SPEECH DEVELOPMENT
OF
A BILINGUAL CHILD

A LINGUIST’S RECORD

Volume II
SOUND-LEARNING
IN THE FIRST TWO YEARS

BY
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AMS PRESS
NEW YORK
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Preface

The materials of Hildegard’s speech of the first two years which are presented in the first volume from the point of view of the vocabulary are used again in this volume for the purpose of examining the learning of sounds in detail and of finding relationships between the sounds of the standard languages and the sounds of the child. To save space, words are generally given only in their standard form. For comparing them with the form they took in Hildegard’s speech, the reader will have to turn back to the first volume with the help of the indexes on pp. 140–148 of that volume. The sounds of Hildegard’s language are discussed with the aim of completeness in the text. The sounds of her sister Karla are given briefly in comparative footnotes; her consonants are treated as completely as the fragmentary record allows; only interesting high-lights are given for her vowels. Karla’s words, in so far as they also occur in Hildegard’s vocabulary, can usually be found in the first volume in footnotes at the corresponding place. For others, the reader will need faith in the accuracy of the author’s observations. If internal evidence does not establish this confidence, the whole study loses its value as a document.

Readers of the first volume have asked for information about Hildegard’s intellectual ability in terms of I.Q. and school achievement. In her school, grades were not given for the first seven years, so that comparative rating on this familiar basis is not available. The periodical reports, couched in general terms, concerning various phases of her attitude and work, gave a very satisfactory impression. In the first reports for the seventh grade, her achievement in content subjects was given the second highest of four marks, with an occasional highest rating; in music, home arts, and physical education, she received the highest mark, with an occasional second; effort and character were rated uniformly high, without specific marks.

The school is, as a matter of general policy, reluctant to give out information on results of specific tests. The following incomplete data have been elicited from two of her teachers in successive years. In an early Kuhlmann-Anderson group test, Hildegard’s I.Q. was determined as 110, which was interpreted as “average, on the bright side.” An achievement test in October, 1940, at the beginning of the fifth grade (age 10;3) showed her English vocabulary as being equivalent to the seventh or eighth grade standard, her English reading comprehension as equivalent to sixth grade. Obviously the exposure to two languages had not affected adversely her record in the school language. In June, 1942, at the end of the sixth grade (age 11;11) her I.Q. was tested again individually by the school and was found to be four points higher than before. It was stated that she was shy. An achievement test at about the same time disclosed the fact that she was a superior student because of hard work.

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No such data are available for Karla.\textsuperscript{1} My own subjective judgment is that Karla, who is an extrovert, whereas Hildegard is decidedly an introvert, is quicker and more skilful both manually and intellectually. She learns very easily. I should not be surprised if her intelligence should prove to be much higher than her sister's. I have doubts whether she is equally conscientious, but the teachers praise her reliability, industry, and thoroughness as highly as they do Hildegard's. She also is sometimes shy with strangers. Her learning of sounds and words in the first two years gives the general impression of having been faster than Hildegard's, although this is not true for every detail.

The value of the minute examination of sounds which is given in this volume will be questioned by some. In the literature, we find, however, repeated calls for phonetically exact observations of the first stages.\textsuperscript{2} Grégoire (p. 5), haunted by similar apprehensions, asks with complete justification: Scientists study wasps and ants with painstaking minuteness; why not devote the same attention to small children? He did so, and earned the compliment of a judicious reviewer\textsuperscript{3} that his book deserves the designation "geradezu eines neuen Anfangs in der Kindersprachenforschung." Students of psychology and pedagogy cannot be accused of having neglected the small child, but not many linguists have seen the possibilities which lie dormant in the exact study of children's language learning. Linguistic scholars have studied regional and local dialects with punctilious care, sometimes with far-reaching results beneficial to the development of their field. "In spite of the fact that the number of published articles dealing with language development is relatively large, the knowledge of the subject is still comparatively meager." This is the judgment of a group of non-linguists, and they go on to call for more systematic individual records.\textsuperscript{4} Is there not some hope that the participation of more linguistic scholars will help to fertilize a promising field which has not yielded enough fruit after so many efforts?\textsuperscript{5}

\textsuperscript{1} Since the above was written, test data have been received from the school. Upon my request, Karla was given the Stanford revision of the Binet-Simon tests on May 5, 1943, at age 6.9. The results were listed as M.A. 7.4, I.Q. 107, G.E. 2.4; "shy; lacking self-confidence; slow response." I do not delete the remarks in the text above, as they may be of interest for comparison. Karla's excellent classroom teacher doubts the validity of the test results and explains the comparatively low ratings by the personality of the examiner, which does not put a child at ease. The criticism "shy" is undoubtedly justified; the remaining characterizations follow directly from it. She does not lack self-confidence in familiar surroundings, including the classroom, and her responses are strikingly quick. An example of the effect of shyness: she was unable to give the examiner her home address, whereas before and immediately after the test she gave it to the teacher cheerfully, fluently, and correctly.

\textsuperscript{2} Cf., in addition to the preface of vol. 1, Grégoire p. 6 and K. Bühler, fifth edition, p. 218; also A. Sommerfelt's review of Stern.

\textsuperscript{3} Adolf Busse in Zeitschrift für Psychologie 146 (1939), p. 189 f.

\textsuperscript{4} National Yearbook, pp. 566 and 568; cf. McCarthy (1929) p. 636 (note to 338 below).

\textsuperscript{5} Cf. the affirmative answer of A. T., reviewer of vol. 1, in British Journal of Educational Psychology 10 (1940), p. 175.
so, and I submit my findings with the quiet confidence that they will eventually help in a small way to advance our knowledge and understanding of that all-important instrument of civilization which is language.  

Bilingualism plays a very subdued rôle in this volume on sounds. More about it will be offered in the general linguistic chapters of the third volume, which will follow if conditions allow its publication. It is intended also to carry the examination of the speech development on to the sixth year.

I wish to express my gratitude to Professor Roman Jakobson of Columbia University and the École Libre des Hautes Études for reading the manuscript. His thorough and competent appreciation of my aims, methods, and results has encouraged me greatly.

W. F. L.

Evanston, December 28, 1943

The publication of this volume has suffered considerable delay in consequence of war conditions. Vol. 3, containing syntax, morphology, and

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6  The approach remains monographic. I have paved the way, however, for future investigators writing about child language in general by providing numerous footnotes and some discussions in the text which will help to coordinate my observations with the findings of others.

7  After this preface was written, the principal of the junior high school placed the battery of former tests at my disposal. The following data are culled from them.

510 Metropolitan Readiness Test. Kindergarten, 5-13-36. “Average.” (This was less than four months after the return from Germany. She had entered kindergarten with a severe handicap in the use of English.)

610 Gates Primary Reading Test, Paragraph Reading. Grade 1 A, 5-28-37. Grade placement 2.6. “Good.”


The most interesting fact emerging from these test results is that bilingualism has not affected her command of English adversely. It should be kept in mind that her English is not strengthened much by the fact that she belongs to a cultured family. Her father speaks German at home. Her mother’s conversation centers around domestic matters and human relationships; she is not an “intellectual.”
general linguistic problems of the first two years, and the diary covering the later years are completed in manuscript and will be submitted in the fall of 1946 for publication in the same series.

During the war, the International Phonetic Association has adopted new symbols for ɪ and ʊ, with a slim vote. The old symbols continue to be "official," too. I retain them.

The printer has used a simple bold-face colon as a length-sign instead of the special form prescribed by the IPA. It is to be understood as a length-sign, as in vol. 1.

W. F. L.

Sister Bay, Wis., June 26, 1946
Corrections for Vol. 1

P. 50, last line of text, for “from” read “form”
P. 57, l. 18, for bitæ read bitæ
P. 70, l. 13 from bottom of text, for das read das
P. 79, l. 2 from bottom of text, for dus read dus
P. 96, ll. 5 and 12 and p. 99, l. 16, for əlo read əlo
P. 123, l. 9, for 3u read 3u
P. 144, l. 33 (“rock”), for əwəkəˈbebi read əwəkəˈbebi
P. 146, l. 31 (“Dasch”), for das read das
  l. 38 (“Ei”), for ı;9 read ı;8
P. 147, l. 20 (“Katz”), for das read das
P. 185, l. 21 from bottom, for 1931 read 1930
  l. 14 from bottom, for “Spansh” read “Spanish”
  l. 13 from bottom, for “oιn” read “on”
P. 187, l. 27, add 81912
P. 188, l. 22 from bottom, add 81930
  l. 15 from bottom, for “Michelin” read “H. Michelant”
  l. 14 from bottom, for 1869 read 1863
Further Linguistic Terms

(Additions to Vol. 1, pp. 5–11)

Blending, the creation of one word-form out of two prototypes, or the influence exerted by one prototype on another. The result of the process is a blend. Older terms are “contamination” and “crossing of words.” The numerous cases in which Hildegard’s form was based on closely related English and German words are not designated as bilingual blends, although such a use of the term would be quite legitimate. It would, however, have overburdened the category (457).

Dorsal, articulated with the upper surface of the tongue, behind the tip.

Level stress, also called “even stress” (“schwebende Betonung”), approximately equal amount of emphasis given to two syllables of the same word; especially applied to dissyllabic words in which neither syllable is regularly subordinated in stress to the other.

Nonce-word, equivalent to the Greek term ἕραξ λεγόμενον, a word which occurs only once in a record, document, or language.

Open syllable, a syllable ending in a vowel. If one consonant follows, it is assumed not to belong to the same syllable, but to the following one. Otherwise we should be facing a closed syllable. This phonological use of the terms is not to be confused with the phonetic use, in which they refer to the distance between two organs of speech and to the angle of the jaws. In the latter use, the terms are applied to the description of a single sound, usually a vowel.

Syllabic use of a sound means its function as the bearer of a syllable. The term is practically restricted to consonants, which are usually accompanied by vowels as the normal bearers of a syllable, when they take over the function of vowels in exceptional instances. This happens most commonly with l, r, m, n, the consonants which are nearest to the vowels in their characteristics. The term and the corresponding transcription were introduced incidentally in vol. 1, p. 3 f., under the symbol r.

Tautosyllabic, belonging to the same syllable.

Vocalization, transformation into a vowel. Vocalic, vowel-like. Intervocalic, between vowels.
Representation of Standard Sounds in the Child’s Speech

It should be recalled that the term “standard” in this study refers to the form of language, English and German, which the child heard, namely the colloquial speech of educated speakers using an informal, unaffected pronunciation.

Vowels

1. A distinction must be made between vowels with strong stress and vowels with weak stress. Their quality differs somewhat in standard German and very much in English, where most of the unstressed vowels are reduced to a. Correspondingly, their treatment in the child’s speech differed considerably. In this study, strong stress will mean the main stress in a word and a relatively strong secondary stress. Weak stress then means a weak secondary stress and what is commonly called “unstressed.” We shall not hesitate to use the term “unstressed” in referring to a vowel or syllable not bearing the main or a secondary stress. This division is to a certain extent arbitrary, but will be found to be practical.

2. The vowels will be dealt with in a threefold division into low, mid, and high vowels. These terms refer to the position of the tongue. The division is again arbitrary, because the gradual raising of the tongue admits of no objective line of demarcation. Roughly, however, the low vowels are the group around a, a, the mid vowels are the group around e and o, and the high vowels those around i and u. Since the angle of the jaws usually varies in conformity with this series, decreasing in the direction from low to high, the terms “open,” “half-open,” and “close” vowels can be synonymous. In addition, however, a distinction is made within each group between relatively higher and lower vowels, as e and e, or u and u, and for this distinction the terms “close” and “open” (also “narrow” and “wide”) are used in preference to “high” and “low.” In English and German, the relatively high vowels are articulated at the same time with tenser muscles, and the relatively low vowels with laxer muscles, so that “close” u can also be called “tense” u, and “open” u, “lax” u.

3. We begin with the low vowels because they are the first to be articulated by children. They require no fine adjustments of the tongue position as the higher vowels do, and are therefore easier to produce and to imitate with approximation to correctness.

4. The low vowels of the presentation in German and in American English were judged to be varieties of back a; but they were not ex-

1 The standard views of general phonetics are the basis of this classification. The minute investigations of instrumental phonetics may eventually make changes necessary. Up to the present, however, its results are limited in scope.
treme back vowels. In both languages the difference between a and α is not phonemic. The spelling is in German always "a," in English "a" when it is long, usually "o" when it is short, with some intrusion in both quantities of English words spelled with "a" after "w," where the pronunciation presented waivered between o and vowels similar to a.

5. In the child's speech, the vowel was generally represented by a, that is, the pronunciation was a little more fronted than in the presentation. A fair number of transcriptions with α occur, however, usually in variants of words which otherwise appeared with a; some words had always a. The forms of both vowels were not extreme. The choice of transcription was often somewhat arbitrary. It is noteworthy, however, that no altogether different vowel was ever substituted.

6. English α: is attested in *dark 1;10 as a:.* In water the Midwestern American pronunciation waivered through several variants between α: and o:. If this were not a known fact, it could easily be inferred from the waivering vowels in Hildegard's forms of the word: 1;7 a, o; 1;8 a, o, o. For further details, cf. 16 ff.

7. German α: appears normally as a of varying length. Only a: is found in Haar 1;10 and in *Banane, once 1;11, which might however also be based on English banana with a:. Only short a is recorded in tragen 1;11, *Hase, once 1;8, *Glas, once 1;11 (also based on glass with a:). The length varied in *Bad, baden 1;3-9, da B 1;0, and ja 1;3 (ja with short vowel o;9-11 may or may not have been based on this word). This is due to the fact that the very frequent words da and ja had varying length in the presentation, from short to overlong. In Bad and Glas I probably often used the Northern German short vowel instead of the standard long vowel. Ja was once heard 1;7 with α, the only instance of a back vowel for the German long a:; but this was a playful variant, consciously used with the intention of being funny. In the early stages, her vowels were always short. Conscious distinctions of quantity cannot be expected until the later months. Long a: became frequent only from B 1;6 on, except in the word da, in which she reproduced her German grandfather's long vowel as early as B 1;0. Even as late as 1;11 the long vowel was rendered by short a in tragen.4

8. The English short a occurred chiefly in words containing the so-called "short o," which is lowered and unrounded in Midwestern pronunciation. The only spellings other than "o" are cases of "a" after "w," and "a" in mama and papa. It is regularly transcribed in Hildegard's forms by a; a occurs occasionally as a variant.

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* The distinction between long and short vowels, which presents no problems in German, is a complicated matter in English; cf. Kenyon 84. Length of English vowels and of those in Hildegard's words is marked on the traditional impressionistic basis, with no claim to great exactness.

* Cf. Kenyon 291, 9, Krapp III, 3c.

* Karla had a curious case of o for a: in Mahleseit 1;11, after having echoed α: more correctly earlier in the month; see vol. 1, p. 85, note 151.

* Cf. Kenyon 272.
The transcription a was always used in the following words: bobby-pin 1;7, block 1;7, box 1;6 (also 2;0–1), dolly 1;6, forgot 1;11, *knock, once 1;11, stocking 1;7 (got 2;0, gosh 2;1); also in mama from the time that it was a real word (1;3), whereas in the babbling combination of the same form (0;9–1;2) both varieties of the vowel had occurred; for papa, cf. 11. The frequent word hot 1;4, which was whispered 1;4–7, was regularly listed with a, but once 1;7 with a.

Both a and a were recorded in bottle 1;6, not 1;11 (a 2;1), wash 1;8 (also based on waschen; a prevailed). *Pocketbook 1;8 is transcribed with a, which might be explained as an influence of the back vowel which followed in Hildegard’s dissyllabic form; the transcription may however be accidental, particularly in view of the fact that *pocket 1;10 appears with a (but pocketbook recurred 2;1 as a trisyllable with a). For tick-tock, see 11.

*Pocket 1;10 was uttered once with a and once with u in the same breath. The second substitute is completely isolated and should, in view of the wealth of examples with a more faithful rendering of the vowel, be disregarded as an experimental failure, which amounted to no more than a slip of the tongue.

9. In a few words, the child’s vowel was sometimes lengthened to half or full length, namely in bottle and dolly. Apparently this was done in order to retain the dissyllabic character of these words; the a, a was immediately followed by i, which would have merged with a short vowel into a diphthong. This explanation is confirmed by the fact that bottle no longer appeared with a lengthened vowel as soon as a u was added in the second syllable, 1;8. The lengthening was however not used consistently in such instances. Dolly appeared 1;8–11 also with ai, which is the normal substitution. There was no general endeavor to preserve the number of syllables of the prototype (479), and the lengthening was also found exceptionally in original monosyllables (cf. Ball, 11).

10. Apparently, short “o” was not always pronounced a in the standard. In one word, rock, the child’s vowel was o at first, 1;8, but changed to a later, 1;10, and remained that consistently.

Watch had a, a 1;9–2;1, but then started to take o. (What was learned 2;1, still with a.)

11. German short a, spelled “a,” always took the form a: A-a 1;1 (frequent), *ab 1;11, alle 1;7 (frequent), Nackedei 1;7 (probably also 1;6), *hache 1;11 (once), Kait 1;10–2;0 (frequent), *klappert 1;11 (once), kratzen (scratch?) 1;11–2;1, *Nachd 1;11 (rare), nass 1;8, *natt-natt 1;6, *patsch 1;11, *Tasche 1;10 (once), *wachtel 1;11 (once), *Taschentuch 1;7 (later distorted by blending).

In some words, a is used in early transcriptions; but all of them (except backe once 1;11) had a in the later stages. For arme, the two listings

*daf, vol. 1, p. 70, should be corrected into daf. It was always transcribed with a in the diary.
1;7 show *α:, with a long vowel, which is explainable by the shortening into a monosyllable; but at the time of its displacement 1;10, it is recorded as *a short. The transcription with back vowel can probably be disregarded as accidental. In *Ball 1;0-9, the transcriptions waver as long as the word was whispered 1;0-4; after that, a appears regularly in the frequent word. At the stage when the whispered vowel was followed by an i (1;3-5), it was sometimes lengthened: αi 1;3, αi 1;4. The two early words *Papa 1;0 and *Ticktock E 0;11, which were supported by German and English (papa, tick-lock), also showed a and α until 1;2 and E 0;11 respectively, and later only a. *Papa had both varieties of the vowel while it was a meaningless babbling combination (0;7-1;0), a E 1;0, α, later a 1;7; the a was consistently used exactly from the moment that the word gave up its whispered articulation, after M 1;1; for Mama, cf. 8. *Ticktock, included here because it was frequently presented with level stress (although with falling intonation), showed a only repeatedly at E 0;11; from B 1;0 the vowel was regularly a; however, at E 0;11 and B 1;0, it sometimes lacked the vowel altogether. The a was regularly whispered in this word until 1;4, often so until 1;7; it became regularly voiced 1;8 under the influence of an English nursery rhyme. At 1;7 the second syllable was for a while assimilated to the first, resulting in the reduplicated form t'it'.

The frequent words da and ja have been treated in 7; both occurred also with short vowel in the presentation and had therefore often a short vowel in the child's speech; but, as in other words with long α, she shortened the vowel more frequently than was warranted by the presentation. Waschen wavered between a and α; this was due to interference of English wash, see 8.

12. The preceding sections do not include cases in which short α is followed by a nasal consonant in the same syllable. The normal representation of it was also fronted a; but separate treatment is required by the fact that in a number of instances, the nasal left traces in the guise of a nasализation of the vowel. The nasal consonant in this position was never reproduced in full during the first two years, except perhaps once in a freak mechanical reproduction of *danke schön 1;1. Hildegarde's ă for an amounts to a complete mutual assimilation, or a fusion of two different sounds into one.

The nasalization is attested in the following words: English on, German an 1;9-2;1 (always ă; very frequent word);7 German Hand 1;11 (but rather from English hand; frequent word; always ă; but the compound Handschuh 1;10-2;1 never had nasalization, 156); Mann 1;5-2;1 (most frequently with unasalized ă 1;5-11; ă with faint lip-rounding 1;6-10). (Come on acquired nasalization as late as 2;1.)

Back α is, in addition to its occurrence in Mann, recorded in the iso-

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7 Karla also had ă, but nasalization was less frequent with her; she said on correctly as early as 1;8.
lated mechanical imitation of *danke schön 1;1, 2, which occurred in the second syllable of come on 1;10–11 (later a 1;11, ã 2;1), goes back to the standard variant pronunciation with o. The standard vowel a itself before the voiced final consonant in English is longer than the German equivalent and often a little farther back and slightly rounded.

13. In all other words the substitution was regularly simple a: *andere (ʔa; once 1;7), *bimbam 1;2 (the only instance involving m, which was, however, also omitted), danke 1;3 (reduplicated form, based also on thank you), Handschuh 1;10, *John 1;11, *Tante 1;1.

The variant dr-dæ for Tante 1;1 does not fit into the pattern of substitution. It should be disregarded as an early inadequate experimental form.

Handschr had the regular a only at 1;10. At 1;11 the first syllable always had the diphthong au (once transcribed as au 2;1), which is easily explained as a partial assimilation to the vowel of the second syllable (436).

Thus a with tautosyllabic nasal follows the same pattern as a without nasal, except that the nasal received subdued attention, which resulted in wavering attempts to reproduce it in the form of an assimilative modification of the vowel, consistently only in two frequent words, German an, English on and German Hand. The nasalization was observed during a long period, 1;5–2;1; but unasnalized vowels occurred at all times concurrently. The substitution did not become regular.

14. Standard a with weak stress also resulted normally in a: Hildegard 1;11–2;1 (presented in English pronunciation with a somewhat longer and more retracted a than in German; in pretonic position to the family name, the syllable was sometimes omitted at 2;1), Mama (German and English alike) 1;3 (in the babbling combination o;9–1;2 it had also occurred with a), Papa (German and English alike) 1;0–2;1 (babbling form o;7–1;0 also with a; possibly M 1;1 in whispered articulation still sometimes with a), *streetcar, once 1;11, sandbox 1;10. The unstressed 2 of Theresa 1;11–2;0, which is commonly closer to a than to 3 in American pronunciation, was also rendered by a. In two words, *Opa 1;0–1 and *Zwieback, once 1;9, the weak stress curiously prevailed over the main stress; Zwieback was ba; Opa was usually whispered pa or pa, although sometimes the first syllable was represented.

15. Pretonic syllables usually remained unrepresented (476); but there are two instances in which pretonic a was reproduced, Papier 1;8 and kaputt 1;10. In Papier, it was a on the first occurrence, but with the stress shifted onto the first syllable as in the English equivalent, the vowel of which, however, could not be the model. From 1;10 on the vowel of the first syllable was assimilated to that of the second (446), which was a substitute derived from the English prototype rather than the German. In kaputt, the pretonic vowel was rendered at first by o, which is probably to be considered the normal substitution in this position; but
the pretonic vowel was more commonly still missing, at 1;11 regularly so. The word, however, suffered interference on the part of the synonym broke. (At the age of five, she pronounced the pretonic a of allein still occasionally as a. In the colloquial standard it is sometimes reduced, but remains a in quality).

16. The next low vowel to be treated is long and short o in English, which is at least as low as a, but farther back. In Midwestern American it is frequently unrounded and somewhat fronted, so that it often comes very close to a. Yet the fact that the representation in Hildgard’s speech wavered between a and o proves that it does not simply merge with a. It occurs only in stressed position, sometimes with secondary stress. It is necessary to separate the English vowel from the German a, which is a mid vowel. The use of the same symbol o for both vowels is an inaccuracy that must be charged to the somewhat simplified and conventionalized habits of phonetic transcription, with which I do not dare to break in this study.

17. Long o: appears in Hildgard’s speech most frequently as a, a and o, with varying length. In addition, o and au, au are found in some cases. The tendency was toward o as the final representation. Many words which had one of the other vowels in the earlier stages, developed o eventually; but the process had not gone far enough by the end of the second year to result in a consistent representation.

18. We find only a in *Paul 1;8, because this word did not last long enough to reach a more standard form. In all other words, the a was temporary: all (adverb and adjective) 1;5 (long or short a, rarely a, but at the end of the period, favored by assimilation in “all gone,” also o; 2;1 o), call 1;11 (but, on account of the late date, at once also with o, which prevailed), naughty 1;5 (short a 1;5–7, always o 1;11–2;1).

In two words with o: after w, walk 1;8 and water 1;7, her vowels, curiously enough, at first resembled o, then yielded to a, and finally returned to o, which is eloquent testimony for the difficulty of the vowel, for the early tendency to substitute a, and for the later switch to the representation o. Walk had fronted o resembling a: 1;8, a later 1;8, a B 1;11, o second half 1;11 (o 2;1). Water showed experimental forms with a and one with o: 1;7, a 1;8, a B and M 1;11, later a, with o only as a variant; the well-established form with a maintained itself because the pronunciation had become habitual and fortified by frequent practice. It should be noted, however, that the word did not evolve normally; in its later stage (from B 1;11, perhaps from 1;8), it suffered analogical interference from

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8 Cf. Ripman 43.1, Vietor 43. Kenyon spoke of a low position of the jaw for o in the earlier editions of his book (130 f. and 187); in the later ones he has dropped this description, but he still treats o as a low back vowel. In the treatment of o-sounds I follow the simpler classification of Vietor, 45.


10 Karla said work 1;11.
bottle, with short a, a fact which also helps to explain the observation that the vowel was always shortened except in one of the unstable experimental forms of ı;7. Notice, however, that the vowel of walk was also short from ı;8 to ı;11. In Milwaukee, wá·ti ı;10, the vowel after w was always a· (but o· was reached 2;1). Concerning come on, which contains lengthened ə, see 12.

ə with no preceding a stage was observed in gone ı;11, which has in Midwestern American English at least a half-long, fairly well-rounded vowel (ə ı;11; ə: 2;ı), and in fall ı;11 (regularly ə; 2;ı ə·). Also with secondary stress: fall down, ə ı;11–2;1, ə· 2;ı, cf. 22; sidewalk, ə· 2;0–1). The regretful interjection oh, presented in this function as ə: without fronting, appeared in the same form sporadically E ı;1–7, but without a clear distinction from the enthusiastic ə.

19. These last examples lead us to a separate category, namely words in which standard ə: is never fronted, but sometimes raised toward o. It is a higher ə more closely related to German mid ə (32); but for practical reasons it is included here. The group comprises words in which the vowel is followed by final r or r-consonant. 11 Hildegard’s vowel also wavered between ə and o: door ı;10 (oı and ə ı;10, o ı;11), fork ı;11 (once o, later ə·), *more ı;6 (ə), New York ı;11–2;0 (ə·) (and peg-boards 2;1, ə); cf. also horsey, treated under hottey, 20.

20. o appeared however also in hottey (ə ı;10, but o ı;11), *dog ı;11 and doggie ı;11, where it does not seem to fit into the pattern of substitution. The presentation hovers between a slightly raised ə· and a fronted variety of the vowel, but not one raised as far as o. This proves no more than the fact that vowel-qualities were still unstable. The distinction between o and ə was not well learned by the end of the second year (362).

21. There remain to be considered some instances of au, au for ə.: English ball ı;9, with au, sometimes au, is plausibly explained as containing the substitute a combined with u proceeding from velar l (203), particularly since the appearance of the u coincided with the shift from the German to the English prototype. Fall usually had ə, only once au in wau da, fall down ı;11. Call ı;11, however, never showed a substitute for l. All, adjective and adverb ı;5, had au only rarely in cases where it is more convincingly explained as an assimilation to the vowel or the w of the next syllable (431, 437).

On the other hand au occurred in some words where neither one nor the other explanation applies. *Aboard ı;10 had only au, Milwaukee, wauwi ı;8 only au. Gone ı;10 showed au at ı;10 (and 2;ı!). To be sure, aboard and gone occurred only with preceding all; but in every one of these instances all itself was rendered without an u, which makes it improbable that the u of the following word could be due to the l of all.

11 Kenyon, in the newer editions of his book, treats this r as a vowel forming a diphthong with o or o, 366 ff. Without contesting this view, I follow the more conservative practice of classifying the r as a consonant.
No such explanation could even be thought of in connection with Milwaukee. The substitution, which occurred also for standard o (45), can be explained as a sort of dissimilation (462) of a type well known in the history of other long vowels in standard English and German (diphthongization). The long rounded vowel \( \epsilon \) was split into an unrounded and more fronted variety of low vowel plus a high back vowel which introduced the lip-rounding too late and served at the same time as a transition to the following velar \( k \). The possible instance of \textit{off} \( > \text{au} \) B 1;11, mentioned in vol. 1, p. 39, is too improbable to be discussed further.

\textit{Auto}(mobile) 1;5 had \( a, a \) and \( au, au \), the diphthong prevailing, but never \( \epsilon \) except once in an early variant 1;7. In view of the fact that all other words tended to develop \( \epsilon \) eventually, it is reasonable to assume that the German model, which is pronounced with \( au \), was reproduced in Hildegard’s diphthong. There is a bare possibility that this frequent word created in her subconscious mind a feeling that \( \epsilon \) should be rendered by \( au \), which might be used to explain the substitution of \( au \) in the instances previously mentioned. No such influence of the sound-system of one language on that of the other was however observed otherwise. It does not fit her speech pattern. I reject the explanation.

22. Short \( \epsilon \) usually appears in general American as \( a \) (8–10). Before \( r + \) vowel, however, in the name \textit{Florence} 1;11, the vowel was sometimes unrounded, but not fronted as far as \( a \). Hildegard always raised it to \( o \), which may be due to the influence of the following \( f \). (\textit{Lost} 2;1 had \( \epsilon \); the vowel is rather short in standard Midwestern English.)

Unstressed shortened \( \epsilon \) was reproduced in \textit{all right} in pretonic position. The vowel, unrounded in the standard, was at first given as \( a i \), assimilated to the second syllable, in the earliest, fully reduplicated form consisting only of vowels 1;8–9. When the two syllables became different, the first had \( a \). \textit{Fall down} 1;11, usually with short \( \epsilon \), sometimes with \( au \) (18), can also be listed under pretonic \( \epsilon \).

23. \( æ \) is more fronted and raised than \( a \), but still classified as a low vowel. It occurred only in stressed position and only in English, with one exception: I presented the playful German interjection *\textit{bäh} with a long \( æ \): and the child reproduced it ephemerally at 1;5 in the same form.

The representation of English \( æ \), short or long, was consistently \( a \), from the beginning to the end of the period: *\textit{Carolyn} B 1;3–10 (after an ex-

12 Germans in America sometimes use the spelling pronunciation \textit{milwauki}. Hildegard heard no such form.

13 Karla, whose speech leaned much more heavily on English, used \( a \): in \textit{auto} 1;10.

14 Cf. Kenyon 201, (1).

15 Different in Karla’s speech. \( a \) also occurred, in \textit{gaga}, \textit{candy} B 1;4, \textit{daddy} at 1;7, and \( da \), \textit{jack}, about 1;7. Usually, however, she had \( æ \): \textit{back} E 1;5, \textit{both} 1;6, \textit{had} 1;8, \textit{daddy} at 1;8, \textit{scratch} 1;9, \textit{man} 1;10, \textit{thank you} B 1;11, \textit{glass} M 1;11, \textit{that} E 1;11. \textit{Grandpa} is recorded with \( e M 1;4 \), with \( æ \) from E 1;8. She said \( ëpūx \), \textit{apple} 1;10, but \( pënæpū \), \textit{pineapple} B 1;11; the latter is clearly English; the former might contain traces of German \textit{Apfel}. \( e \) was recorded in \textit{carry} E 1;11, which lacked the second syllable.
perimental form with e, E i;2), thank you i;3, apple i;5, *Jasper i;7, cracker i;7, *Mack i;7, hat i;8-2;i (at i;6, the vowel was missing, an unusual form for a word; one recording with a i;8 should be disregarded), *Jack i;9, *ask i;11, piano i;11-2;o, crash i;10, scratch i;11-2;i (kra-zen?), glass, once i;11 (Glas?), *that, one day i;11, Mary Alice i;11 (occasionally with au), *banana, once i;11 (German?), *wheelbarrow i;11 (back 2;o-1). The list contains some of the child’s most frequent words. In all her forms, the vowel was short, no matter what its duration was in the presentation. Only in alley i;11 and *Alex i;11 do we find a half-long a to preserve the disyllabic character of the words after omission of -l-. In ba: i;3-9, it was recorded as long i;3, short B i;4-8, long again i;9; but in this word, English bath was at best a contributory model, German baden (a:) and Bad (a: or a) being the chief prototypes.

24. The only word in which the child used æ, in an otherwise very imperfect word-form, is Grandpa i;8. 16 (The irregular e in mammy 2;i, vol. 1, p. 105, is difficult to explain, unless a blend with meme, Marion is assumed.)

Aside from Grandpa, the development of æ followed by a nasal in the same syllable is parallel to that of a in the same position (12). The half-long æ was rendered by short or half-long a with or without nasalization. There is only one clear case of æ, namely candy. In all other instances, a German cognate with a could be the etymon also; but there is no reason to assume that the German models prevailed, since æ not followed by a nasal also became a.

Nasalization was always present in the frequent word hand i;11, to the formation of which German Hand may have contributed. Man i;5, rather inextricably intertwined with Mann, had more commonly an unasalized vowel i;6-11 (the forms recorded with back a i;6-10 should be traced to the German), but occurred, early and late, i;5-2;i, also with nasalization.

Words in which the nasalization was always missing were candy i;10, sandbox i;10-2;i, and thank you i;3. This may be due to the disyllabic character of the words (cf. Hand and Handschuh, 12). The vowel, which stood in an open syllable in the child’s rendering, was always half-long in candy. In sandbox it was recorded as half-long at i;10, as short thereafter. In thank you it was always short. 17 Interference of German Sand in sandbox is possible, but not probable.

The only word which does not fit in this pattern of substitution is hang i;11, which showed the unasalized vowel e. Since e does appear as substitute for e, it is necessary to conclude that German hängen was the etymon.

16 Even in this word the vowel yielded to the regular pattern of substitution at 2;i: qaga, rarely nana; in the latter form the consonants were normalized as well.
17 Karla had em in sand E i;9, em in sandbox i;10, the m being due to assimilation to the following b. The shortening of the vowel in the compound is parallel to Hildegard’s practice. Thank you had æ B i;11.
25. The mid front vowel ε is somewhat variable in standard German and more so in standard English pronunciation. English ε: before r varies between e and ae: in individual and regional pronunciations, the intermediate e: being the average value in Midwestern American. In other positions, lengthened e is sometimes raised to e. Variations in length accompany these fluctuations. German e: is fixed in the standard pronunciation; but in the North German colloquial, which influenced my pronunciation, it is e. English short e is somewhat raised in Southern British, lowered in Irish types of speech; Hildegard, however, heard only e. German short e has no normal variations.

26. It is no wonder, therefore, that similar variations appeared in the child's representations of the vowel. The average rendering was e. English e: before r appears as e in bear *i;7, i;1i (it varied to e and even i i;1i, which might preferably be traced to German Bär), and in *there (e short or long) o;10–B i;10 and i;5 (variants: i; and e). It was raised to e in Marion i;6, after a stage of e i;4–7 (variant ae often at i;6); consistently e from i;8. Where also had e throughout i;1i (but changed to e, 2;i). Hair i;1i had only e. Airplane i;1i, with ɛi, is the only word differing from the regular scheme of representation; the r must be an attempt to reproduce the raising of the tongue for r (210); it has a parallel in the word door i;10 (and perhaps in peg-boards 2;i).

27. English ε lengthened before a voiced consonant occurred in egg. Hildegard's form was ëekt i;8–11, ëek for a while later in i;1i (again ëek, 2;i). The raising to e might reflect the variant pronunciation eg, which is not infrequently heard in the middle West, more likely it is due to a parallel instability of the vowel in the child's speech (also peg-board 2;i with e).

In *yes the vowel is often lengthened before the fricative; but Hildegard used only short e *i;14; her form lacked the final consonant. The earlier doubtful occurrences of the word in the babbling stage are here disregarded; they would introduce no difficulties.

28. Long e: in German is independent of the following consonant. There are two examples, *Nägel i;1i with e, and *ütsch!, i;6 with e, i;10 with e: Since English nails is more convincing as the prototype for the former, for non-linguistic reasons, the correct e: should be considered the normal correspondence at the end of the period. Cf. 36.

29. English and German short e can be treated together. There is no standard variation for this sound in German, nor in English in those cases where it is not lengthened. Yet in the child's speech, it was sometimes lowered as far as a and even more frequently raised to e, in one word as far as i. The vowel e prevailed over e.

18 Kenyon 17 and 362 f.
19 Kenyon (old editions) 15i. I do not find the popular pronunciation of "egg" and other words with e in the newer editions, but it occurs.
20 Cf. also Karla's ephemeral form ber for hair, i;10.
21 Designated as "popular" by Kenyon (old editions) 15i.
a is attested in dress 1;10–11; she started with a, then improved it to e, but returned E 1;10 to a, which continued in frequent use to the end of the period. Before I, the exclusive representation was a, in Helen 1;9–10 (hara > haja) and bell 1;11 (bau, assimilated 2;1 into bo).22

e was found in English dress at 1;10 and wet at 1;8; but in both words the correct vowel was rare, yielding to lowered and raised varieties respectively. It occurred in German *Gertrud 1;1, first long, then short, at a stage when all vowels were still subject to fluctuations; and in *weg 1;10, but only once, along with e. In Bett, Hildegard used e 1;4–8, but later, from 1;8, always e, even when she added the final consonant B 1;11.

e was the prevailing substitution, in English wet 1;7–2;1, in German-English Bett, bed from 1;8, and in German *weg 1;10 and hängen 1;11; in the latter, e was never observed. The following nasal consonant made no difference. Only the low vowels were affected by them.

Finally, i was consistently used in neck 1;10. It is surprising that this excessive raising was restricted to one word (cf. 435 n.); but some of the vowels registered as e must also have been quite high; at 1;8 an entry reveals that all wet, with short e, was difficult to distinguish from Augenblick, with i.

30. Standard unstressed e also appeared in varied forms, ε, a, and e, in Hildegard’s rendering. English half-long e before r usually took the form e before the main stress, in Mary Alice 1;11, which had also e M 1;11. The word was, however, irregular; it suffered interference from mehr, miau. After the main stress, a was substituted: high-chair 1;5. German short e remained e in *da ist es 1;5; the presentation was really rather o, only with some e tinge (85).

31. The rounded variety of e, i.e. oe, was attempted in one word, *Löschcr 1;11. Hildegard substituted o, that is, the back vowel for which the lip-rounding is more normal, with slight raising.22

32. The back vowel corresponding to front e is o, which occurs only as a short vowel in German. The English vowel transcribed by the same symbol usually belongs to the a phoneme in American pronunciation and is treated there (16–22). For the related English raised o, see 19 f.

a produced the same varied vowels as the corresponding front vowel, but, of course, in the back range: o, a, and o; however, the excessive raising of e to i did not find a parallel in a raising of o to u.

a was found in *hoppe 1;11, an unstable word of somewhat uncertain etymology. The child’s form probably came from this German prototype. Although the a is unique as a substitute for German o, the parallelism with the representations of e makes it credible that the back vowel could also vary within the same range.

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22 Karla, who omitted the -l in bell B 1;11, had the correct vowel.
23 o did not occur. In one freak mechanical repetition of *danke schön 1;1 (vol. 1, p. 65), she dropped the vowel altogether. Preyer (p.182) reports “e” for o 2;8; Bloch (1913), p. 51, says that “ö” and the nasals are the only difficult vowels; substitute “ö,” or “ö” correct at once.
appeared correctly in *Onkel 1;8–2;0; the nasal had no effect on the vowel, but usually produced a prothetic ə forming a diphthong with it. ə was also regularly the vowel of *rollen 1;8; the variant ə 1;11–2;1 had better be traced to the interfering English roll. (*New York 2;1 had ə.

0 was the vowel of *Loch 1;10 and of *donnert, once 1;11. (The ə in the last syllable of *Leopold, with fairly strong secondary stress, was also ə at 2;1.)

33. There is no clear case of unstressed German ə. If *haba 1;11 goes back to *hopp, hopp, hopp with rhythmically alternating stress, then a would be the substitution for the second ə; but this is doubtful, and even if it were true, the vowel might still be influenced by that of the syllable with main stress.

34. The next higher front vowel, which is at the same time tenser than ē, is ē; it occurred only long. To be sure, the length varies somewhat in English, depending on the following consonant; but no fine discriminations need be introduced here. Also, the vowel is in Midwestern American English slightly diphthongal; but the child's representation was the same for the English and for the German vowel, except in final position, so that the two varieties are most conveniently treated together.

35. Ē was quite regularly rendered by pure ē; in English, therefore, the off-glīde ē was suppressed (but cf. 38). There are very few irregular cases.

36. Ĕ was retained from the beginning in the following German words: Baby 1;2, *steht, once 1;11, mehr 1;5, *Schnee 1;6–9, Peter 1;11–2;0 (vol. 1, p. 117), Wehweh 1;8 (Leopold 2;1, Wiedersehen 2;1).

With these cases should be listed the instances of German long “ä,” which I should pronounce ē: in the classroom, but in informal home speech probably articulated as ē. There are, however, no clear examples of it. Bär 1;1;7, 1;11 had ē, ē, and ī, but it is difficult to separate from English bear. If a separation is attempted, ē 1;1;7, ē 1;11 is likely to be the representation of the English vowel (26); ē 1;11 would stand for colloquial German e, ē being the same vowel raised too high; but blending with spielen is also possible, adding to the complexity of the picture. In the interjection *äscht, ē appeared at 1;6, ē at 1;10—probably because of varying presentation. *Nägel, once 1;11, had ē; but its chief prototype was English nails (37; cf. 28).

37. English e1, also rendered by pure ē, is attested still more frequently: *Bates 1;7–8, pail 1;11, baby B 1;2, *break 1;10, bake 1;11, bacon 1;9, bathe 1;9, make 1;11, *nails 1;11, train 1;11, radio 1;10, wake up 1;10.

38. English ē in final position demands separate treatment, because here the diphthong is more definite in standard pronunciation and was therefore sometimes imitated by the child. The word away was used

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24 Karla likewise, 1;10. There is a possibility with both children that this ē came from the English pronunciation of the name.

25 In Karla's speech, Leopold had the irregular form (h)apo 1;10; ē seems to be a compromise between ē and the immediately following ē.
1;6–8 only in a stereotype expression with great emphasis, with e:: i;6, e::i 1;8; at 1;8 it appeared in a less emphatic position, usually with er, once with ei. After that, curiously enough, the standard diphthong was again given up. At 1;10 and 1;11 (and even as late as 2;1), the vowel was consistently e, thus conforming to the regular substitution in medial position. The historically related but descriptively separate word way, common in “way up” and “way down,” occurred with er at 1;8, but in general had only e, sometimes emphatically over-long, from 1;7 to the end of the period. That is natural, because in its usual position before another, semantically more significant word the diphthong was not very definite in the presentation.

39. There remain to be considered a few instances of irregular raising or lowering of the vowel; they occurred only in English.

Cake had e probably at *i;6, regularly from i;10; but at 1;9, when the word first became really active in her vocabulary, it is registered once with i, which means nothing more than a first inadequate adjustment of the tongue elevation. It could possibly be explained as a partial assimilation due to the high tongue position of the k which preceded and followed it (437).

A similar uncertainty was observed in the rendering of the vowel of wait i;11, which was first spoken with e:, later correctly with e. The initial lowering is curious for the late stage in which this word was acquired, when e had been said correctly in baby since B 1;2 and in many words later. It means only that complete separation of e: and e had not yet been achieved even during the last month of the second year.

40. There are hardly any instances of unstressed e. In the following words, which have a fairly strong secondary stress, the second vowel conformed to the representations of e with main stress: Eiskrem i;9, Wehweh 1;8, airplane i;11. The first two words had the correct e; the last had i, with the same raising as in cake. In spite of the late date, no combinatory explanation for the irregularity need be looked for. It is sufficient to say that Hildegard did not succeed in giving the tongue the exact intermediate elevation. In Leona i;11 e was correct, but the form was distorted by child etymology (457).

41. Since o has been disposed of in a note to 31, we are ready to examine the back vowel corresponding to e, namely o. The situation closely parallels that with regard to e (34 ff.), except that the variability of the vowel and the spread of the child’s substitutions were wider. This is easily explained by two facts: the distance between the lowest and the highest back vowels is shorter than the span between the corresponding front vowels, requiring a finer adjustment of the tongue position; and the back of the tongue is less flexible than the front, which adds to the difficulty of adjustment.

42. German o was less frequently rendered correctly than the corresponding e. Boot (also based on English boat) i;10 is the only word which
had o consistently. Still, it was the normal representation; several words which displayed a variable vowel, had o more frequently than the variants under which they will be discussed.

43. English o was in many more examples rendered by o. Final o does not need to be treated separately, as was final e; the child's representation did not differ, which is due to the fact that its diphthongal character is less prominent in the Midwestern standard than in the case of er and disappears practically altogether in pretonic position (like "go away") and in medial position. o before nasal (cf. comb, don't, home) did not undergo any special treatment.

We find exclusively o in boat i;10, cold i;10, go i;10, comb i;10, throw i;11 (still no diphthong at 2;1, before "away"), Joey i;7, stone i;11, coat i;11, don't i;11 (2;1), *cocoa i;8, *kimona i;9–10, nose i;8, *oatmeal, once i;11, roll i;11 (2;1) (if we trace instances with o to German rolen), *snow i;6–8 (but *snowing also with o: i;8), (whole 2;o, clothes, hole, toes 2;1). There was some variation in the length of o: short, half-long and long, which is judged to be less important than the quality of the vowel. Indications of length are given under the individual words in the first volume.

44. German o varied upward as far as u and downward to e. Toast, which, in German, was presented with pure o, began with o i;9, had u, later i;9, u i;10, and again o i;11; the succession u > v > o represents a growing accuracy of reproduction; the first o was correct by accident. In Brot i;7, the correct vowel o was also hit from the beginning; but the variant u was found i;7 and i;9, u i;8. During i;9, before the word had the final t or a substitute for it, even uʃ was heard, the fricative representing an off-glide with a still higher position of the tongue. Later in the month, the word began to have the final consonant, and from the same moment o was used without variation. No interference of other words need be thought of; inaccurate adjustment of the tongue position at the earlier stages is a perfectly satisfactory explanation.

The downward variation to e is explained in the same way; it persisted later, but occurred only in ephemeral words which had no chance to be improved: *helen and *hoch i;11, exclusively e in both words. Dodo (English and German) had usually o i;6–2;1; o occurred i;6–8; later the name was fixed by habit with o in both syllables. The interjection *oh had o i;10 and E i;3 (and 2;1), but e: E i;1, E i;3, B i;4, and i;7; it was however presented in both close and open articulation, with a differentiation of value which was not clearly reflected in the child's division of vowels.
At a very early stage, 1;0–1, the stressed vowel of *Opa, a whispered word, was either inaudible or 0, once with metathesis of syllables. When the word became fully voiced, second half 1;1, the second syllable was reduplicated, the first vowel thus losing its identity. The word did not continue into a more perfect stage.

45. English o, although more stable in general, suffered even greater variation, namely all the way from u to a. The high variant u, u occurred in toast (see under German o, 44). In view of this example, it is not impossible to trace 3uf, with u and u 1;i, to closed. Broke(n) 1;9 had at first o, later u, from 1;i0 regularly o; but blending with kapu is rather probable (457).

Lowering to 3 was observed as the exclusive representation of o in home 1;i1–2;i. It occurred, antedating o or at the same time, in Dodo 1;6–2;i (see 44), hello (o 1;i5–10, o 1;i0–11), *snowing (o: once 1;i8, o: once 1;i10; *snow had always o 1;i6, 1;i8), no (o 1;6–2;i, o 1;i9–2;i; o especially in pretonic position), *oh (see 44).

Further lowering to a occurred regularly in one word, open 1;i8 (2;i registered with o). The retention of the very imperfect vowel in this frequent word is a case of fixation through her own frequent repetition, which built a dam against the corrective influence exerted by the presentation (496).

A further complication arises, only for English o, through two instances where the vowel, along with examples of correct o, was split into a combination of the lowest with the highest substitutes, auv. Blow B 1;i1 occurred first as baux, which however yielded to bo at once. In soap 1;i0, auv was the regular substitute for the vowel 1;i1, after auv, o auv had occurred in the preceding experimental stage, 1;i0–B 1;i1. One might think of the diphthong as an attempt to reproduce the slightly diphthongal quality of the standard oU. In a great majority of examples, however, no such attempt appeared at any stage and the diphthong is also found for the non-diphthongal o: (21). The diphthong belongs to the earlier, experimental stage rather than to that of improved pronunciation, as the development of blow shows. The fixation of a more imperfect pronunciation in soap has enough parallels; it does not invalidate the assumption (cf. also 462).

46. Looking back over the irregular representations of German and English o, we find that the shifts to a higher vowel ceased entirely after 1;i0. The only exception is closed 1;i1, which is for that reason a suspicious etyom. The shifts to a slightly lower vowel persisted longer, new words with o still appearing at 1;i1; in most examples, however, they were carry-overs from earlier stages in words which had become temporarily fixed in form. The earliest occurrence of o is 1;i5 (hello).

The correct o appeared as early as 1;0 in *oh and *Opa; at 1;i6 in *snow; more or less regularly from 1;i0.

47. Unstressed o and oU varied within the same range. Since un-
stressed vowels receive less attention, it is not surprising to find that they tended less clearly toward representation by the standard sound.

The only word which is recorded exclusively with o is *cocoa 1;8; Hildegard used it, however, only for a few days, and the unstressed vowel was supported by assimilation to the stressed one in the reduplicated form which the word happens to have. Dodo 1;6, a name with reduplication, had in both syllables o more frequently than o (o even at 2;1).

Further lowering and fronting to a occurred in *radio 1;10, to a, a in pillow 1;11.29 a was the first substitute in Auto, auto at 1;5, supported by assimilation to the stressed vowel, which at that time had the form a (439). From 1;7 on (still at 2;1) the second vowel was o or o, with o prevailing. This o intruded also into automobile 1;11 by analogy; the presentation had no o in the second syllable, but o (84 and 87).

Raising to u is recorded in *wheelbarrow 1;11, where the vowel formed a diphthong with the a of the preceding syllable; but o might just as well have been used as the transcription, the acoustic effect of ao being practically the same as that of au. I do not trust the accuracy of my diary transcription to the extent of claiming an actual raising of the tongue as far as u.

The o remained entirely unrepresented in the monosyllabic rendering of piano 1;11–2;0 (and in the middle syllable of Leopold 2;1;30 for an un-stressed middle syllable this was to be expected).

48. The next higher front vowel is i. The fine adjustment of the tongue is more difficult on the high levels than on the lower ones, at least for a child, who learns to articulate low vowels earlier than high ones. Yet, the representation of the high vowels was not less accurate. The effort required for the articulation made for greater carefulness. No separation of English and German is needed. Nor was the fate of i before a nasal different from that of i in other configurations; since only low vowels were sometimes affected by a following nasal consonant, this note is not repeated for every higher vowel.

49. i was normally rendered correctly, in a great number of English and German examples. English: big (frequent word) 1;8, *spill 1;11, pick 1;9, drink 1;10, stick 1;10, *mitten 1;5–10 (2;1; the vowel was short, half-long, or long), ring 1;11, fix 1;11. English and German: *Mickey mouse 1;10. German: dicken 1;10, *klingelingeling 1;5, *mit 1;8–10 (vowel half-long 1;8, short 1;9–10), *kritze 1;1–4, Fritschen 1;8. In addition it was the regular sound in a number of words in which variations occurred.

29 Karla had o in the second syllable of this word, and this vowel intruded, by anticipation, also into the stressed syllable, 1;11. Yellow B 1;10 had o, with no influence on the stressed vowel.

30 Karla's form (h)apo 1;10 contained a stressed vowel which seems to be a compromise between e and o.
50. The variations consisted, as was to be expected, of inaccurate adjustments of the tongue position. The tongue was frequently raised a little too high, sometimes not quite high enough.

51. Raising to i was the most frequent occurrence. German *Bild, which never acquired the final consonants, had regularly i of varying length, o;ö, E i;3, i;4, and perhaps i;8. From E o;iı to the turn of i;o/ i;i, the vowel was y, which can pass as a variant of i with the lip-rounding carried over from the bilabial b as an assimilation; the vowel was whispered at that stage. At E o;iı the tongue was raised so high that the whispered y resembled a fricative; later it was more clearly an y (cf. pieks, 63). *Wischen had the correct i at i;8, but i at i;iı. Similarly, at a much earlier stage, *bimbam, without the nasal consonants, contained i at i;i, but i B i;2 (Finger 2;i had i).

In English words, only i was heard in pillow i;iı (string and fishes 2;i). Kiss had regularly i i;iı-2;i, but it is once i;iı recorded with i. The first record, B i;iı, states that the i was fairly high, “almost i,” a fact which emphasizes the lack of significance of the imperfect adjustment of the tongue reflected in the various cases of “substitution” of i for i. Sticky i;7 had usually i, favored by the quality of the unstressed vowel; the word had then the form of an exact reduplication. At i;iı, when the final vowel was omitted, the correct i was used. *Kitty had i at i;3, i at i;10 and i;iı; reduplication was perfect at i;3, given up for the vowels at i;10, for the consonants as well at i;iı; the word was steadily moving toward its standard form without reaching it completely. (The verb ring, which lacked the nasal, had i during i;iı, but lapsed into the less perfect i at 2;i.)

52. Lowering of the vowel was less frequent, which seems to testify to the fact that the child made an effort to raise the tongue correctly and ended more often by raising it a little too high.

The very frequent word this i;8 always contained i correctly; but once i;iı it is registered with e, in a somewhat doubtful example (and once i;iı with i; but in this case, German dies may have been the model). In milk, Milch i;6, i was usually correct; once i;9 a short e is listed, again in a case where the interpretation was not quite certain.

The adverb in i;10 contained e and even e at i;iı (and 2;i), only e i;iı. The form was however distorted by child etymology; it suffered interference from ätsch in the consonant as well. Still, the blend might not have taken place if the substitute sounds had not been felt to be a fairly satisfactory rendering of the standard sounds.

31 In Karla's curious form of pillow, pot'o i;iı, the stressed vowel was assimilated to the unstressed one.
32 The word appears in vol. 1, p. 73 with i because this happened to be the last recorded occurrence in the second year.
33 Vol. 1, p. 56, first line. The “relative nearness of e to i” (Kenyon 83, note 40) makes this transition natural; cf. also Viętor 55.
There remain some words in which \( i \) was used by the child, but also other vowels which cannot always be explained as due to minor deviations from the correct position of the tongue.

