guerssel/Lowenstamm (1994)): aspectual
opposition expressed by a vocalic alternation in $V_1C_2C_3$

<table>
<thead>
<tr>
<th>vocalic alternations in CA</th>
<th></th>
<th>perfective</th>
<th>imperfective</th>
<th>sense</th>
</tr>
</thead>
<tbody>
<tr>
<td>a - u</td>
<td>ktb</td>
<td>katgb-a</td>
<td>ya-katgb-u</td>
<td>schreiben</td>
</tr>
<tr>
<td>a - l</td>
<td>Drb</td>
<td>Darbg-a</td>
<td>ya-Drb-u</td>
<td>schlagen</td>
</tr>
<tr>
<td>i - a</td>
<td>lbs</td>
<td>labgs-a</td>
<td>ya-lbs-u</td>
<td>sich kleiden</td>
</tr>
<tr>
<td>u - u</td>
<td>kbr</td>
<td>kabgr-a</td>
<td>ya-kbgr-u</td>
<td>wachsen</td>
</tr>
</tbody>
</table>

(7)

the following vowels are opposed

pf | ipf

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>

the two sets (pf- and ipf vowels) can be predicted one from the other

by no means.

(8)

hypothesis:

a) CA vocalic alternations are not lexicalised
b) the output-set is predictable from the input-set
predictability assured under one condition: apart from the three surface-vowels \( [i, a, u] \), a fourth object exists: \( X \)

\[\begin{array}{c}
\text{pf} \\
\text{ipf} \\
X \\
i \\
a \\
u
\end{array}\]

(10)

what is the identity of \( X \)?

a. ex. pf Dar\(g\)b \(\rightarrow\) ipf ya-Dri\(b\)

b. given (9), ipf \( [i] \) must originate in \( X \)

c. thus, \( X \) must be different from the observable \( [a] \)

d. \( X \neq \emptyset \) the null set

(11)

\[
\begin{array}{cccc}
\text{CV} & \text{CV} & \text{CV} \\
/\text{Dar} \emptyset \text{b}/ & /k\text{at} \text{a} \text{b}/ \\
\text{CV} & \text{CV} & \text{CV} & \text{CV} \\
/\text{Dar} \emptyset \text{b}/ & /\text{kat} \text{a} \text{b}/
\end{array}
\]

(12)

the set of ipf-vowels thereby is predictable from the underlying set of pf-vowels:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{lexical identity} & \text{perf} & \text{imperf} & \text{example} \\
/\emptyset/ & [a] & [i] & \text{Dar-a-b} & \text{yaDr-1-b} \\
/a/ & [a] & [u] & \text{kat-a-b} & \text{yakt-u-b} \\
i/ & [i] & [a] & \text{lab-i-s} & \text{yalb-a-s} \\
u/ & [u] & [u] & \text{kab-u-r} & \text{yakb-u-r} \\
\hline
\end{array}
\]

(13)

(underlying) apophonic

input \( \emptyset \) \( \rightarrow\) \( i \) \( "X\rightarrow Y" \) means \( X \) and \( Y \) contract an apophonic relation

i \( \rightarrow\) a

a \( \rightarrow\) u

u \( \rightarrow\) u

Apophonic Path:

\( \emptyset \rightarrow i \rightarrow a \rightarrow u \rightarrow u \)

C - New-High-German (NHG) strong Verbs

(Ségéral/Scheer 1994)

(14)

Classical Arabic: 2 degrees

German: 3 degrees

perf \( \rightarrow\) imperf

pres. \( \rightarrow\) past \( \rightarrow\) past part.

kataba \( \rightarrow\) ya-ktybu \( \rightarrow\) sing-e \( \rightarrow\) sng \( \rightarrow\) ge-syg-\( \text{en} \)

(15)

survey of NHG strong verbs

column 1: historical classification (J. Grimm) in 7 classes (I-VII)

column 2: our numbering of the different Ablaut-series

columns 3, 4, 5: the three root-vowel defining the series (present, past, past participle)

column 6: the verbs belonging to the Ablaut-series under interest

column 7: number of the verbs functioning in the series

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\( ^{1} \) Guerssel/Lowenstamm (1984) claim that the apophonic path is not only underlying Form I alternations, but the whole CA verbal system.
very complex vowel-system in NHG: 16 vowels, 3 diphthongs

<table>
<thead>
<tr>
<th>a</th>
<th>e</th>
<th>i</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
</tr>
<tr>
<td>u</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

challenge in comparison to CA:

a. extreme fragmentation of the verbs: 180 verbs for 43 Ablaut-series, i.e. only 4,18 verbs per series
b. 16 of the 19 different vowels are represented in the Ablaut-system

in CA, all vowels appearing at the surface are members of the apophonetic path.