There is the very early and frequent word *pretty* B 0;10. Hildegard usually pronounced it in whispered form 0;10–1;8. The first vowel was ə; \( i \) was achieved soon for the first time, E 0;10. The vowel was often missing, \( r \) being replaced by syllabic r or the related fricatives ζ, ʃ, ʒ 0;10–E 0;11. It took the form ɪ and ə 1;0; and B 1;3; it was ɪ, ə, or missing B 1;4; regularly ɪ, whispered ɪ;4–8, aloud from ɪ;9. Thus, the variants were restricted to the earlier months, 0;10–B 1;4, receding more and more before the correct ɪ. The pronunciation with syllabic r was probably not heard from the speakers, mostly educated, from whom she learned the word, but it has a parallel in a common popular pronunciation which, in ordinary spelling, is frequently reproduced as “purity.”

ə may be based on actually presented forms in rapid articulation; the ɪ is commonly so short that it may, at least acoustically, often appear as ə. Even if these replacements should not be based on any form heard by the child, their occurrence in the early months would be quite understandable as comparatively slight inaccuracies.

In *Ticktack*, *tick-tock*, another early word, the first syllable was omitted altogether at the first occurrence E 0;11 and again, as a freak variant, at ɪ;7; at E 0;11 and B 1;0, forms lacking both vowels were heard among others. Otherwise the vowel was regularly ɪ from E 0;11, always whispered to ɪ;7, then also aloud upon request, and spontaneously aloud from ɪ;8. Of course, forms without the first syllable or its vowel were never presented; they are early failures in the groping attempt to reproduce what was heard; the importance of the word made it emerge from passivity before the child was quite able to cope with it.

Her own name, *Hildegard*, started with ɪ B 1;11, but had thereafter always ə or ai (only əi 2;0–1); the ɪ of ai might be an effect of the following ɪ (see 200; other explanations are suggested vol. 1, p. 87).

The greatest variations occurred in the exceedingly frequent word *bitte* 1;5. The normal representation of the stressed vowel was ɪ from the very beginning E 1;5; but, especially at ɪ;7 and ɪ;8, considerable deviations from the norm were also observed. The vowel was lowered to ɛ ɪ;7 and even to æ, æː ɪ;8, but never as far as ə. It was never raised to iː but instead there occurred, repeatedly at ɪ;7 and ɪ;8, a shift from ɪ to the equally high back vowel ʊ, an unusual phenomenon, which was not favored by the surrounding sounds (292). The greatest variation was that to ai, recorded once ɪ;7, which is comparable to the same diphthong

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24 Kenyon records it as an “unstressed form,” 137, p. 106. Karla said budi around ɪ;8; the ʊ seems to point to syllabic r.

25 The transcription with ɪ, vol. 1, p. 57, line 18, is a misprint.

26 The substitution of o for æ (31) is comparable, but less surprising on account of the complex articulation of æ.
in Hildegard above. The lowered vowels are inaccurate articulations. 
\textit{ai} might be due to a severe inaccuracy, \textit{a}, immediately corrected by the 
addition of \textit{i}. \textit{u} might be due to the desire to create a stronger contrast 
between the vowels of the two syllables, the second having \textit{a}, \textit{ae}, or \textit{e} at 
that stage; such a tendency would however be exceptional. After \textit{1;8} the 
vowel became more stable. The recurrence of \textit{1;10} was probably no 
longer a physiological inaccuracy, but an assimilation to the second syllable, 
which had \textit{e} at that time.

54. Unstressed \textit{1} was also rendered by \textit{i} and \textit{i}. It usually came to stand 
in final position and was more commonly raised to \textit{i}, which here tended to 
be the normal representation. The correct \textit{1} was used in *Augenblick 
\textit{1;7–11} (but once \textit{1;11} recorded with \textit{i}), pudding \textit{1;11} (but \textit{i} 2;1), and 
ring (pretonic in ring bell) \textit{1;11} (but \textit{i} 2;1). \textit{i} is attested in stocking \textit{1;7}, 
Bleisift \textit{1;6} (vowel short at first; once \textit{1;7} raised still higher, practically 
\textit{j}), *da ist es \textit{1;4–5} (with stress on the first word) \textit{1;5} also \textit{i}, *snowing 
\textit{1;8}, \textit{1;10}, *Liebling \textit{1;11} (but the word was not regular) (schmutzig 2;1).

If the instances of d\textit{t}to, d\textit{f}fo \textit{1;11} (vol. \textit{1}, p. 75) really stand for \textit{this is}, 
the substitute would here be \textit{a}; the weakening might have occurred in 
the standard model, as far as the vowel is concerned.

Semi-consonantal pretonic \textit{1} in \textit{piano} \textit{1;11} was missing; \textit{pl} was treated 
like the consonant combination \textit{pl} (107). It was also suppressed in 
*radio \textit{1;10}. (In a pretonic syllable, \textit{i} became \textit{a} in Milwaukee 2;1, a pro-
nunciation which may well have occurred among the presentations. 
Before this stage, the pretonic syllable was omitted in this word, as com-
monly in others.)

The only irregular representation of \textit{1} with reduced stress would be \textit{u} 
in handkerchief \textit{1;10}; for that reason, it is rejected as the etymon of 
\textit{haftzu}, which should, in spite of the meaning, be traced to Handtuch 
and Handschu (vol. \textit{1}, p. 8q).

55. \textit{v}, the corresponding vowel in the back range, was treated simi-
larly. Here too the tongue was raised a little too high, to \textit{u}, as fre-
quently as it assumed the correct position. No such raised pronunciation, 
which does occur in dialectal varieties of standard German, was pre-
sented to the child.

56. Only the correct \textit{u} occurred in *bums \textit{1;9} (but \textit{u}: in the interjec-
tion *bu:: for thunder, \textit{1;11}, which was probably developed from the 
same word), Schnucks \textit{1;10}, put \textit{1;11}, pudding \textit{1;11} (but \textit{u} 2;1), push \textit{1;10}.

57. Only \textit{u} was observed in *Butler \textit{1;9}, *Zunge \textit{1;11}, *Kuss \textit{1;11},

*iutscht \textit{1;10} (schmutzig 2;1).

58. Both \textit{u} and \textit{u} occurred in kaputt \textit{1;10} (\textit{u} more frequently, but also 
\textit{u}, early and late) and cookie(s) \textit{1;10} (\textit{u} \textit{1;10} and 2;1, \textit{u} \textit{1;11}; earlier, \textit{1;6–10}, 
the vowel of the first syllable was assimilated to that of the second, 
which resulted in a reduplicated form).

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\textsuperscript{7} The transcription d\textit{u}f, vol. \textit{1}, p. 79, line 2 from bottom, should be corrected into d\textit{u}f.
59. Besides, there are a few instances of lowering. In book, we find u 1;6–8 and i, u i, 8–10, and o in the last form, i, i. The alternation between u and u proves nothing with regard to the prototype; both vowels could stand equally well for German u in Buch and English u in book, but the late o is more convincingly explained as a lowering of English u, English being predominant at that stage. During 1;6–9, the final u or u usually had a faint or strong off-glide x.

Dunkel had, in the earliest experimental reduplicated forms E 1;8, both u and the much lowered vowel e. On the first day of 1;9, the reduplication was given up for the consonants, but continued for the vowels, e. From 1;10, the stressed vowel was invariably u (A strange lowering and fronting at the same time appeared in look 2;1, which was fixed as hek, he:k.)

60. u with weak stress occurred only in *pocketbook 1;8 as u (2;1, in a more perfect form of the word, as u).

61. The highest front vowel, i, was quite regularly rendered correctly, in numerous examples. There were very few deviations.

English i was reproduced without change in *I see you 1;5 (second word), automobile 1;11, peas 1;10, please 1;9, piece 1;11, beach 1;11, beads 1;9, dear 1;11, *streetcar once 1;11, Theresa 1;11, eat 1;10, me *1;4, 1;11, *measles 1;10, meat 1;10, knee 1;7, three 1;10, read 1;11, feed 1;11, *wheelbarrow 1;11, feet 1;10, Rita 1;5.

German i was imitated correctly in Automobil 1;11, spielen 1;11, Brief 1;11, *dies once 1;11, *Miesi 1;11, Knie 1;7, *piep-piep o;11 (both vowels), *kiek i;1, i;3, *Liebling 1;11, *Spiegel 1;8 (vier 2;1, Wiedersehen 2;1).

62. Lowering to i took place consistently only in one word, here, hier 1;9. The following r (not reproduced by the child) may have something to do with this, but the standard English lowering to r described by Krapp (167) and Kenyon (357, 377 f.) is not regular in our part of the country. i occurred in peekaboo at 1;8 (ii), but i was used at *1;4 and E 1;11. Wheel had i: at 1;8, but i 1;10-2;1.

63. In a few words, greater irregularities occurred. The vowel was further lowered to e in ear 1;8, again before (omitted) r, but was i 1;11. (Notice that dear 1;11 had only i.) It was rounded to approximately y in pieks *E i;1, which means a persistence of the bilabial articulation of the preceding consonant, exactly as, a little earlier, in *Bild (51); at 1;11, the vowel of pieks was correct. The entire stressed syllable was, rather surprisingly, omitted in *Zwieback 1;9. The stressed second vowel of Papier 1;8 found no representation at all; her word must be traced to paper; it is mentioned here only because there were signs of interference by the German word at the earliest stage.

64. Unstressed i was frequent in the common English endings “-y,”

38 Holmes (p. 221) observed bur:k: for English book at 1;6.
39 Cf. Kenyon’s remark about the “relative nearness of . . . o to u,” 83, note 40.
40 Therefore Karla’s vowel in the same word was prevalently i.
"-ey," "-ie," etc. In agreement with the Midwestern American pronunciation, Hildegard had regularly i: alley 1;11, baby B 1;2, candy 1;10, *kitty 1;3, 1;10, 1;11, Joey 1;7, doggie 1;11, hotley 1;10, Mickey 1;10, cookie(s) 1;6, Milwaukee 1;8 (mammy 2;1); similarly German *Miezi 1;11.

65. i was also imitated accurately in disyllabic words having i with reduced stress in the second syllable: ice-cream 1;11, *oatmeal once 1;11. Some of the instances of me 1;11 had already reduced stress when it was used as object after verbs; the form did not differ from me with full or secondary stress. Read 1;11, always in the combination "read (a) book," with reduced stress in pretonic position, also had i.

66. A number of words ending in i lost the consonant separating it from the preceding stressed vowel. The resulting diphthong did not always preserve the high position of i, but lowered it, by a slight assimilation, to a. ai going back to a standard diphthong was not distinguished from the secondary diphthong developed in the child's speech. Buggy had at the start, B 1;6, the reduplicative consonant b replacing g, which kept the two vowels apart; but from 1;10 the g was, as usually, unrepresented and the word was fixed with the diphthong ar. Dolly was disyllabic and had i at 1;6; from 1;7 on, the i was lowered to i; from 1;8 it often formed a diphthong with the preceding a, which varied in length. Throughout the later months, the word varied between forms with a clear short diphthong and others which gave the impression of a disyllabic word. The latter type prevailed; the I remained always unrepresented. Money 1;11 was always mai, even in the combination mai mai, my money. Naughty, at first reproduced from the reduplicated presentation "naughty naughty," dropped the second syllables at 1;5. At 1;7, the two syllables were contracted into one with the diphthong ar; but at 1;11 the disyllabic form with ai was reached (which continued 2;0).

67. In two words, the final i suffered in part irregular treatment. Sticky had the regular i at 1;7, but lacked the second vowel altogether at 1;11, which meant a dissimilation unless some other (unrecognized) word interfered. Pretty, being a very early word, rather naturally showed some irregularities at first; it had i from the beginning, B 0;10, 0;9.
but it also sometimes lacked the vowel during the first month or lowered it to \( i, E o ; i i \) and \( B i ; o \).

68. *Miau, meow* had, in the pretonic syllable, \( i r; 8-2 ; i \), but from \( E r; 8 \) to the second half of \( r; i i \) usually \( e \). This lowering was, however, not simply a physiological inaccuracy, but was caused by interference of the word *mehr*.

69. *y* occurred only in *Füsse r; ii*. It was unrounded to \( i \).\(^{44}\) Short \( y \), as in "hübsch," was not tried at all.

70. The high back vowel \( u \) was usually rendered correctly: *Blumen i; o, i; 7, i; ii, balloon i; 10, pooh i; ii, *June i; 8, too i; 10, do i; ii, *Kuchen i; 10, room i; ii, muh, moo *i; 2, i; 7, new i; ii, two i; 10, through i; ii, toothbrush *i; 6, i; 10, *hoohoo, huku i; 5-6, Fuss i; ii (use 2; 0, you, your 2; i).\(^{46}\)

71. Sometimes it was lowered to \( u \), but in no word regularly so. *Peekaboo* lacked the last syllable at *i; 4, had \( u \) at i; 8, but developed \( u \) toward the end of the period. *Juice* had \( u \ i; 7 \) and \( u \ i; 7-11. Zu i; ii \) had \( u \) at the first occurrence, later \( u \). *Spoon* had \( u \) *r; 7, u* from i; 0. *Buch* had \( u \) *i; 6-11 and u* i; 8-11, also o i; ii; but it is blended with English *book*, for which \( u \) is standard and \( o \) more easily explainable. During i; 6-9, the final \( u \) or \( u \) usually had an off-glide \( X \) of varying intensity in this word.

72. Further lowering to \( o \) is attested in only one word aside from *Buch*, namely *poor i; 10*. At B i; ii, the standard \( u \) was reached without transition.

73. In the early stages, the vowel was sometimes missing. In addition to *peekaboo* *i; 4 (71), this happened in pooh *i; 2-4 (u 1; ii). In choo-choo, the later vowelless forms i; 8 and i; 10 were probably based on similar vowelless variant presentations of an onomatopoetic character; normally the word had \( u \) in both syllables from i; 7. *Schuh, shoe* also began with a form lacking the vowel, i; 6-7 (383).

74. This latter word showed the greatest irregularities. After the \( f \) stage i; 6-7, its form was *i; 7, i; 7*, the vowel being prothetic to the alveolopalatal fricative. At i; 8 the prothetic vowel was placed behind the fricative, \( i \) or \( i \) taking the place of standard \( u \) (181). On the last day of i; 8, it was replaced by the back vowel \( u \), and thereafter only the correct \( u \) was used.

The ephemeral *huch*, which occurred only once i; 7, with the irregular diphthong \( o u \), does not warrant detailed consideration.

75. *u* with weak stress was \( u \) in *Handschtuh i; 10, sun-suit i; ii, choo-choo i; 7* (with the same occasional omission as in the stressed syllable, 73), and *hoohoo, huku i; 5-6. The \( u \) of *Taschtuch i; 10-ii* was also correct; but her word came formally rather from *Handtuch* and *Handschtuh* earlier, *i; 7*, the second syllable was distorted by blending. For *peekaboo*, see 71.

\(^{44}\) Karla replaced \( y \) instead by back \( u \), retaining the lip-rounding, in *Tür su*, after i; 4.

\(^{46}\) The fronting of \( u \) after \( j \), described by Kenyon 341 ff., can be disregarded in this record.
New York 1;11 assimilated the first vowel to the second in quality, o, not in quantity (short).

*Gertrud(e) 1;1 never had the correct vowel in the second syllable, but a or i. At that early stage, this inaccuracy is not surprising. The same holds true for the early *I see you 1;5, with u weakened to e. The maid, from whom she learned the sentence in a game, may even have used the same weakened vowel in the presentation.

76. Looking back over the various representations of u, we find that omission occurred from 1;2 to 1;7 (eliminating choo-choo), u from 1;7 to 1;11, and u from 1;10 on (*Blumen). u prevailed definitely from 1;8 on, becoming frequent at 1;7. The o of poor at 1;10 is an irregular lowering due to the following r, just as in a Southern British standard pronunciation; but it was not heard in the presentation and therefore did not last (nor did it appear at all in the later your, 2;1).

77. The only vowels which remain to be considered are the “neutral” vowels, or those which are more or less indifferent with regard to the positions high/low and front/back, being articulated centrally with regard to both principles of classification. There is no need, for the purposes of this study, to discuss their exact position.

78. The stressed vowel a is classified by phoneticians describing American English as a central vowel.46 Hildegard regularly lowered it to a: up, frequent from B 1;4, buggy 1;6, button 1;10 (-2;1; B 1;11 once e, assimilated to the vowel of the second syllable), cover 1;11, duck 1;6, sun-suit 1;11, money 1;11, much 1;9. *Other had a: 1;7 (hug, a 2;1).47

A with secondary stress in toothbrush *1;6, 1;10 always became a (for brush, see 79). In *powder-puff 1;11 the syllable with secondary stress was suppressed.

79. There are only two words in which the vowel was not always a. In bug 1;11, it was a at first; but toward the end of the month, the vowel was raised and retracted to o. This looks like a first attempt at improved articulation; but it remained isolated for months to come. In the early word brush, the vowel of the first imperfect form was o E 1;5, which is not far from the correct articulation; but from B 1;6, short a became regular in this word too. Once M 1;6 it was transcribed a; this should be disregarded, since the substitute sound for a was front a in all other instances.

80. While a occurs only in English stressed syllables, the related o is an extremely frequent sound in English and German unstressed ones,

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46 Kenyon 323.
47 Karla also used a most commonly; tummy B 1;9, up 1;7–B 1;10, buggy B 1;10, button 1;7–E 1;9, duck 1;6; but a was used in transcribing her forms of bus B 1;9, cover up E 1;10, sun-suit B 1;11, one 1;11. Other with o in both syllables was irregular. Brush had irregular u, u, u at a very early stage, M 1;4–B 1;5; later the normal a appeared and returned also at 1;10, after a period of interference by another word. Butter had a B 1;10, but raised o in both syllables later 1;10. Come and coming are transcribed with a at 1;9, but also with a at 1;11.
particularly in English, where all unstressed vowels can be reduced to \( \varepsilon \) and most of them are so reduced regularly.

81. Here arises the difficult question whether words ending in “-el,” “-en” (English also “le” and “-on”), “-er” were presented with \( \varepsilon \) or with syllabic consonants. A word like English “open,” for instance, can be pronounced, in different types of pronunciation, as \textit{open}, \textit{opn}, or \textit{opm}, and all three types of pronunciation may have actually occurred at different times in the presentation. Besides, the preceding consonant has an influence on the presence or absence of an \( \varepsilon \).\footnote{Cf. Kenyon 87-92.} In order to avoid a complication of the picture which would be unbearable for a study of this character, I choose in such instances the intermediate type of pronunciation with syllabic consonant (type \textit{opn}). Thus, the endings “-el” and “-en” will be found discussed under the syllabic consonants \( l \) and \( n \) (191 and 151). American \( -j \), however, is judged to be a vowel rather than a consonant, and will be treated as the last vowel in this chapter (90). German “-er,” finally, contains in my colloquial pronunciation\footnote{Cf. Viétor 48, note 3 and 67, note 5.} no \( r \) at all, but consists only of a fronted variety of \( \varepsilon \) approaching a brief and muffled \( \varepsilon \) or \( \text{ae} \).\footnote{Cf. Trager and Bloch 7. They even group certain varieties of English \( \varepsilon \) phonetically and phonemically with \( \varepsilon \).} It alone will be included here under \( \varepsilon \), but segregated from other examples (88). Final consonantal \( r \) is likewise slurred into a faint \( \varepsilon \) in my northern German colloquial pronunciation; for practical reasons it is, however, discussed together with English \( -r \) (210).

82. In the majority of instances, \( \varepsilon \) was rendered correctly. Lowering to \( \varepsilon \), as in the case of the stressed \( \lambda \), occurred too. In addition, there is a considerable number of examples in which the vowel remained unrepresented, which is readily understandable because lack of stress and low sonority combined to draw the attention of the child away from unstressed syllables in favor of the stressed ones. Fronting to \( \varepsilon \) took place in some German words, but in none as the exclusive substitution. Other vowels which occurred must be traced to assimilation or blending.

83. The correct \( \varepsilon \) appeared in German \textit{alle} 1;7, \textit{backe} 1;11, \textit{*hacke} 1;11, \textit{*meine} 1;7, \textit{*kritte} 1;1-4, and in English \textit{*pocket} 1;10. In pretonic position, that is, in first and middle syllables, it is attested in English \textit{peekaboo} 1;8 (but \textit{*i};4, 1;8-11 also with omitted \( \varepsilon \)), \textit{*of} 1;11 (just as often omitted), \textit{*a} 1;11 (also \( \varepsilon \), both of very doubtful interpretation; at 2;1, the indefinite article existed, but was rare even then), \textit{away} 1;8 (along with \( \varepsilon \) and omission), \textit{hello} 1;5-10 (omitted 1;10-2;1), \textit{rock-a-by}, \textit{baby} 1;11.

In the exceedingly frequent German \textit{bitte} 1;5, \( \varepsilon \) was used correctly 1;8-11. The word always had two syllables, but both vowels varied considerably. The second vowel was most commonly \( \varepsilon \), 1;5-7, \( \varepsilon \) 1;8-10; during 1;5-7 it was still unstable; variations from short \( i \) to \( \varepsilon \) occurred.
e continued to compete with a to the end of the period. Both æ and e should be explained as due to emphatic forms presented; in this word, which was as a rule used in isolation, the vowel can assume similar fronted forms in the standard. For the same reason, e occurred also in alle at i;9–10, modified to a sound resembling œ or a at i;11.

84. The a was missing with the whole final syllable in English *banana, once i;11, Mary Alice i;11 and in German *Auge once i;7, *Zunge i;11, *Banane, once i;11. The whole second syllable was lost in Nackedei i;6. It was likewise unrepresented at the end of German danke at *i;1, *Hase i;8, *Tasche i;10, *Füsse i;11, perhaps Schuhe i;11. Only the first syllable of *andere was reproduced, once i;7. The a in the second syllable of automobile i;11 was displaced in consequence of a blend (87); the third syllable dropped out.

The a was never represented in Florence i;11 (–2;0). It is almost absorbed by the preceding r in rapid colloquial pronunciation. If the possessive Florence's goes back to the inflected form rather than to the undifferentiated basis, the a of the third syllable was also omitted (177).

English washes i;8 and i;11 and fixes i;11, which really lacked the endings, should be treated as verb-stems without personal endings.

Unrepresented pretonic a occurred in Hildegard i;11–2;1; in German *klingelingeling i;5, in which only the stressed syllables were reproduced; and in English *aboard i;10, balloon i;10 (always contracted into one syllable; in careless colloquial pronunciation the a practically disappears), *of i;11 (also a), away i;6 (but also with a, a from i;8; missing especially after vowels, as late as 2;1), hello at i;10–2;1 (a i;5–10), *banana, once i;11, peekaboo *i;4, i;8 (along with a from i;8), rock-a-by, baby i;10 (a i;11).

85. Fronting to e occurred, in addition to some German words ending in “-er” (88), in German alle at i;9–10 and bitte at i;8–11 (83). At an earlier stage, i;5–7, the latter word had most commonly æ, and this lower vowel was the nearest approach to the standard in the very early *Tante i;11. Otherwise, the latter word had a in a perfectly reduplicated form, so that the vowel of the second syllable had better not be considered a substitute for a. In alle, æ was sometimes rounded to œ at i;11. *Da ist es i;5, with e for a (30), can also be listed here.

86. Lowering to a was not observed often. There is a clear example in the pretonic syllable of away, for which a variant with a is recorded once at i;10. Cf. also bitte (83) at i;5–7. The ephemeral experimental disyllabic form for soap, which occurred at i;10 with a in the second syllable, might be traced to interference of German Seife; but this is very doubtful. If *haba i;11 really comes from hoppe, it is another instance of

41 Karla omitted a in orange B i;10; since the r was also lost (208, note), the word became a monosyllable. The same thing happened to Florence at i;8, but at i;9 the a was reproduced, while r was still missing. Later she used the diminutive Florencie, which lacked the a again, E i;9–11; it had two instead of three syllables.
a for η; but this again is uncertain. The other instances concern German “-er” (88). I exclude cases of reduplication like dada for German danke, where the second a cannot be interpreted as an attempt to render η. Concerning v > a in Theresa 1;11, see 14.

87. There remain some examples of i and o for η, which are however not normal substitutes. *Kimona 1;9–10 had first o, later i in the last syllable (the pretonic syllable was omitted). The o, not based on the standard dictionary form ending in “-o,” which the child did not hear, was due to assimilation to the vowel of the stressed syllable. The i represents a blend with the name Joey, with which it was combined. The o in the second syllable of automobile 1;11 was due to the influence of Auto 1;5. (At E 2;1, fisheς displayed an i in the plural ending; it was also due to assimilation, if not to blending; see vol. 1, p. 138, top.)

i in the second syllable of *Alex 1;11, her form consisting merely of two vowels, seems irregular; the neighboring sounds l, k, and s all have, however, some affinity to i, and a purely formal analogy with alley is probably involved (457).

88. The German ending “-er,” as explained in 81, is treated separately. On account of its somewhat greater sonority, we find it omitted in only two words; otherwise it was represented by ε, e (and η). One instance of o is the result of assimilation (likewise one of i at 2;1).

In *Butter, only once 1;9, and *donner(i), once 1;11, the whole second syllable remained unrepresented.

The representation was η in *klapper(t), once 1;11, and *weisser, once 1;9. (For *donner(i) and *klappert, see also 211.)

It was ε in dicker 1;10, frequently, but became η 1;11. It is hard to decide whether dicker or dicken was the model, or both. She heard sentences like “Wer hat einen dicken Bauch?” as often as others of the type, “Wo ist dein dicker Bauch?” Final syllables can also result in ε (151).

ε for “-er” is supported by one form of *Löschner 1,11; the other form assimilated the final vowel to the stressed one, o.

(Lowering to a occurred after the two-year limit in Finger 2;1, which could also be English, and in Peter 2;0. The one attempt to say Peter 1;11 resulted in a substitution of the word baby, vol. 1, pp. 53 and 117. In Wiedersehen 2;1 the middle syllable had i, due to assimilation to the vowel with main stress.)

89. Stressed r, in ordinary spelling “er, ir, ur,” etc., is classified as a vowel, because its consonant characteristics are, in the actual pronunciation, of secondary importance. No detailed discussion of its formation is needed for the purposes of this study. The sound is common in standard American English, cf. such every-day words as “her,” “bird,” “dirt,”

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82 Karla had η in Butter 1;10; ε, later η, in Wiedersehen 1;1; omission of second syllable in Peter 1;10.

84 Cf. Kenyon 179; also Kurath, p. 128. For a different view, see Krapp 67 and Viétor 68, note 1.
“shirt,” “hurt,” “heard.” Hildegard never attempted any of these words during the first two years, which seems to testify to the fact that the sound appeared difficult to her and was therefore avoided.\textsuperscript{64}

The name *Gertrud 1;1 was usually presented with the German vowel \varepsilon; but once \varkappa: was heard, which points to English *Gertrude. The only other occurrence was nine months later in the word church 1;10, which was frequently used during the last two months in a nursery rhyme, always with u for r. The necessity of raising the tongue to produce the vowel was recognized, but executed incorrectly, in a simplified manner. Since the standard vowel is neither a front nor a back vowel, it did not fit in the simplified contrast pattern or early child speech and was therefore shifted to one of the established positions.

\textbf{90.} Words with unstressed \textipa{r} in final position were attempted more frequently, because the child worried less about her ability to reproduce unstressed syllables; her attention was concentrated on stressed syllables. The second syllable remained unrepresented in cover 1;11, flower 1;11,\textsuperscript{65} and *other once 1;7 (unless the latter was based on German andere).

\textit{Water} started 1;7 with the forms \textipa{wa}, \textipa{wə}, \textipa{wə}. The second vowel was short \textipa{ə} at 1;8 and, after a pause of inactivity, always \textipa{u} at 1;11. The word, however, did not evolve regularly; it was influenced by \textit{bottle} (138).

The same \textipa{u} was fixed in \textit{paper} from 1;8, with a variant \textipa{v} at 1;10. The child was so confident about the high vowel character of the second syllable that she even extended it to the first syllable in a reduplicated word-form, from 1;10.\textsuperscript{66}

Obviously then, \textipa{u} tended to become the regular substitute for -\textipa{t}, although the final vowel remained often unrepresented to the end of the period. Notice that this is the same substitution as that used for the stressed vowel \textipa{r} in the only word in which it was attempted at the later stage (86).

\textipa{a} appeared in \textit{cracker} 1;7; but the word had reduplicated form, and the final vowel was assimilated to the stressed one. (\textit{Finger} 2;1, with \textipa{a}, could be English or German.)

\textbf{Diphthongs}

\textbf{91.} The diphthongs to be treated here are \textipa{ai}, \textipa{au}, and \textipa{oi}. The diphthongal character of English \textipa{e}_1, \textipa{o}_1 is so slight in general American that

\begin{itemize}
  \item \textsuperscript{64} Karla, who was less cautious with regard to difficult sounds, used it, substituting \textipa{oο} in \textit{hurt} 1;10 (vol. \textit{I}, p. 136, note 286). In \textit{purple} B 1;10 and \textit{dirty} B 1;11 she used \textipa{aι}.
  \item \textsuperscript{65} \textit{Flower} is a two-syllable word according to Krapp 160. Kenyon (353 f.) says it wavers between disyllabic and monosyllabic pronunciation. Cf. 210 below.
  \item \textsuperscript{66} Karla’s form \textipa{çuku} for \textit{sugar} 1;10 confirms the substitution \textipa{f > u} (\textit{perpu} 2;2). In \textit{butter}, \textipa{boda} 1;10, the vowel of the second syllable was assimilated to the stressed vowel (earlier \textipa{a}). She omitted the entire second syllable in \textit{cover up} E 1;10 (by haplology), \textit{water} E 1;10-11, \textit{paper} 1;7-8 (a much garbled form). She had a in reduplicative \textit{cracker} 1;4, 6 by assimilation to the stressed vowel in \textit{other} 1;11. \textipa{a} occurred in \textit{finger} 1;10 and \textit{butter}, early 1;10; the similar \textipa{a} in \textit{picture} E 1;10.
\end{itemize}
they have been discussed under the simple vowels (38–40, 43, 47). In combinations like ar, or, which Kenyon now treats as diphthongs, with good reasons, we retain the more conservative practice of considering r as a consonant.

92. From my observation of the diphthong ai as pronounced in the Illinois and Wisconsin region, I prefer this transcription to ai for English as well as German, although it must be admitted that the first element tends to be a more fronted vowel in American than in German. It is not an extreme variety in either language. Hildegard made no distinction between the two languages in rendering the diphthong. I transcribed her pronunciation uniformly as ai, which means that she generally began the articulation of the diphthong at a slightly more advanced point than in the standard pronunciation. The first element of the diphthong tends to be longer in English than in German; this was sometimes reflected in Hildegard’s pronunciation.

93. The child’s representation was ai in the overwhelming majority of instances.

German: ei 1;4, Ei 1;8, eins 1;11, Eis 1;7, *Eiskrem 1;9, *beissen 1;10, drei 1;10, heiss 1;5, mein 1;6, *nein 1;6–9 (also in the second syllable of nein, neinl 1;6–7), zwei 1;10 (also emphatically lengthened a1 1;11), *weisser once 1;9.

English: I 1;5, eye 1;7, ironing 1;8, all right 1;8, *buy 1;11, bike 1;11, bite 1;10, cry 1;10 (also a1 1;11), dry 1;10 (also a1 1;11), ride 1;8, *outside 1;9, high 1;11, high-chair 1;5, light 1;6, write 1;11, lie 1;11, slide 1;11, mine, my 1;6, nice 1;10, night 1;5 (also in the second syllable of nighttime 1;5–10), *knife 1;11, fly 1;11, *why 1;10, right 1;11 (hide 2;1, like 2;1, sidewalk 2;0; pie with ai 2;1).

94. In a few words, a was sometimes substituted for ai. By-by began 1;3 with whispered a in both syllables, developed whispered ai B 1;4 only in the second syllable, continued 1;4 aloud in the same form; ai in both syllables began 1;5 and was after that the most common form, but the dissimilation of the first syllable to a continued to occur (even as late as 2;1). Quite likely it was modeled on a similar simplification in rapid adult speech. At B 1;4, the stress was temporarily shifted on the second syllable. (The pronoun I 1;5 had ai quite regularly during the first two years, but also a at 2;1, a simplification which certainly has a model in careless adult pronunciation.) Ice-cream 1;11 began with ai, but soon became fixed with a as a result of dissimilation, which in this case had no adult prototype. Dissimilation from the following i is the obvious expla-

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67 Kenyon, in the older editions of his book (209 f.), also used the generalized transcription ai. He now uses ai without an essential change in the description. He states that “the variety ai is also frequent in the North” (331). Krapp (72 and 209 ff.) uses ai. Vítior (48 f.) uses ai for English and German, but describes (47, note 1) the a as neutral, with a slightly stronger affinity to the back vowels.

68 I have found “a” for “I” in letters as a slip of the pen reflecting the pronunciation.
nation; for the earlier German *Eiskrem 1:9, with e in the second syllable, always had the correct ai. Bleistift began with ai B 1:6, but had a consistently from 1:7; this can be explained by the same kind of dissimilation as in ice-cream; but in addition, the resulting form dadi was at that period a favorite form, in which a number of different words became merged. 89

95. Substitution of au occurred once 1:11 in I do, clearly a partial assimilation to the vowel of the verb.

The word Nackedei was dai 1:6, which looks like the third syllable reproduced alone; but from 1:7 dadi displayed an imperfect rendering of the final diphthong, which was due to the dadi merger just mentioned.

96. There is no clear example of unstressed ar (in I do there was a strong stress on I), except the early ephemeral *I see you 1:5, which had ar. Nein, nein and night-night had more or less level stress, although the intonation differed in the two components; these words have been treated in 93. By-by often had level stress, but sometimes, especially in "go by-by," weak stress on the last syllable. The child rendered this ar by ar or a (see 94). In *Carolyn 1:2–10, the ar was lost because the name was rendered in the form of a reduplication of the first syllable. 80

97. The picture for the diphthong au 81 is less simple. Usually au was rendered correctly, but there is a considerable number of words in which a was substituted. The diphthong is quite often transcribed with front a, but not so regularly as in the case of ar. The u favors the use of back o.

98. Only au and au are found in au 1:8 (au), Auge once 1:7 (au), *Augenblick 1:7–11 (always au), *powder-puff 1:11 (au), towel 1:10 (au), Haus, house 1:8 (always au, only once 1:8 au), mouth 1:10 (au), miau, meow 1:8 (always au, but au 2:1), flower 1:11 (au). au prevails over au; no distinction by languages can be established. Possibly the first vowel was often a medium a, less fronted, because of the following v, than in ar.

99. In the following words the diphthong was the same, but sometimes x was added at the end of word-forms terminating in au. If we remember that au is a simplified transcription for an unbroken glide from a low to a high-back position of the tongue, 82 the non-standard continuation of the glide to a point where only a narrow opening remained between the back of the tongue and the velum, is quite natural and must be considered a simple variant of au. It occurred also after simple final u and u (44, 59, 71). aux for au is found in auf 1:7–11 (au 1:6–9), aus, out 1:7–11 (au

89 Pavlovitch (54 f.) finds "a" at first, "ai" from 1:8, in final position earlier, 1:6.
80 Karla had ar in Mahlzeit 1:11 and outside E 1:10–11. In Hildegard's case the second syllable was stressed in the latter word (93); she lacked the former.
81 Krapp (73 and 222 ff.) uses the same transcription. Kenyon also used it in the older editions (211 f.), but changed it to au in the newer editions; he still states, however, that "many Americans" say au, even though they may use the front a in ar (335). Vietor (47–49) writes au, but he avoids a distinction between a and o for German and English.
82 Cf. Kenyon 201.
1;9-11; bau=en 1;9-11 (also auX; au, au 1;9-11), Baum 1;8-10 (au 1;8-11). The last word did not have the unconventional final consonant during the last month, but in all the others it continued to appear until the end of the period.

100. There is no word in which a was consistently substituted for au. It prevailed definitely, however, in down 1;4: a: 1;4, a:o B 1;5, a regularly B 1;7-2;1, with very short, short, or long vowel; at M 1;11, she once said dau and immediately “corrected” it into da, which proves that the memory of her own imperfect form was stronger for this well-established word than the effect of the form heard from the environment.

In other examples, an earlier a developed later into au: Bauch (a 1;6, a 1;8, au 1;10, au 1;10-2;0), Maus, mouse (a 1;8, a 1;10, au 1;11). Frau 1;7 had usually au, less frequently au, but once 1;8 a. One word, now 1;8, reversed the sequence; it began with au, but had a from 1;9. Since it always occurred in combinations like “now this,” it is likely that pretonic au was often reduced in the presentation itself; she learned this word from the maid.

The word Wauwau 1;1 presents a complicated picture. Hildegard developed it out of an interjection with a in both syllables and therefore continued a in the first form linked to this word. During 1;3 and 1;4, however, the vowels were u, based not on the standard form, but on my imitation of a dog’s barking. At E 1;4 they were i, which may be her own onomatopoetic modification. Finally at 1;6 the word fell in line with the normal development. The vowels were at first a, then very soon au, which remained stable from 1;6, varying only, quite frequently, to au.

The word Auto 1;5 had also a and au, but with a less clear development toward the diphthong. a, a was heard at 1;5-7, ao at 1;5, au at 1;7 and exclusively au at 1;8-10; but during 1;11, a appeared again alongside au, contrary to the regular development. This is of course due to the fact that, at the period of predominant English, the English auto, with its colloquially unrounded vowel, asserted itself again (cf. 21). (Automobile 1;11, with a, was also based on English, but had au always at 2;1 under the influence of the German word, or rather its shortened form, Auto.)

101. The first form of Maus, mouse 1;7 was ma?, a very unusual substitution. From 1;8, the word followed the regular course (100).

102. Unstressed au occurred in Wauwau; the vowels of the two syllables were always treated alike (cf. 100). In the presentation, the first syllable was often stressed when the word was used as a noun; as an imitation of barking, the second syllable was more likely to be emphasized; but this distinction was hardly carried out consistently, and it makes no difference for Hildegard’s form, which always had initial stress.

In *outside 1;9, the pretonic syllable was omitted.67

67 Karla’s hatar(d) E 1;10-11 was based on the standard variant pronunciation with stress on the first syllable.
103. \(\text{ei}\) was rendered more or less correctly. The transcription of Hildegard's diphthong was \(\text{ei}\) in \(\text{boy}\) 1;8 and \(\text{oil}\) 1;6.\(^4\) In \(\text{noise}\) it was the same at 1;10, but changed to \(\text{oi}\) at 1;11. An attempt to explain this variation is found in vol. 1 on p. 115. The nickname \(\text{Oino}\), based on \(\text{Onkel}\), became an etymon when the adults adopted it. It had \(\text{ei}\).

(German \(\text{ei}\), or \(\text{ey}\), did not occur until 2;1: \(\text{Neuyork}\). It was rendered faithfully by \(\text{ei}\). This was at the same time the only instance of un-stressed \(\text{ei}\). The diphthong \(\text{ui}\) in \(\text{pfui} \ast 1;2-4\) was omitted, but the etymon is dubious.)

Consonants

104. If we continued to observe the elevation of the tongue into positions higher than for \(\text{i}\) and \(\text{u}\), we should reach such consonants as \(\text{j}\), \(\text{ç}\), \(\text{x}\), and then stops like \(\text{g}\), \(\text{k}\). We shall arrange the consonants however in a more conventional order by following the places of articulation from front to back, subdividing each category by stop and continuant, voiceless and voiced articulation. Each consonant will be examined separately in initial, medial, and final position, and consonant combinations by themselves. Medial will mean between vowels or vowel-like consonants (nasals and liquids). Medial combinations are linguistically treated as a unit only when they belong to the same syllable. We shall sometimes deviate from this procedure when Hildegard's substitutions suggest the advisability of a different method. For example, words containing \(-\text{nk}-\) are better discussed together under medial \(\text{nk}\) than under final \(\text{g}\) and initial \(\text{k}\).

105. The bilabial voiceless stop \(\text{p}\) in initial position was, in spite of the aspiration it has in English and German, most commonly represented by \(\text{b}\): *\(\text{Paul} 1;8\), \(\text{piano} 1;11\) (\(-2;0\)), *\(\text{pocket} 1;10\), *\(\text{pocketbook} 1;8\) (\(-2;1\)), *\(\text{powder-puff} 1;11\), \(\text{pail} 1;11\), \(\text{peas} 1;10\), \(\text{pillow} 1;11\), \(\text{piece} 1;11\), \(\text{Papier} 1;8\), \(\text{push} 1;10\); also *\(\text{Opa} 1;0-1\) (\(\text{b}\) and \(\text{p}\)) and *\(\text{kaputt} 1;10\), in which the pretonic syllable was usually clipped off. *\(\text{Petticoat} 1;11\) had \(\text{b}\), but it was disturbed by child etymology.

Both unaspirated \(\text{p}\) and \(\text{b}\) occurred before the end of the second year in \(\text{Papa} 1;0\), \(\text{papa} 1;9\), *\(\text{patsch} 1;11\), *\(\text{peekaboo} 1;4\), 1;8, *\(\text{pieks} 1;11\), 1;11, *\(\text{poor} 1;10\), *\(\text{piep-piep} 0;11-1;9\). *\(\text{Papa}\) began E 1;0 in whispered articulation with a release of the closure energetic enough to be interpreted as \(\text{p}\) in both syllables. During 1;1 however, the explosion was gentler so that it was often transcribed as \(\text{b}\). From 1;2 the sound was consistently \(\text{b}\) in both syllables, unmistakably so from 1;3, when the whispered articulation had ceased. The form remained unchanged (except for playful variants B 1;4) beyond the end of the second year; but all during 1;11 forms with initial \(\text{p}\) appeared with increasing frequency alongside \(\text{baba}\), the \(\text{b}\) usually persisting even then in the medial position.

\(^4\) Pavlovitch (55) also reports “\(\text{qi}\)” as easily acquired 1;5, whereas Schultze (p. 37) states that “\(\text{eu, au}\)” was at first unrounded to “\(\text{ei}\)” (\(\text{ei}\)).
Pick generally had b, but at 1;10 p is also recorded. *Patsch occurred in combination with papa; either both words had p- or both b-. Peekaboo had b at *1;4 and 1;8; p occurred at the very end of the second year. Pieks had b at *E 1;1, p when it occurred again 1;11. Poor is registered with p at 1;10, with b at B 1;11 (again p B 2;0). *Piep-piep began E 0;11 with p, had voiceless B 1;3, p B 1;4, b 1;4, p 1;9. (At 2;1 the first element of peg-board was transcribed as pek, but at first misunderstood as big; the p was still unaspirated.)

Two words had always b, but reached the p stage soon after 2;0: put 1;11, pudding 1;11.

The word pooh had rudimentary form *1;2–4: aspirated p, or p followed by a bilabial fricative or vibrant, without a vowel. When, however, at 1;11 it was learned again in adjective function, it also yielded to the general pattern of representation; its initial consonant was b 1;11 (b and p 2;0–1). It was the only word in which initial aspirated p was ever used, but even here only syllabically. The name Peter (mentioned vol. 1, pp. 53 and 117) had b E 1;11 because of blending with baby (but p 2;0).

Concerning the irregular development of p- in Grandpa, see 120 and 222. The η appearing here is not a substitute for p, but a reduplicative repetition of initial η.68

106. Summarizing the situation, we find that Hildegard's regular substitute for initial p was b from the beginning of speaking to the end of the second year. Toward the end of the period, however, the correct p began to be used, earliest in *piep-piep 1;9, more frequently during 1;11. Not a single word had p consistently. (b continued for several months at the beginning of the third year, but yielded more and more to p.) The development was clearly about to reach the correct reproduction of the standard pronunciation, except for the aspiration, which was not yet added. The tendency toward assimilatory voicing (430) still interfered strongly, however.68

The fact that seven of the words involved appear in the alphabetical vocabulary (vol. 1, pp. 117–121) under p instead of b is accidental. It is

68 Karla, who reached a less infantile form for Grandpa, rendered mp incorrectly, because of reduplicative assimilation, by d *1;4, by n 1;8. She discarded the reduplication and used m E 1;9. The correct mp was achieved 1;10–11; a rare variant mt was due to assimilation to the initial n, a compromise sound which still persisted.
68 b for p occurred also in Karla's speech, but less frequently. She learned p much sooner. Only b is recorded for push B 1;9. In all other words p superseded it. Papa had b in both syllables from 0;11, occasionally p in emphatic pronunciation; from 1;7 both syllables had p, the aspiration being soon reduced to normal strength. Pieks had p 1;4–6, b 1;9, again p M 1;9. Pooh had the rudimentary form pφ 1;1 and 1;4, as a more normal word it had b 1;4 and 1;9, p' B 1;9, p B 1;11. Only p is recorded in pin E 1;8, purple 1;10, picture 1;10, pineapple B 1;11, pocket E 1;11 (with aspiration), piece (p' 1;8, p E 1;11), poor 1;11, Peter 1;10, Piepvoegel 1;7 (reduplicated), pillow 1;11. For paper she used a garbled form with n 1;7 (in both syllables 2;2); she rendered the second p of Paper, with the first syllable clipped off, by b M 1;7, by p B 1;8. Bilabial m instead of bilabial p, a substitution which never occurred in Hildegard's speech, was used in men, pencil 1;8; cf. Karla's m for b, note to 114.
due to the mechanical principle of listing each word under its last recorded form. In this way some words happened to occur last with p, which was becoming more frequent during 1;11, without as yet being the regular equivalent.

107. Initial consonant combinations beginning with p are pl and pr. Each of them occurred in only one word. In both cases the p was treated like the simple p-, and the consonant following it was omitted. The example for pl is please 1;9. The combination was invariably represented by simple b (cf. also 110). The situation is more complicated with regard to pr, represented by pretty, because this mechanically imitated word did not bow to rules of substitution at first. The p was always correct B 0;10–1;9. It was regularly followed by some sound representing the r B 0;10–1;8. This representation itself varied considerably (see 207). As soon as the word was pronounced with voice, 1;9, the r was omitted, a thing which had happened only once during the long period of whispered articulation, at B 1;4. The word is recorded once more 1;9 with pw, for the last time. During 1;11, the p, which had been carried over from the whispered stage, yielded to the normal substitute b, and b continued to the end of the period as the only representation of pr; it is the definitive substitute.

Concerning the affricate pf in pfui, see 125.

108. Initial consonant combinations with p in second place are sp and fp. In both of them, the child omitted the fricative and reproduced the p as b: *spill 1;11, spoon 1;7, spielen 1;11 (b and p 2;1) and the doubtful *Spiegel, 1;8. It should be kept in mind that in these standard combinations the p is unaspirated. spr and fpr did not occur.

109. Medial p appeared only as b in paper (Papier) 1;8, *kopp 1;11, and kaputt 1;10. At 1;11 the b became initial in the latter word because the pretonic syllable was clipped off. p and b are recorded in apple (unaspirated p or voiceless b B 1;5; voiced b 1;5, p 1;8), open (b 1;8–11; also p 1;11; but again b 2;1), Papa (practically always b, even when, at 1;11, the initial b began to change to p; p occurred in the early whispered stage at E 1;0–E 1;1, along with b, and again, just once, at 1;11; b continued regularly during 2;0–1. At E 1;1 the p was specifically noted as being of lenis, or soft, articulation), *Opas (whispered stage E 1;0–1 always p, but not clearly distinguishable from b; b in reduplicated form E 1;1; first syllable usually missing), *piep-piep (p E 1;1, voiceless b B 1;3, p B 1;4, b 1;4, p 1;9). (p in Leopold, new 2;1; cf. vol. 1, p. 87.) 61

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67 pr- in piano was treated in the same way; cf. 54.
68 Karla t', p' E 1;7, then t' until 1;11; p in playing.
69 Karla p during the whispered stage, 0;9–11, b around 1;8–9; usually without a substitute for r; but at times the r following it in her form was shifted to v under the influence of r, 1;8–9.
70 Karla once imitated Spange as papa 1;9. Earlier she also had b in spoon 1;4–7.
71 In Karla’s case, b occurred only in papa in both syllables from 0;11; but even in the early months it varied to p in emphatic pronunciation. From 1;7 p was regular, at first over-
The only deviation from the pattern is found in *klappert i;11, where
the bilabial stop was apparently replaced by the palatal stop k. The word
was heard only once, and its interpretation is not certain (see 142); but
the substitution is possible, cf. soap 112. Perhaps the etymon was klappt,
with final p and no personal ending.

110. The medial consonant combination pl in airplane i;11 was ren-
dered as p. *Liebling, echoed once i;11, had t for pl; it is not a regular sub-
stitute, but the result of blending.72 (Correspondingly, pr became p in
epi, apron, if the mother's report about Hildegard's pronunciation of this
word, which named an article she received on her second birthday, can
be trusted and was correctly transcribed.)

The only instance of pf, in German Apfel i;5, is doubtful. The child's
form, apa, apa, was based on English apple, the German synonym being
at best a contributing model.

111. The medial p was therefore treated like the initial p, except that
the substitute b, once the whispered stage was definitely overcome,
showed a little more persistence, which is natural enough in voiced sur-
roundings. Strangely, however, p was definitively introduced in apple
at i;8, a month before the appearance of initial p (106). This may be
accidental (but cf. 311). Hildegard's medial p was as unaspirated as the
initial p.73

112. Final p was as a rule represented correctly (or by a substitute),
whereas the other final stops were frequently omitted.

The only instance of its omission is in the word *piep-piep. In its earlier
stage E o;i;11-E i;i, Hildegard's form was based on the simple piep, with
-p at E o;i;11, but without it in an experimental form E i;i. It was added
again at once in further experimentation, and soon the word settled into
a reduplicated form without final -p, which satisfied her and remained
stable until the end of the active period of this word, i;9. Thus appar-
ently the addition of the final consonant was felt as inconvenient at an
early stage of speaking, and later the word retained its settled form.

In other examples, however, the final p was represented, and that quite
early. The frequent word up ended in p from the very beginning, B i;4,
and with absolute consistency. For months it was the only word in the
child's vocabulary which ended in a consonant. During i;11 it even had
aspirated p repeatedly. *Ab i;11 occurred only once, with p. For *Liebling
i;11, see 110.

72 Pl in the first word can be counted as initial. In the second one the consonants belong
to different syllables. In Hildegard's forms, however, both were treated as medial. Karla
had p in airplane B i;10, p and pt in Liebling B i;11.

73 Karla began to aspirate stops much earlier than Hildegard.
-b- in hoppe can hardly be traced to hoppp and is therefore treated under medial p, 109.

The only difficult word is soap 1;10. It ended in k 1;10–11 (also 1;10 with an added vowel), aspirated k 1;11, x 1;11. The k seems to be a shift in the place of articulation; it could be explained by the fact that a back vowel preceded it. x is best considered as a part of the preceding vowel or diphthong, which means that the final consonant remained unrepresented after it had, for a while, been indicated by an unsatisfactory substitute. Survival of a primitive form was postulated for the vowel as well (45).74

113. Ament (p. 47 f.), who also reports voicing of p (and the other voiceless stops), explains it as an imitation of Middle German dialectal pronunciation. This explanation is not convincing. At any rate it cannot be applied to Hildegard’s speech; she heard no such pronunciation. The voicing of initial and medial p is simply an assimilation to the surrounding or following voiced sounds, particularly vowels. Notice that in the words which started in the whispering stage, p was generally used until they began to be said aloud. Then it soon yielded to b. Whispered vowels, of course, did not tend to induce voicing of the p.

114. Initial b was always b. For examples, see the extensive lists of words beginning with “b” in the index, vol. 1, pp. 140 f. and 146. The earliest example is *Bild 0;9. Notice especially bitte 1;5 and book, Buch 1;6; their forms varied greatly, yet the b was absolutely stable. The only words in these lists in which the child’s form did not begin with b are *Banane, banana and Bleistift. In the former, the pretonic syllable remained unrepresented. In the latter, the bl was at first indeed rendered by b B 1;6 (115); but from 1;7 the first syllable was assimilated to the second, the result being a quasi-reduplicated form with d instead of b.

To the examples in these lists should be added instances of interior b after a consonant, which linguistic scholars expect to develop like initial b: *pocketbook 1;8 *wheelbarrow 1;11, sandbox 1;10; in the child’s word forms the b became medial (peg-board 2;1).

The only word in which p is once recorded instead of b is German *Ball at 1;1, and that was during the whispered stage. The variant thus did not mean unvoicing, but only a slightly more energetic articulation. After that, 1;3–9, the initial consonant was always b, even during the whispered period of the word. English ball 1;9 had always b.75

74 Karla lacked -p in the reduplicated form based on the first element of Piepogel 1;7. p was correct in up 1;7, sleep 1;9, and soup 1;10–11. Soap also seemed to have k at first 1;8; but the word was learned with the correct p at 1;10. Holmes (p. 222) likewise records soap with -k E 1;6.

75 Karla reproduced b- just as consistently in the correct manner. The name of her dog, Bonnie, began in her varying forms from 0;11 always with b (vol. 1, p. 132, note 279). Only at E 1;9 it was rarely replaced by the bilabial stop with nasal articulation m, a substitution which we had heard with amusement years before from a girl-friend of Hildegard’s who was a year and a half younger than she; Hildegard had not adopted this form and never used this substitute. Cf. Karla’s m for p, note to 106. m appeared also, by assimilation
Initial *bl, *br, and *br were also rendered consistently by simple *b: *block 1;7, *blow 1;11, *Blumen 1;0, 1;7, 1;11, *Bleistift *B 1;6 (114); *brush 1;5, *break 1;10, *broken 1;9 *toothbrush 1;6, 1;10; *Brief 1;11 (-2;0), *Brot 1;7. To these examples might be added *balloon 1;10, in which the pretonic *ə may, in careless colloquial pronunciation, be reduced to the vanishing point.76

*Augenblick 1;7–11, with *bl after consonant, lacked *bl in the first experimental form, B 1;7. It was *b in another form at the same time, but *w, sometimes *β, at 1;8 and 1;11. The latter substitutes are due to an assimilation to the *v which preceded it in her pronunciation (cf. also 433).

Medial *b was also *b: *automobile 1;11, *bobby-pin 1;7 (unless the -*b- of *babi was based on the *p), *by-by 1;3, *baby B 1;2, *peekaboo 1;8; *Zwieback 1;9 (the second syllable alone was reproduced so that the *b became initial).77

The consonant combinations *bl and *br occurred medially only after consonants; the examples are therefore included under initial *b (115).

There was no instance of final *b.

The bilabial voiced nasal continuant *m is first considered in its function as the carrier of the syllable. The few instances of syllabic *m all belong to the colloquial language: *m: B 1;0, an interjection to express delight at food, *hm 1;8, the frequent interrogative, and *m*m 1;6, the American informal negative. In all three words the *m was reproduced without change.78

Unstressed syllabic *m did not occur, unless the second syllable of the negative just mentioned be counted as such.

Initial *m was invariably *m. There are 21 words beginning with *m listed in English (vol. 1, p. 143) and 11 in German (p. 147); the earliest was *mush (moo) 1;2;79 some of them are duplicates. To these should be added *oatmeal once 1;11, with *m beginning a syllable after a consonant; by insertion of an *ə this *m became medial. *Arme 1;7 lacked the entire second syllable.

Milwaukee had no *m because the entire pretonic syllable was omitted (1;8) 1;10 (and even, along with a perfected form, at 2;1).80

Difficulties of conscious articulation seem to have delayed the active

at a distance, as the initial of *Bonbon 1;8; it recurred occasionally at 1;9, after she had begun to reproduce the *b- correctly 1;8. In the second syllable of *Bonbon, colloquially pronounced *bam/*bə̈ŋ, the *b was sometimes correct; sometimes it disappeared by complete assimilation to the preceding *m 1;8–9. Notice that wherever a bilabial stop was replaced by *m, a nasal was present in the same syllable of the etymon.

76 Karla also used *b for these combinations: *block 1;3–9, *Blumen 1;4, 1;8, *Bleistift 1;8 (after assimilatory *d, B 1;7), *balloon B 1;9 (but two syllables, M 1;9), *blue B 1;10, *brush 1;4–10, *broke 1;10, *Brot 1;8–11, *bread 1;10–11, *broom 1;5–7.

77 Karla had also corrected *b: *by-*by ə 1;8, *baby ə 1;9, *automobile E 1;11.

78 Karla *m B ə 1;11, *hm 1;5.

79 Karla's *m- was also invariably correct; first example: *mama B 1;11. In *Mahlzeit 1;11, the form with *m was preceded by one with *h, which however was the result of a blend with outside (see vol. 1, p. 85, note 151).

80 Karla also omitted the first syllable of Milwaukee 1;11.
emergence of *Mama until B 1;3. Before that time her efforts to imitate
the name resulted in the substitution of a voiceless or voiced bilabial stop
for the continuant. In view of the fact that *muh had been imitated cor-
rectly a little earlier (*1;2) (aside from the frequent spontaneous produc-
tion of *m- in babbling), the difficulty was apparently not purely a psycho-
physiological one. The semantic interference of the older word *Papa 1;0
contributed to the delay of the new acquisition.

About *come on* and *kimona*, see 119.

Initial consonant combinations containing *m* did not occur during the
first two years (2;1 *schmutzig*, with *m* for *fm*, but also *b*, vol. 1, p. 121.
Since *fn* → *n* (182), *fm* should be *m*. *b* was due to blending with the simulta-
neous *bu* for *pooh*).

119. Examples for medial *m* are too few to establish a definite rule of
substitution. blumen 1;0, 1;7, 1;11, used sporadically, always lacked
the second syllable, which, in the later months, may have been due to the
subconscious persistence of the first infantile form (but cf. 120). The re-
duplicative *Mama* had the *-m* from the beginning B 1;3. The *b, p* which
appeared in the preceding months in both syllables is to be judged as in
118. *Mickey-mouse* 1;10 might belong here as a non-reductive word;
but it had level stress. (Mammy 2;1 had *m* in both syllables.)

*Come on* 1;10 had *m*, but it belongs more properly under initial *m*
because the first syllable was always clipped off (even at 2;1).

*Kimona* 1;9–10, also with the pretonic syllable clipped off, replaced
*m* by *n*. This is certainly no phonetic substitute, but the result of an
assimilation to the following *-n*, even though the latter itself dropped
out in the definitive form 1;10 because of the interference of another
word.

Automobile 1;11 lost the whole third syllable.

120. Final *m* was always missing, because Hildegard's speech did not
allow voiced consonants at the end (312) and there was no satisfactory
way of unvoicing it. It did not even cause nasalization of the preceding
vowel: *Eiskrem* 1;9, *ice-cream* 1;11, *Baum* 1;8, *bimbam* 1;1–2 (second
syllable), *comb* 1;10, *home* 1;11, *room* 1;11. The same holds true for *m*
at the end of a syllable before a consonant: *bimbam* 1;1–2 (first syllable)
and *Grandpa* 1;8; the latter is colloquially pronounced, with assimilation,
gra*m*pa (cf. the common child form "gramps"); it retained a very in-
fantile form without *m*, but with an influence of *m* on *gr* (222).

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81 Karla had *-m*- regularly, not only in reductive *Mama* B 1;1, but in non-reductive
forms as well: *mammy* 1;7, *tummy* B 1;9, *coming* 1;9. Automobile E 1;11 lost the third
syllable, later also the second.

82 Karla learned final *m* much earlier: as in *b* in the second syllable of *bimbam*
1;3; as *m* in *broom* 1;7, *Baum* 1;7, *bimbam* (or *mm* in both syllables) 1;8, *Bonbon* (first syllable)
1;3–9, *comb* and *home* 1;9, *ice-cream* M 1;11 (delayed by persistence of established imper-
fect form).

83 Karla lacked the *-m* in this word at *M* 1;4, but transposed it sometimes in the form
of *g* to the end of the word. At E 1;9 she rendered *-mp* as *m* and reached the correct *mp*
at 1;10 (rare variant *nt* by assimilation at a distance, cf. note to 105).
The real explanation for the omission of m in *Blumen (119) is in all likelihood the fact that I often assimilate, in colloquial pronunciation, the syllabic n of the second syllable to the m, so that Hildegard heard blum:, a form ending in m, which was therefore omitted in accordance with the rule.84

The final consonant combination ms was also dropped: *bums 1;9.85

121. The bilabial glide,86 voiced w, voiceless hw, is best described by Kenyon 223-227; cf. also Ripman 26.3. It is debatable whether the voiceless item consists of two sounds, h followed by w, or is a unified voiceless sound; in that case transcription by a simple symbol (inverted w) would be better. Theoretical phonetic discussions are not within the province of this study. Functionally it is one sound, namely the voiceless counterpart of w. I retain the common transcription hw, treating it, however, as a single sound, as Kenyon also does (46 and footnote).

hw, in standard spelling "wh," occurred only initially in English words. It was rendered by voiced w: *why 1;10 (2;1), where 1;11 (-2;1), wheel 1;8 (-2;1), *wheelbarrow 1;11 (what 2;1).87

122. Initial w was always reproduced correctly, from 1;7 on: water 1;7, wash 1;8, watch 1;9, way 1;7, wake up 1;10, wet 1;7, wait 1;11, walk 1;8. To these words should be added one with w after consonant, Milwaukee 1;8 and 1;10, in which it became initial through clipping of the pretonic syllable. (In sidewalk 2;0 it became medial; cf. vol. 1, p. 95.)88

Wauwau had a glottal stop in place of v in both syllables at 1;0-1, w from E 1;1; Wehweh had w in both syllables from 1;8. Both words go back to German, with v, primarily (130), but must be mentioned here because Hildegard’s mother used them with English w.

123. Medial w in away was also w. The pretonic syllable was at first (1;6) omitted; it was sometimes represented from 1;8 (but was at other times lacking even as late as 2;1).89

The remark about Wauwau and Wehweh applies here as well as in 122, for the second "w."

Final w does not occur in American English.

124. The next series of consonants to be considered is that of the labiodentals, consonants which are articulated by means of the lower lip and the upper row of teeth. They seem to be among the sounds which are most difficult to produce for children, even long after they have a sufficient number of teeth.

84 Karla bu once M 1;4, bum 1;8.
85 Karla bum B 1;7 and 1;8.
86 The classification under which w is listed by the International Phonetic Association, "frictionless continuant," is less clear than Kenyon’s description of it as a "glide" and easily reconciled with it.
87 Karla where E 1;11 also with w.
88 Karla pronounced wet with w 1;8, lost the glide E 1;9, making the sound ß, and re-acquired w 1;10. From then on, the reproduction was correct: sidewalk 1;11, water E 1;10, Milwaukee 1;11, walk 1;11, one 1;11.
89 No example recorded for Karla.
125. Initial f was not attempted until late. It was generally turned into the bilabial glide w by Hildegard: feed 1;11 (2;1), feel 1;10, Füsse 1;11, fix 1;11 (fishes 2;1). In far away 1;8, the w may go back to f, but one cannot be sure of it because her form was the result of a multiple blend of prototypes. In addition to these instances, w was the normal substitute for f in other words, in which, however, other replacements also occurred.

In the frequent word fall 1;11, for instance, w was always the substitute, except for one instance of f, which however was caused by deep breathing following physical exertion. (At 2;1 this word was the first one to reach f, whereas otherwise, according to a specific statement in the diary for 2;1, initial f was at that time regularly represented by w, then in process of transformation into v; for instance vier, wiə and viə.)

Two other substitutes occurred during 1;11 which must be interpreted as experimental. Fuss M 1;11 had a glottal stop for f. It can be explained by the physiological difficulty of articulating w before u, which has a very similar position of the lips and tongue. The plural Füsse, with a quite different vowel, had the regular w. Fork 1;11 had h the first time, but soon w. (At 2;1 Finger had the substitute m, which shares with f the labial and continuant articulation; cf. vol. 1, p. 106.)

Pfui, in Northern German colloquial pronunciation with f-, was thought of as a prototype of Hildegard’s rudimentary interjection p’, pφ, pw: (with bilabial vibrant) *1;2–4. If it had any standard model, it came however rather from pooh (105), the affricates being due to faulty release of the closure.

In forgot 1;11 the pretonic syllable was suppressed.

126. The initial combinations fl and fr were treated like simple f. The normal substitute was w: fly 1;11, flower 1;11, Florence 1;11 (2;10). With regard to fr it is striking that several phenomena of substitution, which were not found for simple f until 1;11 or later, appeared several months earlier; that is, the pronunciation of fr was attempted much earlier than that of f, with identical substitutions. Frau had the glottal stop (cf. Fuss M 1;11, 125) at 1;7; w from 1;8, but 1;8 also v, which became frequent for f as late as 2;1. Fritzchen started 1;8 with a w which was not clearly a glide, but approached a bilabial fricative; it also settled at 1;11 into real w, which was at that stage the normal substitute for f.

90 Karlà pronounced voiceless f much earlier. The substitute w was recorded only in the name Florence during 1;8. f was heard in fallen, second half 1;7 and 1;8, foot, free, fly 1;9, Florence from 1;9, fix, Fleisch, and flower 1;11. At 1;10 all words (fork, Vati, finger, fix) are listed with bilabial f. Since I did not study Karlà’s pronunciation with the same care as Hildegard’s, it is likely that her f was bilabial up to and including 1;10, labiodental from 1;11. Vati, before reaching f at 1;10, had assimilated the initial consonant to the t at the beginning of the second syllable 1;8. Fine is recorded with f at 1;9 and 1;11. Cf. the vocabulary chapter in vol. 1, footnotes 32, 212, 272, 276, 290, 293, 294, 297.

91 Karlà’s pφ 1;1–4 was definitely traced to it.

92 Karlà’s examples are therefore included in the note to 125.
It was probably an accident that words beginning with fr became important earlier than those with simple f. There is no instance of English fr-.

127. There is no case of medial f; an influence of German "Seife" on Hildegard's form for soap is more than problematical.93 For medial pf there is a dubious case (see 110).

128. Final f should be considered as normally unrepresented, although there is only one word to substantiate the assumption, auf 1;§, and this word is sadly intertwined with aus, out 1;6. It was however a very frequent word. The adverb auf was used without any final consonant 1;6-9, with a final x 1;7-11. The fricative was however not an equivalent for l, but a modification of the preceding v (99). (The preposition auf appeared 2;1 in auf Wiedersehen, also without a final consonant; note, however, that its omission is here favored by the homorganic v following it.) ²auX for off B 1;11 (vol. 1, p. 39) is too doubtful to serve as a convincing support for a rule of substitution.

There are two words in which a familiar alveolarpalatal fricative or affricate was substituted for the unfamiliar labiodental fricative: *knife 1;11, a word which was used only for one day, with s and tf, and Brief 1;11, with tf (according to her mother's report at 2;0 apparently also with $f$).94

129. The final combination ft in Bleistift 1;6 was also omitted.95

130. The voiced labiodental fricative v in initial position was also, like its voiceless counterpart, represented by the bilabial glide w.96 In the early stage of one word, Wawwau E 1;0-B 1;2, there was at first a glottal stop in both syllables; but the form of the word was at that stage so primitive that it is doubtful whether the glottal stop should be considered a substitute for v. In the later stages of this word, and in all others beginning with v, the substitute was invariably w. There happened to be no English words beginning with "v"; but every one of the seven German words beginning with "v" in the list, vol. 1, p. 148, shifted the v to w. This was true for Wawwau in part as early as E 1;1, regularly from 1;3. The other words were later, 1;8-11 (same substitute in Wiedersehen 2;1).

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93 Karla had p in kapi, Kaffee 1;9. No substitution of the bilabial stop for the labiodental fricative occurred in Hildegard's case. It is frequent with other children, even in initial position; cf. Preyer p. 230, Holmes p. 222.

94 No example for Karla. In her speech the pretonic preposition in auf Wiedersehen 1;1 was usually omitted and sometimes assimilated to the following stressed syllable to such an extent that its identity was destroyed (vol. 1, p. 47, note 43).

95 Karla’s first form of Bleistift B 1;7 also lacked ft. Her later forms lost the second syllable entirely.

96 The same substitute is reported by Jegi, p. 247. It was also found, among a variety of substitutes, by Bloch (1913), p. 43 f., starting E 1;8. Karla also used w: Wawwau *E 1;1 and from 1;4, weG 1;8, Wiedersehen 1;1 (later b, due to blending with by-by). In Welwek *E 1;10, however, she substituted b, an improved fricative. In the name Vira she used d in both syllables from 1;3, b from 1;6.
In the initial consonant combination *tsv*, the child dropped the affricate and rendered the *v* alone in the regular manner by *w*. The only example is *zwei 1;i0–2;1*.97 In *Zwieback 1;i*, which the mother also pronounced in the authentic German way in English contexts, the whole first syllable was disregarded.

The only clear example for medial *v* is in *cover 1;i1*, where it was dropped together with the final syllabic *r* (90).98 This probably represents the normal treatment. In *Wauwau 1;i* and *Wehweh 1;8–2;i* the medial *v* took the same form as the initial *v*; that is to be expected in fully reduplicated words.

Final *v* occurred only in *of 1;i1*, where it was omitted by the child. This omission, however, is quite common in careless colloquial speech,99 and the word was as yet too rare to establish a rule about the treatment of *-v*.100

In the dental (alveolar) series, the voiceless stop is *t*.

Initial *t* was originally represented by the corresponding voiced stop, *d*, and this substitute continued to occur even after the end of the second year. From *i;8* on, however, the standard *t*, usually without aspiration, also appeared, more frequently from *i;10*.

Only *d* occurred very early in *Tante, 1;i*, for both instances of *t*, if we wish to consider her infantile reduplicated form *da-da* a reproduction of the whole word. There was no further attempt to say words beginning with *t* until six months later: *Taschentuch 1;7*, *toast 1;9*, *towel 1;10*; these words had *d* always, *Taschentuch* in both parts; but *dadi* was not regularly derived from this etymon.

*Too* began with *t 1;i0*; after the first occurrence, the word always had *d* during the last two months (after the turn of the third year, *t* became regular). *Two*, with the same standard pronunciation, followed the same course of development, with slight accidental deviations: *d* was the regular initial consonant *i;10–11*; *t* occurred repeatedly already during *i;11*, but *d* was still heard at *2;0*. The general picture is the same as for *too*: mostly *d 1;i0–11*, mostly improved to *t* from *2;0*.

The first word in which the correct *t* was used was the bilingual *Ticktack*. In the experimental stage, *E 0;i1*, Hildegard articulated the initial consonant of both syllables as *t* or reduced each syllable to a click. During the long period *1;0–7* in which the word was usually whispered, the *t* was regularly aspirated in both syllables. This aspiration disappeared at once as soon as the word was spontaneously said aloud, *1;8*; thereafter unaspirated *t* remained stable. *d* occurred at no stage in the long history.

97 "wai" for the same word 2;i5, Preyer, p. 177. No example for Karla.
98 Omission may also have caused Karla's haplophonic shortening of *cover up to kap*, E 1;i0. *Wauwau* and *Wehweh* were fully reduplicated, *-v* being treated like *v*.
99 Cf. Ripman 27.21.
100 Jegi reports *f* for *-v: wave >"wafe"* (p. 247). Karla did not use *of* or any other word ending in *v*. 
of this word. Because of its interjectional character, it did not submit to
the rules of sound-substitution.

The emergence of the regular equivalent t for standard t' in this word
was months ahead of the transition from d to t in other words. Instances
in which t appeared without a preceding d stage are *Tasche 1;10 and
toothbrush 1;10; in the latter word, the initial consonant of the first
syllable had previously, at *1;6, been assimilated to the initial b of the
second syllable. (Toes had t at 2;1.)

135. The situation with regard to initial t is therefore parallel to that
concerning initial p (106), except that the voiceless stop gained ground
over the voiced substitute a little sooner.101

136. Initial consonant combinations beginning with t are tr, ts, ts, tsv,
and tf. They were not rendered uniformly. In tr, ts the stop prevailed as
in pr (107). In tsv only the v was reproduced; the single example of it
has been dealt with under v- (131). In the affricates ts and tf the child
tried to render both elements, with varying success; sometimes only one
of them, either the first or the second, achieved representation. Details
follow.

tr, ts was treated just like t alone. Its representation was usually d,
beginning at 1;11: tragen, Theresa (still at 2;10). In the latter word, which
Hildegard also spoke with t, her mother suppressed the pretonic vowel.
Train M 1;11 was transcribed with t, but the unaspirated consonant
still resembled d. If the early infantile forms for *Gertrud(e) 1;1 obeyed
rules of substitution, they are further illustrations for ts, tr > d.102
Concerning str-, see 137.

ts occurred in two German words, *Zunge and zu 1;11. The combina-
tion of the two elements of the affricate was not achieved. The sporadic
attempts to say Zunge resulted once in d, based on t, once in j, based on s,
on the same day 1;11. In zu 1;11 the s was rendered alone as j, more
commonly as s. If the form d3u, recorded under *klappert 1;11 (vol. I,
p. 95), is correctly interpreted, we have a more perfect rendering, d3
representing both elements. The word generally ended in s, which cannot
be explained satisfactorily (metathesis of the s contained in the initial
affricate?). (ts- remained a difficult combination because of the child's
prevailing English habits of pronunciation. It was long simplified to s.
The first perfect pronunciation of zu was noted as late as B 4;1.)103 Per-

101 Ament (p. 49) lists d and k as substitutes for t. Hildegard did not use k for initial t,
but we shall find this substitute in final position (141). Karla always reproduced the t cor-
rectly, with or without aspiration; t': tick-lock 1;4 (whispered, later t, whispered; B 1;9 t',
aloud), Tag 1;8 or 1;7, toast at 1;8, tummy B 1;9; t: tick-lock after 1;4 (whispered), Tür after
1;4, Tisch 1;7, teeth B 1;9, toast at 1;10, loo 1;11, two 1;11.

102 Karla tr > t: tree B 1;7.

103 Karla replaced ts, also in zu and Zunge, by t' 1;9, at a time when initial s was c and
final s was t. Zu had t months earlier in reduplicative Tür zu (vol. I, p. 126, note 266).
The f which Hildegard added irregularly at the end of zu had a parallel in Karla's form
tut' E 1;9, which she used along with t' u. Both final consonants probably represent -s.
haps English *outside 1;9, with omission of the first syllable, belongs here; the substitute was h < s.

*If occurred in two English words, *choo-choo 1;7 and *church 1;10. Choo-choo started 1;7 with d. From 1;8 to 1;11 both *if and d3 occurred frequently, d3 prevailing. t was heard once 1;8. The consonant of the second syllable, although it is there in medial position, was always the same as that of the first syllable because of the reduplicated character of the word. I disregard the instances of t 1;8 and *if 1;10 without vowels. They are probably direct or indirect imitations of the sound of a starting train, less conventionalized than *choo-choo, although the latter has of course the same origin. *Church was used only in a nursery rhyme, first with d3 1;10, then simplified to 3 1;11.

Hanschuh 1;10 also should be listed here because the syllabic separation of -t and f- did not exist for the child. *If became d3 (medial) just like initial or medial *if; the form of the word did not agree with the treatment of initial f (181).

137. Initial consonant combinations with t in the second place are st and str. In both of them the initial sibilant remained unrepresented. In fact, both took the same form as simple initial t, since str also lost the r (136).

st therefore appeared usually as d: *stocking 1;7–11, stick 1;10. *Sticky had unaspirated t at 1;7, which however yielded to the regular d at 1;11.106

str was represented by d in *street-car, once 1;11 (and in string 2;1).

In judging the prevalence of d over t in these combinations, it should be kept in mind that the aspiration of the voiceless dental stop is faint or absent in both German and American pronunciation.

There is one instance each of st and the parallel German f t with irregular development. In stone 1;11 and *steht once 1;11 the regular d appeared, to be sure, as the initial consonant; but both words had at the end a f, which is difficult to explain. It might conceivably be the initial sibilant added later by metathesis; but I confess that this explanation is rather venturesome in view of the consistent omission of the sibilant in all other clusters of the same type (167). (For other explanations, see 177 f.) The extremely uncertain word *story, b z f 1;11 might belong here as a parallel to stone.

*Steht is the only example of initial f t;106 for medial f t in Bleistift, see 140.

138. Medial t underwent similar treatment. d and t are also the most

Mohlszeit 1;11 had t, later t. (At 2;11 she imitated ts in much more perfect form than Hildegard.) Pavlovitch (69) reports a gradual transition from t to ts for 1;11, Ronjat one from s to ts for 2;5 (p. 48).

104 Karla used t for tf-te, chair 1;10, tuna, children M 1;11. ti, di chair 1;7–9 came either from chair or from Tisch. She said *choo-choo with d in both syllables about 1;4, with t later. She omitted the postconsonantal f of picture E 1;10.

106 Karla rendered st and f t by d or t: d in stick 1;8, sticky 1;10, stone 1;10; Stock 1;8, Stuhl 1;9; t in stone 1;11; Stuhl E 1;6–8, 1;10, Stein 1;11–2;1. I have no example for str.
frequent representatives. t appears earlier and more frequently than in initial positions. This is surprising, because in medial position it is more exposed to assimilatory voicing, not only in the child's speech, but in the standard as well. Not in German, but in the American colloquial form of English which the child heard, medial t is often articulated very laxly so that it comes close to d. On the other hand, her mother, when speaking to the child, was apt to articulate carefully. Perhaps, a tendency can be found for t to appear in words which were more likely to be pronounced emphatically and in isolation, like hottey, Peter, whereas assimilated d took its place in words used in a context, like pretty as an attributive adjective; the call kitty, with d, runs counter to this hypothesis, however. At the same time the tendency to improve d to t proceeded apace; it is next to impossible to unravel the strands. In addition, there is a number of cases in which the medial t was lost altogether.

In the following, the treatment of -t- will be illustrated in detail.

There are two words in which -t- was rendered only in the form of d, *Tante 1;1 and *Taschentuch 1;7. In both of them, the consonant n preceded it so that it could be counted as an initial t; but the n was omitted and the t became intervocalic, a position which favors voicing; both words had a primitive, semi-reduplicative form.

d, voiceless d, and t are recorded for Auto 1;5, bitte 1;7, pretty B 0;10, and *kitty 1;3, 1;10, 1;11. All except the last one were very frequent words, and their pronunciation is amply documented. In the early whispered stage, attested by pretty B 0;10-1;8, the t was perfectly stable, although otherwise the form of the word varied considerably; since the vowels were not voice, there was no temptation to voice the t. In the earlier months of full articulation, the t was changed to d by assimilation; thus in Auto at 1;5, in bitte (exceptionally) at 1;7, in *kitty as late as 1;10 and 1;11. The only recorded case of faulty reproduction of the stop as such occurred in *kitty at B 1;3; the imperfect closure resulted in a sort of affricate. Pretty continued its correct t at 1;9, when the word was at last pronounced aloud, but thereafter had the assimilated d usually as late as 1;11. Otherwise, t was normal in the later months; in Auto from

106 Kenyon (163 and 379) has a good discussion of this sound. He calls it "voiced t," but claims that it is not a d (nor an r).

107 Karla used -t- most commonly, ephemerally aspirated in pretty at 0;11 in the whispered stage, in Vati at 1;8, and in dirty B 1;11; unaspirated in Vati at 1;10, auto 1;10, bitte E 1;10 (M 1;7?), hottey 1;10, Peter (English pronunciation) M 1;11, automobile E 1;11, Butter B 1;10, butter at B 1;10. d also occurred, much more rarely: butter at 1;10, pretty at 1;8-9. She replaced -t- by -k, with omission of the standard final sound, in water E 1;10-11. -t- was omitted in the earliest whispered form of pretty at 0;9 and in the early game sentence there it is E 1;1-4. The whole second syllable including the t was suppressed in mitten from B 1;7, Peter (German pronunciation) 1;10, bottle M 1;4-8, petticoat 1;11, automobile at E 1;11 (later than the form with t).

108 This was the rule in the case observed by Holmes (p. 223) as soon as two-syllable words, even those which formerly had reduplicated form like kitty, reached genuine two-syllable form, 1;10. It was not the rule with Hildegard.
1;7 without exception, in *bitte always from 1;5 with a single exception at 1;7, in *kitty only at the latest occurrence 1;11, but in defiance of the perfectly reduplicated form which this word had had up to that time. Pretty displayed the t in its later stage only once at 1;11; otherwise it had d, probably because by that time it was used as a pretonic attributive adjective, with little attention concentrated on it.

All words which showed no variation from t were late: button 1;10, hottey 1;10, automoble 1;11 (Peter 2;0, see vol. 1, p. 117).

There were a few words in which the t was omitted together with the entire second syllable: *Butler 1;9 and *mitten 1;5-10. (Mittens had the second syllable with t at 2;1.)

In two words the t was suppressed in favor of the syllabic consonants following it, to which it may have been partially assimilated in the presentation: bottle 1;6 (193) and water 1;7 (90). Water had at 1;7 one experimental form with omission of the whole second syllable including the medial consonant, another with d. After that, in part even at 1;7, the word was deflected from its regular course by blending with bottle and contained a medial l or a substitute for it, which should not be traced to t.

139. Medial consonant combinations with t in first position are ts and tf. In general they developed like simple t.

ts was rendered as an imperfect affricate in the early whispered word *kritze 1;11-B 1;4. The s resembled f, which could be a normal substitution; but the affricate was premature. At a later stage the fricative was suppressed in the combination. *Miezi 1;11 (and schmutzig 2;1) had only t.109

tf suffered greater variation; but that was due to the reduplicative form of the word choo-choo: the medial tf was always rendered in the same form as the initial tf (136). In high-chair 1;5 we find an unaspirated t resembling d, in *watschel 1;11 a k, a substitute found otherwise only for final t. The examples are too few to establish a definite trend of substitution; but, apart from reduplication, t and its equivalents seem to be the normal representation. There was a stronger tendency to simplify the affricate than in initial position. About ntfs in Handschuh, see 136.

140. The only medial combination with t in second place (apart from the ntfs just mentioned) is ft in Bleistift 1;6. It was simplified to t 1;6 and voiced to d by assimilation from 1;7. That is probably the normal substitution, although one cannot be sure of it, because the form dadi suffered from a cross-blend of a number of different words (457).110

141. There is a wealth of examples for the treatment of final t. The picture is simple. In the earlier months the final consonant was omitted,
and it continued to be omitted in many words to the end of the period. During the last two months, however, the t was added in more and more words, at the end of the period even with deliberate aspiration.\(^{111}\) (The beginning of the third year marked the stage when the omission as well as the exaggerated aspiration became obsolete.) There are three words with occasional k instead of t and two irregular cases.

Words which always lacked the t are the following: out 1;6 (with t 2;1), all right 1;8, *Bad 1;3-9, pocket 1;10 (*pocketbook lacked the whole second syllable at 1;8; the t was still missing in the improved form of 2;1), put 1;11 (with t 2;1), *Gertrud 1;1, *street-car once 1;11, write 1;11.

The following words lacked the final consonant at first, but added it later: Bett 1;4-8 (with t B 1;11, t' 1;11), Brot 1;7-9 (k' 1;9, t' 1;10-11), light 1;6-8 (t 1;10, t' 1;11), hat 1;8-11 (only once with t' 1;11; regularly t 2;1), hot 1;4-10 (t 1;11), *mit 1;8-9 (t' 1;10), night 1;5-10 (t' 1;10), wet 1;7-8 (t, t' 1;10-2;1), feet (t' 1;11).

Words which had the final t from the start are all new acquisitions of the last two months, with the single exception of *natt-natt, which had it as early as B 1;6; it was an ephemerally echoed word. This is the list: Boot, boat 1;10 (t'), bite 1;10 (t' 1;10-2;0, once because of faulty release th 1;11, 143; t 1;11-2;0), kaputt (t 1;10, t' 1;11), *that 1;11, forgot 1;11 (t' > t), coat 1;11 (t), eat 1;10 (t'; 2;1 t), sun-suit E 1;11 (t), meat 1;10 (t' and even exaggerated to ts 1;10; t 1;11), not 1;11 (t, in emphatic pronunciation also t'), right 1;11 (t'), wait 1;11 (t') (got 2;0, t, what 2;1, t). In *oatmeal, once 1;11, the t at the end of the first syllable was rendered as to (cf. kə in wake up 1;11, 216 note).

The replacement of -t by k occurred in two words in addition to Brot, but likewise not lastingly: Boot, boat, k at 1;10 along with t' 1;10-11, and kaputt, k at 1;10, but usually t, t' 1;10-11. In the latter word, blending with the synonymous English broke is probable (see vol. 1, p. 58), but no such explanation is possible for the other example. Exchange of stops is much more frequent in the speech of other children than it was in Hildegard's case.

The two irregular cases are *steht, once 1;11, and feet, one instance 1;11, in both of which s seemed to take the place of final t. This substitution is quite improbable. In the second case, the etymon was probably not feet, but German Füsse; feet was later 1;11 rendered correctly with t'. In the first, metathesis of initial s (cf. 137) or substitution of the English third person singular ending z (177), both with omission of -t, are tentative explanations.

142. Final consonant combinations ending in t are ft, xt, lt, nt, (pt), xt, and st. As is to be expected, these combinations were omitted entirely

\(^{111}\) Karla was a little earlier in pronouncing the final t. From the incomplete record, it appears that she generally added it by E 1;9 or B 1;10. All words recorded had it by E 1;11. The only occurrence before 1;9 was in the word eat 1;8. Pocketbook still lacked the whole second syllable E 1;11. Energetic aspiration is recorded only for all right 1;9.
in the earlier months. The omission lasted a little longer than that of simple t, in some cases beyond the end of the period under consideration. At the next stage the t came to be reproduced. Only xt was reproduced in full by the end of the second year.

The combinations which remained unrepresented are ft, lt, (gt), and rt. ft occurred only in one word, Bleistift 1:6. lt in *Bild was always missing in the sporadic occurrences of the word o;9–1;8 (but it reached the representation t in the name Leopold 2;7 in its German pronunciation).112 rt was omitted in Hildegard 1;11–2;1. I pronounced the name in German with rt, the mother in English with rd; rd was omitted likewise (149). *Donnert 1;11 and the doubtful *klappert once 1;11 are other examples if the verbs with third person singular endings are really the etyma.113 It should be noted that the n in this position is not clearly articulated in the colloquial North German standard; “er” is practically dissolved into a compromise vowel (cf. 8t). Omission of gt in hängt 1;11 is also doubtful; the personal ending t of the standard was probably disregarded.

The combination rt was probably omitted at 1;10, the n leaving at best a trace in the nasalization of the preceding vowel (12); but there is no clear example of it at 1;10. German Sand had hardly an influence on sandbox, in which the combination nasal+dental stop disappeared without trace 1;10–2;1. German Hand and English hand together resulted in hâ 1;11. In the compound Handschuh 1;10 (136) the nasalization was absent, just as in sandbox, but the t was represented. In don't B 1;11–2;1, the t was pronounced, whereas the n was suppressed entirely; this should be considered the normal representation from 1;11.114

In st, the t was also represented alone.115 The only example is toast. Here the final consonant appeared very early, 1;9, at first as t or k, soon and lastingly as k, sometimes with aspiration. Interference of Kuchen or cake is not impossible, but more probably it is an instance of substitution of k for t, which has some parallels (cf. 463). (At 2;1 st appeared as s in lost, that is, the s was rendered and not the t. There might be a hidden parallel to this representation in such sentences as mama dis mar 1;11, which could be an early instance of a preterite, “mama kissed me” rather than uninflected “kiss.” The explanation for the prevalence of s over t is what has been called the “three-consonant rule” of English pronunciation, according to which t as the middle of three successive

113 Karla pronounced Leopold 1;10 without final consonants. Her form was based either on the German pronunciation with lt or on the English with ld. She lacked the rt of Bleistift B 1;7 and later. She omitted the rt of Hildegard in all her varying forms 1;1–9. They may however also be based on the English pronunciation of the name with rd. -rt in sweetheart 1;10 was also omitted.

114 The sentence dr jáku dzu, left unexplained in vol. 1, p. 95, is probably a blend between “this klappert” and “this klappt zu” (“this rattles” and “this snaps shut”). jáku might even be based on klapp(l).

115 Karla pronounced nt correctly in don't, E 1;10.

116 Karla omitted st in toast at 1;8 and represented it by t at 1;10.
words would be a quite normal change,\(^{124}\) the unequivocal testimony of all other words ending in \(d\) compels us to infer that in this case the model was not English *bed*, but German *Bett*; final \(t\) became active \(1;10\).

149. Final consonant-combinations ending in \(d\) are \(ld, \ nd, \ rd,\) and \(zd,\) all English, of course, because the German language does not permit words to end in voiced consonants. \(ld, \ nd,\) and \(rd\) were omitted just like simple \(d,\) except that, in a monosyllable, the \(n\) of \(nd\) nasaled the preceding vowel.\(^{125}\)

\(ld:\) *cold \(1;10.*\)

\(nd:\) monosyllable with nasalized vowel: \(hand \ 1;11;\) dissyllable without nasalization: \(sandbox \ 1;10-2;1.\)

\(rd:\) *aboard \(1;10, \) Hildegarde (in English pronunciation) \(B \ 1;11-2;1.\)

(At \(2;1, \) peg-board was *pek bois*; the \(sf\) must come from an illogical plural \(z,\) probably induced by a subconscious reference to the many pegs or holes.)

\(zd\) in *closed \(1;11\) was \(s.\) It does not fit in the pattern, unless we assume that \(d\) preceded by a fricative behaved otherwise than \(d\) preceded by a liquid or nasal, which is possible. In that case \(s\) would render \(z,\) as it does in other instances, and final \(d\) would be omitted. But *closed* is a doubtful etymon for \(zus;\) it is better to trace it to German *zu*, although that etymology, too, is not without difficulties.

150. The only final combination containing \(d\) not in end position is \(dz\) in *beads,\) which in both its meanings was usually presented in the plural and was therefore reproduced with the plural \(z.\) At \(1;9\) the \(d\) was omitted and the \(z\) rendered as \(f;\) but at \(1;11 \ dz\) achieved its own representation in the form of \(tf,\) the \(d\) unvoiced by assimilation to \(f\) (unchanged \(2;1).\)\(^{126}\)

The verb in *"reads a book"
proved that she still used the verb-stem without a personal ending, the final \(d\) dropping in agreement with the rule.

(*Peg-boards \(2;1,\) ending in \(sf\) after the vowel, has the more primitive form corresponding to \(bifs,\) beads at \(1;9,\) with omission of \(rd.\) Cf. \(149.\)*)

151. In taking up the dental voiced nasal continuant \(n,\) let us examine it first, as in the case of \(m\) (\(117),\) in its syllabic function. \(n,\) unlike \(m,\) does not occur under the stress, but quite frequently in final syllables.

The rendering of \(-\)\(^{\eta}\) presents a very motley picture. In the early

\(^{124}\) Karla, who also omitted \(-d\) at first (in *hide \(1;8, \) bed \(1;7, \) bead \(1;9,\) latest in *outside \(E \ 1;10),\) reproduced it in the form of \(f\) from \(1;10\) (in *good \(1;10,\) with \(t,\) *ride \(1;10, \) read \(1;10, \) red \(B \ 1;10, \) bed \(B \ 1;10, \) bread \(1;11).\) She reached \(d \ 1;11\) in *outside* and *sidewalk.* In *lemonade \(E \ 1;11,\) the \(-d\) was replaced by \(m,\) the end consonant of the first syllable; by means of two different distant assimilations (cf. note to \(196),\) the word was simplified into the near-reduplicative form \(menn/mem.\)

\(^{125}\) Karla omitted them likewise in *cold \(1;8, (Leopold \ 1;10),\) and Hildegarde \(1;1-9.\) English *hand* had a faintly nasalized vowel, but no end consonants at \(1;9, \) \(n\) without nasalization \(1;10, nd \ 1;11.\) *Sand* had \(n\) \(E \ 1;9,\) assimilated into \(m\) before the \(b\) of *sandbox \(1;10.\)

\(^{126}\) *Bead* without plural ending would have resulted in *bi.* Karla had it in this form \(1;9.*\)
months, it was omitted, together with the rest of the unstressed syllable. This is natural for that period, during which the attention was still concentrated solely on the stressed part of the word. Later the substitutions ran the whole gamut of vowels. The substitute was never a consonant; the correct n was not achieved in any instance; in fact her speech did not contain any final n. Obviously, the syllabic, vowel-like function of the sound loomed larger for the child than its consonant characteristics; she made a sharper, simpler functional distinction between vowels and consonants than do the standard languages involved.

The only clear instance of omission is the word *mitten 1:5-10, in which everything after the stressed vowel was lacking. This treatment was natural for the period in which the word began; but later, when there should have been a vowel substitute for -n, the primitive form must be explained as the lingering of an infantile version which had become fixed in the child’s memory.127 (An i substitute appeared suddenly in a perfected form of the word, 2:1.)

Another example of omission is *Blumen 1:6, 1:7, 1:11, a word which in its sporadic occurrences also lacked the whole second syllable; but this word had, in my colloquial pronunciation, really no -n at all, as explained in 120.

Theoretically, most German infinitives belong here, since every German infinitive ends in n, most of them in n; it was always lacking in the child’s infinitives. Actually, however, the child used verbs in pure stem form without endings, as they were commonly presented in imperative function; practically all Northern German colloquial imperatives lack an ending. The only exception is perhaps rollen, which I happened to present to him in the infinitive form with imperative function. In this word she tried experimentally 1:8 to render the ending as o; but even in this word it disappeared soon, and it is not certain that a represented the ending; it could stand also for l (cf. also ju, lu later in this section).

In all other instances, -n was replaced by a vowel. The front vowels i, e, and a, the back vowels u, o, and o, and the neutral vowel ə occurred in this function. The uncertainty in the choice of vowel quality which this wide variation of substitutes bespeaks is further proved by the fact that several varieties occurred at different times within the same word. It is noteworthy that front vowels of varying shades were used after stressed front vowels in the child’s word-forms, and back vowels after stressed back vowels. In other words, there was a tendency to establish a vowel harmony, which, however, rarely went to the point of complete agreement of vowels. The only vowel which does not clearly yield to this principle is a, which seems to be treated sometimes as a front vowel

127 Karla also omitted the second syllable, B 1:7. In her speech, omission of -n was more frequent. Open lacked it 1:9-11, button E 1:9. Substitutes did not last: *Kuchen ephemerally with o B 1:9, button with i 1:7, which was dropped later.
and at other times as a back vowel; the various varieties of a are indeed formed in a region where front and back articulation come together.

There are only two words with back vowels in the second syllable, open i;8 and *Kuchen i;10–11. Open had u i;8, o i;10, o, o, and u i;11 (u 2;1). *Kuchen had o i;10–11. The stressed syllables of both words have back vowels in the standard language. The difficulty is that open had in Hildegard’s speech the stressed vowel a, a front vowel. If the rule established above is correct, we must assume that the observation as to the quality of the stressed vowel was inaccurate, that it was really back u. (As such it was actually transcribed at 2;1.) In addition, u appeared in the tentative forms woju, wolu for rollen at B i;9; but ju and lu were also used as substitutes for velar -l in bottle (193) and might therefore also come from the l of English roll (203).

Varying front vowels appeared in the following words: button e, i i;i0–11, usually i (e 2;1); bacon e i;9, o i;11; dicken e i;10, o i;11 (cf. also 88); Helen i;9 a (complete vowel harmony); Fritzchen i;8, always i (apron 2;0 i, millen 2;1 i). All these words have stressed front vowels in the standard and in Hildegard’s equivalents, with the exception of button, which however had a front a in the child’s rendering; the vowel harmony should be based on the child’s words and not on their standard models.

It should be noted that the final trend was toward a, a neutral vowel, which came in rather frequently at i;11 without winning the field in all words (even at 2;1). In rollen, the o in an experimental form at 1;8, followed by omission 1;9–11, would be much too early as a representative for -n, which is another reason for giving preference to the explanation that a stands for l.

152. The situation is much simpler with regard to purely consonantal n in initial position. Its representation began 1;5. At that time and B 1;6, Hildegard did not have a correct n in her speech. She replaced the dental nasal continuant by y, which, however, did not have the correct velar closure, but was a non-standard compromise sound (396). It was the substitute for the initial consonant in nein at 1;6, night at 1;5, no at 1;6, and naughty at 1;5. At 1;6 she learned the correct n, and all these words had it by 1;6 or 1;7; new words had n from the start. The complete list of examples is found in vol. i on pp. 143 and 147 under “n.”

To these should be added *knife i;i1, *knocx i;i1, and knee i;i7, which, of course, are pronounced likewise with initial n; and *banana, Banane, once i;i1, in which the first n functioned like initial n because the pre-tonic syllable was clipped off.

The only word in the list on p. 147 of vol. i in which n suffered sub-

128 Helen has in standard pronunciation not really a syllabic n, but a reduced vowel plus consonantal n; but this difference, difficult to hear even for the phonetician, certainly was inconsequential for the child.

129 Karla Pete, essen i;i0–11.
stitution is Nachedei 1:6. Because of assimilation to the consonant of the last syllable, the n was replaced by the buccal stop d from B 1:7 and perhaps also at 1:6 (n was reached at the beginning of the third year). 120

In ironing 1:8, where n begins a syllable, the child omitted r, so that her form contained a medial n; but it wavered between n and s as late as 1:9.

153. The initial consonant-combinations with n in the second place, kn, sn, and fn, were rendered by n; the consonant preceding it was disregarded: Knie 1:7; *snow 1:6-10; *Schnee 1:6-9, Schnucks 1:10. 121

154. The story of medial n is a little less simple. There is a number of instances, in which the n was reproduced correctly. In words used in reduplication, like nein-nein, no-no, naughty-naughty, night-night, the medial n took the same form as the initial n, first s, later n. She said meine just once 1:7 with n. *Kimona 1:9-10 had experimental forms with n 1:10, but later lost the n by blending.

The normal treatment of -n- seems to be omission, 122 as attested by money 1:11, *banana, Banane, once 1:11 (second n; the first functions as initial n, 152), *kimona 1:10 (the last form, after experimental forms with n; deflected, however, by assimilation to another word which always accompanied it). In addition, the whole last syllable, with its n, was lacking in piano 1:11-2:0 and *donnert, once 1:11; in the latter word, the omission of the second syllable might be due to the operation of two separate sound-rules (cf. 88).

155. The only medial consonant-combination with n is nd. 123 The two examples for nd are dealt with in 147. The n dropped without trace; the d was also omitted. In *andere, once 1:7, the n seemed to cause lengthening of the vowel.

156. Final n in stressed syllables dropped quite regularly. 124 Examples

120 Karla’s n- was correct from 1:4 (nein). Banana began with n as in Hildegard’s case, 1:10.

121 Phonetic support for the problematic derivation of the latter word given in vol. 1 (p. 116) was later found in Karla’s speech (E 2:8). She rendered the similar name of a radio character, “Baby Snooks” as bebi nuk. Karla also dropped the fricative in snow and Schnee, 1:7-8. No example for kn.

122 In Karla’s case the omission lasted only until 1:7; thereafter -n- was correct. Omission: Bonnie at 0:11, sometimes at 1:5, money at 1:7. Bonnie sometimes had the n as early as 1:5. n: nein-nein 1:8, no-no 1:8; money at 1:9, Bonnie 1:9, banana 1:10, Glenna 1:11, pineapple 1:11.

123 Karla had in addition a case of -ns- in the diminutive Florencie E 1:9-11; it was rendered by long n E 1:9, by short n 1:10-11. Although the syllable-boundary probably lies between the n and the s in the standard, the child’s treatment of this cluster as well as that in the text above suggests the advisability of listing them as medial.

124 Karla was much earlier in pronouncing final n. It was missing in nein 1:4-8, spoon 1:4-6, balloon before 1:9, Wiedersehen 1:11. It was replaced by g in gone 1:1-B 1:9, sun-suit B 1:11. It was generally correct after 1:8: on 1:8, pin E 1:8, in B 1:9, mine 1:11, nein 1:9-10, balloon B 1:9, fine 1:9, airplane B 1:10, green B 1:10, stone 1:10, Stein 1:11, man 1:10-11, one 1:11, *rein 1:11. Pencil had -n 1:8 while losing the second syllable. Down, an early word with her, had g E 1:1, either n or omission as early as B 1:4 and as late as 1:11. The irregular substitute m in spoon 1:7 is due to confusion with broom.
are plentiful: spoon 1;7, balloon 1;10, down 1;4 (–2;1), *John 1;11, *June 1;8, gone 1;10 (–2;1), airplane 1;11, sun-suit 1;11, come on 1;10, mine, mein 1;6, *nein 1;6–9, train 1;11 (Wiedersehen, pronounced -zen, 2;1).

In two frequent words with the stressed vowels a and Æ, the n dropped, but caused nasalization of the vowel. Only in the adverb on, on 1;9 was this always the case. In Mann, man, the earlies: (1;5) and the latest (2;1) forms had nasalization, and it occurred also at 1;6 and 1;7; but as a rule the word lacked nasalization 1;6–11. (Come on had an unasalized vowel 1;10–11, but nasalization at 2;1.) Handschuh 1;10 was for the child hun-tʃu; the final n was lost without nasalization of the vowel.135

The final n did occur exceptionally in two words: in mein at 1;7 and 1;11, in *nein at 1;7 and 1;8. In both words the forms without n continued unabated afterwards; the articulation of the -n when it was pronounced was strikingly conscious and even exaggerated. Obviously, Hildegard heard the n and a few times made an effort to imitate it; but it was more natural for her to omit it, because her speech-pattern did not allow voiced consonants at the end of words (312).

There is only one case of a substitute: the adverb in always had a form ending in aspirated t; but that was the effect of a blend with another word, *ütch (457).

157. Final combinations with n are nd, ns, and nt. Examples are too few and too late to disclose the trend. In all probability, they would have been omitted at first. Toward the end of the period, the last consonant began to be reproduced if it was voiceless, the n still disappearing. In nd, voiced d continued to be missing, but the n caused nasalization of the preceding vowel in a monosyllable.

nd (149) was omitted with nasalization in hand 1;11, without nasalization in sandbox 1;10–2;1.

nt (142) dropped with nasalization in Hand 1;11, but was represented by t (no nasalization) in don’t B 1;11. Don’t shows the normal equivalent. hâ may be based only on English hand (see also 323). Concerning Handschuh, see 156.

In ns the n was dropped without trace and the sibilant rendered by ñ: meins once 1;11, eins 1;11 (also without ñ because of sentence phonetics), Florence 1;11–2;0. (Correspondingly nz>ñ in mittens 2;1. Thus ñs in dörs, stone 1;11 might come from -n+s or z; see 137 and 178.) Omission of the ns of meins may well be hidden in some of the earlier examples of mar attributed to mine 1;6.136

135 Nasalization was rare with Karla. It occurred occasionally in on. Pavlovitch (63) found omission of -n with nasalization of the vowel o 1;1 and 1;5, “sans doute sous l’influence des sons nasaux français”—doubtless an unwarranted inference in the light of my observations. Holmes (p. 222 f.) observed slightly nasalized i in pin 1;8; the n was pronounced 1;10.

136 mar<meins is recorded for Karla E 1;8. Otherwise omission of final clusters with n was rare. It is recorded for hand 1;9, with faintly nasalized vowel. The usual substitute in her case was n, first in the imperfect form g, in Florence 1;8, then correct m: hand 1;10, sand
158. Having disposed of the dental stops (n is a stop with regard to its mouth articulation, a continuant by virtue of the fact that the breath-stream escapes unhindered through the nose), we come to an examination of the purely dental continuants θ and Ø. It is a well-known fact that they are acquired late by children. We must therefore expect substitutes wherever they were attempted at all. They do not occur in German, of course.

159. Initial θ was attempted in only one word, thank you E 1;3, the testimony of which is not absolutely certain because German danke was a competing model. Still, the d, with which this word began throughout the second year, can be assumed to be the regular substitute.137

160. There is one initial consonant combination with θ, namely ɔr. Contrary to frequent statements about the fate of this combination in children’s speech, Hildegard’s substitutes wavered between equivalents for the first and for the second consonant. The three words falling in this category began late. The adverb through had ɒ B 1;11, t M 1;11, both of course based on θ, with omission of r. The verb throw had d, based on θ, early during 1;11 (but w, based on r alone, 2;1). The numeral three, however, had always w, rendering only the r, 1;10–2;1.138

161. There being no instance of medial θ, final θ is the next case to be considered. Like most final consonants, it was at first omitted: *bath 1;3–9 (but based more on German Bad or even the corresponding verb), toothbrush *1;6. By 1;10, however, it was pronounced, with substitution of a different fricative, f: mouth 1;10, toothbrush 1;10. In the latter word, the f, perhaps supported by the occurrence of the same sound at the end of the second part of the compound, was stable during the last two months. In mouth, however, she once 1;10 used again a different fricative, f, with a faint offglide ɛ, which testifies to the fact that she recognized the fricative nature of θ and experimented unsuccessfully with its imitation. f, being at that time the only regular fricative at her command, was bound to become the normal substitute. f was not yet in her speech; it was an accidental substitute.139

162. Initial voiced ɔ was a little more frequent. It was always replaced by the corresponding stop d: *that 1;11, *there 0;10–1;1, 1;5, this 1;8–2;1.140

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137 Karla also had d *1;1, 1;6–E 1;9, but in her case it seemed to be based primarily on the German etymology. The two prototypes split B 1;11, her equivalent for the English expression then having initial aspirated t. t for θ is also recorded for 2;2.

139 Karla had w in three E 1;11.

138 f is reported to be a common substitute for θ in southern Negro English in such words as “both,” “truth,” “breath,” also “through,” “three,” “throat.” It is found also “in bad southern English” and “almost invariably (!) in baby speech” according to Ripman, 31.2; and often in foreigners’ English, cf. Krapp, 32. The record for Karla reveals no substitute for -θ; it was lacking entirely in bath 1;6, teeth B 1;9, mouth 1;10.

140 Karla also d, E 1;1–B 1;4 in there it is, before B 1;4 in there, 1;11 in this and that.
163. There is one doubtful case of medial ŋ, *other, once r;7. If the etymon is correct and if Hildegard’s much abridged form is regularly developed from it, it drops out.\(^{141}\)

164. Final ŋ in bathe was missing r;9, f r;11.\(^{142}\) (In clothes, dof 2;1, the f may stand for both or either of the final consonants; considering parallel cases, r;78, it is more probable that it represents ŋ, the ŋ being omitted, as it sometimes is even in standard colloquial pronunciation.)

165. We shall next consider the group of continuants consisting of the hissing sounds s, z, f, ŋ and the “liquids” l and r. All of them require a complicated adjustment of the tongue, which makes them difficult for children. Phoneticians have not reached complete agreement in the description of hissing sounds;\(^{143}\) but the theoretical problems of their classification need not concern us here. For the purposes of this book, it is sufficient to treat both groups as intermediate between dentals and palatales. Most of them fall, entirely or in part, under the classification alveolar; in some of them, the articulation is in part palatal.

166. The fricative s in initial position was not achieved by Hildegard in the first two years. The standard language has many English (not German) words beginning with simple s, among them a considerable number, like “say,” “see,” which one would expect to be important for the child. Few such words were attempted by Hildegard, doubtless because of the difficulty of the initial sound. Only one word with standard s- occurred before r;9, namely *I see you r;5. In this sentence, imitated mechanically, the s was omitted; but it might be better to classify this s as medial (169). Another example of omission is soap r;10, which during r;10 had no initial consonant. During r;11, the glottal stop was a frequent substitute in the same word, but h also occurred and won out. The only other word with h was *outside r;9, in which the first syllable was dropped; perhaps this word should be classified under ts- (136 and 168). The definitive substitute was j, but the examples are few in number: sandbox r;10–2;1, sun-suit E r;11–2;0 (first s) (sidewalk 2;1).\(^{144}\) The second s of sun-suit was f, the regular substitute for medial s (169).

167. Initial consonant combinations beginning with s are numerous in English: skr, sl, sn, sp, st, str. Their treatment is perfectly uniform. The s is omitted in every instance, and the remainder of the combination follows the regular course.

\[\text{skr} \rightarrow \text{t: scratch r;11} \text{ (definitely from English 2;1).}\]

\(^{141}\) Karla r;11 in the same word.
\(^{142}\) Karla r;11 and earlier.
\(^{144}\) Karla had omission in soap r;8; t in see r;10, sun-suit B r;11 (second s); ʃ in sand E r;9, soap, soup, and sandbox r;10, sun-suit (first s), sidewalk, and sissy r;11 (still ʃ 2;2). Gutzmann (p. 140) lists ʃ for s as a typical “mistake” of children, but claims that it occurs almost only in cases of organic deformation of the two jaws. This explanation does not fit Karla’s case. Probably it is nonsense. Substitution of one fricative for another is a normal process.
sl > j: slide 1;11.
sn > n: *snow 1;6–10.
sp > b: *spill 1;11, spoon 1;7.
st > d: stocking 1;7, stick 1;10, stone 1;11 (137), sticky 1;11; t: sticky 1;7.
str > d: *street-car 1;11 (string 2;1).
The case of sl is not conclusive, because j is a substitute for both s and l (197).