Which mechanism guarantees the interpretation of vowels such as [e, o] that are unknown in the apophonetic path?

apophonically irrelevant properties:

a. vowel length: apophony as understood here manipulates the quality, not the quantity of vowels. Anyway, vowel-length is predictable in about 80% of the cases (controlled by the right context: geminate vs. single consonant, voiceless vs. voiced).

b. ATR depends on vowel-length:
   short ==> -ATR
   long ==> +ATR

the difference [ee] nehmen vs. [ae] gebären is also context-driven ( [ee] / [lab/vel_r/vel]. [ee] elsewhere: geRäten, erWäGen, Gärten, schwären)

c. diphthongs [aj, aw]: the vowel is /a/

<table>
<thead>
<tr>
<th>0</th>
<th>N</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>j</td>
<td>a w</td>
</tr>
</tbody>
</table>
(21) Phonological table of the Ablaut-series

<table>
<thead>
<tr>
<th>PIE</th>
<th>PHET</th>
<th>PART</th>
<th>ORIGIN</th>
<th>VERB</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>IA</td>
<td>E</td>
<td>V 4</td>
<td><em>liegen</em></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>V</td>
<td>V 5.2</td>
<td><em>bitten</em></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td></td>
<td>V 6.2</td>
<td><em>sitten</em></td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>IA</td>
<td>A</td>
<td>III a 4</td>
<td><em>bringen</em></td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>IA</td>
<td>U</td>
<td>III a 1</td>
<td><em>binden, bringen, dringen, finden, gelingen, klingen, ringen, schlingen, schwinden, schwingen, singen, sinken, springen, trinken, trinken, trinnen, winden, wringen, zwingen</em></td>
<td>18</td>
</tr>
<tr>
<td>D</td>
<td>IA</td>
<td>O</td>
<td>III a 2</td>
<td><em>beginnen, gewinnen, rinnen, schwimmen, sinnen, spinnen</em></td>
<td>6</td>
</tr>
<tr>
<td>E</td>
<td>IU</td>
<td>U</td>
<td>III a 5</td>
<td><em>scheiden</em></td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>IO</td>
<td>O</td>
<td>III a 3</td>
<td><em>gelitten, klingen</em></td>
<td>1</td>
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<tr>
<td>G</td>
<td>IE</td>
<td>A</td>
<td>a</td>
<td><em>lehnen</em></td>
<td>24</td>
</tr>
<tr>
<td>H</td>
<td>EA</td>
<td>A</td>
<td>III a 6</td>
<td><em>brinnen, denken, kennen, nennen, rennen, senden, wenden</em></td>
<td>11</td>
</tr>
<tr>
<td>I</td>
<td>EA</td>
<td>E</td>
<td>V 1</td>
<td><em>essen, fressen, messen, vergessen, stecken</em></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>V</td>
<td>V 5.2</td>
<td><em>geben, gesessen, gescheten, lesen, sehn, trenen</em></td>
<td>11</td>
</tr>
<tr>
<td>J</td>
<td>EAO</td>
<td>b</td>
<td></td>
<td><em>bergen, beraten, gelten, helfen, schelten, sterben, verdenben, werben, werfen</em></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td></td>
<td>IV 1</td>
<td><em>bebrechen, erschrecken, sprechen, stechen, treffen</em></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td></td>
<td>IV 2.1</td>
<td><em>befehlen, stehlen</em></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td></td>
<td>IV 3.1</td>
<td><em>nehmen</em></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td></td>
<td>IV 5.2</td>
<td><em>gebrännen</em></td>
<td>16</td>
</tr>
<tr>
<td>J *</td>
<td>EAO</td>
<td>rr.</td>
<td></td>
<td><em>wagen, werden</em></td>
<td>16</td>
</tr>
<tr>
<td>K</td>
<td>EO</td>
<td>O</td>
<td>III b 2</td>
<td><em>brachsen, fachten, fliechten, meken, quellen, schmelzen, schwellen</em></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td></td>
<td>V 2.2</td>
<td><em>bewegen, heben, pflügen, scheren, weben</em></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td></td>
<td>V 7.2</td>
<td><em>verwägen, gären, schwären</em></td>
<td>15</td>
</tr>
<tr>
<td>L</td>
<td>AI</td>
<td>a</td>
<td></td>
<td><em>nehmen, befliegen, bleichen, bleichen, gleichen, gleiten, greifen, kleifen, kroischen, leiden, pflügen, reilen, reilen, reilen, schelten, schleichen, schelten, schließen, schneiden, schreiten, spielen, streichen, streien, welchen</em></td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>I b</td>
<td></td>
<td>I b 2</td>
<td><em>bleiben, gedeihen, leihen, meiden, preisen, reiben, schenden, scheinen, schreiben, schreiben, schreiben, schreiben, schreiben, steigen, treiben, weisen, zählen</em></td>
<td>35</td>
</tr>
<tr>
<td>M</td>
<td>AIA</td>
<td>VII</td>
<td>a 1</td>
<td><em>bläsen, braten, ratten, schlafen</em></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>a 2</td>
<td>VII a 2</td>
<td><em>hellen, halten, lassen</em></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>a 3.3</td>
<td>VII a 3.3</td>
<td><em>fliegen, hängen</em></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>a 1.3</td>
<td>VII a 1.3</td>
<td><em>erfahren, laufen</em></td>
<td>12</td>
</tr>
<tr>
<td>N</td>
<td>UA</td>
<td>VI</td>
<td></td>
<td><em>backen, schaffen, wachsen, waschen</em></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>VI</td>
<td></td>
<td>VI 2.3</td>
<td><em>fahren, graben, laden, schlagen, tragen</em></td>
<td>9</td>
</tr>
<tr>
<td>O</td>
<td>AO</td>
<td>II</td>
<td>a 3.5</td>
<td><em>saugen, schnauben</em></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>a 4.6</td>
<td>II a 4.6</td>
<td><em>saufen</em></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>VI</td>
<td></td>
<td>VI 4.3</td>
<td><em>schallen</em></td>
<td>4</td>
</tr>
<tr>
<td>P</td>
<td>YO</td>
<td>II</td>
<td>a 3.4</td>
<td><em>lügen, kürzen, trügen</em></td>
<td>3</td>
</tr>
<tr>
<td>Q</td>
<td>ED</td>
<td>IV</td>
<td>a 8.2</td>
<td><em>verlöschen</em></td>
<td>2</td>
</tr>
<tr>
<td>R</td>
<td>UI</td>
<td>VII</td>
<td>b 3.4</td>
<td><em>ruhen</em></td>
<td>7</td>
</tr>
<tr>
<td>S</td>
<td>UA</td>
<td>aih</td>
<td></td>
<td><em>lun</em></td>
<td>7</td>
</tr>
<tr>
<td>T</td>
<td>OI</td>
<td>VII</td>
<td>b 4.3</td>
<td>* slept*</td>
<td>7</td>
</tr>
<tr>
<td>U</td>
<td>OA</td>
<td>IV</td>
<td></td>
<td><em>kommen</em></td>
<td>7</td>
</tr>
</tbody>
</table>
functioning of apophony
verbs enter the apophonic path with their lexical vowel