168. The only initial combination with s in second place is the affricate ts, alone or followed by v. In ts the s alone was usually rendered by the substitutes j, 3, and perhaps b, but reproduction of the t alone as d also occurred; for illustrations, see 136. Notice that 3 is not attested for simple s (166), doubtless by accident; there are other instances which prove that j and 3 were interchangeable (388). tsv in zwei 1;10–2;1 however resulted in w, a substitute for v; the affricate was dropped entirely (131).

169. Medial s took a decidedly different development. In the mechanical phrase *I see you 1;5, where s should probably be considered medial, it disappeared. The same is true of the similar expression *da ist es 1;4–5; the "t" of ist is suppressed in colloquial German. There is no further instance of -s- until four months later. From then on it was consistently rendered as f: *beissen 1;10 (where however the etymon is rather the pure stem, with final s), sun-suit E 1;11, *weisser once 1;9, Füss 1;11 (vol. i, p. 128, under Fuss). Only in sun-suit and weisser did f come to stand in medial position. In sun-suit the second s functions like an initial s from the point of view of standard pronunciation (166); but it did not follow the course of initial s in Hildegard's form.146 If dfs 1;11 stood for this is, it is a further illustration for -s- > f; but it was just as often dfs, in which the t would then be carried over from simple this with final s (172).

There is one word in which -s- was replaced by a different substitute, d or t, namely Theresa 1;11. Here, however, it did not represent an attempt to pronounce s, but was assimilated, in a semi-reduplicated wordform, to the initial d or t (136).147

146 Karla treated most of such combinations in the same manner, although her substitutes for the remainders of the clusters, after omission of s, were not always exactly the same: smoke mo B 1;10, scratch gat, daet 1;10, sky kai 2;1, school kul 2;1, stone toum 2;1. In sl, not l, but s was rendered, as h 1;9, h and c 1;70, c 1;11, in sleep(ing). In sw, the s left a trace, transforming the glide w into the voiceless bilabial fricative ɬ: sweetheart 1;10, swing B 1;10 to end of third year (sw- did not occur with Hildegard, unless Liebling, with irregular w-, was influenced by sweetheart). Otherwise Karla disregarded the s- in clusters for more than a year later. At the end of the third year, she pronounced it laboriously in individual words after instruction, and at last learned it abruptly 3;2. For sw > f, cf. Lewis (1936) p. 8.

147 The medial f of jafut did not result from an assimilation of sj. The presentation contained no j.

147 Karla, however, used t as the regular substitute for -s- from 1;10: essen 1;10–11, sisy, cti B 1;11, sun-suit B 1;11 (also treated as medial s, in spite of the presence of n
170. There is one medial consonant-combination beginning with s, namely skr, skr in ice-cream 1;11, *Eiskrem 1;9. Although the two words took a slightly different form, the medial combination in both variants was rendered by t, that is, the s was suppressed and the r, k remained unrepresented in the remainder of the combination (217). Older children like to play at conjugating “ice-cream”: “Ice-cream, you scream, we all scream for ice-cream;” this humorous phonetic game may serve to justify our treating skr in this word as a single consonant combination; note that *Eis had s as early as 1;7. Hildegard used no word with medial sp or st; sp in the name *Jasper, dadi 1;7, was distorted by a semi-re-duplicative repetition of the first syllable (450).

171. Medial combinations with s in second place are ks and ts. In both of them the s was suppressed. The example for ks is doubtful; fixes is probably not the etymon for wit’ 1;11, but uninflected fix, with final ks (174). ts, curiously enough, was rendered fairly adequately in the early whispered word *kritze 1;1-4; the s was imperfect; but it was pronounced, together with the t. Later the t alone was reproduced, in *Miez 1;11 (and schmutzig 2;1). Fritzchen 1;8, with t, fits here if we disregard the c in the mutilated second syllable; her version sounded more like German “Fritzi,” but the name of the doll was fixed as Fritzchen, on which her form must therefore be based. *Outside 1;9 had h, which fits better in the pattern of substitutes for s- or perhaps ts- (136, 166, 168); the word lost its first syllable so that ts was no longer medial.149

172. Final s was omitted in the earlier months, but attempts to pronounce it started almost as soon as words containing it were used at all. From 1;7 and 1;8 it regularly took the form f, which remained the normal substitute. Occasionally tf, representing a slightly inaccurate adjustment of the tongue position for f, occurred to the end of the second year. One word, this, behaved abnormally. It was very frequently pronounced without a final consonant to the end of the same period. Otherwise t was usually substituted for s in the same word, which is without a parallel in Hildegarde’s speech.

Omission of -s is attested by *yes 1;4, heiss at 1;5, nass at B 1;8. Aus lacked the s practically always 1;6-11; the x, which frequently appeared in its place 1;7-11, was not a substitute for s, tempting as that explanation would be, but an off-glide of u (99). This 1;8 had very frequently no final consonant from the beginning to the end of its history (even at

in the form of u) (Kissen 2;2, kisses 2;3). At B 1;9 it was still lacking in heissen. (At M 2;5 she began to improve t to ts, tf, f.) Gutzmann (p. 140) lists t among the frequent “mistakes” for s, f and t are listed by Ripman (p. 140) as typical substitutes.

148 Karla, strangely enough, had n B 1;9-11 and n+k M 1;11; her last form was Panik: survival of the early primitive form, with redundant addition of “cream” in perfected form.

149 Karla however, who reproduced both syllables of outside, replaced ts by t 1;10-11. She had in addition a case of -ns-, in which the s was also suppressed (see note to 155).
Mouse, Maus
did not have a glottal stop in place of s at its first occurrence
1;7, but it was undoubtedly not a substitute for s (cf. 224). Mary Alice
1;11 lost the whole last syllable because of blending with another word.
The regular substitute f is amply documented: Eis 1;7, aus at 1;10
(only once the definitive substitute; otherwise omission 1;6–11), *heiss-
1;10, piec B 1;11, dress 1;10, *Glas, glass 1;11, kiss 1;11–2;1, this at 1;11
(rarely), *dies (perhaps once 1;11), juice at 1;7 and 1;11, *Kuss 1;11,
heiss from 1;7, Haus, house 1;8, Maus, mouse from 1;8, nice 1;10, nass
1;8. In three of these words, the f sprouted a prothetic r ephemerally,
juice at 1;7, Maus, mouse at 1;8–10, nass at E 1;8; in all of them a more
accurately articulated s is found later. The possessives Mamas, Papas E
1;10 (with f) belong here if they came from German (for English -z, see
177).

Affricates, as unsuccessful attempts to pronounce -s, were heard re-
currently. Something like ts occurred, along with omission of the final
consonant, very early during the first month of whispered pronunciation
of heiss, 1;5. Juice started B 1;7 with tf, tfs. tf occurred occasionally in
piece and kiss at 1;11. In all these words, f was the normal substitute
eventually. The only word in which tf was not superseded by s is Fuss
1;11; but the word began late in the month and did not have time to
settle into a more regular form; the plural Füsse, with medial s, did have
s (169).

Whereas all these substitutes are in line with the regular development,
this with -t 1;8, 1;10–2;1 went its own way; the form was used fre-
cently along with frequent omission and rare regular f. There is noth-
ing abnormal in this substitute; the surprising feature is that it occurred
only in this one word.150

173. Final consonant-combinations beginning with s are sk and st. In
both of them, omission of s was the regular procedure, but sometimes
the s was rendered and the following consonant omitted. sk occurred
only in *ask, which was rendered in different ways in the course of the
same week, B 1;11: f, fri, t'. fri is only a variant of f; i frequently intrudes
before f; its addition after f was rare, but is explainable in a similar
manner, as a relaxation in the difficult adjustment of the tongue which
is necessary to form the narrow opening required to produce f. f is based
on s, whereas t' is based on k. It should be remembered that the k of ask
is often suppressed in the colloquial standard before consonants, as in
“ask papa.” In st, as illustrated in 142, the s was rejected and the t
rendered in two different ways (at 2;1 omission of t and reproduction of

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150 Karla substituted t for -s generally in the last two months, although omission some-
times continued late; no final consonant in heiss 1;8–9, yes B 1;9, piece 1;8 (?), heiss- B 1;9,
bus B 1;9, house 1;9–11, nice 1;11–2;1 in juice B 1;11, nass 1;10, piece E 1;11, dress 1;10–11,
glass M 1;11, kiss 1;11, this B 1;11, nice, sometimes E 1;11, bus B 1;11 (house 2;2–3; on re-
quest hauts E 2;3; ts, f, s for -s from M 2;5).
s occurred, although in this case a special explanation was attempted in 142. The explanation might apply to sk as well, cf. 328).

174. There are more final combinations ending in s, namely ks, ms, ns, and ts.

In ms and ns, the first stage was omission of the whole combination; ms was omitted in *bums 1;9 (120); ns was sometimes omitted in eins 1;11. Later the nasal was omitted and the s rendered as f (157). There is no evidence for later ms; *bums did not survive. f for ns is sufficiently attested by eins 1;11, meins, once i:11, and Florence i:11–2;0 (157).161

In ks and ts, an early stage of complete omission was followed by a period of waverling between the two elements. ks was missing in the curiously imperfect form of *Alex i:11, in box at 1;6, and in pieks at *E i:1. ts was omitted in *Bates 1;7–8. Later Hildegard reproduced in ks generally the k, but in ts generally the s. In both cases, however, there are instances when the other consonant was rendered alone, although in ks only just after the end of the second year.

ks>k in box from 1;10 (2:20), Schnucks 1;10, sandbox 1;10–2;1, and pieks at i:11. ks>t, a substitute for k, in fix i:11 (but f in the same word 2;1, now definitely from the uninflected form, cf. 172).162

ts>f generally, but occasionally >t; for details, see 143.

175. The voiced counterpart of s is z, a sound which Hildegard did not learn in the first two years, and which was therefore always represented by substitutes.

Initial z occurs in English and is very frequent in German; it is found in many common and useful words like "sehen," "sagen," etc. Yet there is not a single word in Hildegard’s vocabulary which can be traced with certainty to an etymon beginning with z. That seems to point to the inference that difficulty of pronunciation plays a definite part in the selection of words for active use (cf. vol. 1, p. 172).

The only two words which might have contributed to Hildegard’s vocabulary in this category are Seife and Sand, both of them so doubtful that they are not even listed in the index of her German words (vol. 1, p. 148). Her words came from the English equivalents soap and sand (in sandbox), as explained under these words in vol. 1. In Seife, if it had any contributory effect at all, the z would be omitted at 1;10 and successively represented by the glottal stop and h at i:11. In sandbox, if German Sand had anything to do with it, the substitute for z was j i:10–2;1. (At 2;1, the first substitutes definitely traceable to z, perhaps functioning

161 Karla, on the other hand, also omitted these combinations at first, but later rendered the nasal and not the s, from 1;17–8, see notes to 120 and 157. Hildegard’s occasional omission of the final fricative in eins might be due to the initial affricate of the numeral zwei following it; this is likely to happen even in the standard in rapid counting.

162 Karla omitted ks to b 1;9 and reproduced the k alone correctly from M 1;9. Omission: box E i:3–B 1;9, pieks 1;4–9; k: box i:10, pieks M 1;9, fix i:10–11; sandbox had k at i:10, but not always.
like an initial consonant, were $f$ and $s$ in *Wiedersehen. *widi $se$ contained the substitute $f$. *widi $3e$ > $widi_{3e}$ E 2;1 had the better voiced $3$.)

176. Medial $z$ is also poorly documented. In *Hase, once 1;8, it became final $f$, but in *measles 1;10 it was omitted. (About *Wiedersehen 2;11, see end of preceding section.)

177. Final $z$ occurred much more frequently in standard words active in Hildegard’s vocabulary. The difficulty of final consonants, which were generally disregarded in the earlier months, never deterred the child from attempting to pronounce words.

Omission of $z$ is attested by $peas$ 1;10, please, always 1;9, usually 1;10, frequently later, nose, once at 1;8. One cannot be sure whether the omission of a $z$ to indicate the plural of nouns, the third person singular present of verbs, and the possessive is phonetic or morphological. Such modifications were generally disregarded in favor of fixed unchangeable forms. If for instance the plural $z$ of shoes was absent at E 1;8, it might mean either that -$z$ was still omitted in her phonetic scheme, or that she did not yet feel the need for learning a plural form distinct from the singular. The situation is similar for the possessives Mama’s, Papa’s: no ending 1;8, -$f$ E 1;10 (cf. 172). Verb-forms which she used at 1;11 in the third person might either go back to standard fixes, washes, cries with the $z$ phonetically unrepresented, or to the unmodified stems fix, wash, cry. If *dia, *dia (vol. 1, p. 75) contain a budding $is$, this would seem to favor the phonetic explanation, but the instances are too doubtful to serve as a basis for explanation.

Of the words just mentioned, the following had the substitute $f$ later: please from E 1;10, but not always; Mama’s, Papa’s E 1;10; nose from 1;10; shoes from 1;11, first $f$, then, with more accurate articulation, $f$. The latter word did not always have the plural sign, but some of its uses may go back to German Schuhe, with omission of $a$ (84).

Although peas never attained representation of the $z$ during the first two years, and please and shoes did not always have it, new words learned 1;10 and later regularly rendered final $z$ as $f$: noise 1;10, cookies 1;10–2;1

(years 2;0, use 2;0–1, toes 2;1, fishes E 2;1). Even after -$z$ was phonetically represented, the functional distinction between singular and plural was not yet clearly understood; cf. beads (567). The form wof for Florence’s may be either the uninflected name, or the inflected form with phonetic omission of -$z$, or the result of a contraction of $f<-s$- and $f<-z$.

*def, steht once 1;11 belongs here if it goes back to steh- with English third person -$z$, which is dubious. The situation is similar with regard to

153 Karla had $s$ for medial $z$ in the same word 1;11; later it was often, but not always, assimilated to the d of the preceding syllable.

154 Karla lacked final $z$ in there it is E 1;1–4, nose 1;9, please E 1;7–11, two babies 1;11, Florence’s 1;11, house-shoes M 1;11, three bears E 1;11. (It was $t$, like final $s$, in kisses 2;5.)
the very uncertain word *bl*f, story 1;11, which might contain an incorrect plural -z. (For another explanation, see 137.)

178. Final consonant-combinations ending in z are dz, nz, lz, lz, (nz). In dz the z was rendered alone by f from 1;9, both components by tf from 1;11 in the only example, beads (150).

nz occurred in stones 1;11 if its final if was due to an incorrectly added plural z. (For another explanation, see 137).

lz, only in *measles 1;10, was a, that is, the l was rendered, the z dropped.

lz became uif, uf in balls at 1;11, both components being rendered. *Nails 1;11 had only a; in this word the plural z was omitted (cf. also 204).

nz probably did not occur. Hangs at 1;11 is an improbable etymon for her form without a final consonant; the third person ending was not yet added, and her vowel requires the corresponding German etymon häng(t) (24).

(At 2;1, nz in mittens, rdz in peg-boards, and dz in clothes all ended in simple f, peg-boards in the variant form if. In all three cases, therefore, the z alone was rendered.)

179. A final combination with z not in last place would be zd in closed if this etymon were not so improbable for 3uf (149).

180. Looking back over the representation of z, we find a regular substitute for it with certainty only in final position, namely f, after earlier omission; it continued to be unrepresented in a few old cases, always or partly, to the end of the second year.185

181. The standard fricative f in initial position was in most instances reproduced correctly from 1;0 on; but in the only real, permanent word, it suffered variation.

Hildegard repeated *danke schön once mechanically 1;1 in premature partial perfection, f standing for the whole second word. The onomatopoeia *sch, taught her by her grandfather in Germany with an imaginative train game B 1;0, not only developed into a word serving for a variety of noises, motions, and movable objects 1;0–6, but probably gave the initial impulse for the prominence of the consonant f in her sound-system. In the first timid imitation, it sounded like s, but quickly developed into a correct f. The English interjection sh, an admonition to be quiet and go to sleep, functioned like the verb “sleep” from 1;6 (−2;1). The real word shoe, Schuh began 1;6 with the correct f and no vowel. At 1;7, however, it began to vary: f with a prothetic vowel: if; the same voiced: if; 1;8 with metathesis: si and with substitution of a simpler voiced fricative: ji. From E 1;8 the standard vowel was introduced, at first inaccurately as u, then correctly, but the fricative con-

185 The substitute f is not listed by Gutzmann (p. 140) among the typical “mistakes,” which, according to him, are the substitutes “d,” “w” (= v), and “j.” He is probably thinking only of initial position.
continued to waver between ʒ and j, with ʒ prevailing. The correct s̄ never returned in this word (ʒ even at 2;1). ¹⁸⁶ For an explanation of the curious difficulties which the child encountered in learning this important word, see 383.

182. Initial consonant-combinations beginning with s̄ are ʃn, ʃp, and ʃt, all in German words. In such combinations, just as in similar ones with ʒ, the fricative was consistently omitted and the other consonant reproduced alone by its regular equivalent. ¹⁸⁷

ʃn > n: *Schnee 1;6-9, Schnucks 1;10 (153).
ʃp > b: spielen 1;11 (p 2;1) and perhaps *Spiegel 1;8 (108).
ʃt > d: *sieht 1;11 (137).

(ʃm > m or b: schmutzig 2;1; see 118.)

183. The only initial combination with s̄ in second place is the English affricate tʃ (136). In the two words choo-choo 1;7 and *church 1;10–11, the first representation 1;7–8 was d, t; from 1;8 it was correct tʃ, also voiced dʒ and simplified voiced ʒ; only the two voiced varieties in *church. For Handschuh see 136, end.

184. Medial s̄ had no unified substitute, and the examples are too few to establish which one prevailed. At 1;10 it became final s̄ in *Tasche, once, but the whole middle syllable dropped earlier in the compound *Taschentuch, dadi 1;7 (134). Washes 1;11, with final s̄, can hardly be counted as an instance of standard medial s̄, since the personal ending was probably still lacking. For the early *danke schön, once 1;1, see 181. In the phonetically difficult word *Lö cher 1;11, which varied considerably in form, the s̄ was always k̄, a strikingly unsuccessful imitation of the standard sound; a “consciousness” of phonetic failure may be responsible for the dropping of the word, which was important enough for the child because she liked to play with the blotter. (t in fishes E 2;1, vol. 1, top of p. 138, seems irregular; it may be due to dissimilation from s̄<z or to blending with another word.) It is significant that s̄ almost never remained medial in the child’s form. When it was rendered correctly, in *Tasche 1;10 and *danke schön 1;1, the remainder of the word was dropped because, in her sound-pattern, s̄ could as a rule only be final (383). ¹⁸⁸

185. The medial combination ʃt occurred in Bleistift. It was t 1;6, d from 1;7 (140), that is, the sibilant was omitted as in initial position (182).

¹⁸⁶ The history of shoe in Karla’s speech was different, but just as motley (see vol. 1, p. 122, note 258). She had no s̄ in her sound-system; it began to evolve just before the end of the second year, but her usual substitute for s̄- (as for s-ϕ) was ç: sugar ʧuk 1;10, Schaukel ʧuk 1;10, sh! ç 1;10–11, shoe ʧu 1;10–11, also ju 1;11; budding s̄ M 1;11.

¹⁸⁷ Preyer (pp. 166, 170, 174, 178) found s̄ omitted in such combinations at 2;2–6. s̄ sometimes resulted in sv (p. 166), but at other times lost the s̄ (pp. 168, 174). s̄ > st 2;5 (p. 177) > s̄ after 3;6, but as late as 3;10 only in this combination (p. 179).

¹⁸⁸ Preyer p. 174: s̄ > s 2;4: “Flaschė”>“Flassee.”
186. In medial tʃ, the t was always reproduced in some form; the s was also sometimes rendered (see 139).

187. Final s was reproduced correctly from 1;8. Before that stage it was omitted. Brush lacked it at 1;5–8, toothbrush at *1;6. Both had it later, brush from 1;10 (often ʃ at 1;10), toothbrush from 1;10 (only ʃ at 1;10). With s from the start: push 1;10, crash 1;10, wash, wasch(en) 1;8 (ʃ 1;8, s from 1;9, once š ʃ 1;10), *wisch(en) 1;8 (gosh 2;1).159

188. Final tʃ was likewise omitted at 1;6. From 1;9 it was generally rendered by s, which remained the normal substitute (even at 2;1); but in two words it was produced correctly at 1;11. Details are found in 143.

189. The voiced counterpart of ʃ is not frequent in standard English (it is contained in such words as “vision,” “pleasure,” “garage”) and very rare in German. It is not surprising that no word with standard z occurred in Hildegard’s vocabulary. The affricate dʒ, unknown in German, is much more frequent in English, and there were several such words in Hildegard’s language, all with standard initial dʒ. In all of them the d was rendered alone; the z dropped out, although she used z and even dʒ as a substitute for other consonants. The examples are found in 145.160

Note: The click tsk, tsk (German t, t) was reproduced faithfully.

190. In the first of the “liquids,” l, the alveolar position of the tip of the tongue161 is not particularly difficult. The obstacle to correct imitation of the sound lies in the unusual feature that the breath stream operates over one or two edges of the tongue (165). Hildegard was not very successful in learning it and did not attempt to use many words containing it by itself, especially in the crucial position at the beginning of the word. English and German l differ in their manner of production, the German l being articulated with a flatter tongue than the English, which is often accompanied by more or less raising of the back tongue.

191. As in the case of m (117) and n (151), we shall first discuss l in syllabic function. It occurs only in final unstressed syllables. In this position, its function resembles that of a vowel more than that of a consonant, and it is not very surprising that the child’s substitutes were all vowels.

The variety of vowels chosen as substitutes is almost as great as in the case of -n, but the principle of choice is not quite so clear. The approximate vowel harmony postulated for the substitutes of n operates here as

159 Karla had omission in brush 1;4–5, push B 1;9, Tisch 1;7–9; ʃ > t, like -s > t, in brush 1;10; s, apparently an assimilation at a distance, in faf, Fleisch M 1;11. Franke’s confidently stated rule, “Nie behalten einsilbige Wörter bei konsonantischem Anlaut auslautendes r, sch und wohl auch engl. th” (p. 668) is not confirmed by Hildegard’s case.

160 Karla had one word with final ndʒ: orange B 1;10. She rendered the combination, quite inadequately, by ňk.

161 Cf. Kenyon 37, 220, Krapp 45. “Liquids” are a category by themselves at best by their manner, not by their place of articulation, of course. For the purposes of this study, however, it seems best not to deviate from the traditional classification.
well, but not in every example. In one word, the velar overtones of English -l asserted themselves with greater force than the urge for assimilation.

192. German -l was omitted only once in *Spiegel i;8, and the etymon is not certain. Later examples happen to contain mostly back vowels in the stressed syllables; o and ø are therefore the usual substitutes for l. Dunkel E i;8 started experimentally with fully reduplicated forms containing u or ø in both syllables. At B i;9 the consonants were no longer alike, but ø continued to be used in both syllables. At i;10 the vowels became differentiated, too, but the u of the stressed syllable continued to be followed by a back vowel, o or ø, with ø prevailing eventually. Onkel M i;8 began with ø, which agreed with the vowel of the stressed syllable. Early variants a and o occurred; the latter was reinforced by the adoption of the word on the part of the adults with this vowel; the whole word became fixed in the form it had reached at i;10. Hildegard’s attempt i;11 at deriving the word anew from the presented standard form introduces no new principle; u for l in that form is quite in line with the harmony of vowels otherwise observed. *nea, once i;11, could come from Nägel, the front a being in harmony with front e; but it is more probable that English nails was the prototype (204). *Watschel, once i;11, had ø after a of the first syllable. Just as in the case of U (151), the definitive substitute might be this ø; but the dearth of examples prevents the assumption from being susceptible to proof.

193. There are even fewer illustrations for English -l. Apple i;5 always had a as in the stressed syllable, perfect vowel harmony prevailing. Towel i;10 lacked the l completely as late as i;11, a procedure which fits much better in the picture for final consonantal l (203); apparently, then, Hildegard heard the monosyllabic colloquial form described by Krapp 147. The frequent word bottle i;6 had as its second syllable an i (i;6–7), not fused into a diphthong with the immediately preceding vowel; it was based on the front part of the articulation of l, the tip of the tongue not establishing the correct contact. At i;8 the syllable was pronounced lu, continuing the previous articulation, but adding the velar characteristics of English l separately. At i;9 the i was replaced by a surprisingly correct l, but the u was retained; the result was lu. A few years later the less perfect form with ju reappeared; j was in other positions a common substitute for l (195–199 and 203). From i;10 the form was fixed with lu. In this word, therefore, the attempts at accurate imitation of the difficult English l overshadowed the rival tendency to use a vowel substitute in harmony with the first syllable.163

162 Karla omitted -l in Schaukel, cauk i;10.
163 Jespersen p. 109: “00 stands for the hollow sound of syllabic l.” Karla omitted the whole second syllable in bottle i;4–8. Her substitute for -l was u regularly i;10–11, for instance in apple. It occurred also in purple, along with ø and correct l, i;10. She had ø in bicycle B i;11. The similar u is mentioned as a frequent substitute in child speech by
194. Final syllabic I followed by another consonant is illustrated only by English *measles 1;10. The word was always presented in the plural. The final as well as the medial z was omitted, which is not irregular (177 f.) The a of the second syllable stood for l as in apple (193), both syllables of the child’s form containing a front vowel, although there was a wide span between them; the vowel harmony was not so perfect as in apple. There may have been plurals like apples which were not recorded because the child did not yet distinguish singulars and plurals. Cf. consonantal lz, 204.

195. Coming to I as a pure consonant, we examine it first in initial position. Here the standard articulation in English is not strikingly different from German, and we find the treatment of the two varieties to be rather similar.

German I- became j in *lutscht 1;10 and at times in Loch 1;10 and *Löscher 1;11. Sometimes Hildegard achieved a correct l in the latter two infrequent words, at the same time as j. (At 11, she used h in the name Leopold, which may be an assimilation to the initial consonant of the name Hildegard preceding it, but is probably a genuine substitute, for it was used at the same time for English I-.) Omission occurred in *Liebling 1;11 for the second l, if we consider it an initial l; it might be better, however, to treat it as part of the medial combination pl (110). The first l of this word was, quite irregularly, w;164 this was not a real substitute, but resulted from blending with another word, either Fritzchen or sweetheart (or even sweetie?).

196. English I- was h in light at 1;6 and 1;8, and always so 1;10–11. At 1;7 and, after another occurrence of h, at 1;8, forms without h were heard; but the word was not introduced by a glottal stop, as words beginning with a vowel regularly were otherwise in Hildegard’s speech. Thus these forms can safely be treated as variants of h-; the breath being so faint that it was inaudible. (Look, which was very frequent at 2;1 in the strange form hek, had h even at that late stage.)

Whereas the old word light remained fixed with h, the new word lie 1;11 had j (likewise like and lost 2;1). I consider j the normal substitute at the end of the period, for both German and English.165 It appeared

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Kenyon 221. Karla also used w in both syllables of purple 1;10. She had i in both syllables of people pipi 1;10. Bergmann (p. 185) gives u as the regular substitute even for German -l 2;2–3. There are dialectal features in the examples. His dialect should be examined as to the kind of l which it uses. There are German dialects which use a velar l.

164 For Holmes (p. 222 f.) w was a regular substitute for l- at 1;9.

165 Karla also had difficulty with l-. She omitted it as late as B 1;11 at the beginning of Liebling; omission and h in Leopold 1;10; w in like 1;10. In Loch she substituted the related, but simpler tongue-point stop d 1;9. Only in lie did she use a surprisingly early l B 1;1; it yielded to assimilatory d in lie down B 1;4, which proves that it was not yet securely acquired; but it returned later. In her name, Karla, the second syllable was a repetition of the first B 1;9, but the l was soon introduced, M 1;9, in English articulation, imperfect at first. Lemonade E 1;11, a word much distorted by assimilations, began with n under the influence
also in *hello (199) at its later stage, when the pretonic syllable was omitted, 1;10–11 (also in reduplication). (The name *Leona was much distorted by child etymology 1;11, but probably developed j at 2;0.)

197. Initial consonant combinations, with l in second place, can be discussed without separating English and German examples. bl, fl, gl, kl, and pl were treated alike. In all of them, the l was suppressed in favor of the preceding consonant. In sl it is impossible to say whether s or l was rendered; the substitute j could stand for either. It cannot be decided which rule took precedence, the one that l in such a position is omitted, or the other that s beginning initial combinations remains unrepresented (167).166

bl > b: six examples, see 115.
fl > w: three examples, see 126.
gl > d: *Glas, glass 1;11.167
pl > b: please 1;9 (107).
sl > j: slide 1;11.

There is no clear case of kl (before 2;1: clothes, > d). In *klingelingeling 1;5 the substitute was apparently an awkward l; but in the fully reduplicated form of this word it is better explained as the result of assimilation to the following syllables. In closed 1;11, j and 3 took the place of kl; but the etymon is very doubtful.168 The j as a substitute for l, with omission of k, is supported by *klap pert 1;11 (see 142); this word, however, is also doubtful.

198. Medial l in German words had an approximately correct rendering surprisingly early. In all three syllables of *klingelingeling 1;5, an imperfect l was heard. The exceedingly frequent word alle 1;7 had in the first month a real l, but with a raised back tongue as in English. During the next two months it yielded to j, which must be considered the normal substitute for this stage. In the last two months it was a real German l. Rollen 1;8 was always presented to the child with the infinitive ending and might therefore be said to contain a medial l; but the treatment of l in this word agrees much better with that of final l, where it will therefore be taken up (202); the assumption is that Hildegard disregarded the infinitive ending in this word as in others (cf. 151, in two passages).

199. English medial l has more examples. Most commonly it was omitted, early and late: alley 1;11, *Alex 1;11, pillow 1;11, do lly 1;6 (dissyllabic 1;6–11, monosyllabic 1;8–11), Mary Alice 1;11 (all of -l is of the initial consonant of the stressed syllable (cf. note to 148). The substitute j seems to have been less common in Karla's groping attempts to imitate l; but it is attested by jek, lake 1;10.

168 Karla treated l combinations in the same manner. In her case it was definitely the s of sl that was rendered and not the l (see 167, note).

167 Karla gl > g M 1;11 in Gie nna, glass.
-las omitted); balloon 1;10 (see 197, bl). It was rendered in only two words: Helen (1 1;9, j 1;10) and hello (definitely English l, with raised back tongue, 1;5–10). The latter word, after five months of correct l, reverted at E 1;10 to a more primitive form, which was, however more normal for the stage: the pretonic syllable was omitted (196) and the l rendered by j. The word was sometimes reduplicated, and that form became the regular one 1;11.169

200. The medial consonant combination ld in her name, Hildegard 1;11 (–2;1) remained unrepresented, the word being contracted into a two-syllable form.170 It is possible, however, that her variant ar was a phonetic representation of il, as it was of el in Helen (29, 199). l and d belong to different syllables in standard speech, but not necessarily in the child’s version (see 325).

201. In the medial combinations bl and pl, the l was suppressed; there are no clear examples of intervocalic position.

bl > b normally, with assimilatory modifications (115 f.).

pl > p normally (110).

202. Final German l as a pure consonant was never pronounced correctly. It was sometimes omitted; in several words it was represented by non-syllabic vowels.

Omission occurred in *Ball at its earliest whispered stage, 1;0–4, and again when it was uttered aloud, 1;5–9, but not always; in spiel(en) only in pretonic position 1;11 (and 2;1); in *hol(en) 1;11; in roll(en) in one experimental form at B 1;9 and regularly at 1;11.171

Its substitute i formed a diphthong with the preceding vowel in *Ball at the end of the whispered stage 1;3–4 and later; but at other times the stressed vowel was lengthened, the word becoming dissyllabic. The inadequacy of the substitute i seemed to be felt when the word was pronounced aloud, 1;5–9, for it was then frequently omitted. It occurred also experimentally in roll(en) at B 1;9.

The latest substitute was ë. It occurred first in roll(en) at 1;8, but was later given up. It was regular in Automobil 1;11 (–2;1) and spiel(en) 1;11 (at 2;1 transcribed i, which, immediately after i, may pass as a variant of ë).

169 Karla omitted l in balloon to B 1;9 (indistinct representation M 1;9), yellow B 1;10, and dolly 1;10. She had t’ in a very unstandard form of pillow 1;11. In hello she always omitted the pretonic syllable; initial l was n 1;9, p 1;10, h 1;11; h might also be the standard initial b of the two-syllable form contracted into one syllable.

170 Karla’s very varying forms for his sister’s name (vol. 1, p. 86, note 155) were different, but followed the same principle; ld was also omitted, 1;1–9.

171 Karla omitted German -l in Ball 1;3–8, Automobil E 1;11 (the latter word rather from English, even in Hildegard’s case). Fall(en) omitted l at 1;7, replaced it by i 1;8. In Stuhl she tried l E 1;6, but omitted it B 1;8–1;10. In Mahlzeit 1;11, the l was at first missing, but at that time the word appeared blended with outside (see vol. 1, p. 85, note 151); as soon as it was improved, the l was regularly present. She had no l or r until B 1;9, when the first faint velar l appeared in German Ball.
The substitutes ju and lu, which occurred ephemerally in other experimental forms of rollen at B 1;9, are, on account of their velar feature, more satisfactorily traced to the English l of roll, which competed with the German synonym in Hildegard's language (cf. 157). 172

203. Final English l as a pure consonant was also not learned correctly. Most commonly it was omitted, but vowel substitutes are also found as in the case of German -l (202).

Omission is attested by all (adverb 1;5, adjective and pronoun 1;10–2;1), all right 1;8, *Paul 1;8, tovel 1;11, call 1;11, wheel at 1;8, wheelbarrow 1;11, fall 1;11 (-2;1), roll 1;11–2;1 (whole 2;0, hole 2;1).

The substitute u, the result of imitating the raising of the back tongue without the contact between the tip of the tongue and the alveoles, 173 is found regularly in ball 1;9. It formed a diphthong with the preceding vowel. The diphthong was the same in bell 1;11 (at 2;1 au was even assimilated into monophthongal o).

Except for the word bell, with its curious lowering of the stressed vowel, l after front vowels (higher ones than e in all examples) was reproduced as o or a unless it was omitted. o is found in automobile 1;11, *spill 1;11, wheel from 1;11 (-2;1). v is used as the transcription of the first substitute for l in wheel at 1;10. At 1;11 wheel had a in competition with o. Only a is used to transcribe the substitute in pail 1;11 and nail 1;11 (see also 192).

There is one word in which an l was achieved, although not in final position, namely oil 1;6. Imitation of the l was attempted in this word from the beginning, but unsuccessfully. At 1;7 the substitute was o, but variants including la showed that the struggle to master the l continued; the l had the raising of the back tongue like standard English l, but needed a supporting vowel after it (391). At 1;9 o occurred, without the l. From 1;10 she fixed the representation as lo, giving up the struggle for complete correctness. The experimental forms of roll with ju, lu at B 1;9 (202) are parallel to this development; but in this word she abandoned the substitute and omitted the sound altogether in the later months.

In *oatmeal 1;11, the l was replaced by t, which was however not a substitute for it, but the result of blending or assimilation. The fact that her speech did not tolerate a final l may have contributed to the irregularity. 174

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172 Cornioley (p. 19) reports "balli" or "baue" for German Ball. The latter form resembles Hildegard's word which I trace to English ball on account of its velar feature. It must, however, be remembered that Swiss German has a non-standard velar l; cf. alls>"aus" (p. 21), Mal>"mau" (p. 36). Thus his record confirms my assumption instead of invalidating it.

173 Kenyon 221 f.

174 Karla omitted English -l, just like German -l, almost always: in all 1;1–6, all right 1;8–9, call 1;11, nail 1;10, bell B 1;11, automobile E 1;11. The only substitute recorded is u in ball B 1;10. She had l in oatmeal E 1;11 (school 2;1).
204. Final combinations of l with another consonant following it are l'd, lç, lk, lt, and lz. Their treatment, with the scarcity of examples available, does not show a clear or uniform trend (see also 326).

ld in cold 1;10 was omitted; this was regular for -d (149) and the most common procedure for -l (203).

lç and lk occurred only in Milch, milk 1;6, and it is difficult to separate the two prototypes. At first, 1;6–7, the combination was omitted. At 1;7–9 it was represented by a, which looks like a substitute for l, either German (202) or English (203). Finally, at 1;10–11, when the etymon was in all likelihood English milk, because English prevailed at that stage, the cluster was rendered by k.176

It was omitted in *Bild 0;9–1;8 (but became t in Leopold 2;1)177 (142).

lz was a in *nails 1;11, but uf > uf in balls at 1;11. That means, in the second word l had its regular substitute and z was represented, in agreement with the prevailing rule (177 f.), by f with or without a prothetic vowel. The a in *nails is also a regular substitute for l (203), but the z is missing. Apparently then, this word was still reproduced in its stem form without a plural sign, in spite of the fact that it had the plural z in the context in which it was presented. This happened also with balls at 1;11, even after it had occurred with the plural sign; the category of plural was still in the stage of dawn. Concerning -lz, see 194.

205. The other “liquid,” r, is even more difficult than l. Its chief characteristic is a moderately raised position of the tip of the tongue requiring a complicated adjustment of the tongue muscles, which we could not expect children to learn early. In fact, Hildegard did not learn an r during the first two years; wherever she used words containing it in standard pronunciation, she had substitutes or omitted it. Adding to the difficulties is the fact that German uvular r, the only comparable sound she heard from me in German, is quite different in its manner of production. In a strict classification, it should be taken up among the velar consonants. In colloquial speech, it is actually a velar vibrant or roll, commonly even a velar fricative.178 Functionally, however, it is closely parallel to English r, and Hildegard treated it in much the same way, because it is also difficult to imitate. For the sake of practical convenience I include it here in the loose classification of “liquids.”

There are several varieties of American r,179 but the differences can be disregarded here, since the child’s substitutes fell far from the mark of exact reproduction. Syllabic r at the end of words is classified as a vowel

176 Kenyon (221, note 70a) records muk as a “frequent child’s pronunciation.” A. M. Caffee reports muk as common in Southern American (American Speech 15, 1940, p. 259).

177 Karla, milk, omission 1;7, k 1;9–10. She had no form with a.

178 Karla omitted It (or English ld) in Leopold 1;10.

179 Cf. Kenyon 237 and Krapp 39–44. Kenyon (37, 77, 234 ff., 380) now describes r as a glide, final r as a vowel. Although there is good reason for these classifications, I retain the more conservative treatment.
in this study (90) and does not appear in the discussion of the consonant r.

206. Initial r, r was at first omitted in all right at 1;8–9 (unless this word be classified under medial r, 208); her form consisted at this stage only of vowels.

Otherwise the substitute w was generally used:180 in all right from 1;10, right 1;11, *radio 1;10, read 1;11, ring 1;11, Rita 1;5, rollen, roll 1;8 (–2;1), rock 1;8. Notice that rollen is the only word with initial German r which she attempted; it resulted at first definitely from German presentation.

There are two cases of h for r, ride 1;8–2;1, and room 1;11–2;1. (At 2;1 initial r always became h.) Once 1;11 ride had a glottal stop instead of h.

In one word r- was replaced by j, namely write 1;11; was this due to phonetic analogy? (see 457).

w is the regular substitute. h and j are experiments testifying to the difficulty of the consonant. It may be more than accident that these two sounds are also regular substitutes for l. Exchange between r and l is well known in standard languages (425).181

207. There is a wealth of words beginning with a consonant combination of which the last component is r, r. The presence of this sound seemed to be no deterrent; Hildegarde used such words freely; but it was regularly disregarded, except for the early stages of the single word pretty and, in part, for the combination thr.

br, br > b. Three English and two German examples, 1;5–2;0 (115).

dr, dr > d. Three English examples, one German, 1;10–2;1 (145).

fr > w: Frau and Fritzchen 1;8 (in the case of Frau preceded by a stage of glottal stop, 1;7). Sometimes the w was improved to v or g ephemerally at 1;8 in both words (at 2;1 v became the regular substitute for f); this variant proves that the substitute stood for f and not for r. This assumption is also sustained by the parallelism of fl and fr (126).

gr > η only in the primitive, reduplicated form for Grandpa 1;8, which was not improved. It cannot be interpreted as a regular substitute. It

180 Explained and recorded as a mannerism in nineteenth-century standard British English by Ripman, 325 f.; cf. Viëtor 94, note 2. An illustration of its use in affected speech can be found in Thackeray's Newcomes. Students have told me that it still occurs in the speech of certain American ministers of the Gospel, in addition to being a common substitute in children's language. Cf. Holmes p. 222 f.: 1;9 wi-d, read. Horn (p. 88) records the same substitution among recent phenomena of standard English.

181 Karla used w even more regularly, in all right at 1;9, radio at 1;11 (still at 2;11), read 1;10, red B 1;10, ring 1;11, ride 1;10, write E 1;11. The latter word had at E 1;8 β, with voiceless θ as a variant; this is only a slight variation. All right still lacked a substitute at 1;8. She had j for r- in rein 1;11. Radio had garbled forms with n at 1;6–11. Cornicloy (p. 44) lists n, l, and j as substitutes for German (tongue-tip!) r at 1;10. n seems to be confirmed in my records by Karla's early forms for radio. Grammont (p. 63) claims that the replacement of initial and medial r (θ?) by l is almost general. He finds it, as I do, omitted in final position and before and after consonants. Hildegarde, however, did not learn l well.
was induced by g and by the nasal m at the end of the syllable (see 120 and 222).

kr, kr retained the stop alone in various forms, most frequently d: English cry 1;10, (cracker possibly at 1;6,) crash 1;10; German kratzen (English scratch?). The related t appeared earlier in German *krütze 1;1–4. Improved representation by kς appeared experimentally in cracker at 1;7; the ς should not be understood as a substitute for r; the affricate was due to the fact that the attempted closure for the stop k was imperfect. The word settled from 1;10 into a reduplicated form with g, which had also appeared as early as 1;7. d, t, k, and g all stand for simple k (213 f.).

pr>b: pretty at 1;11. In this word, the treatment of which was exceptional, r or a substitute for it appeared after p with almost complete regularity as long as the word was whispered, 0;10–1;8. As soon as it was articulated aloud, B 1;9, the r was left out and appeared only once more, later 1;9, in the shape of the substitute w after p. At the end of the year, b was the regular substitute for pr in the adjective pretty. The general rule of substitution had won out against earlier, more perfect reproductions of the word in isolation. Among the early representatives of r during the whispered stage, the following were heard: ɕ, ʃ, s at 0;10; palatal rolls and fricatives at E 0;11; ʃ at B 1;3; w at B 1;4, gliding y at 1;4 and 1;6; omission is recorded only once at B 1;4. The r was quite perfect at 0;10 and 1;0; sometimes it was the bearer of the syllable, as it often is in careless colloquial pronunciation (popular transcription, "purty"). The early fricatives were due to excessive raising of the tongue blade.

skr>d: scratch 1;11 (definitely from English, 2;1).

str>d: *street-car 1;11 (string 2;1). The rule that s before consonant is dropped (167) makes skr and str follow the same course as kr and tr.

tr, tr>d: English Theresa 1;11; German tragen 1;11. Unaspirated t was reached in train 1;11; it occurred also in Theresa. *Gertrud(e) 1;1 with d might also belong here (136).

θr did not follow consistently the rule which applies to the preceding combinations. To be sure, through 1;11 had d B 1;11, t M 1;11, substitutes for θ. Three, however, omitted the θ and substituted w for r, 1;10–2;1. Throw began with d 1;11 (but switched to the substitute w 2;1) (160). Both components being difficult, Hildegard hesitated in her choice.

208. Medial r was always omitted: Marion 1;14 (reduplicative), Mary

182. In the same word, Karla sometimes had fricative substitutes for r at 0;11, but more commonly she omitted it, the vowel being tinged by it, resulting in y, y, during the whispered stage, 0;9–11, and in u, when it was said aloud, around 1;8. The compromise sound y may have occurred in Hildegard's pronunciation (cf. vol. 1, p. 28).

182. Karla's treatment of these combinations is parallel. Examples have been given under the sections referred to in the text. I have no examples for fr, str, and tr. gr in Grandpa was, more regularly, d *1;4, n by assimilation at a distance of d- to -m, 1;8–11; in green B 1;10, gr was g. kr was g in cracker 1;4, k in cry 1;10 or 1;11.
Alice 1;11, *wheelbarrow 1;11, Florence 1;11, possibly *story 1;11.  

All right 1;8 can be included here since the I is often slurred in careless colloquial pronunciation and was omitted in the child's form. The r was unrepresented at 1;8-9, rendered by w from 1;10. The latter substitution fits better with initial r (206).

German medial r occurred only in *andere 1;7, and this etymon is doubtful; her form consisted only of the first vowel.  

209. Medial combinations ending in r, r omitted it.  

skr, skr > t: ice-cream 1;11, *Eiskrem 1;9 (170).  

(pr > p: apron 2;0; 110.)  

rn in ironing 1;8 is not treated as a medial combination with r, but discussed under final r (210) and initial n (152).  

210. Final non-syllabic r, r usually remained unrepresented, but was sometimes indicated by a vowel sound.  

It was omitted in English high-chair 1;5, poor 1;10-2;0, *there o;10-1;5, *street-car 1;11, door at 1;10-1;11, here 1;9, ear at 1;8, *more 1;6, flower 1;11 (see 90), where 1;11-2;1, ironing 1;8 (your 2;1); in German Haar 1;10, hier 1;9 (if also from German), mehr at 1;5-2;1 (but not always; omitted especially in pretonic position); *arme 1;7, *Gertrud 1;1. Papier 1;8 also lacked the r, but the vowel of the syllable did not come from the German word; it came from the syllabic r of paper (90).

The vowels a and e occurred as substitutes in English bear *1;7, 1;11, dear 1;11-2;1, hair 1;11 (only a), ear at 1;11 (only e); in German Bär *1;7, 1;11, mehr at 1;6-2;1 (a 1;6, B 1;8, e 1;7-2;1; also omission concurrently, 1;5-2;1) (vier 2;1).

The vowel i, more remote from the standard, took the place of r in English door at first 1;10 (later omitted); in airplane 1;11.  

If there is a rule behind the varying treatment of the consonant, it would be the following: it was always omitted in the earlier months (*there until 1;5); later it was omitted in most positions, but reproduced as a vocalic off-glide after a tense mid or high front vowel in the child's form. Not all the examples, however, can be subsumed under this rule with ease, and the distinction between pretonic and stressed position adds a further complication. It must not be forgotten that final r in Northern German colloquial pronunciation is slurred into a vowel best trans-
scribed by ə (81), or omitted; after a it becomes practically inaudible. I did not, however, use the extreme form a, which can also be heard from uneducated Northern German speakers. In American English, no vocalization of this type is made, but it is potentially present in the consonant, as proved by Southern British practice. The substitute i in door does not find a model in the pronunciation heard by the child, nor does it fit into the foregoing tentative rule; but it did not last.

211. r, r in final combinations was always dropped, and the consonant following it was treated as if it were alone the final consonant; more commonly it disappeared also.

rd was omitted: Hildegarde i;11–2;i (but probably based more on German, with rt), *aboard i;10 (peg-boards 2;i with if for z, but no rd) (149).

rk > t: *dark i;10; > k: fork i;11, New York i;11–2;o (rk > k: Newyork 2;i).

rt was omitted: Hildegarde i;i1–2;i (in German pronunciation) and, doubtful with regard to the presence of the personal ending t, *donnert i;i1 (entire second syllable missing) and *klappert i;i1 (88 and 142).189

212. Having disposed of the intermediate series of the “liquids,” we approach the last remaining major group, the palatals and velars. There would be no practical value in making a distinction between palatals and velars with regard to the stops k and g. Even in the standard languages involved, the difference between palatal and velar articulation is small and not distinctive; the accommodation to a neighboring sound is made automatically. In Hildegarde’s speech, not even the distinction from the dental series was definite as yet, much less finer discriminations within the group.

213. In spite of the imperfect imitation of k which prevailed in her speech to the end of the second year, she did not hesitate to use words beginning with k. Obviously, she was not conscious of the imperfection of her imitation and did not feel the sound to be difficult; she avoided words beginning with consonants with regard to which she had this feeling.

The most frequent substitute for k-, early and late, was d: English cover i;11, *Carolyn B i;3–10, candy i;10, kiss i;11–2;i, cold i;7, comb i;10, coat i;11, *call, early i;11, *kitty i;3, i;10, i;11, cookie at i;10 and B i;11; *street-cure i;11; German Katz i;11–2;o, *Kuchen i;11, *Kuss i;11. Some of these words also had other substitutes part of the time.

t is the same dental substitute without the voicing induced by partial assimilation to the following vowel. It occurred only as a variant in cake once i;11 by assimilation to a preceding s (in bisteck, piece (of) cake; other-

188 At 10;7, when Hildegarde sometimes tried to write German, she was often undecided whether to add or omit an “r” in words like lieber, deine, wieder. Grégoire (p. 215) describes vocalization of -r to a in the Walloon dialect of French; he finds it reflected in the pronunciation of his children.

189 Karla similarly: omission in Hildegarde i;1–9 and probably later as well; rk omitted in dark E i;6, > k in fork i;10 or i;11.
wise k and g); in *kitty at B i:3 (with imperfect closure, resulting in a sort of affricate; usually d), cookie at i:6–7 and i:10 (and 2:i) (alternating with periods of d). It was the only substitute in the early German *kiek E i:1, even with the standard aspiration at B i:3.

In a much smaller number of cases the substitutes were palatal or velar. Once the velar nasal continuant η, a stop as far as its buccal articulation is concerned, was substituted in an experimental reduplicative variation of *Carolyn at B i:3 (usually d). g, the correct stop voiced by assimilation to the following vowel, occurred in the first experimental form, semi-reduplicative, of *Carolyn E i:2; early in candy i:10 (soon fixed with d), early in Katz i:10 (later i:10 k, i:11 fixed with d). It became regular only in cake during i:11 (following a period of unassimilated k i:9–10).

The correct k also occurred, but without aspiration, in Katz i:10 (but d i:11), *Kuchen i:10 (d i:11), cake (i:6) i:9–10 (g i:11), *call i:11, *cocoa i:8.

The k beginning a syllable after an η at the end of the preceding one was normally also rendered correctly; but there were instances in which ηk seemed to be handled as a unit. Details are therefore found under medial ηk (217).

Obviously d must be considered the normal substitute. It is striking that g and k were more frequently used in the earlier months, i:2 and often (i:6) i:8–10, than at the end of the year. Dentals superseded g and k in every word except cake and cocoa, and in the latter the reason is only that it did not survive beyond i:8.190 It did not make any difference whether the following vowel had front or back articulation. The only word in which k was later than d is *call, in which both sounds were used at i:11. The process of improving the articulation had begun in the second half of i:11 (but even two months later, the dental had not yet been displaced; cf. cookies with t at 2:1).

The k- was never omitted except in pretonic syllables, which were usually clipped off in their entirety: come on i:10, *komm mit i:8–10, *kimona i:9–10; kaputt i:10. The latter word, to be sure, started as a two-syllable form, with the vowel o preceded by the glottal stop in the first syllable and no k; but it subsided very soon into the regular onesyllable clipped form.191

Thus voicing was as frequent as for initial p (106) and t (135); but the

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190 In cake gek the palatal stop was supported by the final stop of the same nature; cf. Jakobson p. 40 f. Even in this word a dental substitute occurred as late as the second half of i:11. ("Palatal" and "velar" with reference to the stops are rough terms, which do not indicate the places of articulation accurately.)

191 Karla handled k- much better; most words had it correctly: cold i:8, car B i:9, comb i:9, Kaffee i:9, coat i:9–11, cake i:8–10, Karl a i:9–10, come i:9–11, carry E i:11. It was even aspirated in *Kuchen B i:9, g occurred in cookie i:13–4 earlier than aspirated k B i:8; along with k in call M i:11. d was recorded only for kiss i:11, t never. Candy had an assimilatory n i:7–9, but the correct k from i:9. As to consonant combinations, g and d in competition also stood for k in the skr of scratch i:10.
picture is complicated by the intrusion of dental substitutes, whereas p and t were always articulated in the correct place.

214. Initial consonant-combinations beginning with k were represented by a substitute for k alone when it was followed by a liquid. In kn, however, the k was dropped as in the history of modern English.

kl > d would be regular; but there is no example for it (until 2;1, when the substitution was clearly that in clothes). Three examples at 1;5 and 1;11 point to omission of k and representation of l; but they are very dubious (see 197).

kr, kr > d in most cases, sometimes t, kk, and g (see 207).

kn > n: Knie 1;7.

215. In the initial combination skr, with k in the middle, both s and r dropped according to rule (167 and 207). k became d regularly: scratch 1;11 (definitely from this English etymon at 2;1).

216. The substitutes for medial k closely resemble those for initial k; but the voiceless varieties, curiously enough, are more prominent in this position. The treatment seemed to lean more to that of final k than to that of initial k.

In earlier stages of some words, medial k was omitted, but in all cases a regular substitute was later introduced: Nackedei (1;6) 1;7 and *pocket-book 1;8 (entire second syllable omitted; k at 2;1), pick up, omitted 1;9-10 (k concurrently at 1;10, t 1;11), peekaboo, omitted *1;4, 1;8 (at 1;4 perhaps better traced to peek alone, but not at 1;8; k E 1;11), wake up, omitted 1;10 (soon with k, from 1;10; also t 1;11).192

Replacement by dentals occurred frequently, but not so commonly as for initial k, and often not lastingly. In fact, d, with assimilatory voicing, is found only in reduplicative and semi-reduplicative forms in which the initial consonant gave the cue. Still, I would not rule out d as a substitute for -k-; if it had not been felt as suitable for this purpose, the words might not have taken reduplicative form. The examples are stocking 1;7, cracker, perhaps at 1;6 (g from 1;7), cookie at 1;10 and B 1;11 (alternating with t), and *street-car 1;11 (standard initial k, 213, but medial in Hildegard's version).

Voiceless t occurred, never as the exclusive, but sometimes as the last substitute, in pick up at 1;11 (last form), dicken, variant at 1;10, *Mickey mouse, variant at 1;10, sticky 1;7 in the normal quasi-reduplicated form, cookie, reduplicated or semi-reduplicated at 1;6-7, 1;10 (and 2;1) (alternating with d, but always a dental), Milwaukee 1;10 (but k 2;1), wake up, variant at 1;10.

g, correctly palatal-velar, but assuming the voice of the neighboring

192 The theory of a blend with way up, suggested in vol. 1 on pp. 133 and 135, can be given up. The non-standard glottal stop before up is also recorded in pick up and must be due to the child's recognition of up as a familiar word by itself. Wake up had at 1;11 sometimes the transition vowel a after k, a rare type of reinforcement of a final consonant (cf. oatmeal 141). k really functioned as final in wake up and pick up.
vowels, became regular in the reduplicated form of *cracker from 1;7 (subsequent to doubtful d 1;6 and experimental kX 1;7 in both syllables). The g is primarily due to the initial kr (214), the second syllable being simply a repetition of the first (90).

The correct k, always unaspirated, is amply represented, at 1;7 in *cocoa, a word which happens to consist of two practically identical syllables in standard English; from 1;9 without the help of reduplication. It did not as yet win the field alone by the end of 1;11. Examples: backe 1;11, *pocket 1;10 (pocketbook) dropped the k with the whole second syllable at *1;8, but had k at 2;1, bacon 1;9, pick up at 1;10 (omission earlier and concurrently, t later), dicken 1;10 (also t at 1;10), peekaboo E 1;11 (with or without the middle vowel o; earlier k omitted), wake up at 1;10-11 (sometimes, late 1;11, followed by unetymological o; at 1;10 also t), rock-a-by, baby at 1;11, perhaps 1;10. kX in reduplicating cracker at 1;7 (later g) and -c as a variant of -k in a strange monosyllabic form of sticky 1;11 (normally with reduplicative t) should also be evaluated as abortive k, the closure being imperfect so that friction resulted.102

The earlier form of Milwaukee 1;8, with w in both surviving syllables, was too much distorted by associational interference to allow the second w to be considered as a substitute for k.

217. Medial consonant combinations containing k are nk, ks, skr, and sk. Normally the k alone was represented.

ks occurred only in fixes 1;11 and was rendered by aspirated t. Probably however the personal ending was missing, and then the combination was final (177 and 219).

skr, sk in ice-cream 1;11, *Eiskrem 1;9 was replaced by t (170 and 209).

The situation is more complicated with regard to nk, the elements of which really belonged to different syllables. In danke it was once reproduced as an echo, in premature perfection, as final nk at *1;1; but later, 1;3-11, the word became stabilized in a primitive reduplicated form lacking u and replacing k by d, not by simple substitution, but by reduplicative repetition.106 The first experimental forms of dunkel E 1;8 were parallel, but from 1;9 on the second syllable began with k, the u remaining suppressed. This should be considered the definitive representation. It also occurred once at 1;11 in Onkel, the development of which was otherwise (1;8-2;0) stopped in a more primitive stage representing only the u inadequately (226).

218. Final k was at first omitted, and continued to be omitted occasionally, even in new words, until the end of the second year. In most words, however, it was gradually added from 1;9 on and prevailed during the last two months. The substitute t appeared only in two words.

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102 Karla had g in cracker from 1;4 and in cookie 1;3-4; aspirated k in the latter word B 1;5; -k- in sticky 1;10, bicycle B 1;11, Milwaukee 1;11; but -k in Schaukel 1;10, pocketbook E 1;11 (with omission of remainder of second syllable).

106 Karla drop 1;7, 1;8, dought E 1;9, dought B 1;11.
Omission occurred in *Augenblick 1;7–11 (k later 1;11), *Zwieback 1;9, pocketbook 1;8 (k' 2;1), block 1;7–8 (k 1;10), book 1;6–9 (vowel usually followed by off-glide h or x; k from 1;10), *Jack 1;10, duck 1;6–8 (k 1;11), cake (1;6) 1;10 (reduplicated; last form 1;11 with k), *Mack 1;7, make 1;11 (but usually with k; a transition vowel e appeared sometimes after pronounced or omitted k), peekaboo *1;4 (in the first form, which rendered only the first component, but also 1;8 in the full form, 216), *kiek 1;1, 1;3, Ticktack, tick-tock at 1;0–11 (in both syllables; with k only at E 0;11 and 1;3), walk 1;8 (k 1;11), rock 1;8 (as long as rock was used alone instead of the later extension rock-a-by, baby). (Even at 2;1 the new verb like lacked the k. Back lacked it at 2;0, but acquired it at 2;1).

Words with the k pronounced were the following: *Augenblick at 1;11 (after omission), bike 1;11 (more commonly t'), block from 1;10 (after omission), bake 1;11, *break 1;10, broke 1;9 (always k, usually aspirated), stick 1;10, duck at 1;11 (after omission), book from 1;10 (after omission; k usually aspirated; once 1;10 xk, delayed closure), cake at 1;9 and 1;11 (after and alternating with a reduplicated form lacking k), make 1;11 (also omission), *knock 1;11, neck 1;10, Ticktack E 0;11 and once 1;3 (in this word only in experimental forms, superseded by consistent omission), *weg 1;10 (see also 230), walk 1;11 (after omission). Rock-a-by, baby belongs here at E 1;10, when the earlier rock, rock, without final consonants, was extended to rock, baby with -k (later in full, 216). (Pocketbook acquired -k' at 2;7, after earlier omission. Back came in new at E 2;0 without k, but had it at 2;1. Sidewalk 2;0 and look 2;1 had it at once.)

The substitution of the dental stop t for k was much less frequent than in initial and medial position. Bike 1;11 had usually aspirated t, but also k. Pick, as a rule used in the combination pick up 1;9, was once 1;11 heard alone, with t as in pick up at 1;11. Concerning pick up and wake up, in which k was really treated as final, see 216 and note.

219. The only final consonant-combination with k in first place is ks. As illustrated in detail in 174, it was treated like simple -k to the end of the second year, that is, it was first omitted 1;1–6 (in one imperfect word-form even at 1;11) and later reproduced as k 1;9–11, t' being substituted only in fix 1;11. (Just after the end of this period, however, the s and not the k in the same word fix was rendered.)

220. Of the combinations with k in final position, lk, nk, and rk were treated like simple k, whereas in sk Hildegard wavered between representation of either the first or the second element.

196 Karla generally omitted -k until 1;8 and pronounced it from 1;8. During the month 1;8 the two stages were overlapping. Omission: block at 1;3, jack 1;7, duck 1;6, back 1;5–8 (reduplicated), bike at 1;8, book at 1;2–3 and later, weg 1;8, cake E 1;8–B 1;9. k: pocketbook E 1;11, bike after 1;8, block B 1;9, broke 1;10, stick 1;8, Stock 1;8, book B 1;9 (aspirated k), like 1;10, walk 1;11, sidewalk 1;11, cake at M 1;9–10, make E 1;11; picture 1;10. Ticktack, tick-tock was irregular. It lacked the final consonants at 1;4 and again at 1;9, interrupted by a stage of ka for both parts, which may have been based on the form ticke-tacke used in a German children's song. Substitution of t does not occur in the fragmentary record of Karla's speech.
lk in milk was omitted 1;6−7, rendered by a 1;7−9, and by k 1;10−11. The last form can be traced with some confidence to English milk, whereas the earlier forms may go back to German Milch, with l in (see 204).

γk was omitted in thank you, which retained a primitive reduplicated form 1;3−11 (about the contribution of German danke, see 217). In drink, the k was reproduced alone, 1;10−11 (once 1;11 with relaxed closure as κ).106

rk became t, a substitute for k, in *dark 1;10; k in New York 1;11−2;0, fork 1;11. (rk in the German form Newyork 2;i likewise became k.)

sk was reproduced by substitutes for either s or k at the same stage in *ask B 1;11 (see 173); k became aspirated t.

221. g, the voiced counterpart of k, in initial position was not reproduced correctly like initial b (114) and d (144), but always replaced by the voiced dental d. The number of examples is much smaller than in the case of k: forgot 1;11 (with clipped prefix), *Gertrud(e) 1;i, go 1;10−2;1 (at 1;11 also with t), gone 1;10−2;1 (got 2;0−1, gosh 2;i).107

222. The initial consonant-combinations gl and gr dropped the liquid and developed substitutes for g. The regular substitute d for gl was used in *Glas, glass 1;11 (197). For gr in Grandpa 1;8 we find irregularly the velar nasal g in both syllables of her infantile reduplicated form, which remained fixed to the end of the year. It can be explained as proceeding from g by a change from pure oral stop articulation to oral stop combined with nasal exhalation. It is likely that the nasal feature was induced by the nasal m at the end of the syllable (120), the g thus being a compromise sound resulting from combined elements of articulation of gr and m, transferred also to the second syllable. In fact, there is one parallel case of g being used for the related k of *Carolyn, probably without the assistance of a standard nasal, in an early experimental form at B 1;3 (213).

223. Medial g was generally omitted until 1;11 (cf. the similar disappearance of it in the history of standard English words; compare the more conservative German “Regen” with English “rain,” “Nagel” with “nail,” “Segel” with “sail”; parallels also in German: “Getreide” from “tragen,” “Maid,” “Mädchen” from “Magd”): *Augenblick 1;7−11 (both lacked the entire second syllable, see 227), buggy at

106 Karla had forms, garbled by assimilation at a distance, which ended in n for drink 1;3; a fully reduplicated form without final consonant 1;9; γk B 1;10−11. In thank you, however, although her form was better than Hildegard’s, she reached only k B 1;11, while the German danke had -g 1;1 and 1;6, final γk E 1;9 and perfect form B 1;11.

107 Karla learned g much earlier. In fact, d is recorded only for gone 1;1 and get down until B 1;4; at E 1;11 γ already appeared as a variant and was regularly used by B 1;9. Only g in good 1;10, get 1;11, go 1;11. At E 1;1, when she used the sound g occasionally, she never pronounced k. Her learning of g was unusually early. Bloch (1913, p. 42) reports that g was rare E 1;11 in his case; it was usually replaced by d, g appearing as a variant from B 1;11. Karla used g also for γl M 1;11 and gr 1;10 (see notes to 197 and 207).
1;10–11 (succeeding b, transferred from the first syllable at 1;6), *Spiegel 1;8 (doubtful etymon), *Nägel 1;11 (but probably from English nails, without g).

Toward the end of the period, the dental t, curiously enough the voiceless variety, seemed to become the substitute. In her name, Hildegard, B 1;11, she used consistently t (syllable sometimes omitted at 2;1 in pretonic position before the family name). Doggie 1;11 always had t. The correct g never occurred during the first two years.198

There is no example for a medial consonant-combination containing g.

224. Final g, possible only in English words, was sometimes omitted and sometimes unvoiced to k, but never pronounced correctly. Its treatment differs from final d, which was always omitted (148).

It was omitted in *dog 1;11 and big 1;8–11. In the latter word, I thought I often heard an h or, more likely, a glottal stop in place of the g during 1;8–9; but the substitute was not used regularly in the many transcriptions of the word, and may have been an acoustic illusion due to the extreme shortness of the preceding vowel. The case is similar to the first form of Maus, ma9 1;7, where one would not try to trace the glottal stop to s. At any rate, the final form of big omitted the g.

k is recorded in bug 1;11 (once g B 1;11, which must be an error of transcription), egg 1;8–2;1 (hug 2;1, peg-board 2;1).199

225. Next to the stops, we examine g, which occupies an intermediate position between stops and continuants, having velar stop-articulation as far as the oral cavity is concerned, but falling within the category of continuants on account of the free, continuous escape of the breathstream through the nose, accompanied by voice. It does not occur in initial position in English and German.

Medial g was omitted: *Zunge 1;11, *klingelingeling 1;5 (both words omitted the entire syllables beginning with g) (Finger 2;1, from German rather than English, because initial g of the standard pronunciation of English ng should become d; I admit that this reasoning is not absolutely conclusive).200

226. The medial combination gk usually lost the g, which is the regular treatment of final g (227). As discussed in 217, there was, however, one instance with perfect gk placed in final position in a premature echo of danke *1;1; it did not last, but its occurrence seems to show that Hildegard felt the cluster as a unit, which justifies treating it here (cf. 213, 227).

198 Omission is illustrated in Karla's speech only by Auge, which she echoed at 1;7, also in monosyllabic form. d appeared in her sister's name, Hildegard, 1;1–9, in reduplicated and non-reduplicated forms (variant j in a reduplicated form at 1;9). In buggy she had g at once, B 1;10. k appeared in sugar 1;10.

199 Karla k in egg, 1;9 and later, and in big from the start, B 1;10. Holmes (p. 222) also found -g represented by k, a few weeks after the acquisition of standard -k 1;6, in egg, but with the addition of an unetymological vowel typical of his case.

200 Karla had omission of the second syllable in Zunge 1;9; but her form to was probably based more on English tongue; g in finger 1;10 (probably English) and Spange 1;9.
The name *Onkel* ᵁ;8–2;0 in its ordinary form requires a special discussion. It became stopped, by adoption on the part of the family, in a primitive form, in which the k was dropped and the ɐ replaced by n or ᵁn. This shift is an imperfection comparable to the substitution of a dental for ɐ and k; the unstable i might indicate an unsuccessful attempt to imitate the raised tongue-position of standard ɐ and k. At a later stage of development, the ɐ would have been dropped and the k reproduced correctly (217); one occurrence of the word at ᵁ;11, relearned from new presentation, actually had this form; so did *dunkel* from ᵁ;9.

227. Final ɐ was consistently omitted, in syllables with main stress: häng(en) ᵁ;11, ring ᵁ;11–2;1 (string 2;1); in unstressed syllables: ironing ᵁ;8, pudding ᵁ;11–2;1, stocking ᵁ;7, *snowing ᵁ;8–10, *Liebling ᵁ;11. ɐ before consonant in -ŋk- (226), possibly also in -ŋg- (225), was also omitted as a rule, but not without exception. The middle syllable of *Augenblick ᵁ;7–11 likewise disappeared (223); it belongs here because I assimilate, in informal speaking, the n to the preceding ɐ, which results in syllabic ɐ. In fact, in careless pronunciation, the first two syllables easily become contracted by further assimilation into monosyllabic *tun*, with consonantal final ɐ.²⁰¹

228. The final consonant-combination ŋk always lost the ɐ; the k was at first also missing, but was pronounced in a new word ᵁ;10 (see 220).

ɐt, omitted in one instance of hängt at ᵁ;11, is very dubious; the verb was probably used without a personal ending, terminating in ɐ (227). ɐə of hangs, which might be thought of as the prototype in the same example ᵁ;11, must be ruled out entirely; the etymon was German, not English (see 178).

229. For the purely oral continuants, we make the customary distinction between palatal and velar fricatives.

The voiceless palatal fricative ç, which is the pronunciation of German “ch” in the majority of its occurrences, played a very minor part in Hildegard’s early speech. She attempted few words containing it. In initial position, it is rare in standard German, but frequent in the diminutive ending “-chen,” in which ç after a consonant functions like an initial sound. In Germany, mothers like to use diminutives when speaking with their children. In Hildegard’s case, however, the father was almost the only source of German words, and diminutives were infrequent in the presentation from which she molded her speech. The only word with a diminutive ending which she reproduced was Frizchen ᵁ;8; it was associated with a rubber doll brought along from Germany with this name. The ç disappeared in her form, the whole second syllable being rendered

²⁰¹ Karla omitted -g in Liebling B ᵁ;11, sleeping ᵁ;10–11, coming ᵁ;9–11. In a stressed syllable she omitted ɐ in tongue ᵁ;9, but pronounced it in ring B ᵁ;11. n was substituted in playing contracted into one syllable (time not recorded; both children heard no substitution of n for ɐ from other speakers at the early stage). In Bonbon ᵁ;8–9, the ɐ of both syllables became m by the effect of two types of assimilation (cf. vol. i, p. 67, note 98).
by nothing but i. This evidence for the treatment of initial ç is not representative; the unstressed syllable received only subdued attention; but its omission attests to the difficulty of the sound.

There is no instance of medial ç.

230. Final ç, quite frequent in standard German, also is almost completely missing in the prototypes of words selected by Hildegard for imitation. The only instance is the adverb *weg, in which she rendered it by tf, 1;10 (I also pronounced this word with k, see 218). The first example with ç in the common suffix “-ig,” therefore in an unstressed syllable, occurred at 2;1: schmulzig, with ç omitted. The final combination kç is uncertain, because its only example, Milch 1;6, is similar to English milk, which she heard at least as frequently. Since the German element was stronger in her speech in the earlier months, the omission of the combination at 1;6–7 and its representation by a, sporadically at 1;7 and 1;9, may be charged to the German model. In the k of 1;10–11, however, the English word probably asserted itself (204). At any rate, the correct ç was not learned during the first two years, nor for some time afterwards.

231. j, the voiced counterpart of ç, can be discussed without separation of English and German. There is a slight difference of articulation in the two languages. German j is purely consonantal, fricative, whereas English j is usually a semi-vocalic, gliding sound. Hildegard, however, treated them alike.

In fact, in initial position, a gliding i was heard in her first form of German ja 1;3 (I disregard the earlier appearances of the word o;9–11, with dj and j, as too doubtful). The adjustment of the tongue was simply not yet quite correct. From B 1;4 the sound is transcribed regularly as j, with one lapse at 1;7 into he’a; in this instance the articulation was distorted by simultaneous laughing. The symbol j is likewise used to transcribe her initial consonant of *yes 1;4 (with equally doubtful precursors at o;9–10). These were the only two words beginning with j which the child attempted; apparently the sound was felt to be difficult and words beginning with it were avoided, even though j appeared as substitute for other consonants. (Just after the turn of the third year, there was a rush of new words beginning with j, rendered correctly: years 2;0, use 2;0–1, you 2;1, your 2;1. It was not yet quite stable; the last two words had more frequently ç.)

232. Medial j was omitted in the early game sentence *I see you 1;5,

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202 Karla omitted the final consonant of the word weg, which she echoed at 1;8.
203 Karla, who used ç as a substitute for initials and j at 1;10–11, had at the same time no active German ç in her speech, but repeated ich correctly from presentation (at 2;8, the ç became voiced to j in ich auch).
204 Cf. Ripman 34, Krapp 25, Kenyon 37, 43, 71, 230, 380 (the latter's is the best description). For a different view and a survey of opinions, see Vítior 80, note 1.
205 Karla j in ja 1;9–11, yes 1;9–11, yellow B 1;10, you on the last day of the second year. The j remained unrepresented in thank you B 1;11.
which consisted only of vowels in the child's rendering. The next instance was six months later, and then the ğ was correct: New York ğ;11 (and Newyork 2;1).

Final ğ does not occur in the standard languages.

234. The voiceless fricative ğ, the velar counterpart of palatal ş, is frequent in German, also spelled "ch"; it does not occur in initial position, since the standard language uses it only after back vowels including a. Hildegard tried only one word with medial ğ, and that only ephemerally; the numerous German words containing it were thus obviously felt as difficult and were avoided. The word is *Kuchen ğ;10–11, with k substitute; the substitute may be regular (cf. the form duko ğ;11), but is favored in this word by the initial k of kuko ğ;10.206

235. Words ending in ğ were not shunned; the difficulty of final consonants did not usually prevent words from being imitated since they received less attention. Hildegard's treatment of the consonant varied greatly. It was omitted in the earlier months, until about ğ;9, but in some words, even in a new one, still at the end of the year. On the other hand, she used the correct ğ as early as ğ;7 and again at ğ;11. Replacement by the homorganic stop k, with aspiration, also occurred ğ;10–11.

The ğ was always missing in the various forms of Taschentuch *ğ;7, ğ;10–11; the word was, however, never regularly developed from this etymon. The late trag(en) E ğ;11 still lacked it; while this verb has a final k in the imperative in formal pronunciation, I pronounced it in informal speech with the Northern German colloquial ğ; the verb occurred always in the imperative.

ğı was correct in *huch ğ;7, which occurred only once, and in *hoch, which she used rather frequently ğ;11 (see also 400).

The replacement by k, which is made almost invariably by adults unfamiliar with the fricative, occurred in Loch E ğ;10; the k was aspirated.

Bauch ğ;6 had at first no final consonant. From ğ;10–2;0 it also ended in aspirated k.

Buch ğ;6 is difficult to judge because English book crossed the development and because, furthermore, a fricative following u was in her speech a fairly frequent off-glide, which needed no standard prototype. Thus, the final h at ğ;6 and the faint ğ at ğ;7–8 cannot be considered equivalents of standard ğ; the final consonant was really omitted. Later ğ;8–9 the ğ was articulated more energetically; there is no way to decide whether it was then still the off-glide or the standard ğ. From ğ;10 the final consonant was always k, usually aspirated (once ğ;10 ğk, which might be a compromise between the older ğ and the new k, but can just as easily be explained as an unsuccessful, delayed closure for the k); but k can equally well stand for English k and German ğ.207

206 Karla echoed Kuchen ephemerally with aspirated k in both syllables, B ğ;9.
207 Only two examples in Karla's speech, which had fewer German words: Tag ğ;8, with omission; Loch ğ;9, with k. (At E 2;8, she replaced ğ in the second word of ich auch by the labial fricative ğ.)
The combination \( \text{x} \) at the end of *Nacht 1;11 was reproduced correctly (142).\(^{208}\)

The voiced counterpart of \( \text{z} \), transcribed by \( \gamma \), occurs in place of \( \text{g} \) in dialectal forms of standard German; but in my speech, this assimilation is not made. \( \gamma \) is therefore absent in Hildegard’s speech record.

My pronunciation of \( \text{r} \), which is theoretically a uvular vibrant, actually is very similar to the velar voiced fricative \( \gamma \). I do not, however, unvoice it before voiceless consonants; pronunciations like *gern for “Garten” can be heard in my home town, Hamburg; but they belong to a less educated level of speech. \( \text{r} \) is, for practical reasons, discussed together with American \( \text{r} \) (205 ff.). In final position, my \( \text{r} \) has vocalic quality (81, 88, and 210).

The classification of \( \text{h} \) is still debated among phoneticians. For the purposes of this study, it is unnecessary to take sides. We simply take up \( \text{h} \) as a consonant, as any native observer would do, and place it after the velar consonants, because its localization in the mouth, after the breath stream has entered the oral cavity, is not definite.\(^{209}\)

Initial \( \text{h} \) was usually correct; but sometimes it was omitted, the initial vowel then beginning either with the glottal stop, which was normal in this position in Hildegard’s speech, or, rarely, without a glottal stop.

\( \text{h} \) is found in numerous examples. The complete list is identical with the words beginning with “\( \text{h} \)” in the indexes, vol. 1, pp. 142 and 147, excepting only *hello, high-chair, hoohoo, hhuu, and huch, which had no initial \( \text{h} \) in Hildegard’s forms. (At 2;1 hide, hug, whole, and hole, all with \( \text{h} \)-, were added.) The earliest initial \( \text{h} \) was that in *hot, 1;4.

Omission of \( \text{h} \) occurred, without glottal stop, always in high-chair 1;5 (whereas high 1;11 had \( \text{h} \)) and in *huuu, hoohoo at 1;5. This omission should really be understood as a variant of \( \text{h} \), with the breath-stream so faint that it was inaudible. Real omission required in her speech-pattern a glottal-stop release, as in all words beginning with a vowel (241).

Glottal stop, or real omission, occurred also, but not lastingly. It was recorded once 1;8 for heiss, which otherwise had \( \text{h} \) 1;5-11. *Hello 1;5 began regularly with a glottal stop 1;5-10; thereafter, the first syllable was clipped off and the second said alone or, more commonly, in reduplication; the word then began with \( \text{j} \), which was, however, not a substitute for \( \text{h} \). *Hoohoo, hhuu had the glottal stop at 1;6, succeeding inaudible \( \text{h} \).

The ephemeral *huch 1;7 also had the glottal stop.

Thus the regular representation was \( \text{h} \) from the beginning, with a period of faint \( \text{h} \) at 1;5, which lingered on in high-chair, and a period of omission 1;5-10; during these months there were, however, other words

\(^{208}\) Karla rendered the \( \text{x} \) from 1;5, by \( \text{k} \) at 1;10, but always omitted the \( \text{t} \).

\(^{209}\) The International Phonetic Association, Viétor, Kenyon, and Krapp all describe it as basically a “glottal fricative.”
which had the h correctly.\textsuperscript{210} The first form of hat B 1;6 consisted of nothing but syllabic h, a very unusual form, which did not last.

\textbf{240.} Medial h is not frequent in English and rare in German, in spite of the spelling. *Hoooho, huku was really presented without medial h and therefore did not have it in Hildegard's reproduction.

Final h exists only as a spelling device.

\textbf{241.} Continuing our examination of consonants beyond the velars, we reach the glottal stop ?. The layman is not conscious of its existence, because it is not represented in standard spelling. Nevertheless, normally every German word beginning with a vowel starts with it. That is not true for standard English; yet, when a word is spoken in isolation or with emphasis, the glottal stop is quite frequently used before initial vowels.\textsuperscript{211} This consonant, which Trubetzkoj (pp. 30–32) calls a "signal for the demarcation of words" (Wortabgrenzungssignal), was generally present in Hildegard's speech, even at the later stage when words were used in sentences, and in English words as well as in German ones. This might be a transfer of German pronunciation-habits to English words, but may as well proceed from English words said in isolation. Thus every word beginning with a vowel in the child's speech was introduced by a glottal stop, with rare exceptions discussed under h (239) and l (196). The sound was not observed with assurance in every individual instance. Since it was generally present, I developed the habit of writing it in transcribing words with initial vowel, and specially noted its absence in the diary in the few cases where I observed it to be lacking.\textsuperscript{212} The consonant was faithfully reproduced wherever it was present in standard words, including cases of medial position as in German A-a, English m-m. In fact, the first form of A-a 1;1 consisted only of a double voiced glottal stop, without vowels.

\textsuperscript{210} Karla also had h in numerous words, the earliest being the name Hildegard 1;1, in which, however, it yielded to reduplicative d, rarely j, as early as 1;1 and as late as 1;9. Omission occurred in hoooho before 1;2 and continued to 1;9; introductory glottal stop was not regular in her speech. Glottal stop, however, also occurred at 1;10 in her monosyllabic form of hello, subsequent to irregular n for l at 1;9; it improved to h at 1;11.

\textsuperscript{211} Kenyon 56.

\textsuperscript{212} The glottal stop in this position was much less general in Karla's early speech, in which English prevailed more strongly. English words with initial vowel began frequently with an h in her rendering: haut, out and hap hat, up high at E 1;8-B 1;9; hæpen, airplane B 1;10 (cf. note 136 on p. 80 in vol. 1), hatau(d), outside E 1;10-11. The glottal stop, however, did occur in other words, e.g. egg 1;9, eins 1;10, eye 1;8-10, open 1;9-11, auto 1;10. Apple had initial ? or h 1;10. Up had ? at 1;7 and again 1;10, h at E 1;8-B 1;9 in up high, while at 1;9 it had neither ? nor h. Out had initial vowel, h, or ? at 1;9; most commonly there was no introductory consonant, thus at 1;8 and 1;11.
Tabulation of the Child’s Representation of Standard Sounds

242. In the foregoing chapter, the fate of every standard sound in the child’s speech has been discussed exhaustively, with full explanation of instances which do not fit neatly in a regular pattern of substitution. The special attention which had to be given these exceptional cases might obscure the fact that in the majority of instances a definite scheme of substitution is present. The following summary repeats the essential information about regular sound-substitutions, omitting all irregular cases; less frequent, but not exceptional substitutes are added in parentheses. An interpretation of the facts thus established will be found in 292–332.

243. Vowels

\( \alpha > \alpha \). Stressed, 4–11; unstressed, 14–15.

\( \alpha + \text{nasal} > \alpha, \tilde{\alpha}. \) 12–13.

English \( \varepsilon, \varepsilon > \varepsilon (\alpha, \alpha, \varepsilon, \alpha, \alpha, \varepsilon, \alpha). \) Stressed, 16–22; unstressed, 22.

\( \varepsilon > \alpha. \) 23.

\( \varepsilon + \text{nasal} > \alpha, \tilde{\alpha}. \) 24.

\( \varepsilon > \varepsilon, \varepsilon. \) 25–28.

\( \varepsilon > \varepsilon, \varepsilon \), \( \tilde{\varepsilon} \) (i). Stressed, 29, unstressed, 30.

\( \alpha > \alpha. \) 31.

German \( \varepsilon > \varepsilon, \varepsilon (\alpha). \) Stressed, 32, unstressed, 33.

\( \varepsilon > \varepsilon. \) 34–40.

\( \varepsilon > \varepsilon (\varepsilon, \varepsilon, \varepsilon, \varepsilon). \) Stressed, 41–46, unstressed, 47.

\( \varepsilon > \varepsilon (i, \varepsilon). \) Stressed, 49–53, unstressed, 54.

\( \varepsilon > \varepsilon (u, u, \varepsilon, \varepsilon). \) Stressed, 55–59, unstressed, 60.

\( \iota > \iota (\varepsilon, \varepsilon, \varepsilon). \) Stressed, 61–63, unstressed, 64–68.

\( \kappa > \kappa. \) 69.

\( \alpha > \alpha (u, u, \varepsilon, \varepsilon, \varepsilon, \varepsilon). \) Stressed, 70–74, 76, unstressed, 75–76.

\( \alpha > \alpha. \) 77–79.

\( \alpha > \alpha (\alpha, \text{ omission}). \) 80–87. German “-er” > \( \varepsilon, \varepsilon \) (omission). 88.

English \( \tilde{\varepsilon} > \varepsilon \). Stressed, 89, unstressed, 90.

244. Diphthongs

\( \alpha \iota > \alpha \iota (\alpha). \) Stressed, 91–95, unstressed, 96.

\( \alpha \varepsilon > \alpha \varepsilon, \alpha \varepsilon (\alpha, \varepsilon, \alpha, \varepsilon). \) Stressed, 97–101, unstressed, 102.

\( \alpha \iota > \alpha \iota (\alpha, \varepsilon). \) 103.

Consonants, arranged by place of articulation. 104.

245. Bilabials

\( p > b > p. \) 105–106.

before cs.\(^1 \) > \( b \) (p). 107.

after cs. > \( b. \) 108.

\(^1 \) “cs.” = consonant.
-p -> b, p. 109.
  before cs. -> p. 110-111.
b- -> b. 114.
  before cs. -> b. 115.
-b- -> b. 116.
m- -> m. 117.
m- -> m. 118.
-m- -> m? 119.
-m omitted. 120.
  before cs. omitted. 120.
hw- -> w. 121.
w- -> w. 122.
-w- -> w. 123.
  246. Labiodentals. 124.
f- -> w (? h). 125.
  before cs. -> w (? v). 126.
-f omitted (f, tf). 128.
  before cs. omitted. 129.
v- -> w. 130.
  after cs. -> w. 131.
-v- omitted. 132.
-v omitted? 133.
  247. Dentals

t- -> d > t. 134-135.
  before cs. -> d, t, omission. 136.
  after cs. -> d (t). 137.
-t- -> d, t, omission. 138.
  before cs. -> d, t. 139.
  after cs. -> d, t. 140.
-t> omission > t (k). 141.
  after cs. -> omission > t. 142.
  before cs. -> omission > t. 143.

-d -> d. 144.
  before cs. -> d. 145.
-d- omitted (d). 146.
  after cs. omitted. 147.
-d omitted. 148.
  after cs. omitted. 149.
  before cs. -> omission > t. 150.
-η> omission > i, ε, a; ο, o, u > ο. 151.

n- -> y > n. 152.
  after cs. > n. 153.
-n- omitted (n). 154.
  before cs. omitted. 155.
-n omitted (nasalization of vowel; n). 156.
0->d. 158–159.
  before cs. > d, t, omission. 160.
-0> omission > f (f). 161.
á->d. 162.
-á omitted? 163.
-Á> omission > f. 164.
  248. Alveolarpalatals. 165.
s-> omission, ?, h>j. 166.
  before cs. omitted. 167.
  after cs. > j, 3, h, omission. 168.
-s-> omission > f. 169.
  before cs. omitted. 170.
  after cs. omitted. 171.
-s> omission (>jf) > f (omission, t). 172.
  before cs. > omission, f (ff). 173.
  after cs. > omission, f. 174.
z-> omission, ?, h, j? 175.
-ž->-˘, omission. 176.
-z>=f, omission > f. 177.
  after cs. > omission, f (ff). 178.
  before cs. > f> 179–180.
f (syllabic) > f. 181.
-f>f (syllabic), if, 13, 3i, ji, 3, j. 181.
  before cs. omitted. 182.
  after cs. omitted > f, 3. 183.
-f-> f, omission (k). 184.
  before cs. omitted. 185.
  after cs. omitted (f, 3). 186.
-f> omission > f. 187
  after cs. > omission > f. 188.
3 missing. 189.
  3- after cs. omitted. 189.
ól>ól. 189.
-u, o, 3, a, a, i; ju, lu (omission) > ø? 191–193.
  before cs. > a. 194.
l-> j (l, h). 195–196.
  after cs. omitted. 197.
-l->j, l, omission. 198–199.
  before cs. omitted. 200.
  after cs. omitted. 201.
-l> omission, r, a, u, ø; ju, lu, lo. 202–203.
  before cs. > omission, ø, a, u. 204.
r-, r-> w (h, j). 205–206.
   after cs. omitted (r, w). 207.
-r- omitted. 208.
   after cs. omitted. 209.
-t, -t> omission, a, æ (i). 210.
   before cs. omitted. 211.
250. Palatals and Velars. 212.
-k-> d (t, g, k). 213.
   before cs. > d (omission in kn-). 214.
   between css. > d. 215.
-k> omission > t, k (d, g). 216.
   after, before, and between css. > t, k (omission). 217.
-k> omission > k (t). 218.
   before cs. > omission > k (t). 219.
   after cs. > omission > k (t). 220.
g-> d. 221.
   before cs. > d. 222.
-g- omitted (t). 223.
-g> omission, k. 224.
-ŋ- omitted. 225.
   before cs. omitted. ((i)n). 226.
-ŋ omitted. 227.
   before cs. omitted. 228.
-ɛ- omitted. 229.
-ɛ> tʃ. 230.
   after cs. omitted? 231.
j-> i> j. 232.
-i-> omission > j. 233.
-ɛ-> k. 234.
-ɛ> omission, x, k. 235.
   before cs. > x. 236.
Laryngeals
h-> h (omission, ?). 238–239.
?-> p. 241.
Consonants, arranged by manner of articulation

Only the most frequent substitutions are summarized in this survey.
The treatment of consonants in clusters is combined with the treatment
of simple consonants.
251. Voiceless Stops
p-> b (> p). 105–108.
   -p-> b, p. 109–111.
   -p> p. 112–113.
t-> d> t. 134–137.
   -t-> d, t, omission, 138–140.
   -t> omission > t. 141–143.
k->d. 213-215.
  -k->omission > t, k. 216-217.
  -k>omission > k. 218-220.
?->?. 241.
252. Voiced Stops
b->b. 114-115.
  -b->b. 116.
d->d. 144-145.
  -d- omitted. 146-147.
  -d omitted. 148-150.
g->d. 221-222.
  -g- omitted. 223.
  -g>omission, k. 224.
253. Voiced Oral Stops, Nasal Continuants
m->m. 117.
  -m->m. 118.
  -m->m? 119.
  -m omitted. 120.
  -n>omission > vowels from i over a to u > a. 151.
  n->u > n. 152-153.
  -n- omitted. 154-155.
  -u omitted. 227-228.
254. Glides
hw->w. 121.
w->w. 122.
  -w->w. 123.
  Note. For English j, see Fricatives; for American r, see "Liquids."
255. Voiceless Fricatives
f->w. 125-126.
  -f omitted. 128-129.
θ->d (t). 158-160.
  -θ>omission > s. 161.
s->omission, ?, h>j (3). 166-168.
  -s->omission > s. 169-171.
  -s>omission > s. 172-174.
ʃ(syllabic)>ʃ. 181.
ʃ->ʃ(syllabic), s, j; before (and after) cs. omitted. 181-183.
  -ʃ->omission, ʃ, s. 184-186.
  -ʃ>omission > ʃ. 187-188.
ç- omitted. 229.
  -ç>tʃ; omission? 230-231.
-x->k. 234.
  -x>omission, x, k. 235-236.
258. **The Child’s Representation of Standard Sounds**

**Voiced Fricatives**

\( h \rightarrow h. \ 238-239. \)

- 256. **Voiced Fricatives**

\( v \rightarrow w. \ 130-131. \)

- \( v \rightarrow \) omitted. 132.
- \( v \) omitted? 133.

\( \theta \rightarrow d. \ 162. \)

- \( \theta \rightarrow \) omitted? 163.

- \( \theta \rightarrow \) omission \( \rightarrow f. \ 164. \)

\( z \rightarrow \) omission, ?; \( h, j? \ 175. \)

- \( z \rightarrow \) omission, \( f. \ 176. \)

- \( z \rightarrow \) omission \( \rightarrow f. \ 177-180. \)

\( s \) omitted. 189.

\( j \rightarrow i \rightarrow j. \ 232. \)

- \( j \rightarrow \) omission \( \rightarrow j. \ 233. \)

Note. Affricates, being stops combined with fricatives, are included under both components without separate treatment (see also discussion of affricates, 314-320).

257. **“Liquids”**

\( l \rightarrow \) vowels from \( r \) over \( a \) to \( u, j u, l u > a? \. \ 191-194. \)

- \( l \rightarrow j; \) after cs. omitted. 195-197.

- \( l \rightarrow j, l, \) omission. 198-201.

- \( l \rightarrow \) omission, vowels, \( j u, l u, l o. \ 202-204. \)

\( r, r \rightarrow w. \ 205-207. \)

- \( r \rightarrow \) omitted. 208-209.

- \( r, - r \rightarrow \) omission, \( a, \ a. \ 210-211. \)

Note. Click: \( c \rightarrow \) \( c. \ 189. \)

**Consonants, arranged by position in word**

Only the most frequent substitutions are summarized here. Simple consonants are separated from consonants in clusters.

258. **Initial**

\( p \rightarrow b. \ 105-106. \)

\( b \rightarrow b. \ 114. \)

\( m \rightarrow m. \ 118. \)

\( hw \rightarrow w. \ 121. \)

\( w \rightarrow w. \ 122. \)

\( f \rightarrow w. \ 125. \)

\( v \rightarrow w. \ 130. \)

\( t \rightarrow d \rightarrow t. \ 134-135. \)

\( d \rightarrow d. \ 144. \)

\( n \rightarrow g \rightarrow n. \ 152. \)

\( ð \rightarrow d. \ 158-159. \)

\( ð \rightarrow d. \ 162. \)

\( s \rightarrow \) omission, ?; \( h \rightarrow j. \ 166. \)

\( z \rightarrow \) omission, ?; \( h, j? \ 175. \)

\( f \rightarrow f(syllabic), \ 3, j. \ 181. \)
l > j. 195–196.
r, r > w. 205–206.
k > d. 213.
g > d. 221.
č omitted. 229.
j > i > j. 232.
h > h. 238–239.

259. Initial before consonant

p > b. 107.
b > b. 115.
f > w. 126.
t > d, t, omission, 136.
d > d. 145.
θ > d, t, omission. 160.
s omitted. 167.
f omitted. 182.
k > d (omission in kn). 214.
g > d. 222.

260. Initial after consonant

p > b. 108.
v > w. 131.
t > d. 137.
n > n. 153.
s > j, z, h, omission. 168.
f > omission > f, z. 183.
z omitted. 189.
l omitted. 197.
r, r omitted. 207.
k > d. 215.

261. Medial

p > b, p. 109.
b > b. 116.
m > m? 119.
w > w. 123.
v omitted. 132.
t > d, t, omission. 138.
d omitted. 146.
n omitted. 154.
ð omitted? 163.
s > omission > f. 169.
z > omission, f. 176.
f > omission, -f. 184.
l > omission, j, l. 198–199.
r omitted. 208.
k > omission > t, k. 216.
g omitted. 223.
y omitted. 225.
j > omission > j. 233.
x > k. 234.

262. Medial before consonant

p > p. 110–111.
t > d, t. 139.
n omitted. 155.
s omitted. 170.
f omitted. 185.
l omitted. 200.
k > t, k. 217.
y omitted. 226.

263. Medial after consonant

t > d, t. 140.
d omitted. 147.
s omitted. 171.
f > omission > f, 3. 186.
l omitted. 201.
r, r omitted. 209.
k > t, k. 217.

264. Final

p > p. 112–113.
m omitted. 120.
f omitted. 128.
f omitted. 128.
v omitted? 133.
t > omission > t. 141.
d omitted. 148.
n omitted (nasalization). 156.
\theta > omission > \theta. 161.
\delta > omission > \delta. 164.
s > omission > s. 172.
z > omission > s. 177.
f > omission > s. 187.
k > omission > k. 218.
g > omission, k. 224.
y omitted. 227.
\varsigma > ts. 230.
\chi > omission, \chi, k. 235.
265. Final before consonant

m omitted. 120.
f omitted. 129.
t > omission > t. 143.
d > omission > t. 150.
n omitted. 157.
s > omission, s. 173.
z > s? 179.
l > omission, vowels. 204.
r, n omitted. 211.
k > omission > k. 219.
p omitted. 228.
χ > ξ. 236.

266. Final after consonant

t > omission > t. 142.
d omitted. 149.
s > omission, s. 174.
z > omission, z. 178.
f > omission > s. 188.
k > omission > k. 220.
c omitted? 231.

267. Syllabic

m > m. 117.
f > f. 181.
C > C. 189.
-n > omission > vowels, with a tendency toward vowel harmony, > ο. 151.

Note. τ is classified as a vowel. 89-90.
Tabulation of the Child’s Sounds
and their Standard Prototypes

268. In this chapter Hildegard’s sounds are surveyed and traced back
to the various standard sounds from which they proceeded. The facts
will be interpreted in 333–426. The information is the same as in the
preceding chapter, but it is here viewed from the angle of the child’s
speech. Sounds resulting not from substitution, but from reduplication
or blending are not listed, because they cannot be traced to standard
sounds. Non-standard words surviving from the babbling stage are
omitted, because they have no prototypes. Developments after 1;11
(previously added in parentheses in the text) are disregarded.

269. Vowels
Stressed a and e normally <a. 4–13.

æ. 23 f.
λ. 77–79.
ocasionally <e. 16–21.

e. 32.
o. 45.
e. 29.
al. 94.
au. 100 f.
unstressed a. 14 f.

Unstressed a and e normally <a. 14.

ø. 14.
ocasionally <ø? 33.
o. 47.
u. 75.
e. 30.
ø. 86.
au. 102.
-r. 90.
-l. 192–194.
-r. 151.
without a standard model in *oka, soap
1;10 (vol. 1, p. 89).

Stressed å frequently <an. 12.

æn. 24.

Stressed æ occasionally <æ. 23 f.

ε. 26 (Marion).
l. 53 (bitte).

Unstressed æ occasionally <e. 83, 85.
Stressed ē normally /e:/ 26–28.
  frequently /e/ 29.
  occasionally /e/ 39.

  i. 53.
  i. 63.
  æ. 23.
  ʌ. 78.

Unstressed ē normally /-ɔ(r)/ 81, 88.
  occasionally /e/ 30.
    æ. 83, 85.
    -n. 151.

Stressed e normally /e/ 35–39.
  frequently /e/ 29.
  occasionally /e:/ 26–28.

  i. 52.

Unstressed e normally /e/ 40.
  occasionally /e/ 30.

  without a standard model after k. 218 (make).

Stressed i normally /i/ 49–53.
  occasionally /e/ 29.

  without a standard model before s, 3 in shoe. 181.

Unstressed i frequently /i/ 54.
  occasionally /i/ 66 f.

     -l. 193.

  without a standard model before or after -s.
  173, 178, 204.

Stressed i normally /i/ 61.

  y. 69.

  frequently /i/ 51.
  occasionally /e/ 39.

  u after s, 3. 74, 181.

Unstressed i normally /i/ 64–65, 67–68.

  i. 54.

  frequently /-n/ 151.
  occasionally /æ/ 83, 87.

    e. 40.

    u. 75.

Note. mæmi *r;6 instead of regular reduplicated meme,

   Marion perhaps by dissimilation.

Stressed y occasionally /i/ 63.

  i. 51.

Stressed ð normally /ɔ:/ 17–19.

  frequently /ɔ/ 32.
occasionally <ə. 44–46.
  u. 59.

Unstressed ə normally <ə with secondary stress. 18.
  o. 47.
    occasionally <-n. 151.
    -l. 192.
    -l. 203.

Stressed ə normally <o. 42–46.
  Æ. 31.
    occasionally <ə. 32.
      u. 59.
      u. 71–72, 76.
      A. 79.

Unstressed u frequently <o. 47.
  -l. 192.
    occasionally <-n. 151.
      without a standard model <-l. 203 (oil).

Stressed u frequently <u. 55–59.
  u. 71, 74.
  o. 44–46.
    occasionally <i. 53.

Unstressed u occasionally <-ɪ. 90.

Stressed u normally <u. 70–74.
  ɪ. 89.
    frequently <u. 55–59.
      o. 44–46.

Unstressed u normally <u. 75–76.
  -ɪ. 90.
    frequently <u. 60.
      -n. 151.
      -l. 191–193.
      occasionally without a standard model <-l. 203.
        -ʃ. 187.

Stressed ə: occasionally <ɪ. 89.

Stressed ə occasionally <A. 79.
  i. 53.
  au. 101.

Unstressed ə normally <ə. 182 f.
    frequently <-ə(ɪ). 81, 88.
      -n. 151.
    occasionally <i. 54.
      a. 15.

---

1 Rarely, in emphatic pronunciation, with a fuller sound resembling ə or Æ (83).
SPEECH DEVELOPMENT OF A BILINGUAL CHILD: II

270. Diphthongs

The diphthongs are falling unless otherwise noted.

Stressed \( \text{ai} \) normally less than \( \text{ar} \), 93.

\( \alpha + i \), 9, 66, 199.

\( \text{al} \), 11, 202 (Ball).

occasionally less than \( \text{el} \), 29, 199.

\( \text{i?} \), 53, 200.

\( \text{i} \), 53.

\( \varepsilon + i \), 18, 66 (naughty).

\( \alpha + i \), 66, 78, 154 (buggy, money).

\( \alpha(s) \), 11, 172 (muss).

\( \alpha u(s) \), 100, 172 (Maus).

\( \alpha(f) \), 8, 187 (wash).

\( \varepsilon(f) \), 79, 187 (brush).

\( \alpha(tf) \), 78, 143 (much).

Note. \( \text{ai} \) occurred sometimes as variant of \( \text{ar} \). When the first vowel was lengthened, as happened in \( \text{alley} \), \*Alex, bottle, dolly, candy, \*da ist es, I prefer to treat the child's vowel-combination as two separate syllables, when it stands for two syllables in the prototype.

Unstressed \( \text{ai} \) normally less than \( \text{ar} \), 96.

Stressed \( \text{au} \) (\( \text{au} \)) normally less than \( \text{au} \), 98-101.

frequently less than \( \varepsilon \), 21.

occasionally less than \( \text{el} \), 21, 203-204.

\( \varepsilon \), 45.

\( \text{el} \), 29, 203.

Unstressed \( \text{au} \) (\( \text{au} \)) normally less than \( \text{au} \), 102.

occasionally less than \( \varepsilon \), 22.

\( \varepsilon + \varepsilon \), 0, 23, 47 (wheelbarrow).

Stressed \( \text{ea} \), \( \varepsilon \alpha \) frequently less than \( \varepsilon \), 26, 210.

Stressed \( \varepsilon i \) occasionally less than \( \varepsilon i \), 38.

\( \varepsilon i \), 26, 210.

Stressed \( \text{ea} \) occasionally less than \( \varepsilon i \), 36, 210.

\( \text{el} \), 37, 203.

---

1 One glance at the variability of the child's vowels shows that it would be of no value to go into fine details concerning the child's articulation of diphthongs. The transcriptions \( \text{ai} \) and \( \text{au} \), for instance, are to be taken as rough indications, without commitment as to the exact height of the tongue in the articulation of the second element.

2 The variant \( \text{bea} \), with rising diphthong, for \( \text{ja} \) can be disregarded as accidental (232).

\[ e + o. \ 37, 47. \]

Stressed e\(\text{o} \) (\(\text{e}\)) occasionally <\(\text{ex}. \ 36, 210. \)

Stressed e\(\text{r} \) occasionally >\(\text{er}. \ 38. \)

Stressed i\(\text{e} \) frequently <\(\text{il.} \ 49, 203 \text{ f.} \)

Stressed i\(\text{a}, \text{i}\)\(\text{e} \) frequently <\(\text{ir.} \ 61, 63, 210 \) (\text{dear, ear}).

\[ \text{il.} \ 62, 202 \text{ f.} \]

occasionally <\(\text{i} + \text{l}. \ 61, 194 \) (\text{measles}).

\[ \text{ex.} \ 36, 210. \]

Stressed i\(\text{a} \) (rising diphthong) occasionally <\(\text{ja}. \ 232. \)

Unstressed i\(\text{o}, \text{i}\)\(\text{u} \) (rising diphthongs) occasionally <\(\text{j}. \ 90, 193 \) (\text{bottle, water}).

Stressed i\(\text{a} \) normally <\(\text{ia}. \ 103. \)

occasionally <\(\text{ia}. \ 32, 226. \)

Stressed o\(\text{a} \) occasionally <\(\text{ol.} \ 32, 202 \) (cf. 151) (\text{rollen}).

Stressed o\(\text{i} \) occasionally <\(\text{o} + \text{u}. \ 43, 157 \) (\text{stone}).

Stressed o\(\text{i} \) occasionally <\(\text{oi}. \ 103. \)

\[ \text{i.} \ 19, 210. \]

Stressed u\(\text{i} \) occasionally <\(\text{u} + \text{i}. \ 54, 56. \)

\[ \text{u} \text{(s).} \ 71, 172. \]

Stressed u\(\text{i} \) frequently <\(\text{rf}. \ 89, 143 \) (\text{church}).

occasionally <\(\text{u} \text{(s).} \ 71, 172. \)

\[ \text{u} \text{(z).} \ 74, 177. \]

Stressed y\(\text{i} \) (rising diphthong) occasionally <\(\text{hi}. \ 53, 207 \) (\text{pretty}).

Stressed o\(\text{u} \) accidentally <\(\text{hu}. \ 74, 239 \) (\text{huch}).

Consonants, arranged by place of articulation

271. Bilabials

p- frequently <\(\text{p}. \ 105 \text{ f.} \)

\[ \text{pr}. \ 107, 207. \]

occasionally <\(\text{pr}. \ 109 \) (\text{Opa}).

\[ \text{b}. \ 114 \) (\text{Ball}). \]

\[ \text{m}. \ 118 \) (\text{Mama}). \]

p\(\text{s}, \) pr\(\text{-}, \) ps\(\text{-}, \) p\(\text{f}, \) pw\(\text{-} \) occasionally <\(\text{pr}. \ 107, 207 \) (\text{pretty}).

pw\(\text{-}, \) pf occasionally <\(\text{p}. \ 105 \) (\text{pooh}).

-p- frequently <\(\text{-p}. \ 109, 111. \)

\[ \text{-pr}. \ 110. \]

occasionally <\(\text{-m}. \ 118 \) (\text{Mama}).

-p normally <\(\text{-p}. \ 112. \)

b- normally <\(\text{b}. \ 114. \)

\[ \text{bl}. \ 115. \]

\[ \text{br, } \text{br}. \ 115. \]

\[ \text{p}. \ 105 \text{ f.} \]

\[ \text{pl}. \ 107. \]

\[ \text{pr}. \ 107. \]

\[ \text{sp}. \ 108. \]

\[ \text{fp}. \ 108. \]
occasionally <b-. 116.
    -p-. 109 (kaputt).
    m-? 118 (Mama).
-b- normally <b-. 116.
    frequently <p-. 109, 111.
    br-. 114.
    occasionally <bl-. 115 (Augenblick).
    br-. 115 (toothbrush).
    m-? 118 (Mama).

m normally <m. 117.
m- normally <m-. 118.
    occasionally <m-. 119.
-m- normally (?) <m-. 119.
    occasionally <m-. 118 (oatmeal).
pf, see p-.
-β- occasionally <bl-. 115.
w- normally <w-. 122.
    hw-. 121.
    v-. 130.
    tsv-. 131.
    f-. 125.
    fl-. 126.
    fr-. 126.
    r-, 8-. 206.
    frequently <w-. 123.
    occasionally <th-. 207.
    p- (vol. I, p. 43: waba, papa).

pw-, see p-.
-w- normally <w-. 123.
    frequently <v-. 132.
    bl-. 115.

272. Labiodentals
The stage of labiodentals was not reached until shortly after the end
of the second year. The following earlier occurrences were more or less
accidental.
f- occasionally <f-. 125 (fall).
-fβ occasionally <θ-. 161 (mouth).
v- occasionally <fr-. 126 (Frau).

273. Dentals
t- frequently <t-. 134-135.
    tr-, tr-. 136.
    occasionally <st-. 137.
    ts-. 136.
    θr-. 160.
    k-. 213.
    kr-. 207, 214.
tf- frequently <tf-. 136.
-t- normally <-t-. 138.

-tf-. 139.
-skr-. -skr-. 217.

frequently <-st-. 140.
-k-. 216.
-g-. 223.

occasionally <-t-. 141 (oatmeal).
-ts. 143 (Fritschen).
-s-. 169.

-ts- occasionally <-ts-. 139.
-tf- frequently <-tf-. 139.

-t normally <-t-. 141.

occasionally <-st-. 142, 173.
-ts. 143.
-tf. 143.
-k. 218.
-rk. 211, 220.
-sk. 220.
-ks. 219.
-s. 172.

-xt normally <-xt-. 142.
-ts occasionally <-t-. 141, 143 (biie).

-s. 172 (heiss).

-tf normally <-tf-. 143.
-dz. 178.
-ç. 230.

occasionally <-s-. 172.
-f-. 128.