partial apophony: verbs where only two of the three degrees contract an apophonic relation
a. *A-B==C is excluded because the entering vowel B is not lexical but the product of a non-apophonic derivation.
b. A==B-C: only A and B contract an apophonic relation. B and C are not related apophonically.
E.g. graben ==> grub - gegraben

working definitions
a. apophonic series:
   A == B == C
b. half-apophonic series:
   A == B - C
c. non-apophonic series:
   A - B - C or A - B == C

16 logically possible series with three degrees where vowels may be identical. According to the above definitions, these are
a. apophonic series
b. half-apophonic series

c. non-apophonic:
   - series E,R,S = 3 verbs (schinden, rufen, tun): lost
   - series L,M = 51 verbs (39+12): important setback

confirmation of the predictions
a. there is NO verb of the shape A - A == B if the present and the past degree don't contract an apophonic relation, the past and the participle degree cannot be related apophonically.
b. the directionality of the derivation is confirmed
   ø == i == a == u == u: NO verb with three different vowels (type A-B-C) is non-apophonic.

STEP 2:

complex vowels
how does apophony treat vowels that don't occur in the path?
a. phonological primitives: Elements

\[
\begin{array}{cccc}
I & U & A & V \\
-\text{round} & +\text{round} & -\text{round} & -\text{round} \\
-\text{back} & +\text{back} & +\text{back} & +\text{back} \\
+\text{high} & +\text{high} & -\text{high} & +\text{high} \\
-\text{ATR} & -\text{ATR} & -\text{ATR} & -\text{ATR} \\
-\text{low} & +\text{low} & +\text{low} & +\text{low} \\
\end{array}
\]

b. combination of different Elements: segments
a segment is an asymmetrical object: one of the Elements it is defined by is its head (heads appear unscored hereafter)

example: [e] = I—A because its articulation is nearer to the I-position

example: [ə] = I—A because its articulation is nearer to the A-position

back—v—i—v—e—v—i—v—i—v—
round—v—u—v—u—v—u—
high—v—v—a—u—v—v—[a i u e a o y ə]

such a series is obviously apophonic interpretation if the apophonic path is not expressed in vowels but in phonological Elements.