-tç occasionally <-t-. 141 (meat).

d- normally <d-. 144.

dr-, dr-. 145.
d5-. 145.
t-. 134 f.
tr-, ta-. 136.
št-. 137.
št-. 137.
str-. 137.
š-. 162.
θ-. 158 f.
g-. 221.
gl-. 222.
k-. 213.
kr-, kr-. 207, 214.
skr-. 207, 215.

frequently <ts-. 136.
tf-. 136.
θr-. 160.

dʒ- normally < tf-. 136.
-d- frequently < -d-. 146.
-t-. 138.
occasionally < tr-, tr-. 136 (Gertrud, -e).
-tʃ-. 139.
-k-. 216.
-dʒ- frequently < -tʃ-. 139.
n- normally < n-. 152.
kn-. 153.
-sn-. 153.
ʃn-. 153.
occasionally < -n-. 152.
-n- frequently < -n-. 154.
ocasionally < n-. 152 (ironing).
-gk-. 226.

-n occasionally < -n-. 156.

274. Alveolo-palatals
ps-, see p-.
-ts-, see -t-.
-ts, see -t.
ʃ normally < f(-). 181.
pʃ-, see p-.
tʃ-, see t-.
ʃ- occasionally < -s-. 169.
-sk. 173.
ʃ. 187 (wash).

-tʃ-, see -t-.
ʃ normally < -ʃ-. 187.
-ʃ-. 184.
-tʃ. 143, 188.
-s. 172.
-ns. 174.
-z. 177.
dz. 178.
nz? 178.
lz. 178.
-ø. 161.
-ð. 164.
ocasionally < -s-. 169.

-sk. 173.
-z-. 176.
-f. 128.
zd? 179.
(276) THE CHILD’S SOUNDS AND THEIR STANDARD PROTOTYPES 103

(t)s-? 136 (su).
 s(t)-? 137 (stone, story).
ʃ(t)-? 137 (steht).

-tʃ, see -t.
3- frequently <ʃ-. 181.
ocasionally <ts-. 136, 168.
 tʃ-. 183.
 kl-? 197.

dʒ-, see d-.
-dʒ-, see -d-.
ʕ normally <ʕ. 189.
ocasionally <t-. 134.
275. “Liquids”
l- occasionally <l-. 195.
 kl-? 197.
-l- frequently <-l-. 198–199.
ocasionally <-l. 202–203.
 -l. 193.

pr-, see p-.
276. Palatals and Velars
k- frequently <k-. 213.
kχ- occasionally <kr-. 207.
-k- frequently <-k-. 216.
ocasionally <-ŋk-. 217.
 -χ-. 234.
 -ʃ-. 184.
 -tʃ-. 139.
 -p. 112 (soap).
 -p-? 109 (klappert).
-kχ- occasionally <-k-. 216 (cracker).
-k normally <-k. 218.
 -ŋk. 220.
frequently <-g. 224.
 -x. 235.
ocasionally <-k-. 216 (peekaboo, sticky).
 -t. 141.
 -st. 142.
 -p. 112.
 -ŋk occasionally <-ŋk-. 217 (danke).
-χk occasionally <-k. 218 (book).
-kç occasionally <-ŋk. 220 (drink).
g- frequently <k-. 213.
ocasionally <kr-. 207 (214.)
g- occasionally <-k-. 216.
g normally <-n-. 152.
-\(k\)- frequently < -\(n\)- 154.
occasionally < -\(n\)- 152 (ironing).
-\(\eta\)-, see -\(k\).

\(p\)-, see -\(p\).

\(-\varsigma\) occasionally < -\(k\)- 216 (sticky).

-\(f\varsigma\), see -\(f\).

-\(k\varsigma\), see -\(k\).

-\(t\varsigma\), see -\(t\).

\(-j\)- normally < -\(j\)- 232.

\(s\)-. 166.

\(l\)-. 195 f.

\(s\)l-. 167, 197.

occasionally < -\(s\)-. 136, 168.

\(-z\)-? 175.

\(-f\)-. 181.

\(-l\)-. 199 (hello).

\(-r\)-. 206.

\(-j\)- normally < -\(j\)- 233.

\(-l\)-. 198 f.

occasionally < -\(l\)- 203 (roll).

\(-l\)-. 193.

\(k\)k\(-, see \(k\)-.

\(-k\)k\(-, see -\(k\)-.

\(-\kappa\)- frequently < -\(\kappa\)- 235.

without a standard model as off-glide of \(au\), frequently. 45, 99.

\(u\), frequently. 44, 59, 71.

\(u\), frequently. 59, 71.

\(o\), occasionally. 45, 112.

\(-\kappa\)k, see -\(k\).

\(-\kappa t\), see -\(t\).

Laryngeals

\(h\)- normally < -\(h\)- 239.

frequently < English l-. 196.

\(-r\)-. 206.

occasionally < -\(s\)-. 166.

-\(ts\)-. 136, 168 (outside).

\(-z\)-? 175.

\(-f\)-. 125.

\(?\)- normally < -\(?\)- 241.

without a standard model before English words beginning with a vowel. 241. (Probably the five listings below with ? for initial consonants should be interpreted as omission of the consonant and addition of the same “on-glide” ?.)

frequently < -\(s\)-. 166.

\(h\)-. 239.
occasionally <f-. 125.
   fr-. 126.
   z-? 175.

-? normally <-?-. 241.

occasionally without a standard model, more or less as a result of
blends (Leona, Mary Alice, miau, pick up, wake up, way up).
-? occasionally without a standard prototype. 101, 224.

Consonants, arranged by manner of articulation

Only "normal" and "frequent" substitutions are summarized in this
survey.

277. Voiceless Stops

p- frequently <p-, pr. 105-107, 207.
   -p- frequently <-p-, -pr-. 109-111.
   -p normally <-p-. 112.

t- frequently <t-, tr-, tr-. 134-136.
   -t normally <t-, -tf-, -skr-, -skr-. 138-139, 217.
   frequently <-ft-, -k-, -g-. 140, 216, 223.
   -t normally <-t. 141.

k- frequently <k-. 213.
   -k- frequently <-k-. 216.
   -k normally <-k, -?k, -ks. 174, 218-220.
   frequently <-g, -k-. 224, 235.

?- normally <?-. 241.
   frequently <-s-, h-, 166, 239.
   -? normally <-?-. 241.

278. Voiced Stops

b- normally <b-, bl-, br-, br-, p-, pl-, pr-, sp-, sp. 105-108, 114-115.
   -b- normally <-b-. 116.
   frequently <-p-, b-. 109, 111, 114.

d- normally <d-, dr-, dr-, d3-, t-, tr-, tr-, st-, st-, st-, str-, st-, th-, g-, gl-
   k-, kr-, kr-, skr-. 134-137, 144-145, 158-159, 162, 207,
   213-215, 221-222.
   frequently <ts-, tf-, thr-. 136, 160.
   -d- frequently <-d-, -t-. 138, 146.

g- frequently <k-. 213.

279. Nasals

m normally <m. 117.
   m- normally <m-. 118.
   -m- normally (?)<-m-. 119.

n- normally <n-, kn-, sn-, fn-. 152-153.
   -n- frequently <-n-. 154.

? normally <n-. 152.
   -?- frequently <-n-. 154.

280. Glides

w- normally <w-, hw-, v-, tsv-, f-, fl-, fr-, r-, r-. 121-122, 125-126, 130-
   131, 206.
   frequently <-w-. 123.
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-w- normally < -w-. 123.
    frequently < -v-, bl-. 115, 132.

281. Voiceless Affricates (Stop + Fricative)

-tʃ- frequently < tʃ-. 136.
    -tʃ- frequently < -tʃ-. 139.

282. Voiced Affricates (Stop + Fricative)

-dʒ- normally < tʃ-. 136, 186.
    -dʒ- normally < -tʃ-. 139.

283. Voiceless Fricatives

ʃ normally < f(-). 181.
    -ʃ- normally < -s-. 169.
    -ʃ normally < -ʃ-, -ʃ, -tʃ, -s-, -s, -ns, -ts, -ts, -dz, -lz, -θ, -ð. 143, 161,
        164, 169, 172, 174, 177–178, 184, 187–188.

-χ frequently < -χ-. 235.
    off-glide after high back vowels. 44 f., 59, 71, 99.

h- normally < h-. 239.
    frequently < English l-, r-. 196, 206.

284. Voiced Fricatives

ʒ- frequently < j-. 181.


285. "Liquids"

-l- frequently < -l-. 198–199.

286. Click

ç normally < ç-. 189.

287. Consonant Combinations other than affricates (281 f.)

-xt normally < -xt-. 142.

Consonants, arranged by position in word

("Normal" and "frequent")

288. Initial

p frequently < p-, pr-. 105–107, 207.


m normally < m-. 118.

w normally < w-, hw-, v-, tsv-, f-, fl-, fr-, r-, r-. 121–122, 125–126, 130–
        131, 206.
    frequently < -w-. 123.

t frequently < t-, tr-, tr-. 134–136.

-tʃ frequently < tʃ-. 136.

d normally < d-, dr-, dr-, dʒ-, t-, tr-, tr-, st-, ft-, str-, ð-, ð-, g-, gl-, k-, 
    kr-, kr-, skr-. 134–137, 144–145, 158–159, 162, 207, 213–
    215, 221–222.
    frequently < ts-, tʃ-, ðr-. 136, 160.

dʒ normally < tʃ-. 136, 186.

n normally < n-, kn-, sn-, fn-. 152–153.

-tʃ frequently < tʃ-. 136.
3 frequently <\textit{f}. 181.
   \(\text{d}_3\) normally <\textit{f}-. 136, 186.
\k frequently <\textit{k}. 213.
\g frequently <\textit{k}. 213.
\n normally <\textit{n}. 152.
\h normally <\textit{h}.- 239.
   frequently <English \textit{l}.-, \textit{r}.- 196, 206.
? normally <\textit{?}. 241.
   frequently <\textit{s}.-, \textit{h}.- 166, 239.
289. \textit{Medial}
\p frequently <-\textit{p}-. \textit{pr}.-. 109–111.
\b normally <-\textit{b}.- 116.
   frequently <-\textit{p}-. \textit{b}.- 109, 111, 114.
\m normally (?) <-\textit{m}.- 119.
\w normally <-\textit{w}.- 123.
   frequently <-\textit{v}.-, \textit{bl}.- 115, 132.
\t normally <-\textit{t}-. <-\textit{t}-. \textit{skr}.-, <-\textit{skr}-. 138–139, 217.
   frequently <-\textit{st}-. <-\textit{k}-. <-\textit{g}.- 140, 216, 223.
\tf frequently <-\textit{tf}-. 139.
\d frequently <-\textit{d}-. <-\textit{t}.- 138, 146.
   \(\text{d}_3\) normally <-\textit{tf}-. 139.
\n frequently <-\textit{n}.- 154.
\f normally <-\textit{s}-. 169.
   \(\text{tf}\) frequently <-\textit{tf}-. 139.
\(\text{d}_3\) normally <-\textit{ts}-. 139.
\l frequently <-\textit{l}.- 198–199.
\k frequently <-\textit{k}-. 216.
\n frequently <-\textit{n}.- 154.
\j normally <-\textit{j}-. <-\textit{l}.- 198–199, 233.
? normally <-?-. 241.
290. \textit{Final}
\p normally <-\textit{p}. 112.
\t normally <-\textit{t}. 141.
   \(\textit{xt}\) normally <-\textit{xt}. 142.
   \(\text{tf}\) normally <-\textit{tf}-. <-\textit{dz}-. <-\textit{ts}. 143, 178, 230.
\f normally <-\textit{f}-. <-\textit{f}-. <-\textit{fs}-. <-\textit{s}-. <-\textit{ns}-. <-\textit{ts}-. <-\textit{z}-. <-\textit{dz}-. <-\textit{lz}-. <-\textit{th}-. <-\textit{th}. 143, 161, 164,
   169, 172, 174, 177–178, 184, 187–188.
\k normally <-\textit{k}-. <-\textit{qk}-. <-\textit{ks}. 174, 218–220.
   frequently <-\textit{g}-. <-\textit{x}. 224, 235.
\x frequently <-\textit{x}. 235.
   off-glide after high back vowels. 44 f., 59, 71, 99.
291. \textit{Syllabic}
\m normally <-\textit{m}. 117.
\f normally <-\textit{f}.- 181.
\(\text{c}\) normally <-\textit{c}. 189.
Analysis of the Child’s Substitutions

Cf. the tabulation, 242–267.

Vowels

292. The vowels, as summarized in 243, were generally reproduced with a fair degree of accuracy. The most frequent equivalent in the child’s speech was usually the correct standard vowel. Obviously the child heard the standard vowels correctly, and aimed at reproducing them as exactly as she could. The situation can be compared to the practice shots of an apprentice in archery. Hildegard did not always hit the mark correctly; her “shots” clustered around the mark as the beginner’s shots do on the target.1 She was a good learner; the spread was rarely very great. Usually, the tongue was placed a little too high or a little too low. Front vowels generally remained front vowels; back vowels remained back vowels. Low vowels were always represented by low vowels. Mid-vowels were often replaced by other mid-vowels, but sometimes spread into the neighboring high or low ranges. High vowels remained high or were lowered to the mid-level, but never to the low range. Lowering was in all ranges more common than raising, because it was favored by the natural low position of the tongue at rest; but the effort required to modify this natural position by raising the tongue to articulate mid- and high vowels overshot the mark often enough to result in raised-vowel varieties. Fronting and retracting occurred, but not frequently. There was considerable overlapping of the substitutes; for instance, those for i ranged from i to e, those for e from i to a.

293. Some vowels suffered little or no variation. a was rather consistently fronted to a, but never replaced by any other vowel, because it is close to the rest position of the tongue.2 a e was always lowered to a; a was lowered and fronted to a. Thus a was the most common vowel even after higher vowels had been learned. e was rendered by e with surprising consistency: it was an exact rendering of long e in German, a simplification of long e in English by omission of the faint higher off-glide of the standard.3 Otherwise, mid-vowels suffered more variation than low and high vowels. Low vowels required little effort; high vowels could be articulated with fair accuracy by contrast; the intermediate articulation of mid vowels required the most delicate adjustment of the tongue between these two extremes, more difficult to achieve and therefore more subject to fluctuation.

294. The vowel ð was replaced rather consistently by u; the raising of

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1 Metaphor from Lukens, p. 493.
2 Bloch (1913) observed rounding to o induced by a preceding bilabial consonant (p. 53; cf. also pp. 55 and 58); no such phenomenon occurred in Hildegard’s speech.
3 Williams (p. 32) also finds a “slight” but “definite” tendency to substitute pure vowels for diphthongs. Thus it is unlikely that bilingualism has any influence on the process. Williams emphasizes that this tendency is the “opposite of the general tendency in English.”
the tongue was imitated, but very inaccurately, because of the difficulty of the articulation. German rounded front vowels were rarely attempted and not very successfully achieved. y was unrounded to i, but in æ the rounding was preserved at the expense of the position of the tongue; it became o. This was nearly the only instance of a shift from front to back position. Such a shift occurred otherwise only as a variant in the very frequent word bitte, which had unusually variable vowels in both syllables. The first vowel of the word varied at an early stage (1;7–8) in a wide range including u, the equivalent of i in the back position (53).

295. Only in the low range, a following nasal consonant frequently affected the preceding vowel, nasalizing both a and æ to a. The relaxed position of the velum necessary for the articulation of n was anticipated during the articulation of a, which is articulated with a relatively relaxed position of the tongue. The child’s sound represents a form of assimilation which is well known in the phonology of standard languages, especially French, but it took place only in the combination in which it can be made easily. Higher vowels, requiring more effort for their articulation, did not yield to the tendency; notice that in the development of French, where all vowels were affected, the higher vowels were eventually also lowered for nasalization, which proves that this type of articulation is more natural for low vowels than for high ones. In Hildegard’s speech, as in later French, the nasal itself was absorbed in the compromise nasalized vowel.

296. There was no essential difference in the treatment of stressed and unstressed vowels, except that unstressed syllables remained more frequently unrepresented.

297. Vowel-quantity was not strictly maintained. In the early months after speaking had begun, all vowels were short. Later, there was more general agreement with the standard quantity, but in quite a number of cases, long vowels were shortened, as in wak i;11 for walk, or, less frequently, short vowels lengthened. The latter usually was compensatory lengthening when a consonant or a syllable was omitted, as in ba:r at 1;6–7 for bottle (9) and *bu: 1;9 for Butter; but it occurred also in monosyllables like German Ball (11) (and even at 2;1 in hek for look). No particular attention was paid to quantity in the chapter on the representation of standard sounds in the child’s speech, because variations along this line are nothing but slight inaccuracies of a less striking na-

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* Also in German dialects (South Rhine Franconian and Swabian), cf. Behaghel 375, 7.

* Passy (1891, 561) has a different explanation, without proof: “Si les voyelles nasalisées deviennent ouvertes, ce n’est pas qu’il soit plus facile de les prononcer ainsi: c’est parce qu’alors elles sont plus distinctes.” This theory certainly does not help to explain the absence of higher nasalized vowels in Hildegard’s speech.

* It is tempting to assume that only standard a was so nasalized and that the greater number of instances in which ma, ma was not nasalized goes back to English man with æ rather than to German Mann with a. This may be the correct explanation, but it does not harmonize with the distribution of a and a, which one would like to trace to English æ and German æ respectively.
ture than qualitative variations. Besides, changes in quantity commonly were concomitants of changes in quality, and quantity in English words also varies in the standard language with the type of consonant following the vowel.

298. Avoidance of vocalic beginning of words by means of reduplication, as reported by Mrs. Hall, was not observed in Hildegard’s speech. The only word which might belong here is Opa. The first syllable was often omitted, the second was sometimes reduplicated. Reduplication, however, was common in monosyllabic words (442), in words beginning with consonants as well, particularly at the early stage when this word was used (*1;0–1). No special tendency to avoid word-forms with initial vowel is needed to explain Hildegard’s form. If it should prove to be a fact in child language, its absence in Hildegard’s case might be explained by her habit of using the consonantal glottal stop before initial vowels. She had, however, some words beginning with a vowel not preceded by a glottal stop (high-chair 1;5, *kookoo at 1;5, light at 1;7 and 1;8).

Diphthongs

299. Little needs to be said about standard diphthongs (244). α in diphthongs was usually somewhat fronted, just like simple α. The second element of αr and αu was usually rendered correctly; but, being weaker than the first, it was also often omitted or absorbed by the first, a process which has many parallels in the development of standard sounds. This assimilation occurred more often for αu than for αr, but less lastingly. The omission of i in αi was supported by careless standard pronunciations and sometimes by dissimilation from a following i (94). The monophthongization of these diphthongs is parallel to the pronunciation of the slightly diphthongal long vowels of English as pure vowels (293).

αi suffered less variation. In one word both elements were raised (103).

Consonants

300. We examine the consonants first with regard to their places of articulation (300–307).

Bilabials (245) were always rendered as bilabials.10 No resistance to words containing them was observed, and they were never omitted except in final position. The voiced varieties were more strongly entrenched than the voiceless. b, m, and w remained voiced, whereas hw always became w and p was generally rendered as b, although p began to appear

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7 Part V: “The difficulty of pronouncing words beginning with a vowel was avoided by preceding the vowel by the consonant which followed it.”

8 The variant “Pa-0,” recorded vol. i, top of p. 118 as probably occurring fairly frequently, was, according to later advice from the grandfather addressed by this word, actually heard only once, but remembered on account of the striking nature of the form.

9 Little attention will be given to consonant-groups in this part of the analysis. They will be taken up later by themselves (313–332).

10 Karla usually shifted the bilabial in please to dental position: ti E 1;7–11. No such shift occurred in Hildegard’s speech.
more frequently at 1;11, especially in initial position; it still lacked the aspiration of standard English and German.

301. Labiodentals (246) were hardly ever imitated correctly, although the child had, after 1;2, enough teeth to be able to articulate them. At the end of the second year they began to appear sporadically. The voiced fricative v was the first to be learned; at the beginning of the third year, it began very slowly to become the normal substitute for initial f.

Before that, the bilabial glide was normally substituted for f in initial position. Labiodental fricatives could not be practiced as long as the upper front teeth, at least the two middle ones, were not fully developed (1;9). The bilabial glide was naturally easier. Another possibility would have been to substitute bilabial fricatives, as her sister Karla did; but bilabial fricatives never were part of Hildegard’s speech-pattern; they occurred only accidentally, as a result of partial assimilations.

In one word the f- was ephemerally replaced by h, in another regularly by the glottal stop. Both can be interpreted as omission of f- and introduction of an on-gliss for the initial vowel.11 The glottal stop was used before u, which is similar enough in articulation to w, the normal substitute for f, to make it possible to explain ?u as the result of total assimilation of w to u. This explanation is reinforced by the fact that the word in question, Fuss, had a plural form, Füsse, with the regular w, because here a front vowel followed it. The word fork, in which h was substituted at first 1;11, had the mid back vowel o in the child’s form, whereas in all other words a front or low back vowel followed. Fork itself soon had the standard lower back vowel z; and at the same time introduced the normal w. Thus mid and high back vowels seemed to favor omission of f-. This urge is phonetically less convincing for the mid back vowel o, and there was indeed one other word, Florence, in which fl- before the child’s o was regularly rendered by the normal w during the same month. Thus the first form hok for fork may also be disregarded as an experimental inaccuracy, leaving only u as repelling the articulation of a preceding w, a phonetically sound interpretation. I still believe, however, that the character of the following vowel had an influence on the experimental form.

Initial fl and fr were treated like simple f-. The glottal stop occurred in Frau at 1;7, but yielded to the regular w at 1;8. In this case, assimilation to the following vowel is not the explanation for the omission; but it was a month earlier than any word with simple f-. Thus, omission was probably the first result of the inability to pronounce f-; it survived only where the following vowel favored it. By accident, bilabial and even labiodental voiced fricatives appeared sporadically for fr much earlier than for simple f-; but the normal substitute was w.

11 “On-gliss,” as sometimes used in this study for the glottal stop preceding words beginning with a vowel in the child’s speech, is an inaccurate term. A stop is not a glide. Functionally, however, as a signal marking the beginning of a word (241), it is parallel to h- in the same position.
Initial v became w even more regularly; there was one doubtful case with glottal stop.

No word with medial f was used. Medial v was omitted except in re-duplicated words, in which both syllables retained identity of form.

Final f, alone or with a following consonant, was normally omitted; sometimes at 1;11, however, it was replaced by a more familiar and therefore easier fricative, namely s or the corresponding affricate tf; the latter should be interpreted as an inaccurate s due to inadequate muscle control.

Labiodentals were thus not really learned during the first two years. There was, however, resistance to the use of words containing them only until 1;7. Later the substitutes, usually w, were felt as satisfactory.

302. Dental stops (including n) (247) are in the standard languages sometimes formed at the back of the upper teeth, as dentals in the narrower sense. More commonly they are articulated just above the teeth (supradentally), or even on the alveoli proper. Hildegard's dental stops must have been alveolar as long as she did not have the upper front teeth, during the babbling stage. (Two upper front teeth were full-grown at 1;0, four at 1;2.) Later, no change in articulation was observed.

Dental fricatives (247), on the other hand, must be articulated against the teeth and can therefore not be practiced during the babbling stage, which provides opportunity for preliminary exercises in the production of other sounds. This fact may be taken as an explanation for the late acquisition of dental fricatives, which seems to be generally observed in studies of child speech.

At any rate, Hildegard learned d early, t somewhat later, with an extended stage at which t was voiced to d, and n fairly early, with a preceding stage of shifting to palatal position. o and ð, however, were replaced by the supradental stops d and t in initial position, and by the alveolopalatal fricative s in final position. This is one of the most striking cases of substitution varying with position in the word, eloquent testimony for the difficulty of the sound. Its two-fold character as a dental and a fricative was evidently recognized, but the child did not feel capable of combining the two features.

In medial position all dentals were frequently omitted, but in many words the stops were rendered with more or less accuracy.

Final t was at first omitted, but learned in many words during the last two months. Final d continued to be missing, except in the rare group dz, where it finally was represented as t combined with s < z. Final n was

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12 Grandgent 14, 3; Ripman 24; Krapp 21 f.; Viëtor 110 f.
13 Kenyon 37, Viëtor 90, note 1, Ripman 31.
14 Hills (p. 89) thinks that the substitutions ð > d and o > f are general with English-speaking children. The second part of this assumption is not corroborated by our case; f for ð occurred only once as an accidental substitute (161). Hills (p. 100) observed it regularly until age 7. Davis (p. 37) speaks of the "well-nigh universal substitution" of d for ð. Otherwise, she found (p. 35 f.) substitution of f, s, z and omission at ages 5½ and 6½.
also omitted, but sometimes caused nasalization of the preceding low front vowel \( \text{a} \); this means the lowering of the velum was correctly executed, but too early and without the contact of the tip of the tongue which makes the sound a consonant. \( \text{an} > \text{\textae} \) means a complete mutual assimilation of two sounds resulting in one compromise sound (as in late French).

Final syllabic \( \text{n} \) was treated similarly. It was at first omitted and later replaced by a great variety of vowels, which eventually tended to settle into neutral \( \text{e} \). The stop formation was always omitted, but the lowering of the velum as well. Nothing but the voice remained of the formal characteristics of the sound; its function as the carrier of the syllable was preserved by substituting vowels, which are more generally used in this function.

303. The alveolopalatal group (248), an intentionally vague classification as to place of articulation (165), contains only fricatives, namely the hissing sounds in the wider sense of the term. In Hildegard’s speech they were dominated by \( \text{s} \), which she acquired early through a game (1:10; see vol. 1, p. 121). The predominance of \( \text{s} \) over \( \text{z} \) is not general in early child speech, but neither is it unusual (384).

Initial \( \text{s} \) was rarely attempted, initial \( \text{z} \) probably never. \( \text{s} \)- was omitted in \( \text{soap} 1:10 \) and the resulting initial vowel introduced by either \( \text{h} \) or glottal stop. Otherwise, the substitute was the simple palatal fricative in voiced form, that is \( \text{j} \), during the last two months and beyond; but very few words of this type occurred. As a substitute for \( \text{ts} \), \( \text{s} \) often took the place of \( \text{j} \), a regular variation.

Medial \( \text{s} \) was at first omitted, but from 1:10 on consistently rendered by \( \text{f} \). Medial \( \text{z} \) occurred rarely; it was also either omitted or replaced by \( \text{f} \).

Final \( \text{s} \) was sometimes omitted 1:4–B 1:8. One word, \( \text{aus} \), retained this primitive form as a rule to 1:11. On the other hand, attempts to pronounce -\( \text{s} \) started as early as 1:5, and from 1:7 on \( \text{f} \) was the regular substitute in numerous examples. Sometimes the tongue adjustment was not perfect. When the tip of the tongue was momentarily brought too close to the alveoli, a prothetic \( \text{t} \) was produced resulting in the affricate \( \text{tf} \). When the opening was not at once made narrow enough, a prothetic \( \text{t} \) developed. Less frequently, \( \text{r} \) followed \( \text{f} \) when the tongue muscles relaxed before the end of the articulation, with the striking result of an added syllable. All these imperfections were accidental and did not last, provided the word in question occurred often enough to have a chance for articulatory improvement. Final \( \text{z} \) was regularly omitted before 1:10. From 1:10 it was also represented by \( \text{f} \), although a few words retained the more primitive form. Cf. also -\( \text{dz} \) (317).

\( \text{f} \) in all positions was rendered correctly when it was rendered at all. Omission occurred medially and finally, and initially before and after consonants, but the tendency was to reproduce it eventually in most of these positions. In initial position, in one word, \( \text{shoe} \), \( \text{Schuh} \), where \( \text{f} \) was at first imitated correctly 1:6, the fricative later developed the prothetic
1, 1;7, and underwent voicing to 3 1;7–11; sometimes the articulation was simplified to j; this word did not return to the correct f (even at 2;1); for an explanation, see 383. Initial tf was also commonly voiced to d$3 or 3. Standard 3 is rare and did not occur in Hildegar d's vocabulary. d$ lost the fricative although the child was able to pronounce the affricate.

The palatal click in the interjection tsk, tsk (t, tl), not a hissing sound, but placed here for convenience (189), was reproduced correctly.

304. The “liquids” (249), also a vague classification, since the name refers to the manner of articulation rather than to the place (and not very precisely to that), constitute another intermediate group. Their function and their fate in the child’s sound-system is closely enough parallel to justify the retention of the old, established classification. Both l and r, r behaved differently in initial and medial position on the one hand, and final position on the other. In the former positions, their consonantal character prevailed; in the latter, the child isolated their vowel characteristics from them. Syllabic l is included here, whereas syllabic r is grouped with the vowels (89 f.). This may seem inconsistent, but the fact is that American r is much more definitely a vowel than l; it occurs in stressed syllables, whereas l is found only in unstressed final position. German r does not occur in syllabic function in the type of colloquial language which Hildegar d heard (88).

Initial l was, in a few words, pronounced correctly, in the last two months. Usually it was replaced by either h or j. j was favored at the end of the period, but h occurred both early (1;6) and late (2;1, in new words); a fixed substitution was not achieved. j as a substitute for l is easily understood; the complicated continuant feature was imitated incorrectly by the production of an easier neighboring continuant, a substitution which has parallels in the history of standard languages. The substitute h is less easily explained. It should probably be interpreted as a form of omission, the presence of an initial consonant being vaguely indicated by the unchecked breath-stream. h- occurred occasionally as a substitute for a variety of difficult initial consonants (276).

Initial r, r was rather consistently replaced by w.15 The reason for this substitution is not immediately apparent. Since it is common in child language, and was for a time in use in the affected speech of adults (206, note), there must be a phonetic explanation for it. Lip-rounding is not a common feature of either r or z; but raising of the back-tongue, essential for r (Viëtor 76), is also registered as accompanying the articulation of r (Ripman 32.11; Viëtor 76, note 1, and 92). The sound is thus akin to u and adopts the lip-rounding characteristic of u.16 Before a vowel, u easily becomes the glide w. In a few cases, r was replaced by h, which is parallel to l > h above, and in one word by j. The latter substitution is not surprising, being an unsuccessful rendering of the front part of r; but why it

15 Davis (p. 35 f.) found this substitution to be one of the most common at age 5$.

16 This is also Viëtor's explanation, 94, note 2.
should have been used just in the one word, *write*, I am at a loss to explain.\footnote{Karla used the regular *w* in *write*, but had also one word with *j*, *'rein.*}

Initial *l* and *r*, when preceded by another consonant were generally omitted, but exceptions occurred with *r* rendered and the preceding consonant omitted when the latter was also difficult.

In the treatment of medial *l*, a difference between English and German words is observable. English *l* in this position was usually omitted as late as *1;i1* (190); only in two words was it rendered, usually in the form of *j i;9–11*, but in one word also correctly *i;5–10*. German medial *l* was never omitted. It appeared as imperfect *l i;5*, as English velar *l i;7*, as *j i;8–10*, as correct German *l i;10–11*; the substitutions *i;7–11* concern the frequent word *alle*. Thus *j* was the most frequent substitute at the later stage; it had a tendency to develop into correct *l* in the last two months. The *l* was obviously heard correctly, but its imitation was too difficult to be used consistently. The simpler continuant *j* is a natural substitute especially for German front *l*. The fact that English *l* was so often omitted may be connected with the standard raising of the back tongue; the front fricative *j* was less satisfactory as a substitute for this kind of *l* than for German *l*. Possibly, however, the picture is falsified by the dearth of examples for German *-l-*. Apart from the omission of English *-l-*, the situation is similar in the two languages, and the fact that *alle* at first contained an English *l* makes it doubtful whether the child tried at all to distinguish between the two varieties of the consonant.

Medial *r*, *r* was always omitted (208 f.).

Final *l* (202–204) and *r*, *r* (210 f.) were either omitted or replaced by vowels of varying quality. In this position, rather naturally, the consonantal features of these sounds had less functional importance; their vocalic characteristics prevailed, and vowels were therefore used as substitutes when they were rendered at all. For *-r*, this vocalization was present even in the colloquial standard heard by the child, and therefore appeared, of course, also in her speech. Standard *-r* is described by Kenyon, in the newer editions of his book, as forming a diphthong with the preceding vowel; in the child's version of words ending in *r*, it became an unmistakable vowel, as in Southern British, only with more variety of vocalic quality. As to *-l*, it is not surprising to find the substitute vowels *i* for German flat *l*, *u* for English velarized *l*. Later the substitutes for *-l* in both languages tended to converge in the neutral *ə*, in English often lowered to *a* or an intermediate vowel. In English, this set of substitutes was regular after high front vowels, whereas in German it occurred also after a back vowel, although not lastingly. In two words, *oil* and *roll*, Hildegard struggled to pronounce the *-l* and achieved *j*, the substitute for consonantal *l*, and correct velar *l*. Interestingly enough, it never stood in final position in her word-forms, but was followed by a
back vowel, so that the consonantal and the vocalic features of the sound were separately represented by substitute sounds. Apparently, in her pattern of speech, j and l could stand only before vowels. Final l was not learned correctly during the first two years.

The same holds for final syllabic l (191-194), for which ju, lu also became fixed in one word, bottle, whereas otherwise the substitutes were always vowels, their quality (front or back vowel) being in harmony with that of the preceding stressed vowel. The word in which imitation of consonantal articulation was unsuccessfully attempted, was the only one in which vowel harmony did not prevail. e might have been the last stage of substitution before correct l was learned, as in the case of -en (302); but there was actually only one example of it.

Summarizing the “liquids,” we find that r and r were not learned during the first two years and l was not regularly articulated in the correct way. Consonantal substitutes were used before vowels, vocalic ones at the end of words.

305. Palatals proper and velars (250) were well represented, but stops were often replaced by dentals. This type of substitution is commonly observed in child language. In Hildegard’s case it was frequent, but not universal; the reverse, replacement of dentals by palatals and velars, also occurred (141).

Initial k (213-215) was usually voiced, and shifted to dental position, resulting in d. Sometimes the assimilatory voicing did not take place, t being the substitute; but this substitute had the character of a variant and was not regular in any lasting word. The correct k and its voiced counterpart g occurred frequently, but usually not as a late improvement. They were in most cases early variants, which yielded later to the dental substitute d. At the end of the last month, the standard sound began perhaps to gain the ascendant, but even that is not certain. At any rate, k and g occurred often enough to prove that t not prevailed shift to dental articulation was due neither to imperfect hearing nor to inability to pronounce the sound. The dental stops were easier, however, and the difference between her own sound and the standard one must have appeared unimportant to the child. It can be said that the difference between d, t, g, and k was for her as yet irrelevant, at least in initial position. Dentalization was definitely not the result of assimilation. The character of the following vowel had no influence on it.

Medial k (216 f.) was sometimes omitted, the latest examples being at 1;10. Usually it was imitated correctly from 1;8 on. t occurred as a variant 1;10-11, sometimes as the last equivalent. Earlier instances of t (from 1;6) appeared in reduplicated forms, where it was induced by the initial consonant. Voiced g and d occurred frequently, but only as the result of reduplicative assimilation at a distance. Thus, in medial position, the correct k dominated, the shift to the dental equivalent t being a frequent variant; but voicing, which can almost be called regular for initial k, was not normal for medial k, although in reduplicated forms,
the medial position did not prevent it from being adapted to the voiced
initial consonant.

Final k (218-220) was omitted for a long time, as were most final con-
sonants, and was not always represented even during the last three
months. Most words, however, had it from 1;9, usually as correct k. It
was never voiced, since Hildegard’s speech-pattern did not allow voiced
consonants at the end of words. The dental stop t was heard in only two
words, in competition with k. Apparently, it was easier for her to pro-
nounce k as a terminal check than to articulate it before a following
vowel, as in initial position. 18

Initial g (221 f.) was shifted to d with almost complete regularity.

Medial g (223) was usually omitted, but at 1;11 sometimes replaced
by the voiceless dental t.

Final g (224) was omitted 1;8-11 or unvoiced to k 1;8-11 (2;1). Again
we see that, apart from the regular terminal unvoicing, the correct back
stop articulation is favored by end position.

q (225-228) is not tolerated by English and German at the beginning
of words. Medially and finally it was dropped by the child, although
there was one word in which medial qk was replaced by (t)n. It is worth
noting that n for q is a dentalization exactly parallel to the shift of g and
k to dental stops.

As to fricatives, ç (229-231) was a difficult sound very rarely attempted
and never imitated correctly. Rules of substitution are unreliable on
account of the scarcity of examples. Omission occurred for initial (post-
consonantal) ç 1;8-11 and final ç 1;6-9 (2;1). Replacement by a more
familiar fricative, f, actually in the slightly inaccurate affricate form tf,
was chosen in one ephemeral word 1;10. The handling of this German fric-
ative did not get beyond the experimental stage. Words containing it
were generally avoided. In view of the fact that the pronunciation of ç
is objectively no more difficult than that of its voiced equivalent j, with
which the child coped better, we must conclude that she felt this sound
as difficult because her basis of pronunciation was already predominantly
English; in other words, that she lacked the incentive to learn this sound
because it is not a normal English sound.

Initial j (232) was gliding i at 1;3, but from B 1;4, the tongue was raised
high enough to produce the correct j. Hildegard learned it only in the
important and frequent ja and its synonym, *yes. Subjectively, the sound
must have appeared difficult, even though she used it freely as a sub-
stitute for other consonants (276). (She learned to use it more liberally
at the beginning of the third year, but even then it was not yet fully
mastered; it often yielded to s, which was easier for her because she ac-
quired f early.) Medial j (233) occurred rarely. At 1;5 it was omitted, at
1;11 reproduced correctly.

The velar fricative x (235 f.) may be considered more difficult, because

18 Pavlovitch (66) observed exactly the opposite condition: final k was changed to k
because “this consonant is much easier to reproduce at the beginning of the syllable.”
it is not supported by a voiced counterpart, because it occurs only in German, and because it is articulated by means of the less flexible back part of the tongue. Yet this sound was imitated correctly in two words \( \text{i;} \text{7} \) and \( \text{i;} \text{11} \), whereas in other words it was omitted \( \text{i;} \text{6}-\text{10} \) or replaced by the homorganic stop \( \text{k} \ \text{i;} \text{10}-\text{11} \). Thus no clear pattern of substitution was evolved by the end of the second year. Unintentionally, \( \chi \) was frequently articulated as an off-glide of final vowels (276).

306. Laryngeals (250) were generally imitated correctly. \( \text{h} \) (238–240) was occasionally faint at \( \text{i;} \text{5} \), one word retaining this pronunciation to \( \text{i;} \text{11} \), and sometimes omitted \( \text{i;} \text{5}-\text{10} \); but in the majority of words it was reproduced correctly \( \text{i;} \text{4}-\text{11} \). The glottal stop (241) was never omitted or replaced by a substitute.

307. Looking back over the consonants with regard to their places of articulation, we find the following situation.

Bilabials (300) were freely imitated and always had correct bilabial articulation.\(^{19}\) The only inaccuracy was a strong tendency to voice the voiceless consonants when they stood before vowels.

Labiodentals (301) were usually shifted to the simpler bilabial articulation in initial position and omitted in medial and final position; they were not learned correctly by the end of the second year.

Dentals (302) were frequent and generally correct,\(^{20}\) except for the fricatives, which were replaced by dental stops initially, by non-dental fricatives finally. Here, too, a strong tendency to voice the voiceless consonants is observable. Final \( \text{d} \) was always omitted, final \( \text{t} \) was eventually learned. Final \( \text{n} \) remained generally unrepresented, but sometimes nasalized a preceding low vowel. Final syllabic \( \text{n} \) was at first omitted and later did not acquire either its dental or its nasal characteristics; the child replaced it by vowels to preserve its syllabic function.

Alveolopalatals (303) were dominated by \( \text{f} \). Voicing (to \( \text{s} \)) was much less frequent in this group; when it did occur, the consonant was most commonly \( \text{j} \), which functioned in Hildegard’s early speech as a variant of \( \text{s} \). This happened only initially in the case of \( \text{s} \) (\( \text{z} \)) and \( \text{f} \), but the fricatives in this group were rarely attempted in initial position. In medial and final position, the hissing sounds were often omitted. All of them were rendered by \( \text{f} \) when they were rendered at all. Toward the end of the year this was the normal treatment. The palatal click, which occurred in one word, was reproduced correctly.

“Liquids” (304) were replaced by consonantal substitutes when they preceded vowels, by vocalic ones when they stood at the end. \( \text{l} \) was some-

\(^{19}\) Bloch (1913, p. 40) finds the labials to be the only consonants which were not variable at \( \text{E} \mid \text{i;} \text{11} \); this statement includes labiodental \( \text{f} \), which in his case was learned early (\( \text{E} \mid \text{i;} \text{8} \)).

\(^{20}\) Bloch (1913, p. 42 f.) also finds \( \text{t} \) and \( \text{d} \) to be very frequent and stable \( \text{i;} \text{6}-\text{10} \). During \( \text{i;} \text{11} \) they sometimes assumed palatal articulation because of the fact that \( \text{k} \) and \( \text{g} \) were learned via \( \text{t} \), \( \text{d} \). No such observation with Hildegard, except that for \text{meat} an accidental form \text{mit} occurred at \( \text{i;} \text{10} \), which seems to point to a retracted tongue position for \( \text{t} \); but at \( \text{i;} \text{11} \) she once said \text{bats} for \text{bite} (rather than for \text{bites}).
times correct, r, r never. The normal substitute for l was j in initial and medial position, but as a part of initial clusters and sometimes also medially it was dropped. r, r appeared initially as w and was omitted medially. For initial l and r, the substitute h also occurred occasionally; j functioned for r- in one word. Final r, r and l were omitted or replaced by vowels, their choice being dominated by a tendency toward vowel harmony; but for l there was a conflicting tendency to indicate the German palatal l by palatal r and the English velarized l by velar u. Eventually ɔ seemed to become the regular substitute. The situation for final syllabic l is parallel.21

Palatal and velar stops (305) were frequently correct, especially in medial and final position, but quite often shifted to dental articulation, especially initially. The familiar voicing in initial position occurred here too, d being the normal substitute of k; but unvoicing of medial g to t also occurred. Medial y was omitted or likewise replaced by dental n; final y was dropped. The palatal fricative j was rarely imitated, usually correctly (but at the beginning of the third year often with a shift to alveolarpalatal articulation, 3); ɔ, when it was rendered at all, became alveolarpalatal f. The velar fricative ɔ was also rarely reproduced, but retained its velar place, although not always its fricative manner of articulation. Palatal and velars retained their correct place of articulation often enough to prove that the frequent shift to dental articulation was not due to imperfect perception; it must, however, have been felt as easier and not too inaccurate.

The laryngeals h and ð (306) were on the whole correct, and never shifted to other places of articulation.

To summarize: bilabials, dentals, the palatal click, and laryngeals usually retained their places of articulation, except for final dental fricatives, which were shifted to other places of articulation, usually alveolarpalatal. Labiodentals regularly became bilabials. Liquids were mostly shifted, l to palatal, r, r to bilabial position. Final l, l, r, r, n and ð lost their consonantal articulation and became vowels. Alveolarpalatalts generally preserved their place of articulation, but ɔ varied to palatal j. Palatals and velars were often correct, but more often they changed into dentals as far as stops are concerned, into alveolarpalatalts as regards the palatal fricatives.

308. With regard to their manner of articulation, the consonants behaved in the following way.

Stops (251 f.) always remained stops when they were rendered at all. Omission was frequent in medial and final position except for p. A special

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21 Ronjat (12) gives “y or an intermediate sound” as the regular substitute 2;6 for German and French l, initial, medial (example has reduplication), and final, his y being the sign for a semi-vowel more open than j (p. 138). The situation is quite similar to Hildegard’s. Wellman, p. 57: consistently low correctness at ages 2–6 for final l (and initial and final ɔ). Holmes, p. 223: l- omitted; l- omitted or d; l > u. The fact that Hildegard’s language did not allow final l is most evident in her struggle with the word oil (203).
problem with regard to voiceless stops is the presence or absence of aspiration. In general, they were pronounced without aspiration. There were exceptions, however. At the early whispered stage, initial stops were often aspirated in words which were imitated with a conscious effort. For *p* the only example is the interjection *pook*, which consisted 1;2–4 only of the stop, with added aspiration among other indications of effort (105). There are two words in which aspirated initial and medial *t* occurred (377). It was most frequent in the early, important word *Ticktack*, which showed other signs of premature exactness (final *k* at 0;11, ten months before it was really learned!). It also lasted longest in the same word, until 1;7, still usually whispered. After the whispered stage the aspiration was omitted. *k*—never had it because it entered late. The same experience repeated itself later for final stops. When Hildegard first learned to pronounce them, 1;9–10, the effort of the unfamiliar articulation was reflected in a strong aspiration, which was not always eliminated by the end of the year (141, 218). Final *p*, which was learned much earlier, 1;4, originally did not have the aspiration; ending the word with closed lips is more natural than to open them again to add aspiration. Even this stop, however, yielded to the pattern set by the new -t and -k; it had added aspiration repeatedly at 1;11 (112). Aspiration was thus an ephemeral phenomenon. Normally, the child's voiceless stops were unaspirated, even though they are aspirated initially in American English, initially and medially in German.22

The nasals (253), which are stops with regard to the oral, but continuants with regard to the nasal part of their articulation, remained nasals when they were rendered, with the exception of final syllabic *n*, which was at first omitted and later replaced by varying vowels, retaining of its original characteristics nothing but the syllabic function. *m* was always correct except in final position, where it was omitted. Initial *n* was at first shifted from dental to palatal or velar articulation, but remained a nasal and became correct later. Medial and final *n* were omitted. The latter, however, sometimes gave its nasal feature, produced by lowering the velum, to a preceding low front vowel. *g* was dropped both medially and finally.23

Glides (254), a group consisting only of bilabials in my classification, remained glides and were not omitted.

Fricatives (255 f.) present a more complicated picture. Omission occurred, temporarily or along with representation, for -th, s in all positions,

22 Grégoire (p. 251 and 1933, p. 385) likewise found stops to be usually unaspirated, although strong aspirations occurred often at first. He traces this fact to the French model—wrongly, in the light of our experience. It would be correct, of course, to say that aspirated stops failed to gain ground later because they were not supported by the French standard.

23 Wellman and associates, in their examination of 204 children, age 2–6, find (pp. 50, 57, 62, 64, 78) nasals to be easier than stops and fricatives and correctest at all ages, a little better in initial position than in others. Williams (p. 28) judges nasals to be slightly less difficult than stops, in all positions. Neither of them mentions vocalization of final *n*. 
f before and after consonants, -f, -f, -ç, -k, -ç, z in all positions, and
-j; consistently and lastingly for -f, ç-, -v, -v and -ç-. Representation
by fricatives, the correct ones or substitutes with shift of place, was
regular for -o, s in all positions, f in all positions (except initially before
and after consonants), -ç, -k, h, -ç, z in all positions, and j in all posi-
tions. The shifted fricatives were most commonly in the favorite alveo-
opalatal articulation, following the lead of the dominant f, but some-
times in purely palatal or in laryngeal articulation, j or h. Changed man-
er of articulation in the correct place also occurred. Initial labiodental
f and v became the voiced bilabial glide w. Initial θ and ð became dental
stops, d or t, whereas in final position they were eventually replaced by f.
χ medially and sometimes finally was k. Actually, correct imitation was
achieved only for f, -k, h, and j, and for most of these not from the be-
ginning nor in every instance. Thus fricatives presented considerable
difficulties to the child in spite of the fact that f was learned early.
Ability to produce a sound did not necessarily mean a corresponding
ability to imitate the same sound when it occurred in words of the
presentation.

"Liquids" (257) are sounds with an exceptional manner of articulation
which are conventionally grouped together, but do not by any means
agree in the way they are produced. Their fate in Hildegard's language
is summarized in 307. Their manner of articulation was always changed;
only medial I was sometimes prematurely correct. The palatal click,
which may be appended here because it also has an unusual manner of
articulation, was learned early and correctly.

To summarize: Final r, r, and I and final syllabic n and l were replaced
by vowels. Otherwise, all consonants remained consonants when they
were rendered. Stops, nasals, glides, and the click retained the correct
manner of articulation. Fricatives appeared generally as fricatives, but
sometimes as glides or stops. "Liquids" became glides or fricatives.

309. The question whether or not a consonant was accompanied by
vibration of the vocal cords, which is also a problem concerning the
manner of articulation, will now be surveyed separately.

Voiceless stops had a strong tendency to become voiced initially, less
frequently medially, never finally. The place of articulation affected the
tendency: initial p and k normally became voiced. So did t at first, after
the whispered stage, but at the end of the second year, it frequently ac-
quired the standard voiceless articulation. Medial p and t were in part

24 Jespersen (p. 168 f.) calls attention to the similar shifts from θ, ð to f, v in Cockney
English, Old French, Primitive Germanic, Latin, and Russian, and from χ to f in English
"enough," "cough," etc.
26 Bloch (1913) notes that s, f and j were very variable, j less so than the other two
(p. 44). Wellman and associates (pp. 64, 66) find fricatives at all ages (2-6) least correct
and most subject to substitution. Williams (p. 28) judges fricatives to be decidedly more
difficult than stops and nasals in all positions.
voiced, in part imitated correctly. Medial k remained voiceless. Medial and final p were not omitted; medial and final t and k were often missing, especially in the earliest months. Thus the bilabial was most regularly represented, but not handled most correctly with regard to voice. The dental reached the most correct articulation with regard to voice, but not the most consistent representation; medial t continued to be unrepresented at a stage when medial k was already regularly present. Medial k, once it was represented, was most consistently voiceless, whereas initial k was usually voiced. To put it differently, t had the best rendering in initial position, k eventually in medial position, p in final position. p in all positions was distinguished by not being omitted even in early stages, whereas t and k were at first dropped medially and finally. The glottal stop was always reproduced without change. It is difficult to account for this variation phonetically. It is clear, however, that voicing was due to anticipation of the voice of the following vowel. This is confirmed by the fact that voiceless stops were usually articulated energetically during the whispered stage, often with strong aspiration, but became voiced as soon as the vowels were spoken aloud, with voice.

Voiced stops always remained voiced, except in final position, where they lost their voice if they were rendered at all, but as a rule they continued to be missing to the end of the second year. For g unvoicing is also found medially.

Nasals, when they were rendered, invariably retained their voice. In fact, final syllabic n, which was represented by vowels, retained nothing but its voice. Final consonantal n, when it was not completely omitted, was represented only by its nasal resonance transferred to the preceding vowel.

The voiced glide remained voiced; the voiceless one became voiced.

Voiceless fricatives always remained voiceless at the end of words. Medially they were usually voiceless, but voicing also occurred for tf, really only in reduplicative repetition of initial tf, voiced. Initially only h was generally correct; the cases of omission can be regarded as examples of voicing. f- and θ- were sometimes voiced, sometimes not; but f- was always voiced when a vowel followed it in the child’s form. s- was omitted at first (? and ι are probably variants of simple omission), but was regularly replaced by voiced substitutes later. f- was always replaced by a voiced substitute. Thus voicing was even more prevalent in the case of voiceless fricatives than in that of voiceless stops in initial position.

Voiced fricatives remained voiced initially. z- is tentatively listed with various substitutes; but this can be disregarded; Hildegard did not really use any words beginning with z (175). Medial voiced fricatives were often omitted; otherwise they remained voiced (-j-). -z- appeared in one example as f, but that was because the word involved lost the vowel following it so that the fricative became final. Final voiced fricatives lost their voice, following a stage of omission.
“Liquids” always retained their voiced articulation, all substitutes being voiced consonants or vowels.

The palatal click remained voiceless.

To summarize: In final position all consonants remained or became voiceless (312); voiced final consonants were omitted longer than voiceless ones. For initial consonants, voiced articulation was normal because it harmonizes with the voiced pronunciation of the following vowel. Voiced consonants always remained voiced, voiceless ones very frequently anticipated the voice of the vowels following them. Specifically, the glide always added voice, the stops and fricatives usually did. The only voiceless consonants which were never voiced are the glottal stop, the palatal click, and perhaps $h$. Medially, the procedure seemed to waver between treating the consonant as opening the following syllable, which would tend to make it voiced, and closing the preceding one, which would favor voiceless articulation.26 Voiced medial consonants normally retained their voice, but there are two words in which a voiceless consonant was substituted for -g- (223). Voiceless medial consonants prevailingly remained voiceless, but quite frequently they became voiced. Thus the child’s aim was to reproduce both kinds of medial consonants faithfully, but, in a minority of instances, voice was added to voiceless consonants by assimilation to the surrounding vowels and, rarely, voiced ones were unvoiced in spite of voiced surroundings, perhaps to indicate the closing of the preceding syllable.

Thus voiced consonants were definitely favored, except in final position (see also 310). This is especially true for the earlier months of speaking after the whispering stage.27 Roughly from about 1;7–8 voiceless consonants began to be more frequent,28 but voiced substitutes for them continued to occur to the end of the year.

26 Grammont (1923) has another explanation (p. 55). He thinks that the effort necessary to articulate a stressed vowel is carried over to the following consonant, causing it to be enunciated more energetically. “La consonne qui suit la voyelle tonique ou accentuée a donc de ce chef une force particulière qui lui permet de résister à l’action ouvrante ou sonorisante de la voyelle.” He gives illustrations from the phonology of standard Spanish (p. 57). Grammont’s theory may help to explain why Hildegard’s medial consonants were less often voiced than her initial ones.

27 Babbling is here disregarded. Consonants were largely voiceless in cooing 0;1–2. Then more and more voiced consonants appeared, until all consonants were voiced by 0;8. At 0;9, voiceless consonants began again (340).

28 It is probable that preference for voiced consonants during the greater part of the second year will be found to be characteristic of child speech. Bloch (1913) also finds voicing of $p$, $k$, and $s$ until about 1;8, but not of $t$, which was voiceless at once 1;6 (p. 37 f.). Preyer (p. 158) reports exchange of voiced and voiceless consonants at 2;1; he traces it to conditions in the Thuringian dialect (2;7; p. 180 f.), which may however have nothing to do with it. Wellman (p. 64) sees no real difference between voiced and voiceless consonants as late as age 6. The same observation is made by Williams (p. 28). But the tendency was to preserve the conditions of the presentation (p. 29). Gutzmann (p. 70) says: “Die Kinder vokalisieren zunächst fast alle Laute” and therefore use $b$ much earlier than $p$, $d$ earlier.
It can be said that the distinction between voiced and voiceless consonants had not yet become important to the child, particularly for initial stops and fricatives. Such a condition is rare in standard languages, but not unheard of. For Ugaritic, an old language of Asia Minor, it is claimed that only a combinative, not a phonemic difference between voiced and voiceless stops existed, which comes very close to the situation prevailing in Hildegard’s speech. 29

310. As is evident from the preceding discussions, the position of consonants in the word had considerable effect on the form they took in the child’s speech. The word was the unit in her pattern of speech. Few effects of sentence-phonetics were observed (429). This is not surprising, since her speech was not yet very fluent.