Apophonic Path
\[\phi \rightarrow I \rightarrow A \rightarrow U \rightarrow U\]

if apophony concerns Elements and not vowels, there must be two kinds of Elements in a complex vowel:

a. one Element that carries the apophonic information. We call it "apophonic Element"
b. one or more Elements that do not participate in the apophonic relation. We call them "parasitic Elements"

How do speakers know which Element within a complex vowel is apophonic, and which is (are) parasitic?

the Apophonic Path makes the following prediction: if the series with complex vowels A.D.F.G.H.I.J.K.O.P.Q.T.U (=98 out of 180 verbs, 55%) function apophonically, the distribution of apophonic and parasitic Elements must be as follows:

Example of a series with complex vowels: series J

bErgen  bArg  gebOrgen:

<table>
<thead>
<tr>
<th>present</th>
<th>past</th>
<th>past participle</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>A</td>
<td>U</td>
</tr>
<tr>
<td>J</td>
<td>[a]</td>
<td>[ə]</td>
</tr>
</tbody>
</table>

Bergen - B ARG - ge B ORGEN:

Series  | optimal apoph. lecture of the series | parasitic Elements to be supposed |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>i ➞ a ➞ e</td>
<td>half-apoph. i ➞ a</td>
</tr>
<tr>
<td>D</td>
<td>i ➞ a ➞ o</td>
<td>APOPH i ➞ a</td>
</tr>
<tr>
<td>F</td>
<td>[e] ➞ a ➞ o</td>
<td>APOPH [e] ➞ a</td>
</tr>
<tr>
<td>G</td>
<td>[e] ➞ i ➞ a</td>
<td>lost (gehem)</td>
</tr>
<tr>
<td>H</td>
<td>[e] ➞ a ➞ a</td>
<td>half-apoph. i ➞ a</td>
</tr>
<tr>
<td>I</td>
<td>[e] ➞ a ➞ a</td>
<td>half-apoph. i ➞ a</td>
</tr>
<tr>
<td>J</td>
<td>[e] ➞ a ➞ o</td>
<td>APOPH [e] ➞ a</td>
</tr>
<tr>
<td>K</td>
<td>[e] ➞ o ➞ o</td>
<td>APOPH [e] ➞ o</td>
</tr>
<tr>
<td>Q</td>
<td>[e] ➞ a ➞ o</td>
<td>APOPH [e] ➞ u</td>
</tr>
<tr>
<td>P</td>
<td>[e] ➞ o ➞ o</td>
<td>APOPH [e] ➞ u</td>
</tr>
<tr>
<td>T</td>
<td>[e] ➞ o ➞ o</td>
<td>APOPH [e] ➞ a</td>
</tr>
<tr>
<td>U</td>
<td>[e] ➞ o ➞ o</td>
<td>lost (kommen)</td>
</tr>
</tbody>
</table>

PRES | PRET | PART | NER |
-----|------|------|-----|
A    |      |      | 3   |
D    |      |      | 6   |
F    |      |      | 24  |
G    |      |      | 1   |
H    |      |      | 11  |
J    |      |      | 19  |
K    |      |      | 15  |
Q    |      |      | 4   |
P    |      |      | 3   |
T    |      |      | 2   |
U    |      |      | 1   |
results:
a. A and U may be parasitic
b. I is NEVER parasitic

definition "entering Element":
the entering Element is the apophonic Element of the lexical vowel. It is the Element the verb enters in the apophonic path with.

Lisibility-Theorem of the german Ablaut
( answering question (35) )
parasitic and entering Elements are complementarily distributed:
- entering Elements are never parasitic
- parasitic Elements are never entering Elements

<table>
<thead>
<tr>
<th>entering Element</th>
<th>parasitic Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>φ</td>
<td>x</td>
</tr>
<tr>
<td>I</td>
<td>x</td>
</tr>
<tr>
<td>A</td>
<td>x</td>
</tr>
<tr>
<td>U</td>
<td>x</td>
</tr>
</tbody>
</table>

the question "how do speakers distinguish between parasitic and apophonic Elements" is raised for the first degree = present only: in the following degrees (past, past participle), the apophonic Element is always the result of the apophonic derivation performed on the former degree.

the following situation obtains for the first degree in NHG:
a. A and U are always parasitic
b. neither A nor U may be an entering Element
4. \( \Rightarrow U \) is lexically present. This explains the long [ii] in IIA-presents:

In the present of class IIA [ii], a conflict arises: the lexically present /-w/ stands besides a I. Such a sequence /I U/ = [iw] is illicit in NHG: it does never occur.

Two solutions:

- the I occupies both positions:
  - result [ii]: series IIA1, IIB (z.B. biegen)
    \[
    \begin{array}{c|c}
    \text{ONON} & \text{ONON} \\
    \hline
    \text{I U} & / \\
    \end{array}
    \]
  - I and U combine:
    - result [yy]: series IIA2 (z.B. lügen)
      \[
      \begin{array}{c|c}
      \text{ONON} & \text{ONON} \\
      \hline
      \text{I U} & / \\
      \end{array}
      \]

there is no such conflict in degree 2 because the /-U/ can freely combine with the apophonically derived A, the result being [o].

<table>
<thead>
<tr>
<th>series</th>
<th>example</th>
<th>Grimm</th>
<th>origin of the U in degree 2</th>
<th>counter-examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>glimmen</td>
<td>IIA3</td>
<td>_mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>biegen</td>
<td>IIA1</td>
<td>_U lexically present</td>
<td></td>
</tr>
<tr>
<td></td>
<td>riechen</td>
<td>IIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>dreschen</td>
<td>IIB2</td>
<td>lexical U: &lt; ahd dresken</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fechten flechten</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>lexical U in /:/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[C]=/x/ ahd fechten, flechten, s. Flachs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>meiken</td>
<td></td>
<td>C[1][2]-LC, wo C[2][v,m] <em>oder m</em></td>
<td>maybe schwinden,</td>
</tr>
<tr>
<td></td>
<td>quellen</td>
<td></td>
<td>schmelzen schwellen</td>
<td>schwingen, zwingen, but</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C[1][2]-NC</td>
</tr>
<tr>
<td></td>
<td>heben</td>
<td>V2.7</td>
<td>_[vel,lab]=[33],r /r/: mhd [r] &gt; mhd [R]!</td>
<td>geben, liegen</td>
</tr>
<tr>
<td></td>
<td>scheren</td>
<td></td>
<td></td>
<td>(but mhd licken, too)</td>
</tr>
<tr>
<td></td>
<td>weben</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>erlöschen</td>
<td>IV6</td>
<td>lexical U: &lt; ahd lesgan (the [6] for the same reason)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>schwören</td>
<td>V13</td>
<td>class VI = non-apophononic (s.(49))</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>saugen</td>
<td>IIA3,4</td>
<td>non-apophononic (s.(49))</td>
<td></td>
</tr>
<tr>
<td></td>
<td>schallen</td>
<td>V14</td>
<td>non-apophononic (s.(49))</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>lügen</td>
<td>IIA2</td>
<td>_U lexically present</td>
<td></td>
</tr>
</tbody>
</table>
the observation (42a) "A and U are always parasitic" sheds new light on the "important setback" (28a) (=the 51 verbs of the series L,M seemed to be lost) and the series N,O:

according to (42a), A is always parasitic in the present. Thus, any series that is provided with an [a] in the present has an apophonically relevant underlying [a] minus [a] = @/.

a. series apophony lisibility number
1 a-i-i half-apophonic @ == i 39 (beizen)
M a-i-a APOPHONIC @ == i == a 12 (töten)

b. new evaluation of series N (a-u-u), half-apophonic according to (28b), and O (a-o-o), apophonic according to (37):

series apophony lisibility number
N a-u-u lost impossible 9 (lades)
O a-o-o lost impossible 4 (saugen)

(48) apophonie recipe for learners of NHG

a. take the present-vowel
b. if present, get rid of A and U
c. the result is your input into the apophonie path
d. according to the context, join U in the past. A in the past participle
remarks on the non-apophonic verbs

a. gehen, tun, kommen, schinden: these are notoriously
irregular verbs. Their exclusion from the group of apophonic
verbs supports our analysis: it would be very uncomfortable
for any theory of NHG Ablaut to be able to account for them.
b. series N plus schallen (series O): apart from schallen, these
are all and only the verbs of Grimm's class VI. This is an
outstanding result that demonstrates the chirurgical precision
apohony operates with: class VI historically did never
oppose different qualities, but different quantities of
vowels. It thus couldn't possibly be driven by an apophonic
mechanism. Even several thousand years later when the
quantitative oppositions were transformed into qualitative
ones by sound change, apophonic theory is able to point them
out as "aliens".