If we look over the conspectus of consonants from this point of view (258–267), we observe that initial consonants, in the vast majority of instances, were voiced; that is to say, voiced ones remained voiced; voiceless ones added voice. We notice also that the normal representatives are bilabial, dental, and palatal, the latter category consisting only of the palatal fricative j, whereas palatal as well as velar stops were shifted forward to dental position. The only consonants which generally remained voiceless are the laryngeals h and ?. Bilabials remained bilabials. Labiodentals became bilabial glides. Dentals remained dentals, but all had stop articulation; dental n was temporarily shifted to velar position, q. Of the hissing sounds, s (and z?) first became ? or h, but later j. Initial f was sometimes reproduced correctly, but never with a vowel following. Before a vowel it was also voiced to j or 3. Words with initial sibilants were rarely used. Of the “liquids,” l became j, and r, r became w. k and g were prevalently replaced by d. j was imitated first as a glide, later as a fricative; but few words beginning with it were attempted. Initial fricatives were resisted by Hildegard’s speech pattern.

311. Medial consonants were largely omitted. 30 Some were omitted at first, but learned later. The consonants for which omission was not normal at any stage are all the bilabials, the glottal stops, and z; but the latter is illustrated by only one word, in which the substitute k was than f, “w” earlier than “v”; it is not clear what he means by the last item (he uses a non-technical German designation of sounds): v earlier than f? Grégoire (pp. 206–208) found, on the contrary, that his sons, particularly the older one, preferred voiceless consonants (1:6–7 and 1:8–11 respectively); they also were indifferent to the distinction between voiced and voiceless. I agree with Jakobson (p. 55) that his explanation for the dominance of voiceless stops and fricatives is not convincing.


30 Holmes (p. 221) found no intervocalic consonants at all at 1:6.
strenthened by its identity with initial k (Kuchen). Representation concurrent with or subsequent to omission is found for t, s, z, j, l, k, and j; in all these cases, omission should be interpreted as the more primitive stage, even though it continued in some words to the end of the second year. For t and p, voiced and voiceless representatives, otherwise in correct place and manner of articulation, were approximately in balance. For k, the third voiceless stop, however, voiced substitutes occurred only in reduplicated word forms; otherwise voiceless k and substitute t were about equally frequent, with a slight preponderance of the correct k. The place of all sibilants was usually taken by the dominant t, but examples are scarce. Fricatives were as yet rare in medial as well as in initial position. l appeared as j and l, but omission was much more frequent, at least for English -l-. j was eventually correct, but there was only one word containing it (New York).31

312. For final consonants, omission was even more definitely the rule in the early months of speaking.32 In the babbling stage (specifically stated in the diary at o;8), all combinations of sounds ended in a vowel, and this pattern continued well into the speaking stage.33 Before i;4, final consonants occurred only very sparsely, as if by accident; instances are listed under piep, piep for E o;i1i and E i;i, tick-tock for E o;i1i and i;i33, mama(m) for i;o, all as occasional variants only. The first word which regularly had the final consonant was up B i;4. It is surely no accident that the final voiceless bilabial stop was the first to be learned.34 It is easiest to articulate because it consists of nothing more than closing of the lips with simultaneous cessation of voice, both of which are natural at the end of an isolated word.

During the next three months there were no new cases of -p or any other final consonant. At i;7–9 there was a limited number. In the name

31 Lengthening of intervocalic consonants for emphasis, as observed by Bloch (1013) in numerous examples, especially at the turn of the third year (p. 50 f.), was never found in Hildegard’s or Karla’s speech. Cf. 408, note.
32 Franke, p. 668: “Von den verschiedenen Konsonanten in einem Wort hält sich am festesten der inlautende, an zweiter Stelle der anlautende, an dritter der auslautende.” Franke is right in emphasizing the importance of position in the word. Our experience agrees with his in regard to final consonants, but not in regard to initial and medial consonants. As far as the omission of final stops is concerned, an explanation might be found in the fact that they are commonly articulated imperfectly by standard speakers, only the occlusion being formed, so that the differences in place of articulation and voice quality are often difficult to discriminate with certainty. This observation, made by Rositzke for General American, holds for German as well.
33 Grégoire (p. 252) states, on the basis of the record of his French-speaking children, that the syllable usually consisted of one vowel and one consonant, and queries whether the same would be true of children of Germanic origin. He answers “yes” himself on the authority of Scupin for the period up to i;7. Our case corroborates this affirmative, and his case serves us as a welcome confirmation of the principle in a Romance language.
34 Holmes (p. 221), however, found k as the first final consonant i;6; no final g at the same time; -t and -d vacillating; no other final consonants (p. 222).
Bates an aspirated t was once added at 1;7 after a brief pause, which indicates a conscious effort and marks the newness of the speaking pattern. The non-standard aspiration of final t and k was found frequently 1;7–10, and sometimes even at 1;11, especially in the case of newly added t. Rarely, the desire for clear articulation of the final stop led to the addition of an unetymological e after it: oatmeal (141), wake up (216 note); e in make (218). The majority of words 1;10–11 no longer showed the self-conscious aspiration. By that time final consonants, always p, t, k, and f, were quite frequent; but many words continued to lack their final consonants (even at the beginning of the third year, old and new words).35

Final voiced consonants were not learned as such during the first two years. During the later stage, they were either unvoiced (fricatives and g) or still omitted (m, d, n, ñ; also l and r, r, which were in other cases represented by vowels). Perhaps the most stringent rule of Hildegard’s speech during the first two years is that voiced consonants could not stand at the end of words. Unvoicing of final stops and fricatives is, of course, a rule of standard German, but not of English. Still, I doubt that it represents a transfer of a German-speaking practice to English words. The phenomenon is found often enough in standard languages and in the speech of non-German monolingual children36 to show that there must be

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35 For Karla the diary states at 1;5 that all of her numerous new words ended in a vowel. Final consonants began to increase B 1;7. At the turn of 1;8 to 1;9 she added many. She pronounced most of them, earlier than Hildegard, at 1;9. Similar observations are found in the literature of child language. Wellman (pp. 3, 60) states that final consonants were slightly more difficult than consonants in other positions. Williams finds them (p. 28) “significantly more difficult.” Mrs. Hall (V) states: “Previous to the fourteenth month, terminal consonants were for the most part ignored.” Pavlovitch (77) says: “La tendance vers les syllabes ouvertes est un fait général dans le langage enfantin, comme pendant les différentes époques historiques des langues, et surtout en slav commun.” His son either suppressed final consonants or (sometimes at 1;5) added a vocalic sound after them to preserve the openness of the termination. Holmes’s daughter (p. 221) liked to add i to final consonants 1;6, “book” becoming “bookie.” This device was very rare in Hildegard’s speech. I also believe that the open termination is characteristic of child speech (cf. vol. 1, p. 20, note 28), but add the caution that it is not universal. I once observed a little boy who said a number of words at 1;0, all with the final but without the initial consonant, e.g., light aut. The reference to Primitive Slavic is confirmed by Kieckers (1933) p. 126. Indo-European final consonants were frequently lost in the later course of the individual languages. French lost most of the Latin final consonants, and the newly developed ones are in turn dropped in French child speech, cf. Feyeux, p. 163. Gutzmann (pp. 14, 72) speaks of the omission of final consonants by children and explains it as due to articulatory difficulties (the details of his explanation do not appeal to me). He claims the children hear that something is missing. The preference for open syllables may well be the reason why Hildegard favored ja over yes and no over nein, possibly Wauwau and doggie over dog, etc. Even Meringer’s observation (p. 179 f.) that a boy added ñ to all words which should end in a vowel at the end of the third year and during the first half of the fourth can be explained as a (relatively late) reaction against the principle of open syllable ending, corroborating its earlier sway.

36 Grammont, p. 70; Jegi, p. 246. Bloch does not deal with this phonetic phenomenon, but in a syntactic discussion of his (1924, p. 40) the child form “yimach” for French
something natural in the practice. In fact, the phonetic explanation is
easy. It is a form of anticipation of a subsequent articulation, in this
case not that of a following sound, but an anticipation of the cessation of
voice. This should come at the end of the word, but is actually performed
a little too early.

The only word in which a final voiced consonant was not unvoiced is
\( \pi \), a temporary form for shoe, Schuh at 1;7. In this form the vowel
was only an on-glide for 3, which represented initial \( s \). Therefore, 3 was
treated as initial by the child in spite of the fact that the following vowel
remained as yet unexpressed. \( \pi s \) occurred at the same time, but there
is no way of deciding whether -s was due to unvoicing at the end or to a
more accurate imitation of standard initial \( s \).

Otherwise all final voiced consonants, when reproduced as consonants,
lost their voice (even at 2;1, when, for instance, the new word hug
appeared as ha-k. The first final voiced consonants were pronounced as
late as 2;7: did did, bedo bed). The frequency of \( s \) for all final fricatives is
especially noteworthy, when we remember that \( s \) and the other fricatives
were rare in other positions. Why were fricatives in final position handled
more skillfully than initially or medially? Perhaps their relative openness
is in better agreement with the character of the word-ending than with
that of the beginning of words and syllables, where the energetic effort
required to pronounce stops is felt to be more suitable, or is, at any rate, a
better-established pattern. After the stage when all words ended in
vowels, the use of final fricatives, still open sounds, but less so than vow-
els, would then represent a progressing refinement of articulation, not
obeying the law of contrast (which would call for stops) on account of the
diminished attention given to the end of words (cf. 426).

313. In the preceding analyses of consonants with regard to place of
articulation (300–307), manner of articulation (308–309), and position in
the word (310–312), no attention has been paid to combinations of sev-
eral consonants, although they are included in a general way, under the
simple consonants which enter into them, in the statistical surveys (242–
267). At some point in this study, consonant-clusters should be treated
with special attention to the problems that are raised by them, and this
will be done in the following pages.

It was found that, basically, clusters follow the same rules of substitu-
tion as simple consonants. Usually, however, the child’s attention was

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"image" is found. Karla, whose speaking habits were much more definitely based on English
than Hildegard’s, also had unvoicing of final consonants. At 1;10 the following examples
were observed: red wet; bed bet, big bik, ride want, read wit. Notice that most of these exam-
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concentrated on one of the constituent parts of the cluster, which alone found representation in the child's word-form. It will be our endeavor to find out what principles the child followed in the process of selection.

We shall examine the clusters in the following groupings: affricates (314–320), clusters containing a nasal (321–323), clusters consisting of consonant+"liquid" (324), "liquid"+consonant (325–327), sibilant+consonant (328–329), and other clusters (330). All of these cases concern primarily clusters contained within one syllable. In medial position, it is sometimes doubtful where the syllable-boundary was for the child; while, for instance, adults might divide Handschuh as hant-fu and ice cream as ais-krim for obvious etymological reasons, the child may very well feel the clusters tf and skr to be a part of the second syllable. Apparently, Hildegard did, since the words fit better into the pattern of substitution if they are analyzed in this manner.

314. The affricates, consisting of a stop followed by a fricative articulated in the same place, differ from the other clusters, which are made up of more heterogeneous elements. They are comparatively easy to articulate, because they require less skill in muscular control. The articulation of a stop requires an energetic muscular effort to check the push of the breath-stream, and an energetic release of the closure at the end of the articulation so as to allow the breath to escape suddenly without obstruction. If this second motion is executed less energetically, the organs of articulation are only slightly removed from each other, a narrow passage remains, friction results, and a fricative is heard, completing the articulation of the affricate. Therefore, affricates were occasionally formed accidentally when pure stops were meant, especially at the end of words (405 ff.).

Accordingly, the treatment of affricates differed from that of other clusters by not displaying a decided preference for one of the components. To be sure, in the earlier stages, one of the elements prevailed: the stop in initial and medial position, the fricative in final position, in agreement with practices observed elsewhere (312). A certain vacillation between the two elements, both of which apparently were heard equally well, could be observed, however, in various positions, so that the pattern of representation just formulated never became a clear-cut rule. Furthermore, the prevalence of one element was only an intermediate stage in the process of learning to pronounce affricates. In the later months, especially

37 Lewis (1936) p. 8: In consonant-compounds 80% elisions of one consonant occur after the child can make both consonants separately. The specific rules which are found operating in the speech of three children are largely confirmed by our observations, some of them only in Karla's speech; cf. note to 167.

38 The problem whether affricates are simple consonants or consonant-combinations need not concern us here. From a purely phonetic point of view they can be considered as consisting of two different successive manners of articulation. Phonemically, it is quite likely that they function as a unit for the child.
the last two, more and more cases of real affricate pronunciation appeared, usually in the form \( \text{tf} \).

315. The only affricates imitated by Hildegard were those in the dental group.\(^{39}\) Palatal and velar affricates did not occur in the presentation. For the bilabial affricate \( \text{pf} \), or rather \( \text{ph} \), common in German and possible in English ("helpful"), there are no convincing examples (110, 125).

The dental affricate takes a variety of forms, because the point of contact for the stop and the manner of producing a narrow opening for the following fricative are somewhat variable. The purely dental affricate \( \text{th} \), which occurs in English, has no example in Hildegard's speech, but \( \text{ts}, \text{dz}, \text{tf}, \) and \( \text{ds} \) were imitated. Since the child did not learn \( \text{s} \) correctly before the age of two, but acquired \( \text{f} \) rather early, it is not surprising to find that she generally handled \( \text{tf} \) more successfully than \( \text{ts} \). The affricate \( \text{tf} \) was learned by the end of the second year, but still fell short of being used consistently.

316. In detail, initial \( \text{ts} \) (136) was represented by \( \text{d< } \text{t} \) at 1;11, but by \( \text{h< } \text{s} \) at 1;9 and by \( \text{j, } \text{s< } \text{s} \) at 1;11. In the same word, *Zunge, even on the same day, once the stop was rendered and once the fricative. Representation of both elements combined as \( \text{ds} \) is recorded only once 1;11 in a dubious case.

Medial \( \text{ts} \) (139, 171) was prematurely reproduced, with approximate correctness, in an early whispered word 1;1-B 1;4; but later, at 1;11 (and 2;1), the stop alone was rendered in another word.

Final \( \text{ts} \) (143) was, like most final consonants, omitted at first in a name, 1;7–8. In the same name, however, an aspirated \( \text{t} \) was once added 1;7 after a pause, which proves that the stop at least was heard correctly; however, the word later returned to the more convenient form ending in a vowel. Much later, from 1;10, the fricative was regularly reproduced alone in the form \( \text{f} \). Combination of the two elements was not achieved, so that \( \text{ts} \) reached in all three positions only the stage of representation by either the stop or the fricative. In the cluster \( \text{tsv-} \) (131), \( \text{ts} \) was omitted 1;10; it was treated like \( \text{s-}+ \) consonant (328).

317. The corresponding voiced affricate \( \text{dz} \) occurred only in final position (150, 178), in one frequent word, \textit{beads}. Since fricatives were favored in this position, \( \text{z} \) alone was rendered as \( \text{f} \) 1;9; but at 1;11 the affricate was reproduced complete in the modified articulation \( \text{tf} \), both substitutes displaying the unvoicing which was regular for final consonants. Thus \( -\text{dz} \) reached a more mature form than \( -\text{ts} \), which may be accidental. Attention should be called, however, to the fact that the later reliable examples of \( -\text{ts} \) occurred in words beginning with substitute \( \text{d} \); dissimilation at a distance may have hindered the development of the dental stop in the affricate.

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\(^{39}\) Pavlovitch (69) states that affricates presented no difficulties to his son. His examples also involve only dental affricates. They were learned much earlier than in Hildegard's case.
318. tf went through the same process of evolution, but reached
greater perfection, perhaps because the fricative was easier for this child,
who had acquired it early. Initially (136, 183), it appeared as d at 1;7, as
t at 1;8; but from 1;8 the affricate was imitated, either correctly or, more
commonly, with the voicing characteristic of initial consonants, as d3.
In the word *church, which had d3- at 1;10, the affricate was later simplified to 3- 1;11. This may mean either that the better substitute was not
yet well established, or that the beginning of the word was assimilated
to the end, where the position favored the open sound f over the half-
closed tf (312, end).

Medially (139) the development apparently followed the same course,
but was slower. There are only two certain unreduplicated examples, in
both of which the affricate was represented by a substitute for the stop,
1;5-11. tf and d3 occurred with certainty only in a reduplicated word,
where they were a repetition of the initial affricate rather than a regular
rendering of the medial cluster.

Final tf (143) was omitted at first (1;6) like most final consonants.
Once 1;10 it was represented by t alone, but the most frequent substitute
from 1;9 was f alone, in agreement with the fact that the speech pattern
favored open or half-open articulation at the end of the word (312, end).
In two words 1;11 tf was already correct, a little in advance of the gen-
eral development, since the prevailing f continued in other examples into
the beginning of the third year.

319. The corresponding voiced affricate d3 occurred only initially
(145). It was invariably represented by d alone, like the other clusters
beginning with d. It was therefore the most retarded affricate as far as
its imitation is concerned. The rather numerous instances date from
1;7-11. At 1;7 the other affricates were also simplified, but tf- began to
be improved as early as 1;8, commonly taking the same form d3 which
presented obstacles to imitation when it was heard in standard words.
This situation is not unique. She often found difficulties in imitating
standard sounds although the same sounds occurred in her own speech
as substitutes for others. The difficulties were not always of a physiologi-
ical nature.

320. The most interesting feature with regard to the affricates is the
fact that, during the formative stage, the equivalents did not show the
usual trend toward a fixed substitute, but fluctuated between two sets of
substitutes of different character, stops and fricatives.

321. We examine next the clusters containing a nasal. There is a
greater variety of them, but less overlapping in different positions. We
therefore take them up by position.

Initially, we have n preceded by another consonant: kn, sn, and fn
(153). The n was uniformly imitated correctly and the preceding conso-
nant omitted (similarly fm just after the end of the period, 118).

322. Medially, nd and nk occurred (155, 217). They were not tauto-
syllabic clusters, but their treatment did not always agree with that which we should expect if we considered their elements as final and initial consonants respectively. mb and mp (120) yield better to separate consideration, but nothing definite can be said about them, because mb occurred only in one reduplicated word with ablaut, and mp in one word which became fixed in an infantile form.

nd, which occurred in two words, one of them frequent, was omitted entirely (147). This corresponds to the normal treatment of both medial n (154) and medial d (146). The two consonants are articulated in the same place. Only one modification in the position of the speech organs is needed to pass from the first to the second. Consequently, complete assimilation of the second to the first, by the omission of the raising of the velum, is not uncommon in standard languages (Low German, Danish). We cannot know whether this process took place in Hildegard’s speech since she did not attempt to articulate the group at all; but it helps us to understand why this cluster was perhaps treated like simple n.40 The opposite assimilation, in which the velum is not lowered for n, in anticipation of the homorganic d, would be an equally plausible explanation in Hildegard’s case.

nk (217, 226) was not treated uniformly. The prematurely correct early rendering -nk *r;i, the later simplification to k r;g, and the dentalizations d r;3 and (r)n r;8 all seem to indicate that the cluster was treated as a unit. The phonetic situation for nk is objectively similar to that for nd. k results when the velum is raised after the articulation of g if the voice ceases at the same time. Failure to lower the velum for g would therefore change nk to kk>k. Failure to raise it for k would result in nk>ng>g. Both assimilations may have actually been performed by the child. They are slightly disguised by the fact that the characteristic shift from velar to dental articulation (k>d and g>n) took place concurrently. Another possible explanation for the use of d and k for nk is that the cluster was taken apart, g being dropped like final g (227) and k being rendered in various ways like initial k. I prefer the former explanation, because final nk also became k (323). In point of time the three words containing -nk- did not go together. Danke had -nk at *r;i, d in a reduplicative form r;3–r;11; it did not reach k. Dunkel began with reduplicative d at once E r;8 and reached k on the first day of r;9. Onkel had (r)n at r;8 and became fixed as a name in this form until beyond the two-year limit, only one form with k being uttered r;11 from new presentation.

323. Combinations of nasal+consonant in final position (120, 157) took a more closely parallel development. All of them were omitted for the greater part of the period, like most simple consonants ending a

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40 Good phonetic description: Lukens, p. 446. I cannot convince myself, however, that the reason is an acoustic one.
word. In some of them the final consonant was pronounced during the 
last two months, usually during r;it, but the nasal remained in every 
instance unexpressed to the end of the period. In a few instances it ef-
fected the articulation of the preceding vowel.

ms, the only cluster with m (120, 174), was omitted at r;9; it did not 
occur later and therefore could not develop further. It would have be-
come f like ns.

nd (149, 157) was dropped with nasalization in the monosyllable hand 
r;11, without nasalization in the disyllable sandbox r;10–2;r. The diffe-
rence in the number of syllables may well be the reason for the divergent 
treatment, but another explanation is also possible. nd was likely to be 
assimilated into nn>n (322). In hand, this final n was then merged with 
the preceding vowel, the velum being lowered prematurely, with omis-
sion of the tongue tip adjustment necessary to produce an n. In sandbox, 
on the other hand, the n could instead be assimilated to the following b, 
resulting first in mb, as actually recorded for Karla (157, note), then, by 
further assimilation, in bb>b. Or, after reaching the stage mb, the m 
could be treated as final (120) and therefore be omitted without nasal-
ization.

nt (142, 157) may have been omitted at r;10, but the evidence is 
dubious. At B r;11 the t was rendered alone. It may be viewed as the re-
sult of anticipatory assimilation nt>t>t.

ns (157) similarly lost the n and rendered the voiceless final consonant, 
with the characteristic substitution of f for s. All examples are late, r;11. 
For that reason the stage of omission is not documented. The instances 
of eins with omission of f should be discounted, because in counting “eins, 
zwei, drei,” the cluster ns-tsv is sometimes simplified to n-tsv even in 
standard pronunciation; the word occurred only in this combination.

gk (220) was omitted r;3 in thank you, and the expression retained an 
fantile reduplicated form through r;11. In the new word drink r;10, 
however, the k was reproduced alone (cf. 322).

324. Clusters consisting of consonant+“liquid” can be disposed of 
very briefly. However unsatisfactory the classification “liquid” may be 
for descriptive phonetics, functionally l and r, r belong together without 
doubt. As a rule and with great regularity, the “liquid” was omitted in 
such clusters and the remaining consonant or consonants rendered in the 
same way as if they stood alone.41 Details for initial pl, bl, fl, kl, gl, and 
sl can be found in 197, for medial pl in 110 and 201; for initial pr, br, hr, 
fr, tr, tr, tr, tr, skr, str, kr, kr, and gr in 207, for medial tr (tr), skr, and 
skr in 209 (see also 328 for the further omission of s in the three-con-
sonant clusters).

41 Karla followed the same principle (see notes to 197 and 207). It is probably widely 
valid in children’s speech. Bloch (1913, pp. 40, 49 f.) finds kl often rendered in various ways 
with I E r;9–E 2;2, but commonly the l was also suppressed.
Only a few remarks remain to be made as a safeguard against oversimplification. The j which was used as a substitute for sl- (167, 197) can equally well be traced either to s with omission of the "liquid" or to l with omission of s before consonant (328). pr- was not rendered by simple p or substitute b until r.9. Before that the whispered word pretty, which was the only one containing the cluster, had always (B o;10–1;8) had, in addition to p, some equivalent for r (207). The fact that the r disappeared, quite abruptly and with nearly complete consistency, from the moment the word was no longer whispered, seems to indicate that the voice of the following vowel has something to do with the suppression of the r; the reason cannot be an acoustic one. gr dropped the r in regular fashion, but the substitute for g was not an orthodox one (222).42 The most disturbing cluster is θr- (207). Most commonly it lost the r r, but concurrently r,1ο–2;r omission of θ and substitution of w for r also occurred. This deviation from an otherwise well established rule is, however, easily explained. r was omitted in the other clusters because it is more difficult to articulate than the accompanying consonant. θ, however is itself among the most difficult consonants (158), perhaps not objectively, but certainly according to widespread observation in children's language learning. Hildegard therefore wavered between attempts to render one or the other of the difficult components. It should be remembered that her speech pattern was averse to initial fricatives (310, end).

325. Clusters consisting of the reverse combination "liquid"+consonant do not occur in initial position; practically all of them were final. Consequently, complete omission was common. The later trend was towards representation of the consonant at the very end, with continued omission of the "liquid." Sometimes, however, the vocalic overtones asserted themselves in the case of l in postvocalic position, resulting in a vowel substitute.

The only medial cluster of this kind is ld (200). The two consonants belong to different syllables in standard speech, but in the child's language they might easily have become assimilated into one consonant (cf. 322).43 The only instance is the name Hildegard r;11, in which the cluster disappeared; possibly the l left a trace in the r of the most common form harta.

326. The final clusters (204) ld and lt remained unrepresented from o;9 to the end. This corresponds to the regular omission of final d and to a common treatment of final t. We would expect to find the t repro-

42 Jegi (p. 246) reports gr>s in "Grace." This does not look like a normal substitute, but an assimilation to the final consonant.
43 Bloch (1913, p. 50 f.) finds lengthened intervocalic consonants as substitutes for similar homorganic clusters. Hildegard pronounced no long consonants. I seem to remember that Karla pronounced her sister's name at one stage as "Hillegard," with assimilation ld>l, but not with a long consonant.
duced at the end of the period, but there happens to be no example after 1;8 (at 2;1 it was indeed pronounced, but I continued to be omitted).

lɛ and lŋ, only in Milch, milk, were omitted 1;6–7; at 1;7–9 the l alone was indicated by ɔ; but when the final k, probably from the English model, became expressed, the l was dropped again, 1;10–11.

The situation was decisively different when the final consonant was z. lɔ became ʊf or a 1;11. In both substitutes, the l was rendered in vocalic form, the vowel-quality depending on the preceding vowel (203). In one case the z was represented by a substitute; in the other it was omitted. lзо was likewise a *ʀ1;10. These cases, however, are quite different from the other clusters with l. The z was always a plural sign, and morphological considerations cannot be disregarded in the phonetic discussion. In most instances, the child heard the word in two forms, the singular ending in consonantal or syllabic l, and the plural having an added z. The category of plural was just beginning to evolve at the end of the second year. Usually the singular was used for the plural also without change in form, occasionally vice versa (beads). Thus the l had already a representation in the singular form, to which the new plural sign f was simply added, if the plural was expressed at all. Only l zo > a in *measles 1;10 may be a genuine phonetic equivalent because the word was not used in the singular; but its form may well have conformed to the habit of disregarding plural signs, a standing for -l rather than -lɔ.

327. The final clusters (217) rd and st, for which the evidence is scanty, were always omitted 1;10–2;1. The treatment of rk represented, at the same time, a more advanced stage. It lost the r, but the velar stop was reproduced, first in shifted dental position 1;10, then correctly 1;11. Thus, clusters with r and n were treated in the same manner as clusters with l, except for the fact that they lost the “liquid” completely, whereas the l sometimes left faint traces.

328. In clusters consisting of sibilant+consonant, the sibilant was consistently omitted, and the following consonant was treated just like the corresponding simple consonant, in all positions.44

In initial position, sl, sn, sp, st, str, skr occurred in English words (167; concerning the similarly treated affricate cluster tsv in German, see 316). In German words we find fn, fp, and ft instead (182).

In medial position, English skr (170) and German skr (170) and ft (185) were encountered.

At the end of words, st and sk occurred (173).

Only a few notes need to be added. The substitute j for sl- can stand for s as well as for l, both components being difficult for the child in initial

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44 This phenomenon is wide-spread in child speech. To give just one example, Sully (p. 151) also reports omission of s and f before other consonants; all his examples concern initial position. Hildegard still dropped the sibilants in such clusters at 3;0 initially, whereas medially st became s. She began to pronounce st- and ft- at 3;2.
position (324). Although this fact does not disturb the consistency of the pattern of representation, it is not possible to decide whether the principle posited here was actually followed or whether the rule that \( l \) after consonant drops out prevailed.

There was one case of actual deviation from the pattern: -sk waivered, in the same word and during the same week B 1;11, between the substitutes \( f \) for \( s \) and \( t^* \) for \( k \). The regular form was that which omitted the sibilant. The forms with \( f \) and without a substitute for \( k \) were due to the omission of the middle consonant in the phrase "ask papa," the "three-consonant rule" described in 142 operating in the child's speech if not indeed in the colloquial standard.

In skr, skr and str, the rule calling for the omission of postconsonantal \( r \), \( r \) (324) was applied at the same time, so that only the middle consonant of the cluster was rendered.

329. Clusters consisting of a voiced sibilant with another consonant could be expected to be treated similarly. There is, however, only one very dubious etymology with -zd becoming \( f \) (149, 179), which had better be left out of consideration.

330. Nearly all clusters occurring in English and German are included in the preceding groupings. A few others remain to be considered.

Initial tsf was treated like sv (316).

Final ft, xt, and ks did not show any parallelism in their development. ft, which occurred only in one word 1;6 (129, 142), was always omitted; this seems to represent an arrested primitive stage. xt was reproduced correctly in one ephemeral word 1;11 (142, 236), if it was accurately observed; I am not quite sure of that because the word involved, *Nachtl, was used rarely, which precluded the possibility of checking, and because the correctness of the reproduction is not in agreement with the usual handling of final consonant-clusters. ks, which has more examples (174), took a more normal development. It was omitted 1;1-6 and in one imperfect word 1;11. At 1;10-11 it was otherwise regularly represented by k or its substitute t'. (At 2;1 the s was rendered instead by f, which makes the development rather closely parallel to that of -ts, 143.)

In medial position, ks did not really occur (cf. 171), nor did any of the other odd clusters.

331. Looking back over the various types of clusters (313-330), we find that affricates (314-320) were represented in the earlier stage by one of their two constituent parts, the stop being favored in initial and medial position, the fricative in final position, while both elements tended to be reproduced toward the end of the second year (314, 320).

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45 Karla, who did not use the same substitute for both consonants, rendered the s of sl- (167, note); but Gutzmann (pp. 14, 71) reports that the sibilant was dropped in ft and fl alike. Where a cluster consists of two equally difficult consonants, the choice between them apparently varies with different children; each child, however, seems to be generally consistent in his choice.
Nasal clusters (321-323) were composed of consonant + nasal in initial position, but the reverse in the other positions. Initially and finally, the second element was eventually reproduced alone. Medially, the same tendency can be observed, but sometimes the nasal won out in the earlier stages. The nasal was therefore pronounced correctly in initial clusters, at the expense of the preceding consonant, which was dropped. Final clusters were omitted entirely at least until 1;9, sometimes longer. Their nasal continued to be omitted through 1;11, but the following consonant began to be reproduced at 1;10–11. The cluster nd did not yield to this principle, probably because it is most susceptible to assimilative simplification. On the one hand, it remained entirely unrepresented in a dissyllable until 2;1; on the other, it was the only final cluster which exhibited a trace of the nasal in a monosyllable in the form of nasalization of the preceding vowel. In medial clusters, we might expect even more consistent omission of the nasal, since it could be treated like final n (302) of the first syllable. This was partly the case, but on the other hand we find instances where the nasal won out over the following consonant in medial nk.

In clusters containing a "liquid" (324-327), the "liquid" was usually omitted, whether it was first (in medial and final position) or second (in initial and medial position) in the cluster. There are exceptions. In pr, both components were reproduced at an early stage, but later, in the same word, the treatment of the cluster fell in line with the rule. Or-wavered between representation of the fricative and the r. I sometimes asserted its vocalic overtones in final clusters and was indicated by a vowel. Complete omission of final clusters was, here too, the rule for the earlier stage.

Clusters composed of sibilant + consonant (328-329), of which there was a considerable number, consistently lost the sibilant.

The few other clusters (330), practically all in final position, seemed to tend toward omission of the fricatives and reproduction of the stops involved, no matter whether each was first or second in the combination; but the trend was not definite; omission of both, reproduction of both, and wavering in the choice all occurred in the few examples involved.

332. Several students of child speech have tried to establish a mechanical principle of substitution operating in the treatment of clusters. Thus Ament (p. 65) claims on the basis of the literature available at his time (1899) that the first consonant is dropped and the second treated in the regular manner. 46 Although that happens to be true in the majority

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46 Röttger also claims (p. 151) that initially the second component is stronger than the first. His materials (pp. 144-146) however prove the contrary at least for the clusters consonant + "liquid." His statistics for them are interesting. They show for all such clusters a decisive preponderance of the first consonant, but for each of them also instances in which the second consonant was rendered alone. This throws some light on those few of Hildegard's clusters which wavered between representation of the first and the second element.
of instances in my observations, it is by no means generally the case. Even Ament (p. 66) has to make an exception for the important group consonant + r, to which should be joined consonant + I in Hildegard’s case, in that of Humphreys as quoted by Ament himself, and no doubt in many others.

In his analysis of materials covering the speech of many children of varying ages, Williams (p. 30) finds, on the contrary, the first element to be slightly favored, a generalization which is certainly not valid for Hildegard’s case. Nor do I find completely different sounds as substitutes, of which he records 31.6%; this question probably hinges on the interpretation of “completely different.” I agree, however, with his statement (p. 31) that there is a substantial regression toward easier sounds.

In fact, the reason for the simplification of consonant clusters is to be sought in the necessity for the child to make the pronunciation easier. There is no evidence in Hildegard’s case that the child did not hear the succession of sounds correctly; but her articulatory skill was not yet sufficiently developed to make the fine adjustments required for the articulation of successive consonants quickly enough to enable her to pronounce two or three elements of a cluster correctly. So she chose that component for reproduction which was objectively or subjectively easiest to pronounce; its acoustic prominence may have contributed to the choice. The theory is corroborated by Wellman’s finding (p. 79) that there is a substantial correlation between motor control and the correctness of sound-imitation.

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47 Gutzmann (p. 72) makes the same claim specifically for the cluster ft-: “Thre (i.e., the children’s) Muskulatur ist nur noch nicht geschickt genug, zwei Artikulationsstellungen so schnell aufeinander folgen zu lassen, wie das notwendig ist, um das Wort Stuhl richtig auszusprechen.” The explanation can also be stated in Jakobson’s terminology of phonemic contrast; but the treatment of affricates shows that contrast is not the only principle involved.

48 Caution counsels not to rule out imperfections of acoustic perception (cf. 498). At the stage (3;2) when Karla learned to pronounce initial s before consonants, she was helped along by reminders. She would pronounce spoon as bun. Upon the question, “Is that the way you say it?” she would correct herself, s-bun, spun. But then it also happened that she said bear as beo. Upon the same question, which this time referred to the vocalization of final r, she “corrected” herself, spee! Who would dare to decide whether this incident reveals that she did not hear the initial s, or whether she accidentally reacted mechanically to a familiar stimulus? Franke (p. 663) makes the general claim that children in their first phonetic stage use a single consonant in combination with vowels (although he excepts Slavic children, who “inherit” more consonants, p. 664) and extends this condition to primitive man and the origin of language (p. 676). He also finds that all consonant clusters are simplified in favor of the easier or, more rarely, the acoustically more striking consonant (p. 674); he gives a good list of substitutions for clusters.
Analysis of the Child's Sound-System

333. In the preceding part, the child's sounds have been analyzed in their relation to the standard sounds of which they took the place. If we draw a parallel with the scientific study of standard languages, this procedure could be called the historical, phonological, or diachronic treatment. In the following part, the child's sound-system will be examined by itself, not primarily with reference to the standard sound-system. In the linguistics of standard languages, this would be called the descriptive, phonetic, or synchronic method of analysis.

In the study of children's speech, however, the two methods converge, particularly with regard to the time-element involved. It is in this fact that I see a special value of this kind of study for linguistic science. Developments which extend over long periods of time in the history of standard languages find close parallels in child speech, but are there compressed into short spaces and therefore much more accessible to direct observation and interpretation.

We shall give a prominent part to the question of chronology in our descriptive scrutiny of the child's sound-system. In this chapter, however, we shall not emphasize the progressive approximation of individual substitutes to the corresponding standard sounds, but the gradual acquisition of sounds and the development of an ever-expanding system of sounds. This treatment is genetic in the psychologists' sense of the word. In child speech, the growing phonetic system goes of course together with growing perfection of sound-imitation. In so far as attention is given to the comparison of the child's sounds with their standard prototypes, the following discussions represent an interpretation of the skeleton survey contained in 268-291.

334. In an examination of the growth of children's sound-systems, it is important to make a sharp distinction between two stages of sound-production. In the earliest stage, after the period of reflex cries, sounds are uttered essentially as playful exercises of various muscles, in close parallelism with exercises of the arms, legs, neck, etc.1 The sounds produced by these exercises have no direct connection with those uttered later when imitative speaking begins; but in genetic retrospect, they are exercises preparatory to speaking. In part they consist of an entirely different set of sounds, and some that are universally common at the earliest stage can later be acquired imitatively only with great difficulty.

The essential difference between the playful and the imitative stages has been pointed out before. Sully (1895), for instance, stressed the sharp cleavage between early "impulsive" sounds and the later "volitional" or intentionally imitative sounds (p. 154). This division, which

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1 O'Shea, p. 23: "The child, then, will play at vocalizing for the same reason fundamentally that he plays at jumping or climbing or pounding."
is methodically imperative, has, however, often been neglected,² and many of the discrepancies between different authors as to the order of acquisition of sounds and their relative difficulty can be traced to the fact that they have one or the other of these greatly differing stages in mind.

335. In the earliest stage of playful sound-production, preference is decided exclusively on the basis of ease of articulation. In the later stage of imitative speaking, the selection is restricted and modified by the model of standard speech, by the imperfections of the child’s perception, and by the functional value of different sounds. If we remember that the sounds of any form of standard speech represent a systematic selection from a much greater array of possible sounds, we realize that this fact alone will eliminate a great number of the unorthodox sounds used during the cooing stage. Although imperfect perception plays a minor rôle in the determination of the child’s substitute sounds according to my observations, it cannot be ruled out entirely and serves to restrict the range of sounds still more. Theoretically the later stage is the poorer one with regard to the number of sounds used. This is obscured by the fact that imitative sounds are more satisfactory to the listener because they resemble standard speech more closely. It is also objectively obliterated by the fact that in the meantime the child’s organs of articulation become much more skilled. The child therefore adds as many new sounds as have been lost because of the restrictions imposed by imitation.

336. The earliest stage might be subdivided into two sections, cooing and babbling. I have not found any attempt at defining the two terms with the exactness necessary for a technical discussion of child speech. The general dictionaries give no definitions satisfactory for our special purpose. They explain “coo” as imitating the sound or note of pigeons or doves, often adding that the word is transferred to children uttering a similar sound. This definition would seem to be strictly applicable in our case only to uk‘xu: noted for Hildegard at o;2 in the chapter on the First Year and a similar combination on the last day of o;7. The sound of pigeons is described by the revised Century Dictionary as “plaintive.” Other dictionaries omit such a characterization or describe it more neutrally as “low” (Webster, Century), “soft” (Oxford, Thorndike-Century), or “murmuring” (Oxford, Standard, Century, Thorndike-Century). “Plaintive” for the sound of doves is at best a subjective evaluation. It does not fit the transferred use to baby sounds. The best definition I have found for this use is that of Wyld in his Universal Dictionary: “utter a sound expressive of satisfaction, somewhat resembling that

² Ronjat 23, note 7. Ronjat uses, within his French text, the German word Krähen to denote the first playful stage of sound-emission. He tries to substitute it for the established German term Lallen. The great difference between babbling and speaking was again strongly emphasized recently by Jakobson, p. 16.
made by doves.” This, in my estimation, comes closest to the actual use of the term in speaking about babies’ earliest sounds. At the same stage, however, other sound-combinations occur which can by no flight of the imagination be described as resembling the sounds of pigeons. If these are to be excluded from the cooing stage and described as babbling, it means that we are not justified in separating cooing and babbling. Overlapping would not keep us from establishing two stages methodically distinguished; overlapping between babbling and speaking is a definite fact which I have emphasized before; but the utterances falling under such a definition of cooing would be too few to warrant setting up a separate stage. We shall indeed abstain from drawing a sharp line between cooing and babbling, and treat cooing as an early phase of babbling characterized by a predominance of back vowels and consonants and expressive of a happy mood. Babbling proper is distinguished from it only by a wider range of vowels and a growing use of varied consonants. The difference is one of degree of development, not of type of sound-production. The fact, however, that the sounds produced in cooing differ more from standards sounds than do those of the later stages of babbling prompts us to dissociate cooing, in our wider definition of the term, even more sharply from the sounds of imitative speaking.

337. Dictionary definitions of babbling also need revision for our purpose. They agree in treating this term as one referring primarily to child speech; the other uses are in this case secondary. In the detailed description they differ somewhat from one another: to talk, speak, utter words or sounds unintelligibly (Webster Condensed), imperfectly (Webster Condensed, Century), inarticulately (Webster, Standard, Oxford Universal, Wyld), half articulately (Concise Oxford), indistinctly (Webster, Oxford Universal, Century, Thorndike-Century), incoherently (Wyld, Webster), unmeaningly (Webster). These definitions, which may appear synonymous at first glance, really hide considerable divergences if we try to apply them to child speech. The definition which serves best, without being fully satisfactory, is that of the second edition of the Webster New International, “to utter unmeaning words.” English-German dictionaries translate “babble” by a single word, “lallen” (Krüger Synonymik, James, Muret-Sanders, Thieme), “pappeln,” “babbeln” (Flügel, James, Muret-Sanders, Sattler), “stammeln” (Flügel, James, Muret-Sanders). Of these equivalents, “lallen” has established itself in the literature of child language as a technical term. I use “babble” as its English equivalent. For our purpose, it means, to produce spontaneously meaningless sound-combinations as a playful exercise of the organs of articulation. These sound-combinations are usually composed of vowels and

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8 Cf. also Ronjat 25.
4 Latif speaks of “the lalling period” in English (p. 162).
6 Cf. O’Shea, p. 15: “a playful use of vocalizations.” The term “vocalizations,” commonly used by psychologists, needs definition; it means no more than utterance of sounds
consonants, both increasing in variety with progressing skill. Repetition of the same combination, the source of reduplication, is frequent, but less so in the earliest stage, M o; i-o;2, than later. Our definition includes “cooing” as a special early phase of “babbling,” limited in extent and not clearly set off from the stage of babbling. Not even the feeling of satisfaction attributed to cooing by Wyld is distinctive; babbling is also practised most in a happy mood. It excludes, contrary to most dictionary definitions, all utterances which result from imitation of standard words and also all spontaneous sound-combinations which serve the purpose of communication, and thus have a meaning for the child. Babbling combinations can secondarily acquire a meaning. In that case, they pass from the category of “babbling” to that of “speaking.” Imitative child words can have exactly the same form as babbling combinations, and frequently do at the stage when babbling and speaking overlap. The sole test is whether the utterance has meaning, serves purposes of communication; the careful observer familiar with the child can make this distinction with assurance. The dictionary definitions would embrace all speaking of the first two years and more. Our technical definition applies the term to a more restricted phase. Nothing in the chapters on Vocabulary, which comprise the bulk of our first volume, falls under it, and not everything in the chapter on the First Year. To avoid misunderstanding, I repeat that babbling continued into the second year while imitative speaking was developing. No record of this later phase of babbling has been presented, because the diary entries concerning it reveal no new principles. By that time, the growth of imitative, meaningful speaking became much more interesting, and articulating exercises making use of imitative words soon superseded meaningless sound-exercises completely.

338. Having defined babbling for our purpose and set it off from the beginnings of speaking, we must say a word about the boundary-line between babbling and the preceding stage, crying, which fills the first few weeks of a baby’s life. The early cries and other reflex sounds soon become differentiated, and parents learn to distinguish the moods and feelings which they express. Unpleasant emotions are voiced first by cries. Later, pleasant moods also find expression, the sounds thus coming closer to the conditions which induce babbling. There is then no longer a functional distinction between “crying” and babbling; neither of them is speaking. The difference between them lies in the form of the utterances: the first sounds produced are unbroken continuants, mostly vowels, whereas, in babbling, interrupting consonants are added; in fact, occa-

or use of the voice. Lewis (p. 55) defines babbling as “utterance of sounds only for their own sake” and excludes expressions of comfort and discomfort, which I include as long as they are not intended for communication.

* Cf. Stern’s chapter, “Vorstadien,” in the second part of the book. The article of Hoyer (cf. 339) defines babbling syllables similarly as “Lautäußerungen, die ruhige Dauererfekte begleiten und eine gewisse Artikulation enthalten” (p. 366). Irwin and associates have
sionally there are no vowels present at all. In our case, the seventh week marked the beginning of the babbling stage. "Crying stage" is a simplified designation. Not all the sounds produced during the first weeks are cries, but crying prevails.

339. The babbling stage has not been given much attention in the literature on child speech. All studies concerned with vocabulary—and that is the majority of them, especially in America—naturally exclude it. Comprehensive monographic investigations like those of Preyer and Deville, and surveys of the field like those of Decroly and Pavlovitch usually include it, but too few of them are on a reliable phonetic basis. Even linguistic scholars are not always as good phoneticians as they should be, particularly when they study child speech, and it is difficult enough to present the facts clearly even with the aid of phonetics. The studies of children's sounds by Wellman and by Williams do not include the first two years. A specialized study of babbling is that of Hoyer. It should be consulted for all investigations of babbling. Grégoire's book, the most careful study of child language on a phonetic basis, is mostly devoted to babbling.

Although babbling is not a form of speaking, it is a form of phonetic exercise, and should be taken into account when the evolution of a child's sound-system is described.

340. I proceed to a recapitulation of the sounds which Hildegard learned to produce in the successive months of the crying and babbling stages. Most of them are included in the chapter on the First Year.

I find the facts too complicated to present a neat list of sounds learned during each month, as Deville, for instance, does. Sometimes sounds are produced, then forgotten, and later relearned. Also, descriptive statements grouping several sounds together are often more significant than an enumeration of individual sounds.

0:ο. Crying stage. Vowels from a to æ, with a prevalence of a; ?, m. This means, in addition to the glottal stop, emission of continuant sounds, not interrupted by movements of the tongue, with the mouth open or closed. Not all the sounds are actually crying (338); some accompany stretching exercises.

presented specialized studies of the sounds of the crying stage. McCarthy (1929) gives a good survey of the international literature, not specialized for the crying stage, but including it. Her conclusion is that, although publications on children's sound-learning have been "quite numerous in the last century, information on the topic is still very scanty, and in a vague and hazy state" (p. 636). If the inclusion of sounds of pleasure in the term "crying" is objectionable, one might speak of the "crying and crowing stage."

7 Summarized by Stern, p. 155 ff. I remark that the samples of babbling monologues presented by Hoyer do not remind me of anything I have heard from Hildegard or Karla. Individual differences between children are great in this respect, as I know from occasional observation of other children. Cf. also Irwin.

8 Vol. 23, p. 331, with an important correction for 1:6 in vol. 24, p. 42. I suspect that the sound "e" listed for 0:0 should really be "eu," 9, to judge from the accompanying description.
0;1. First half, still crying stage, no new sounds. Second half, cooing phase of babbling, prevalence of back sounds favored by the reclining position of the baby.\textsuperscript{9} New vowels: æ or a, a; consonants: r, x, kx, h, γ or g; laryngeal and velar fricatives; consonants not precise. Last day: more definitely voiced consonants, labial vibrant bw:, palatal click, ru;; still mostly back sounds, but some front sounds added; chance combination “Hilda.”

0;2. Beginning of babbling stage proper, while the cooing phase continues: uk/xu:. Babbling monologues, basis shifting to front, more labials; egobw:. Vowels: e, æ, a, a, æ, ø, u, u; high front and mid back vowels missing.

0;3. Babbling more continuous, without phonetic growth.

0;4–6. Less babbling. Screetching. bw:

E 0;6. More definite consonants: d; palatal g (to 0;7); s once, accidental; game of repeated glottal stop (“coughing”).

0;7. b. Long vowels a to e. dada, baba.

0;8. I reacquired (previously in cooing phase accidental, E 0;1). Labial click; spit-bubble r (392). All consonants now voiced (they were largely voiceless during the cooing phase, 0;1–2). dæ and di the most frequent combinations.

0;9. New voiced consonants: ß, j, dj, щ, m (addition of fricatives indicates improved articulatory muscle control). First voiceless consonants of the later babbling stage: t, k, ʦ. New vowel: i. All vowels now short. First diphthong: ar. mamama. End of pure babbling stage: first imitative word E 0;9.

0;10. bw:; palatal click; w. Occasional fricatives, including x. Ephemeral l, not definite.

0;11. Nothing new.

1;0. New sounds in imitative words, not in babbling. Imitated ѕ is now the only fricative.

1;1. ð: occurs spontaneously, but with meaning, oh!

1;2. Babbling infrequent. First g since 0;7: gaiji; g appears frequently.

1;3. ãrek. Velars and u appear only in babbling, not yet in speaking. This month marks the end of babbling; the diary carries no information about babbling beyond it. It states definitely for 1;8 that monologues were then couched in imitative words and therefore belonged to the speaking stage.\textsuperscript{10}

\textsuperscript{9} Cf. Ripman, p. 139: “In sucking the front of the tongue is low and the back somewhat raised, which favours the production of back vowels as well as of ñ, g which appear early,” and his 32.21. Irwin and Curry found that newborn infants use 92% front vowels in the crying of the first ten days (p. 103). Newborn infants are not always in a reclining position, and crying sounds differ essentially from cooing and babbling sounds, which are produced most commonly when the infant is on his back.

\textsuperscript{10} Grégoire’s boys, whose linguistic development was slower, had not yet discontinued their babbling exercises at 1;9–11 (p. 182).
341. Proceeding to the examination of sounds in words imitated from standard speech, or belonging to what we call the speaking stage, we abandon for the time being the chronological basis and use a systematical phonetic classification. We shall try to determine, however, the time at which each sound was acquired as a sound of language, glancing back at its previous occurrences in babbling. We shall keep in mind the question whether a sound is frequent or rare or ephemeral. Each sound of the child’s system will also be compared with the standard sounds of which it took the place. Detailed references are found in the mechanical surveys in 269-291, which will here be interpreted.

342. Among the vowels (269), a was the first. It was present in the first cries, played a prominent part in babbling, and, without interruption, appeared in some of the first spoken words, o;11. At a stage when most vowels were whispered (359), da, with short a, was for a while (1;1) the only word with a voiced vowel. a was however also used in whispered form, 1;3-4. It is natural that a should be the first vowel, since it results as soon as the mouth is opened wide while the vocal cords vibrate;11 these are the normal circumstances prevailing in crying.

a, articulated a little farther back in the mouth, appeared early in babbling (cooing), at o;1. Being nothing but a variant of a, it occurred nearly as often in babbling, among others in the meaningless syllables “mama” and “papa” from o;10. In the first spoken words (Ball, Papa, Opa) 1;1, a was as common as a. The selection of the two symbols of transcription was necessarily arbitrary to a certain extent. It only reflects the fact that a was articulated in varying positions, farther front or farther back, a variability which was not surprising at a stage when even vowels which allow less variation in standard speech were subject to fluctuation. Later, front a prevailed.12 At 1;6, according to the diary, Mann was the only word with back a in the child’s language. Both varieties of the vowel were short at first, as were all other vowels during the later babbling stage. From 1;3 both occurred also long.

During the course of the speaking stage (269), a and a came to stand normally for standard a and its front and central neighbors æ and ə. Occasionally they took the place of the back neighbor ɔ, of the mid vowels ɔ, o, ə, and, by simplifying assimilation, of the diphthongs œ and œ. In unstressed position the same varieties of a normally represented a. The range of other vowels the place of which they took occasionally, was still wider. It included front vowels as high as ɛ and back vowels as high as u (details in 269). In addition, final syllabic r, l, and n had a among its varied vocalic substitutes.

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11 Cf. Pavlovitch 46, with references to Taine, Stern, Meringer, Buffon. In our case, as in Pavlovitch’s own, the vowel did not remain the only one for long. æ appeared as early as o;1, other vowels soon after.

12 Cf. Pavlovitch 52: practically only “open” a 1;1, in some words until 1;6. Back a from 1;6. French makes a distinction between the two varieties of the vowel.
The a sounds are objectively the easiest vowels because they require very few and easy adjustments of the organs of speech for their articulation.\(^{13}\) That is why a was not only the earliest vowel, but retained a prominent position in the vowel system. When vowels strayed from their exact position, they were more likely to tend toward the easiest one. Fluctuations of this kind were most frequent in the earlier months of speaking when the articulation was still generally inaccurate; but even with progressing exactness of reproduction, they were not well overcome during the first two years. æ and A were still regularly rendered by a at the beginning of the third year. It is not surprising that unstressed vowels were more strongly affected by this trend, because they received less attention.

343. The next higher front vowel æ, important in English, but not a regular vowel in German,\(^{14}\) was not a part of Hildegard's system of regular sounds. It was frequent in the crying stage 0;10-1 and in the babbling stage 0;1-10; in fact, at 0;8, dæ was among the most frequent combinations. In the speaking stage, however, it was very rare. Standard æ was consistently rendered by a (23), from 1;3 to 1;7, with the exceptions of the ephemeral interjection *bäh 1;5 and the infantile nææ for Grandpa 1;8. Occasionally it appeared as a chance variant for unstable vowels: for e: in Marion at 1;6 (26) and even for i in bitte at 1;8.\(^{15}\)

344. Mid front e, short and long, occurred often during the babbling stage, B 0;2-1;3. Until 0;7, vowels usually ranged between a and e, and e remained frequent later. There was no break between the babbling and speaking stages in the case of this vowel. e, short and long, appeared in one of the very first words, *de, there 0;10. It reproduced normally the standard long e and the unstressed German ending "-er." Frequently, but less consistently, it rendered the short e. Occasionally, because of an imperfect adjustment of the tongue, it appeared as a variant for the higher vowels e, i, and i, for the lower vowel æ, and for the central vowel a; in unstressed position it also stood for o and -n.

345. Front vowels higher than e had a narrower range of variation. e was learned late; it was not recorded in babbling until E 0;10, a stage when the first words were already spoken imitatively. The early word *there E 0;10, the vowel of which was still unstable, appeared also in the form de. As a stable vowel it was used in baby B 1;2, otherwise with increasing frequency from 1;5. e stood normally for German pure e and English slightly diphthongal e1. Frequently it was the result of raising when she attempted to imitate e. Occasionally it was raised from long e

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\(^{13}\) Jakobson (p. 60) gives a different reason for the prominence of a, a psychological instead of a physiological one.

\(^{14}\) Viétor does not list it at all.