<table>
<thead>
<tr>
<th></th>
<th>Mhd</th>
<th>Mhd</th>
<th>Nhd</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIIa</td>
<td>i-a</td>
<td>i-a</td>
<td>i-a</td>
</tr>
<tr>
<td>IIIb</td>
<td>i-o</td>
<td>i-o</td>
<td>i-o</td>
</tr>
<tr>
<td>IV</td>
<td>e-a</td>
<td>e-a</td>
<td>e-a</td>
</tr>
<tr>
<td>V</td>
<td>e-e</td>
<td>e-e</td>
<td>e-e</td>
</tr>
</tbody>
</table>

2. this innovation is context-driven (cf.(46b)). As for
class II, the U is lexically present since IE times

3. the presence of A in the result past participle is
well known diachronic processes:
- a-Umlaut: non-high vowels lower immediately
  preceding high vowels iff no NN or [NC] high
  intervenes. The OHG suffix of the past participle
  [-an] thereby lowers the root vowel of all past
  participles save those of class IIIa = [NC/N].
- within IIIa, another phenomenon is responsible for
  the [o] before NN, that is lowering under the
  influence of a following nasal (MHG münch > NHG
  Münch). Therefore geb/imDen, but begoNNen.
D - OE strong verb apophony

[54] spelling problems / vocalic system [Mossé 45, Lass 94-...]

a) [æ] (written a or o): variant of a /__N

b) short and long vowels (front rounded vowels let aside):

\[
\begin{array}{cccc}
\text{i} & \text{u} & \text{u} \\
\text{e} & \text{e} & \text{e} & \text{e} \\
\text{a} & \text{a} & \text{a} & \text{a} & (0)
\end{array}
\]

c) "short diphthongs": ea, eo, ie = spellings of monophthongs where one element of the digraph is a diphthong indicating the quality of the following or preceding consonant

\[
\begin{array}{cccc}
\text{C} & \text{pal} & \text{kal} & \text{sl} & \text{sk} & \text{st} & \text{tr} & \text{br} & \text{x} \\
\text{æ} & \text{e} & \text{e} & \text{e} & (0)
\end{array}
\]

d) diphthongs:

<table>
<thead>
<tr>
<th>spelling</th>
<th>phonetic interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ëë or ëë</td>
<td>[aɪ]</td>
</tr>
<tr>
<td>ëë or ëë</td>
<td>[ɪ]</td>
</tr>
</tbody>
</table>

[55] OE strong verbs

a) notes on the table [55b]:

1: only one example is given below for each series (see appendix for more examples)

2: grade 2 "PR Tsg" stands for Pret.1-lo sg. and grade 1 "PR Tpl" for 2 sg. and 1-2-3 pl.

3: the "contract verbs" (appendix: series 2, 3, 14, 16, 30), resulting in monosyllabic infinitives because of the disappearance of a stem final velar and vowel coalescence (diphthong), are not retained here as autonomous series.

4: the table neglects some deviant series. In particular:

- the highly puzzling verbs (Lass 94:157 "...a mystery...") with uo or u in the present (appendix: series 4 and 8)

- some irregular verbs: niman, kuman (appendix: series 10 and 11) and verbs with L-mutation like birnan or irnan (appendix: series 7)

5: for groups VI and VII, the different vowels in the present are compacted, only the 2-grade vowel being considered

b) OE strong verb series

\[
\begin{array}{cccc|c|c|c}
\text{PRES} & \text{PRTsg} & \text{PRTpl} & \text{PART} & \text{example} & \text{Nbr}
\end{array}
\]

\[
\begin{array}{cccc|c|c}
\text{j} & 1 & 1 & 1 & 1 & \text{bídan wait} \\
\text{w} & 1 & 1 & 1 & 1 & \text{bídan command} \\
\text{NC} & 1 & 0 & 0 & 0 & \text{bindan steal} \\
\text{LC} & 0 & 0 & 0 & 0 & \text{helfan help} \\
\text{LNN} & 0 & 0 & 0 & 0 & \text{beran carry} \\
\text{C} & 0 & 0 & 0 & 0 & \text{metan measure} \\
\text{*Cj} & b & i & e & i & \text{seiran sit} \\
\text{Quant. VI} & 0 & 0 & 0 & 0 & \text{dragán draw} \\
\text{Redup. VII} & b & e & e & e & \text{béstan bare} \\
\end{array}
\]
[56] how many grades in OE ?
   a) seemingly, four
   b) but :
      i. the system is evolving to a 3-grade system [see Modern English]
      2-grade 3 is, in general, either similar to grade 4 [I, II, III], or similar to
      grade 2 [IV, V, VI, VII]
   c) that is, the situation is :
      \[ \begin{align*}
      1 & \rightarrow 2 \rightarrow 3 \\
      \text{or} & \quad 1 \rightarrow 2 \rightarrow 3 \\
      2 & \quad \quad \quad 3
      \end{align*} \]
   \( (A) \)
   d) that is, only three apophonic grades are to be considered in OE as in NHG.

[57] KLV theory of Elements : heads and operators
   a) in a complex vocalic expression one Element is the head, the other(s) the
      operator(s)
   b) representation of [e] [o] [æ] [œ] ; head Element is underlined
      \( \begin{array}{c}
      [e] \\
      [o] \\
      [æ] \\
      [ø]
      \end{array} \)
      \( \begin{array}{c}
      I \\
      A \\
      A \\
      A
      \end{array} \)

[58] OE series I to V : apophonic reading
   a) the series I to V
      \[ \begin{array}{cccc}
      I & J & A & I \\
      II & E & Æ & O \\
      III & a & I & A & U \\
      IV & b & E & Æ & O \\
      V & a & E & Æ & Æ \\
      b & Æ & Æ & E
      \end{array} \]
      (NOTA : vocalic length is not taken into account as irrelevant regarding apophony)
   b) observation : these series can all be read as :
      - apophonic \( I \rightarrow A \rightarrow U \) : series II, III and IV
      - or half-apophonic \( I \rightarrow A \rightarrow \) : series I and V

[59] How is the entering-element recognized ?
   If we suppose that the entering-element = I is known, the apophonic element in
   the derived stem is automatically given by the apophonic path : A in the 2nd grade, U in
   the third one.
   But how do speakers known the entering-element is I ?

[60] learnability
   a) NHG : the learnability of which elements cannot be entering-elements depends
      on the regularity of apomorphic element distribution in derived forms. In particular, I is a
      possible entering-element because it is never a parasitic element in derived forms.
   b) OE :
      the distribution of elements into parasitic and possible entering-elements
      is not complementary.
      Therefore the learner cannot capture the set of possible entering-elements

[61] ambiguity
   a) since no clear (= complementary) distribution between possible entering-
      elements and apomorphic elements can be captured in OE strong verbs, the series IIIb could
      be read as (apophonic elements in bold characters) :
      \[ \begin{array}{cccc}
      Gr & 1 & 2 & 3 \\
      [e] & \rightarrow & [æ] & \rightarrow [ø]
      \end{array} \]
      \( \begin{array}{ccc}
      I & A & A \\
      I & I & U
      \end{array} \)
      i.e. as a series \( I \rightarrow A \rightarrow U \)
   but also as :
      \[ \begin{array}{cccc}
      Gr & 1 & 2 & 3 \\
      [e] & \rightarrow & [æ] & \rightarrow [ø]
      \end{array} \]
      \( \begin{array}{ccc}
      I & A & A \\
      I & I & U
      \end{array} \)
      i.e. as a series \( ø \rightarrow I \rightarrow A \)
   b) in itself this could be innocuous, but in such a situation parasitic elements
      could not be predicted any longer : parasitic elements come from the context. One single
      context cannot account for two different sets of parasitic elements.

[62] low vowels :
   the fronted low vowel (œ) and the back low rounded one before nasals (ø) show that the
   influences low vowels undergo in OE don't lead to a merging with existing mid vowels.
   Why ?

[63] Alternative proposal :

OE- ablaut parameter : apophonic elements are heads

[64] Example of class IIIb
   \[ \begin{array}{cccc}
   Gr & 1 & 2 & 3 \\
   [e] & \rightarrow & [æ] & \rightarrow [ø]
   \end{array} \]
   \( \begin{array}{ccc}
   I & A & A \\
   I & I & U
   \end{array} \)
   the heads of the expressions (underlined) are also the apophonic elements (series
   \( I \rightarrow A \rightarrow U \)).

[65] Consequences :
   a) in the lexical vowel, the entering-element is the head of the expression
   b) all elements can be parasitic
   c) all elements can be entering-elements but ø
   d) no series can start with ø
OE classes VI and VII

a) the series VI and VII

<table>
<thead>
<tr>
<th>Quot. VI</th>
<th>A</th>
<th>E</th>
<th>I</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redup. VII</td>
<td>a</td>
<td>E</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>E</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

b) apophonic reading according to [63]
1- almost all series of class VI (but 17 and 19) are to be read as half-apophonic (A ⇒ U-x). The original phonetic alternation *o / œ in these verbs results in an apophonically readable one, since it becomes e / o. Note that the verbs of series 17 and 19 are diachronically root-verbs suffix in -ja, like weak verbs.
2- none of the series of class VII (but one with only one verb weep) can be read apophonically.
c) that is; the situation is the contrary of what we saw for NHG where class VI is lost and class VII is integrated.

[67] Further hypothesis
a) OE ablaut parameter [63] is the normal and natural way for apophony to work.
That is : apophonic elements are heads
b) this can be violated if there is a substitute [learnable] way of identifying with certainty the entering-elements within the lexical form. NHG is the model of such a case.

E - Conclusion

1- The apophonic systems of quite different languages (Classical Arabic, New High German and Old English - to which Berber [Bendjaballah 95], Ge'ez, Akkadian [Ségéral 95], onomatopoeia [see below]... should be added) appears to be born within the same apophonic formula:
   o → i → A → U → U
Accordingly, these systems return in the field of derivational predictability.

2- The differences observed between NHG and OE apophonic systems can be related to the difference in the way of identifying the same objet: entering-elements:
   - OE: entering-elements are heads
   - NHG: a complementary distribution between entering-elements and parasitic ones assures the correct selection of entering-elements.

Onomatopoeic and expressive words

German:
- rutsch - rAtsch
- plItuch - plAtsch
- rl - ra - rltuch
- dlng - dAng - dOng
- der BI - BA - Bürzemann

French:
- zlg - zAg
- llc - lAc
- mlc - mAc
- frlc - frAc
- patal - patAt
- cahin - cAhA
- tAsOU - cAOU
- AouU

bAdabOUM
- dlng - dlng [el] - dOng

References

Ségéral (prep) = Ségéral, Philippe: L'apophonie dans les mots expressifs à réduplication en français.
Ségéral (Ms) = Ségéral, Philippe: La théorie apophonique et l'organisation des schèmes en sémitique.

### Appendix

<table>
<thead>
<tr>
<th>PRES</th>
<th>PRtsg</th>
<th>PRtppl</th>
<th>PART</th>
<th>verbs (orthography)</th>
<th>nb</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 _ì</td>
<td>1 i</td>
<td>ii</td>
<td>1 f</td>
<td>gripan greifen, nigan doele verden, klifan kleben, skrifan schilderen, tōlisfan spelen, swifan spelen, bitan heeten, dritan heeten, skifan schilderen, nítan spelen, bitan spelen, klifan kleben</td>
<td>S3</td>
</tr>
<tr>
<td>i 2</td>
<td>i 2</td>
<td>ii</td>
<td>1 f</td>
<td>bindan bliden, bindan fleken, gründan schilderen, kründan spelen, bindan spelen, bindan spelen</td>
<td>36</td>
</tr>
<tr>
<td>2 eo</td>
<td>a a</td>
<td>i i</td>
<td>1 f</td>
<td>tēn *tiθan nitus, bōn *θiθan schilderen, wroθu *θiθan schilderen</td>
<td>3</td>
</tr>
<tr>
<td>11 _w</td>
<td>3 eo</td>
<td>a a</td>
<td>u</td>
<td>bōdan bietan, kēowan kases, krōopan schilderen</td>
<td>34</td>
</tr>
<tr>
<td>r/JN</td>
<td>7 i</td>
<td>a a</td>
<td>u u</td>
<td>ieran=got rīnan līf, bieran=brinnan brem</td>
<td>2</td>
</tr>
<tr>
<td>IV _L/K</td>
<td>9 e a</td>
<td>a a</td>
<td>o</td>
<td>beran trages, κwelan stakeren, helan verbekelen, *hwelien (?) testen, stelan stekelen, skieran/skysan schilderen, tenan līfelen, Overan līfelen, brekan breken</td>
<td>9</td>
</tr>
<tr>
<td>V _C</td>
<td>12 e a</td>
<td>a a</td>
<td>e</td>
<td>metam verses, drepan erdelgen, skrepren schraperen, sferan schlappen, welan wēsen, fetan falles, kɔndan kases, tredan trieren, sverken spreken, wīken wtrigen, wēkan tages, līken, lesan selmen, genesen genesen</td>
<td>15</td>
</tr>
<tr>
<td>13 i 3</td>
<td>a a</td>
<td>e</td>
<td>e</td>
<td>bīdan bietan, likg(e)an līgen, sītan sīlten</td>
<td>3</td>
</tr>
<tr>
<td>14 eo</td>
<td>a a</td>
<td>e</td>
<td>e</td>
<td>gefeōn *θeθan sik fret, plō̄n *θeθan wēs, sēn *θeθan sreqen</td>
<td>3</td>
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<tr>
<td>INDEX</td>
<td>VERS</td>
<td>PART</td>
<td>vbz (orthog. x)</td>
<td>nb</td>
<td></td>
</tr>
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<tr>
<td>VI Quant</td>
<td>15</td>
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<td>oo a</td>
<td>15</td>
<td></td>
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<td></td>
<td>16</td>
<td>a</td>
<td>oo a</td>
<td>4</td>
<td></td>
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<tr>
<td></td>
<td>17</td>
<td>e</td>
<td>oo a</td>
<td>4</td>
<td></td>
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<td></td>
<td>18</td>
<td>e</td>
<td>oo a</td>
<td>4</td>
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<td></td>
<td>19</td>
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<td>oo e</td>
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<td></td>
<td>20</td>
<td>a</td>
<td>oo a</td>
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<tr>
<td>VII Redup</td>
<td>21</td>
<td>a</td>
<td>e a</td>
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