\(^{15}\) Sully (p. 150) lists æ as a difficult sound. Hildegard's treatment of the vowel seems to confirm this judgment; Karla learned it much earlier E 1;5 (see note to 23). Jakobson (p. 43) cites several authorities to show that æ is late in English and other languages and explains it by the fact that æ is not sufficiently in contrast with other vowels.
or lowered from i. The variations thus covered only the neighboring vowels.

346. i, more clearly different from the low vowels, appeared much earlier than the intermediate e. It was observed on the last day of o;r in the accidental combination which sounded like her name, Hilda. It became very frequent at o;8 in the babbling syllable dr, entered into the first diphthong at B o;9, and often appeared in the early words *there E o;10, pretty E o;10, Ticktack (tick-lock) E o;11, etc. It stood normally for standard i, was occasionally raised from e, and appeared occasionally without a model before j, 3. In this latter position, it was an on-glide for the inaccurately articulated fricative. This on-glide became the stressed vowel only in one word, Schuh, shoe i;7, which lacked the standard vowel at first. More commonly it was combined with another vowel into a diphthong, where other instances will therefore be found discussed (365—367). In unstressed syllables, which were generally subject to greater variation, it took, in addition, the place of i, with lowering, and of final syllabic and consonantal l. The latter phenomenon should be interpreted as an unsuccessful attempt to articulate the difficult consonant; its front closure takes place in the general neighborhood of i in the standard pronunciation. Concerning its rounded counterpart y, see 348.

347. i, being even more sharply in contrast with the low vowels, might be expected to be favored over i in the early babbling stage, when intermediate tongue adjustments were still too difficult. Another difficulty, however, prevents this from happening. When the tongue is raised as high as is necessary for i, it approaches the front palate. It easily happens then that it comes to be raised a little higher still, and the result is no longer a vowel, but a fricative, j or ç, or even a stop. It is not surprising that these consonants appeared as early as, and in part earlier than i.

Therefore i hardly appeared during the pure babbling stage.16 Just once, at o;9, it was recorded, characteristically in combination with the neighboring fricative j, which was also new; both sounds were accidental, that is, they occurred only once and were not practiced. Even as late as B 1;2, the babbling combinations anji, gajji contained j and i in succession.

Two days after the first ji the stage of imitative speaking started with the word *Bild o;9, her form of which contained i. It was later (E o;11, E i;0) rounded to y and whispered; at E o;11 it is especially noted that it had a somewhat fricative quality, that is, it was not clearly distinguishable from j. Precise articulation as i was not reached in this word until E i;3. In the meantime, however, i had appeared in other words: *piep E o;11, E i;1, and B i;3; pretty B o;10, E o;10, B i;0, B i;3; *Gertrud

16 Grégoire (p. 129) found i present during the babbling stage, which however lasted much longer with his sons. It occurred occasionally at 1;5, but only as a variation of e, e.
E i; i, *kiek E i; i, B i; 3; *bimbam B i; 2; *kitty B i; 3; baby B i; 2, E i; 2, i; 3. Thus it may be said that i was acquired at the beginning of the speaking stage and became at once a frequent vowel, which was firmly incorporated in her sound-system.

Since it was not learned until a certain preciseness of muscle control had been achieved, it did not vary greatly. It represented normally the standard i and also, with unrounding of the lips, y. The neighboring i was frequently deflected into i, the tongue being raised a little too high, as in Bild. Once i; 9, in the word cake, i took the place of e, a late inaccuracy which may be explained as insufficient lowering of the tongue between the two stops k, which have, of course, a high tongue position; it was therefore a form of assimilation. It was accidental and was corrected very soon.\(^{17}\) The exceptional case of i for u in the word Schuh, shoe at i; 3 should be disregarded in view of the history of the word, which shows that the i was evolved from the neighboring fricative rather than from the standard vowel; the unusual substitution of the high front vowel for the high back vowel was only a transitory phase in passing from a very incorrect form to the correct one.

In unstressed position, because of the reduced attention which unstressed syllables received, i appeared as the representative of a somewhat greater variety of vowels. Here it stood normally not only for i, but also, with raising, for r. Frequently it was the substitute for final syllabic n, the vocalic function and the front articulation of n being exaggerated to the detriment of other features of the correct pronunciation of n. Occasionally e was raised and a was fronted and raised to i; in all cases neighboring sounds can be blamed for the inaccuracy. i for u, with fronting, occurred only very early (i; i) in an ephemeral name, *Gertrud; at that early stage it is surprising enough that the unstressed vowel, dimly perceived, had at least the correct degree of tongue elevation at times.

348. y, essentially the same vowel with lip rounding, was not a part of Hildegard’s sound system, although she heard it frequently in German standard words. German accounts of children’s speech also report unrounding of y\(^{18}\) with great regularity, which would seem to indicate that the sound is difficult for children generally. Caution, however, is necessary. In many cases the rounded vowels were undoubtedly presented in unrounded form by the adult speakers. This is very common in Germany in standard speech with a dialectal tinge,\(^{19}\) but nothing is usually said

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\(^{17}\) Preyer (p. 152) reports for his son that i was “frequently mixed with other vowel-sounds, particularly with ‘e.’” The phonetic explanation which follows is not convincing.

\(^{18}\) Pavlovitch (52) does not mention unrounding for French, but instead substitution of a in unstressed, use of correct y in stressed position; but he fails to indicate the time (probably before 2; 0).

\(^{19}\) Not only in German. Grégoire (p. 200, note 1) illustrates the unrounding of French y in transcriptions from the Liège variety of the Walloon dialect. Cf. also the unrounding of umlaut vowels in Old English.
about the point by the authors, who are as a rule not linguistic scholars
and phoneticians.

*y* occurred only at the early stage of o;9–E r;1 in the imitated words
*Bild* and *pieks* as a substitute for r and i. In both cases the sound was
the result of assimilation, the lip articulation of b and p being carried
over into the following vowel. Slight rounding is also noted in the diary
for the vowel of br:, *bimbam* at r;1. After E r;1 this assimilation no
longer took place, the articulation becoming more precise. At r;6 an
entry specifically states that y and Y were not used by the child. In fact, 
Y *never occurred,*20 and standard y regularly lost its lip rounding at the
end of the second year. y as substitute for r became ephemerally part of a
rising diphthong (367).

Let us add here as a note that the mid rounded vowels o and æ never
occurred, except for the facts that at E o;1 vowel sounds reminiscent of
æ or a were heard in babbling and that German alle had, in emphatic pro-
nunciation 1;11, sometimes æ or a as a variant of a (83).21

349. Examining the back vowels, we find that a, long and short, was
of subordinate importance in Hildegard’s vowel system during most of
the first two years. No occurrence of it is recorded during the babbling
stage. At E 1;1 the diary notes that an interjection ?a: was used by the
child to greet her doll and that the sound ð did not otherwise occur. The
same interjection was used sporadically E 1;3–7, but few other uses of
the vowel are recorded until 1;7–8 (water, walk), and then it was still
experimental and did not become fixed. Its frequency increased markedly
during 1;11 in words with a standard a, but it took several months before
earlier substitute vowels were displaced generally. Hildegard’s ð was the
mid variety, not the low one, even in the interjection oh with long ð.

In addition to instances based on standard pronunciation, a was occa-
sionally the result of lowering from standard o (1;5–2;1, especially 1;11)
and even u (E 1;8–9). In unstressed position, a was a normal representa-
tive of o and o, but stood occasionally also for final syllabic n and l and
final consonantal l. Unstressed a established itself somewhat earlier than
stressed a, from 1;6, because its intermediate quality (mid a) was suitable
for unstressed syllables; but even in this position there are more in-
stances at 1;11 than in earlier months.

350. The next higher back vowel o was frequent in stressed and un-
stressed position. Again it did not occur spontaneously in babbling, but
only by imitation of standard vowels, first in the interjection oh from r;0.

20 Short y is a more difficult sound than long y, as every teacher of German knows from
experience with his students. This is nicely illustrated by the phrase “ein hibscher Früh-
ling,” reported by Krötetsch (p. 185) for 2;11.

21 Schultze, p. 37: æ unrounded. Pavlovitch 52: æ correct, no time given, inferentially
second year (transcribed as open æ, but described as close æ). Ronjat, p. 44: ð new at E 1;5.
Jakobson (p. 16) gives references for the contention that rounded vowels are often observed
in babbling, but are late in imitative speaking. For Hildegard they were rare, even in babbling.
Mid vowels were in general later than low and high vowels, clearly so in the back range. There were a good many instances of both \(a\) for \(o\) and \(o\) for \(a\), so that one might be tempted to say that both vowels belonged to the same phoneme, with non-significant variations. Still, \(o\) reproduced standard \(o\) more regularly than standard \(a\), so that it is more cautious to state the situation as follows: the child tried to reproduce both standard vowels, which she heard accurately, but the organs of articulation were not yet skilled enough to make the nice varieties of adjustment in the mid position with accuracy.

Consequently, we find the variations decreasing toward the end of the second year when the articulation became more precise. From 1;10, standard \(o\) was reproduced more or less correctly (46) and can from then on be considered established. Accordingly, it appeared as a substitute for vowels other than \(a\) only during these last two months, especially the last. The vowels involved are all mid or high vowels, namely \(ae\), \(u\), \(u\), \(a\). The substitution of \(o\) for them represented an economy of effort: a less energetic elevation of the tongue in the case of \(u\) and \(u\); a simplification of a complicated articulation in the case of \(ae\); and a shift from the unfamiliar central position to the now more familiar back position in the case of \(a\).

Unstressed \(o\) frequently stood for standard unstressed \(o\), although the latter was by no means consistently rendered correctly. It also rendered final syllabic \(l\), but was a slightly less frequent substitute for it than \(a\). Occasionally it was the substitute for final syllabic \(n\) or was evolved from final consonantal \(l\). In this function, as substitutes for "liquids" and nasals in unstressed syllables, \(a\) and \(o\) were in approximate balance.

351. The next higher back vowel \(u\) was heard as early as 0;2, in the babbling stage, but was not frequent. It was reacquired rather late in the speaking stage, at 1;6, occurring at first only as a substitute for the higher \(u\) and, irregularly, for the equally high front \(i\). At 1;8 and 1;10 it appeared also as a variant for \(o\), the tongue being raised a little too high for this vowel. The inaccurate use of \(u\) for \(i\) and \(o\) ceased after 1;8 and 1;10, but the lowering of \(u\) to \(u\) still occurred at 1;11. Meanwhile, however, \(u\) appeared even more frequently as the correct reproduction of standard \(u\), probably not as early as 1;6 when the child's word meaning "book" was more likely to be based on German \(Buch\) with \(u\); but with growing frequency from 1;8, especially at 1;10 and 1;11. Very often it alternated with \(u\); the higher variety of the vowel was more firmly established.

Unstressed \(u\) functioned occasionally as the representative of standard syllabic \(r\) at 1;10, but only as a variant of the more regular \(u\).

352. The highest back vowel \(u\) occurred repeatedly at E 0;1 and 0;2. It is this vowel primarily which gives the cooing phase its name. During the babbling stage after the cooing phase, however, front sounds gained the upper hand and \(u\) was discontinued. It reappeared in the early imitative words \(Blumen\) *1;0 and \(muh\) (moo) *1;2, whispered in the former
word, aloud in the latter. Both words became inactive soon, which may or may not be due to the fact that their vowel had no firm footing in the child’s phonetic system. At any rate, the diary notes for 1;3 that u occurred only in sound games, which are a form of babbling. At 1;3 and B 1;4, u in normal or falsetto voice was used in wuwwu, a playful variant of Wawau, a meaningful word which, however, hovered on the boundary line between real words and babbling combinations on account of its conventionalized nursery form. At 1;5-6 u appeared again in *hooho (huku) in a high pitch, being once more designated as the first successful u; also in toothbrush *1;6. Again, however, these words did not become established. Buch and spoon contained the vowel u, with insufficient elevation of the back tongue, 1;6. She did not succeed in adding the vowel to the word Schuh (shoe) at 1;7. Just the same, at 1;7 u was heard in an increasing number of words: *muh and *Blumen again, choo-choo, juice. The latter two words remained in Hildegard’s vocabulary. It can be said that u finally became established during 1;7. After that month, the vowel seemed to present no difficulty.22

There were rather numerous words in which u was a correct imitation of the standard vowel. Most of them (70) belong to the last two months, a stage of rapid increase of vocabulary. u was also the normal representative of standard syllabic r, although there is only one frequent word, church 1;10, illustrating this substitution. The unfamiliar curling up of the tip of the tongue was replaced by a raising of its back, which was by then familiar. Frequently the child’s u resulted from excessive raising of standard u 1;9-11, which was due to the fact that the definitely high vowel u was more firmly established than the slightly lower u. The same explanation accounts for the frequent raising of o to u, which occurred from 1;7 to 1;9, but ceased thereafter: at first the contrast between the familiar low vowels and the budding higher vowels was exaggerated. The later months brought an improvement over the primitive distinction of two levels; three levels were then distinguished, but the elevations intermediate between them were not yet mastered with assurance.

Unstressed u likewise stood normally for standard u and syllabic -r, 1;7-11, although the latter often continued to be omitted to the end of the year because of the subdued attention it received. Frequently it was the result of raising from u (in one word at 1;8) and of vocalizing of final syllabic n and l following a stressed back vowel in the child’s form, 1;8-11. Occasionally an u was evolved, without vowel harmony, out of English final syllabic l 1;8-11 or consonantal l B 1;9, the raising of the back tongue in English l asserting itself; or out of final j, once 1;10, an accidental vocalized per se rounding of the lip-rounding which can accompany every sound of the word involved, wash.

353. The neutral vowel a did not become a part of Hildegard’s vowel-
system by the end of the second year because it did not satisfy the urge for contrast. It is indifferent both as to the contrast low-high and as to the contrast front-back. Vowels similar to a were heard at oːrₚ B oː. Thereafter they disappeared completely. Standard a was consistently shifted to a. A sound resembling a or æ was occasionally heard r₁ːr in the unstressed syllable of German alle in emphatic pronunciation.

354. ø; also a central vowel, roughly the long and tense counterpart of a, did not occur in the standard model nor in the child’s speech, except as a variant of the stressed vowel in Gertrude E r₁ːr. It is not worth further discussion.

355. The central vowel ø occurs in the standard only in unstressed syllables, its articulation being similar to stressed a. In Hildegard’s speech, however, a muffled vowel best transcribed by ø appeared occasionally under the stress. During the babbling stage, a fronted variety of ø was heard once in the combination kø oː. During the stage of imitative speaking a common demonstrative interjection, which had no standard model itself, took the form of ?ø? with a fronted and raised vowel approaching i in high pitch, E r₁ːr–1ː6. In rare instances ø was an ephemeral substitute for vowels and diphthongs in standard words: for a in brush E r₁ː5 (soon replaced by the less accurate, but consistently used substitute a, B r₁ː6); for i in the first syllable of the exceedingly frequent word pretty at varying times, B oːr₀, r₀, and B r₁ː3 (as a variant of i, which eventually displaced it; probably supported by careless pronunciations used by adults); and for au in Maus (mouse) r₁ː7 (soon improved to a, a, au).

Unstressed ø appeared much more regularly. Since unstressed syllables received much less attention than stressed ones, the subconscious effort to achieve contrasts was not applied to them, and a neutral vowel was well suited to their nebulous character. It is not surprising that most of the examples are comparatively late. In the earlier stages unstressed syllables were omitted entirely or replaced by a reduplicative repetition of the stressed syllable. Later a feeling for the number of syllables contained in a word developed, and an indifferent representation was accorded to the vowels or syllabic consonants of unstressed syllables.

Unstressed ø was observed in some of the earliest articulated sound-combinations. At E oːr it occurred, tinged with a, in the accidental babbling-combination hilda and a few days later, B oːz, untinged in egōbw:. In imitative words ø appeared as a correct reproduction of standard ø as early as r₁ːr in the onomatopoetic *kritze, which was mechanically reproduced in whispered form. But this word did not last, and stood

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23 Kenyon 323.
25 Viétor 68, note 1.
26 Cf. the counterevidence in cases of amnesia reported by Vendryès, English edition, p. 53; cf. Graff, p. 54.
alone while it lasted. From 1;7 on there are more examples, but omission continued to occur to the end of the year. Pretonic ə, before the main or before the secondary stress, was omitted even more frequently, but was represented occasionally from 1;8.

Aside from the normal use of ə for standard ə, it stood fairly frequently for the German ending "-er," for final syllabic n, and in one word, oil 1;6–7, for final consonantal l. Occasionally it took the place of a wide variety of unstressed vowels and syllabic consonants, r, a, o, u, ə, l. This substitution occurred often rather early, 1;5–9, but did not become established in any word. It was no more than an inattentive, indifferent rendering of a syllable of which the child was only dimly conscious. It was not until 1;11 that ə appeared with greater determination, both for standard ə and as a substitute for other sounds. I should say that ə was just beginning to be a real part of Hildegard’s sound-system at the end of the second year.

It is rather surprising that ə did not often intrude unconsciously, without a standard prototype, into utterances, as it does often in hesitant speech of adults. Two instances of it are recorded, for wake up, after the k, and oatmeal, after the t, both 1;11. In both cases, the ə served to accentuate the final stop of the syllable.

The very frequent German words bitte 1;5 and alle 1;7 had all kinds of front and central restressed vowels in the second syllable to the end of the period. These reflected emphatic forms heard by the child. The correct ə prevailed 1;7–11, late, but earlier than in less important words. Its learning may well have been induced by these constantly used words.

356. No more than passing notice is necessary for r as the bearer of a stressed syllable. It occurred only as one of many variants in the frequent word pretty at E 0;11, in whispered articulation. It did not become a part of Hildegard’s sound-system.

357. The survey and analysis of the child’s normal vowels being concluded, there remain to be discussed a few special articulations.

In the first place, there is the nasalization of vowels. Neither of the two standard languages presented makes use of them. Nasalization could and did occur only as the result of assimilation.

Nasalized ꝱ, ə occurred as a substitute for an (12) and for æn (24) in the words an (on), Mann, Hand and man, hand 1;5–2;1. Some of these

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27 Final consonantal l and r, ə were rendered by ə in many more instances, which however do not belong here, because ə did not carry a syllable but formed a diphthong with the preceding stressed vowel (367).

28 Pavlovitch (52) records reproduction of ə, in pretonic position, at E 1;5. Cf. also his 59 for the treatment of unstressed syllables. Bloch (1913, p. 56) reports that unstressed vowels were much more variable than stressed ones and finds full vowels of French first (unstressed) syllables largely replaced by ə at 1;9–10, especially next to dentals and palatals.
words always had a nasalized vowel; others existed also with an unnasalized a, which was the regular substitute for both vowels in other examples 1;1-2;1. The nasalized vowel can therefore only be appraised as a variant, which was bound to disappear with increasing skill of imitation soon after the two year limit, because it found no support in the standards presented to the child.29

358. A few words were uttered with falsetto voice: Wauwau at E 1;1, 1;3 and E 1;4, and its predecessor ?a?al at E 1;1; *Piep, piep at B 1;4; *huch 1;7; kitty at 1;10. In these examples the same type of voice was used, at least sometimes, by the adults. The interjection ?a?, which had no standard model, was characterized by a high-pitched voice, which is specifically called falsetto at B 1;3. As in the standard, this articulation is a non-significant variant serving purposes of onomatopoeia or of emphasis (cf. also intonation, 489).

359. Whispered articulation, which has been given scant attention in the literature on children’s speech,30 deserves more careful consideration. I suspect that it represents a fairly wide-spread early phase of speaking. It is difficult to reconcile with the postulated urge for contrast between sounds in child speech; it might be explained by assimilation of vowels to neighboring voiceless consonants or by a striving for a very general type of contrast, namely that between conscious speaking articulation and the earlier cries and babbling combinations, in which the vowels always had voice. Only imitative words had whispered articulation.

The few words spoken before the turn of 1;0 to 1;1 were mostly whispered. At that time the interj ectional adverb da was the only frequent word which was pronounced with voice, often even very loud; *there o;10-B 1;0, also with a full vowel, had previously been learned and forgotten. The only other word with voice was the interjection ?a?, with varying vowel quality, from o;8. It was, however, a word only in a certain sense, proceeding as it did from a spontaneous sound. The fact that it consisted only of a vowel, if we disregard the glottal stop, may have had something to do with its voiced form.

At 1;1 the three words Ball, Opa, and Papa were not easy to tell apart, since all of them were whispered, and all could appear in monosyllabic or in reduplicated form. A week later, it seemed as if the addition of voice were used to distinguish papa from the other two words. At E 1;3 baba without voice meant by-by, with voice papa. For a month from B 1;4,

29 In the imitation of standard speech which has nasal vowels, children learn them late, generally not before the third year, according to Jakobson, p. 44. Pavlovitch (53) however observed 3 as early as 1;0, and agrees with Ronjat that all nasal vowels are “fixed” by B 1;7; but he found unnasalized vowels to persist in part until 2;0.

30 Preyer, in his careful record (pp. 109, 118, 138), reports whispered articulation at o;10, 1;1, and 1;7. Charlotte Bühler (p. 95) mentions whispered imitation of the word “tick-tack” at B o;9. Gutzmann (p. 7) enumerates whispered sounds among the “Urlaute” of the first year. Grégoire (p. 100) noticed whispered articulation occasionally at o;10-11, but only as a sign of absorbed attention or surprise, analogous to the usage of adults.
dada, usually whispered, seemed to mean thank you, whereas the same combination with voice stood for the name Carolyn. This was crossed at E 1;4 by another distinction: dada whispered meant thank you, but aloud it represented reduplicated da. These inferences were, however, merely tentative. It cannot be established with assurance that the presence or absence of voice in otherwise identical sound-combinations was utilized as a distinguishing feature.

The number of words articulated with voice increased from 1;1. By 1;5, whispered articulation had become rare. The last word which was learned new in whispered form was night-night, 1;5. Other old words continued in whispered articulation for two or three more months, the last one being pretty at 1;8. By 1;9 all words had acquired full vowels, and at 1;10 the diary states specifically that Hildegard used whispered pronunciation only when she meant to whisper as adults do sometimes.

To illustrate the transition from whispered to voiced vowels, I summarize the history of the words in which it occurred. A-a, which had begun B 1;1 as a double voiced glottal stop, had reduced voice B 1;4, full voice 1;6. By-by was whispered 1;3-4, voiced 1;4. German *Ball, whispered E 1;0-4, aloud 1;5. *Blume(n), whispered *1;0, aloud *1;7, 1;11. Thank you, whispered B 1;4, aloud 1;4. Heiss, whispered 1;5-7, aloud 1;8. Hot, whispered 1;4-7, aloud 1;8. Pretty, usually whispered B 0;10-E 0;11, always whispered 1;1-8, voiced 1;9. Ticktack (tick-tock), whispered regularly E 0;11-1;4, usually 1;4-7; regularly voiced from 1;8. *Krise, whispered 1;1-B 1;4 and *Opa, whispered 1;0-1, did not survive long enough to add voice. It is of interest to mention that Papa, E 1;0, was whispered M 1;1 for a very short time, whereas Mama, 1;3, was always fully voiced.

360. Casting a summarizing glance, with special attention to the sequence of acquisition, over the vowels of the stages preparatory to speaking, we find that during the crying stage, 0;0-M 0;1, the vowel resonance moved within the narrow range of a, a and æ; the tongue was held low. During the cooing phase of babbling, M 0;1-0;2, this range was slightly extended upward to include mid-front e and central a and ə; at the same time, however, the high back vowels u and (infrequently) u, which are characteristic of the cooing phase, made their appearance in sharp contrast with the low front range. To put it negatively, the higher and high front vowels on the one hand, and the mid back vowels on the other were missing at this stage. The high back vowels disappeared at the end of the brief cooing phase,31 and so did the occasional central vowels. The low and front vowels, however, continued into the later babbling stage.

It is not easy to give a really reliable picture of the extension of the front vowel system during the babbling stage, because progress was not steady. Some vowels occurred relatively early, without being at once added to the active vowel-system; their first appearance was accidental

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31 Preyer (p. 104 f.) states that "i" and "u" were both rare at 0;4.
and ephemeral. \(a\) and \(a\) continued without interruption. \(ae\) was observed until \(0;10\), but was discontinued after imitative speaking started. \(e\) remained active in babbling as late as \(1;3\), and had in the meantime become a frequent vowel in meaningful words from the very beginning (\(0;10\)). The higher mid vowel \(e\) was at first absent. \(i\) as the first representative of the high range appeared at \(0;8\), if we disregard a single accidental occurrence at \(0;2\). The next acquisition was \(e\) at \(E\) \(0;10\), and the last, \(i\) at \(1;2\), again disregarding a single instance \(0;9\); on both occasions, \(i\) was combined with \(j\), but in real words \(i\) was quite common from \(0;9\). Finally, the high back vowel \(u\) was used by the child, only in babbling combinations, at \(1;3\), after it had already been tried in two non-permanent words. The mid back vowels \(o\) and \(o\) were completely missing in the babbling stage. Rounded front vowels did not occur, either; the vowel resembling \(ae\) at \(E\) \(0;1\) was probably a variant of the central vowels of the cooing phase.

It is apparent that during the later months, \(0;9–1;3\), when babbling and speaking overlapped, the separate consideration of babbling vowels is artificial. During the pure babbling stage \(0;2–9\), disregarding the central and high back vowels of the cooing phase \(0;1–2\), we find the low vowels \(a, a, ae\) and \(e\) holding the field until \(0;8\), when the contrasting high vowel \(i\) was added. 22 The intermediate \(e\) was next \(E\) \(0;10\). Apparently the functional boundary-line in the child’s sound-system ran between \(e\) and \(e\), the latter operating in conjunction with the low vowels. The highest vowel \(i\) was latest in babbling, for reasons explained in 347. The most striking fact is that front vowels were the only ones used in babbling (apart from \(a\), which was only a variant of \(a\)) until the very end of babbling \(1;3\), when \(u\) appeared as the only back vowel.

361. In the more important stage of imitative speaking, which asserted itself increasingly from \(0;9\), we find front vowels used earlier than back vowels as a consequence of the fact that they were supported by the practice gained in babbling exercises. The urge for contrast in the sequence of acquisition shows itself more clearly in imitative speaking than in babbling, 23 particularly if we eliminate the earlier occurrences of vowels due to variations from the standard models and focus our attention on correct imitations of the presentation.

Little attention will be given to the quantity of vowels. It did not seem to be significant for the child. Most vowels were similar in duration to their prototypes, but shortening of long vowels and, what is more

22 Similarly Grégoire (p. 94): \(a\), then \(e\), rarely \(i\) \(0;9–11\). The contrast pattern seems to play a minor role in the effortless sound-games of babbling. Jakobson (p. 54) seems to postulate for the early babbling stage a contrast between vowels and consonants rather than a contrast between different vowels. Vowel contrasts are later in his hypothesis (p. 64).

23 Grégoire’s scanty account (pp. 217–219) of vowel acquisition does not seem to reveal the contrast pattern in operation. My observations on Hildegard, however, confirm Jakobson’s hypothesis.
striking, lengthening of the normally short lax vowels i and u occurred. The transcription of individual words indicates these features.

The low vowels a and a were carried over from the babbling stage without break. So was e, which was correctly rendered in one of the first words o;10, and apparently acted as a low rather than as a mid vowel. This is not so surprising, if we consider that the conventional boundary between ae and e is arbitrarily drawn because it must be drawn somewhere. The child may very well have a different feeling for the functional value of vowels. If this explanation is correct, it seems astonishing that the continuity of the low vowels was broken by the elimination of the intermediate ae. This vowel did occur occasionally, rather late, at 1;5 and from 1;8, but not as a regular representative of any standard vowel nor as a carry-over from the babbling period, during which it had at times, especially at 0;8, been a frequent vowel. As late as 2;7, the diary notes that Hildegarde used only the eight chief cardinal vowels24 (to which should however be added diphthongs, and o in unstressed syllables). If it is true, as this fact seems to indicate, that cardinal vowels are more than an artificial construction,25 the omission of ae from the vowel system of imitative speaking can be considered explained.26

The next vowels to be acquired were front vowels in sharp contrast with the low vowels, namely i and i. i occurred as an inaccurate rendering of i as early as 0;9, frequently for standard i from 0;10. i also appeared in imitated words at E 0;10. It is significant that i was usually imitated correctly (61), whereas i was often raised to i (51). The contrast with the low vowels is brought out better by the highest front vowel i. From E 0;11 to E 1;1 the highest front vowel occurred with lip rounding as y, but only as the result of assimilation to preceding bilabial consonants, not as an independent unit in the vowel system. y disappeared completely thereafter.27

Since e ranged with the low vowels, e remains as the only item to be classified as a mid front vowel.

The finer articulation required to pronounce a vowel intermediate between low and high caused this vowel to be late. To be sure, it was heard as early as E 0;10 in a variant of the word *there. As a correct, stable reproduction of standard e it occurred in the single word baby, which was loaded with interest for the child, from B 1;2; but it did not become common until 1;5.

362. Even this mid vowel was acquired sooner than the back vowels.

25 Jakobson, p. 39: "auf der ... Entwicklungsstufe ... des Sprachwerdens ... besitzt das Kind anfänglich nur die Lautgebilde, welche allen Sprachen der Welt gemeinsam sind."
26 This problem deserves to be watched in studies of children's speech. Karla had ae much earlier, from B 1;5 (23, note), but also replaced it by a before that stage.
27 All rounded front vowels, although common in German, remained in abeyance. They are late, because their difference from the corresponding unrounded front vowels is too subtle or, as Jakobson puts it (p. 73), because this is too advanced a type of contrast.
In the back range, the high vowels were again earlier than the mid ones. \( u \) did occur sporadically at \( 1;0, 1;2, 1;5-6 \). The child was able to articulate the vowel; but the use of all the words containing it, most of them nursery words of a primitive type, was discontinued again at that stage, which may be due to the fact that the high back vowel was not yet firmly rooted in the sound-system. \( u \) was often deflected into \( u \), the articulation of which requires a little less effort. From \( 1;7 \), however, \( u \) became a sure possession of the child and was from then on stronger than \( u \), because it is in sharper contrast with the low vowels. It should be remembered that the distinction between the back vowels is objectively more difficult to make than that between the front vowels, because the back of the tongue is less flexible and less easily controlled than its tip; also, the distance between low and high back vowels is shorter than that between low and high front vowels. \( u \) appeared earliest for standard \( u \) at \( 1;6 \), and the economy of effort resulting in such a lowering continued to occur until \( 1;11 \). From \( 1;8 \) \( u \) had a place of its own in the pattern of vowels, taking the place of standard \( o \) with an exaggeration of the contrast with low vowels and also reproducing, especially at \( 1;10-11 \), standard \( u \) correctly. In the striving for contrast, \( u \) and \( u \) were at first variants of the high vowel opposed to low vowels. With progressing refinement of articulation, a more consistent discrimination between them was introduced without reaching the point of clear separation.\(^{38}\)

363. The mid back vowels were used systematically only at the stage when the more primitive twofold division low-high was improved into the more exacting threefold division low-mid-high. To be sure, both mid \( o \) and \( u \), long, occurred very early in the interjection \( oh \) which was used sporadically \( 1;5-7 \); two different emotional values were connected with it, but their distribution over the two phonetic forms was uncertain. \( o \) appeared also at \( 1;0 \) in *\( Opa \), but only sporadically and waveringly. This gives the impression that it was heard correctly by the child, but was still too difficult for consistent imitation. Otherwise neither of them was used for the next few months. \( \phi \) was a substitute at \( 1;5 \) in \textit{hello}; \( o \) was correct at \( 1;6 \) in *\textit{snow}; but the use of both vowels remained uncertain until \( 1;10 \). \( o \) was often replaced by the higher vowels \( u \) and \( u \); German \( \phi \) and English \( o \) were sometimes lowered to \( a \). This proves that the primitive contrast between high and low vowels was still dominating the vowel pattern in the back range at a time when finer distinctions had already been learned in the easier front range. The occasional split-

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\(^{38}\) Jakobson’s observation (p. 17) on a one-year-old Czech girl that \( i \) and \( u \) (as well as \( e \) and \( o \)) formed a single phoneme finds no parallel in our case except for the highly variable word \textit{bitte}, in which \( u \) could take the place of \( i \) at \( 1;6-8 \). In other instances, like \textit{mouse} and \textit{shoe}, where \( i \) and \( i \) seemed to be substitutes for \( u \) and \( u \), the reason is different (prothetic vowels). Schultze’s instances of the “easier vowel” \( u \) being substituted for the “harder vowel” \( i \) (p. 40) are wrongly interpreted, because, as he says himself, he is not a linguist. In his examples, \( i \) is followed by \( R \) and the resulting \( u \) is due to assimilation.
ting of English ο and ο into lowest a- highest uʌ (21 and 45) testifies further to the desperate and unsuccessful struggle to imitate an intermediate vowel which could not yet be fitted into the crude pattern.

On the other hand, the child's ο was often the result of lowering higher standard vowels, ο (1;5-2;1, especially 1;11) and even u (E 1;8-9). This should be explained as an economy of effort, the tongue being raised less than required.\(^39\) Unstressed ο established itself earlier than stressed ο, from 1;6, because its intermediate quality (mid ο) served well for unstressed syllables, which received less attention and did not strive for vowel contrast in the same way as stressed syllables did.\(^40\) ο, which was acquired later (1;6, common from 1;10), was likewise a substitute for the higher vowels u and u, because of a similar economy, and for æ and a, where it represents a simplification of difficult articulations and at the same time a yielding to the contrast pattern. Besides it functioned in place of ο, especially before r (19 f.) during the last two months.

From 1;10 ο occurred frequently and often correctly; ο was in process of becoming established during 1;11, but did not reach complete stabilization. By the end of the second year, the mid back vowel had been acquired, but the finer discrimination between ο and ο was still uncertain.

364. Central vowels were almost completely missing in stressed syllables, because they are indifferent both to the contrast low-high and to the contrast front-back. The few exceptional instances which did occur can here be disregarded because these vowels gained no place in the sound-system. a, although common in English, was not learned by Hildegard in the first two years. ο is not normally used in standard stressed syllables, but is very common in unstressed ones. It occurred sporadically 1;1-6, but was not used regularly before 1;7, because the lack of attention given to unstressed syllables at first often caused such syllables to remain unrepresented, a practice which was not entirely overcome even by 1;11. In other instances the unstressed vowel leaned toward that of the stressed syllable in a sort of vowel harmony (151, 191-193). When imitation improved, ο was quite suitable for unstressed syllables, because its indifference to contrast reflected the still reduced attention accorded them. Thus ο became more frequent from 1;7 in unstressed syllables. Some instances in which less neutral vowels were substituted testify to the fact that ο had to struggle for a place in the vowel system even in unstressed position. It did not become well established until 1;11.\(^41\)

\(^{39}\) In my opinion, Jakobson's valuable theory that contrast determines children's early sound-pattern should be supplemented by the observation that the urge for economy of effort counteracts this tendency on numerous occasions. This is a manifestation of what I have called "polarity in language." A faint trace of the same view can be found in Jakobson, p. 18.

\(^{40}\) This is another correction which should be added to Jakobson's theory; cf. 340.

\(^{41}\) The sequence in which Hildegard acquired the vowels agrees well with Jakobson's contrast theory. The observations of other writers do not always show the same sequence,
365. Next to the simple vowels, we examine their combinations into diphthongs. One glance at the statistical survey (270) shows that their number and variety was much larger than in either of the standard languages. This is due mainly to three facts: 1) "liquids" (l and r, n) were usually represented by vowels, which merged with the representative of the preceding standard vowel into a diphthong; 2) intervocalic consonants were often omitted, and the two vowels thus coming together were frequently, though not always, combined into a diphthong; 3) on-glides before sibilants were united with the preceding vowel into diphthongs. Practically all diphthongs were falling. Usually they were composed of short vowels. When the first element was long, the two vowels were judged to belong to separate syllables whenever that was their distribution in the standard models; there were, however, a few instances in which a standard monosyllable like German Ball or English light was rendered with a long diphthong.

366. During the babbling stage diphthongs were very rare. The first one was ai B 0;9. This diphthong, which is, characteristically, composed of the lowest and practically the highest front vowel, was heard occasionally at 0;9 and again at 1;0 and B 1;2. The only other diphthong was ea at 1;0 in the exclamation meameamea, which was used to greet food; it changed soon into the rising diphthong ja: mjmanjamam. If contrast determined the elements of ai, the diphthong ea is of an entirely different nature: the difficult mid vowel was not sustained in its pure character; the tongue, not controlled by concentrated attention in this spontaneous sound-combination, was allowed to glide off into the less strenuous central position. It may not be accidental that ea was at once changed to ja, in which the contrast pattern prevails.

367. During the speaking stage, ai was also the first imitated diphthong, 1;4. It was followed by au 1;5 and ai 1;6. The later months brought a wealth of diphthongs, most of which were, however, not imitations of standard diphthongs, but were due to the processes described in 365. The sequence of acquisition was as follows:

1;7 *ea, ea; *ui, wi

but confirm the principle at least in part. Schultze (p. 30) recognized as early as 1880 that contrast brings out high vowels sooner than the more difficult mid ones, but claimed, in agreement with the earlier observer Sigismund, to find high back vowels earlier than high front vowels. This probably refers to cooing, which should be separated from speaking. According to both of them, u and o preceded e and i, a phenomenon which Jakobson (p. 43) declares to be impossible. Pavlovitch (48-50) recognizes the effect of contrast between low and high vowels; in detail his observations are difficult to interpret.

42 Pavlovitch 54: very frequent, accidentally.
43 Schultze (p. 32) also found ai as the first diphthong; he misjudges the phonetic composition of "ei" (German).
44 Exactly the same sequence as that reported by Schultze, p. 32. I did not find, as he did, ai at first replaced by at; but simplification of au to a was common in his case as in his. I note also simplification of ai to a, as early as 1;3; and occasionally as late as 2;1.
1;8 *ei; *er (standard diphthong, later superseded by e); *ea
1;10 ia, io; *oi (variant of standard diphthong)
1;11 ea, eo; ei; ea, eo; io; *oi (variant of standard diphthong); ui
(2;1 *oi, variant of standard diphthong).

In addition the following occurred as accidental combinations: yi, rising diphthong, in *pretty 1;4 and 1;6; *u in *huch 1;7; io, iu, rising diphthongs, for later iu in bottle, water 1;8; and ia, rising diphthong, in ja 1;3. These do not warrant further consideration.

It will be observed that, even though all these diphthongs belong to the later months of speaking, most of them did not become established before 1;11 (as indicated by asterisks) unless they were composed of clearly contrasting elements. The only acquisitions of 1;7–10 which maintained themselves were ui 1;7, with its contrast between high back and front vowels, and ia 1;10, with its contrast between high and low front vowels. The latter was allowed to stray to io, which still contained a contrast, but gave the second element a more neutral position because of the reduced attention accorded it. It is significant that most of the new acquisitions of 1;11 contained the more subtle contrast between mid vowels on the one hand and low or high vowels on the other. This was satisfying only at the stage when the three-level system had definitely replaced the cruder two-level-system, or in other words, when a contrast between mid vowels and both high and low vowels was perceived rather than only the earlier contrast of high vowels with lower, and low vowels with higher ones.

368. Proceeding to the examination of the child's consonant system (271–291), we first summarize the situation during the babbling stage (340). It is not easy to find dominating principles in the early use of consonants. During the first six months, vowels prevailed definitely; they were interrupted only by vague movements of the tongue and other organs of articulation. At E 0;6 these movements became more precise, giving the impression of real consonants; but vowels still dominated the vocal utterances at 0;7.

During the first month, m appeared as the first consonant, which means no more than that vibrations of the vocal cords were not always produced with the mouth open, but sometimes with the mouth closed. During 0;1 the typical consonants of the cooing phase appeared, namely back stops, fricatives, and affricates: g, γ, ɔ, h, r, kx. The explanation that the reclining position of the infant favors back sounds seems plausible. Of course it does not preclude movements of the front part of the tongue; front consonants similar to l and d and front clicks were indeed observed.

Pavlovitch 58: Stressed vowels are imitated much more correctly than unstressed ones. "Ceci se rapporte également aux diphthongues dont l'élément accentué est fixé plus facilement."

Grégoire (1933) p. 376 f.: The back regions of the mouth are the first area which the exhaled breath strikes.
During 0.2 the basis of articulation was already shifting toward the front of the mouth. The lips came into more active play in the bilabial vibrant \textit{bw}:	extsuperscript{47} than in the early \textit{m}. The palatal click appeared, and \textit{g} between \textit{e} and \textit{o} was presumably articulated near the front region of the palate. Back sounds like the affricate \textit{kx}, however, continued in cooing combinations.

The following months brought no progress; but when consonants became more definite at E 0.6, several stops were articulated. They did at first not include, as might be expected from many descriptions of children’s sound learning, the labial stop, but only the dental \textit{d}, the palatal \textit{g}, and the glottal stop. \textit{b} was soon added 0.7, but \textit{d} remained the most frequent stop even during most of 0.8. At E 0.8 \textit{b} became dominant; \textit{g} subsided after 0.7 and was not heard for six months. From the end of the cooing phase (0.2), all consonants were voiced. At 0.9 she learned voiceless stops, front (\textit{t}) and back (\textit{k}), as well as front fricatives, voiced (\textit{g, j}) and voiceless (\textit{ch}). Both sets meant a step forward from the preceding stage, during which her sounds were primarily characterized by the vibration of the vocal cords modified by simpler mouth articulations (vowels and stops). The voiced affricate \textit{dj}, which can pass as a variant of \textit{j}, also occurred, and the nasals \textit{m} and \textit{n} were learned. Notice that up to the time of the first imitative word E 0.9 labials did not predominate; in fact \textit{p} had not yet occurred. It was new at 0.10 in the word \textit{pretty}; so was \textit{w}. From then on, babbling receded before imitative speaking. The only further fact worth mentioning is that \textit{g} and \textit{k} reappeared at 1.2–3, velar vowels and consonants then being restricted to babbling exercises.

Greatly simplifying the picture, we might list the following stages with their characteristic sounds:

- 0.0 Crying stage. Vibrations of the vocal cords, with tongue at rest (\textit{a} vowels) or mouth closed (\textit{m}), and glottal stop.
- 0.1–2 Cooing phase. Mostly back consonants: stops, fricatives, affricates, prevailingy voiceless.
- 0.2–6 Early phase of babbling. Vowels predominating; vague consonants, voiced.
- 0.7–8 Middle phase of babbling. More definite consonants: labial, den-

\textsuperscript{47} Cf. vol. 1, p. 17, note 5, and p. 19, note 20. Hoyer p. 365: “bilabial \textit{r}” M 0.1. Jakobson, p. 13, note 2: “labial intermittent liquid,” with examples from the literature, some of which, however, refer to the similar sound produced with the help of the fingers as a game, as also Gutzmann’s “Brummlippchen” or “coachman’s \textit{r}” (p. 65). Hildegard liked this game, too, but I do not consider the accompanying sound a speech-sound. Grégoire (p. 97) describes the same sound, also only in the lip-finger game, as a variety of \textit{r} preceded by \textit{b}, but with the added explanation that the \textit{r} is really only the transformation of the \textit{b} into a rolled labial fricative. He records it from 0.11 on and registers (p. 245) the last occurrence of the “labial vibrant” for his older boy at 1.3. Diamantaras reports the occurrence of “\textit{r} bilabial” in the early spoken words of Greek-speaking children in Asia Minor (item 24). Gutzmann (1899) says that the “\textit{lip-R}” is a very early, effortless sound (p. 33).
tal, palatal voiced stops, the dentals being most frequent to B o;8, the labials at E o;8.

o;9 Late phase of pure babbling. First voiceless stops (not including p), first fricatives, first nasals.

1;2–3 Latest phase of babbling, during speaking stage. g reacquired after six to seven months' lapse, but absent in imitative speaking.

369. We review the child's consonant-system of the speaking stage arranged by places of articulation, beginning with the bilabials (271).

The voiceless bilabial stop p did not reach a secure position in Hildegard's normal consonant system by the end of the second year. Standard p was normally replaced by its voiced counterpart. It did appear occasionally as a correct imitation of the standard sound, but at the later stage never as a substitute for other consonants, not even other bilabials.

The instances of p that did occur must be grouped in two distinct phases. During the stage when most words were whispered, p occurred frequently; it was a new consonant. The earliest instance is in the word pretty o;10, in which it was also kept longest, until 1;8, because the word was whispered longest. Other words gave up the whispered articulation much earlier; it held undisputed sway only during 1;0 and 1;1, and by 1;5 it became rare (359). Even during the whispered stage p alternated with the earlier b (o;9) or occurred with gentle release, in words with standard p and even occasionally in words with standard b (German Ball). In all cases it was replaced by b as soon as the word was pronounced with full voice. Examples are: Papa whispered with p 1;0–1, aloud with b as early as 1;1; *Opa whispered with p 1;0–1, but not always distinguishable from b 1;1; *Ball usually whispered with b 1;0–4, occasionally with p 1;1, but aloud always with b 1;5–9. Mama was imitated as papa 1;0, the only instance of p for m unless the form was due to a replacement of an inactive word by an active one; pooh consisted only of aspirated p or the affricates pʃ, pw: *1;2–4, but reappeared with b 1;11.

After the end of the whispered stage, p disappeared and was replaced by b. It was not long, however, before p was really and lastingly acquired. In final position, it was learned as early as 1;4 in up, and remained stable, being the first final consonant reproduced. This use is not representative, however, since it was seen later that all final consonants became voiceless. In prevocalic position, medial p developed first, in apple, possibly at 1;5, certainly at 1;8. At 1;9 it was also introduced initially into *piep, piep, which had had p ephemerally in the earlier stages, o;11, 1;1, and 1;4, but the substitute b at 1;3 and 1;4. Pick had p at 1;10, after b 1;9–10, but not yet lastingly; b was resumed 1;11. From then on p appeared more and more frequently, especially at 1;11, but was by the end of the second year not yet used consistently in a single word. The functional distinction

48 No separate survey by manner of articulation and position in the word is given, but these aspects are summarized in the tabulations, 277–291, and taken into account in the phonemic analysis, 416–426.
between \( b \) and \( p \) was about to be learned, but not yet achieved. \( p \) was always unaspirated, while aspiration was often present with other voiceless stops at the end of the year (308).\(^{49}\) (Because of this fact, it could still happen at 2;11 that I misunderstood her rendition of \( peg \) as \( big \).)

370. The voiced bilabial stop \( b \), which had been learned 0;7, rather late, and become frequent 0;8, continued without interruption into the speaking stage and was contained in the first imitated word \( ^*Bild \) 0;9. During the whispered phase it competed with \( p \), although usually only in words with standard \( p \). Thereafter it was the normal representative of both \( b \) and \( p \) and remained the most frequent consonant.\(^{50}\) Examining the initial consonants of the 377 words used by the child in the first two years, we find that 71 of them, or nearly one fifth, began with it, more than with any other consonant. It functioned also as the normal representative of consonant clusters containing \( b \) and \( p \) when the consonant combined with them was left unrepresented, as in \( bl, br, bs, pl, pr, sp, fp \). This was always the case, except in the earlier forms of \( pretty \). Possibly it stood also for the bilabial continuant \( m \) in \( mama \) 1;2 before this word emerged in more perfect form.

There are numerous examples of medial \( b \) from B 1;2 (baby), proceeding from \( b, p, br, \) and \( bl \). It is worth noting, however, that in all examples prior to 1;10, the medial \( b \) was supported by an initial \( b \) of reduplicated or semi-reduplicated word-forms. At 1;10-11 it also appeared without such support: \( kaputt \) 1;10, \( sandbox \) 1;10, \( toothbrush \) at 1;10, \( automobile \) 1;11, \( wheelbarrow \), 1;11. The only earlier example of unsupported -\( b- \) is an experimental form of \( Augenblick \) at B 1;7. Final \( b \) did not occur.

371. The history of the bilabial nasal \( m \) is not so simple as might be expected. True, it occurred during the very first month because of the simple fact that the infant sometimes emitted sounds with the mouth closed. Then, however, it disappeared and was not heard again until 0;9. The meaningless babbling combination \( mamama \) was far from being the first; many other sounds had been uttered earlier (340). The babbling sound \( m \); often introduced by a glottal stop, acquired the meanings food, hunger, and “tastes good” 1;1 and continued into the speaking stage. In fact, there was no further stage lacking \( m \). In spite of that, a break must also be registered between the babbling and speaking stages; for at E 1;1, although \( m \) was familiar in babbling, the child did not succeed in producing the same sound imitatively, when I tried to teach her the word \( Mama \); she observed and imitated the closing of the lips correctly, but then released the breath stream through the lips instead of through the nose, producing \( popo \). Soon after, she finally learned \( m \) in imitative words, B 1;2 in \( ^*moo \), B 1;3 in \( Mama \). From then on, \( m \) was incorporated in her sound-system and became increasingly frequent, so that by the end of the year she had used 27 words beginning with it, \( m \) being one of the

\(^{49}\) Pavlovitch 62: \( p \) with gentle release 0;7, \( b \) earlier; but Stern \( p \) 0;8, \( b \) later.
\(^{50}\) For \( b < p \), see Ament, p. 47, and 113 above.
most frequent initial consonants. It was exceeded in frequency, however, not only by the other bilabials b and w, but also by the dental d; h was as frequent as m. Medial m occurred in reduplicative forms like Mama 1;3 and meme, Marion 1;4. 'miki 'mairf, Mickey-mouse 1;10 (but pronounced like two words) and ?otmit, oatmeal 1;11 are the only non-reduplicative words; but there is no evidence that medial m was felt as difficult. Final m, however, never occurred except in syllabic function, as in hm and the negative m-m, nor did it leave a trace in the articulation of the preceding vowel as -n sometimes did.61

372. The voiceless bilabial fricative, not recorded in babbling, occurred only as part of the affricate ph in a rudimentary, vowelless form of pooh at 1;2-4 (369). The affricate should be interpreted as a variant of aspirated p62 which was also used at the same stage. The breath stream was emitted, after the explosion, through a narrow slit between the lips; the failure to separate the lips more energetically constitutes a very minor modification. φ did not survive this experimental stage.63 It is no regular consonant in the standards presented, except in pf, which Hildegard did not learn to imitate.

The same holds for voiced ß. It existed during the babbling stage, at 0;9 (368), but was not continued. At 1;8 it was again observed in one word, Augenblick, as a substitute for bl with omission of the “liquid.” Like the more common substitute w in the same word, it was the result of an assimilation to the v preceding it in Hildegard’s form, since in all other cases bl was rendered by b. At the same stage, the current w for f sometimes lost its gliding character,64 being ß in Fritzschen at 1;8; but neither the voiceless nor the voiced bilabial fricative took a place of its own in the child’s consonant-system. (At the beginning of the third year, ß for f and v became more frequent, but even a year later, w was still the substitute for v in many instances.)

373. The voiced bilabial glide w was not observed at all in babbling, but appeared at once in the first spoken words. The earliest example is at E 0;10, when w was one of the varying substitutes for r in pretty (again B 1;4, modified to y M 1;4 and B 1;6; w for the last time 1;9). At 1;1 it appeared in its most frequent function, as substitute for v, 61 Thus the frequent assumption that m is the easiest consonant for children (Pavlovitch 63, with reference to Stern, Meringer, Ronjat) is not fully confirmed by my observations, and Sully’s suggestion (p. 153 f.) that it is a carry-over from sucking with closed lips loses its point by the interruptions I recorded. On the other hand, I did not find, as Sully did, that m was later replaced by b (cf. however a single instance of b for sm- in schmutzig, 2;1, 118). An interruption is also reported by Hoyer, p. 366: E 0;2, again B 0;5.
62 Fouke and Stinchfield (p. 161) report “apful” 1;10 for “apple” among forms with correct stop.
63 Karla used φ more frequently. At a stage when she had neither an s nor a f it sometimes served as a substitute for both: 1;7 φu, Schuh, shoe, B 1;9 toφt, toast; it stood regularly for sw B 1;10: φη, swing, φithat, sweetheart.
64 Karla used ß even for standard w E 1;9, subsequent to correct w. The bilabial fricative may have been no more than an incorrectly executed glide; but cf. 422, note.
in Wauwau. From 1;5, it was a substitute for r-: Rita. From 1;6 it was the correct reproduction of standard w (first in away), in initial and medial position. From 1;8 it stood for f- also (first example fr, with omission of r).

To take a clue again from initial consonants in the child’s vocabulary, w was one of the most frequent consonants. Forty of Hildegard’s 377 words began with it. It was next in frequency to b (71 words) and d (66 words). This is due to the fact that w, in addition to being a correct imitation of standard w, was a favored substitute for other standard consonants, namely hw, v (also tsv), f (also fl, fr), r-, r- (also 6r-). Its use for bl in Augenblick was not due to regular substitution, but to assimilation. The single occurrence of it for p- in Papa B 1;4 was a playful variant without significance.

Its frequency was bound to be reduced as the consonants for which it served as a substitute were improved in articulation. Thus the substitute for f was from 1;8 occasionally deprived of its gliding character, resulting in f (Fritschen, 372) or even v (Frau, 376); but the improvement was ephemeral at that stage; as a rule w continued to be the representative of f and v, even in new words (fix 1;11, zwei 1;10), until 2;1 (vier with w and v) and beyond.

The voiceless counterpart of w, common in standard American English, did not occur a single time.

374. The bilabial vibrant tentatively transcribed by bw: was common during the babbling stage. It was especially favored at 0;1, 0;2, 0;4–7, and 0;10, not really as a sound, but as an entertaining lip game. It was not combined with other sounds, but stood by itself, except once B 0;2 in egaww. It would have no place here, were it not for the fact that at 1;3 the p of pooh, in the rudimentary form of the word without a vowel, was sometimes rendered by the affricate pw:, consisting of the voiceless bilabial stop followed by the voiced bilabial vibrant. Just like the other variant p6 (372), this sound was experimental and ephemeral, and can be dismissed with a mere mention.

375. The labiodentals (272) were not learned until the beginning of the third year, and even then it took a long time before they became firmly established. The few labiodentals that did occur before the end of the second year must be rated as accidental.

f did not occur in babbling. At 1;8 the diary notes that it was missing “as a conscious speech sound,” which seems to indicate that it did occur as a non-imitative articulation. At 1;10 Hildegard misunderstood Fuss as “tooth.” One might draw the conclusion that she did not even perceive the sound correctly; but it would be rash to do so on the basis of a single observation; f had regularly been reproduced as w since 1;8. It is worth noting that words beginning with f were not imitated by the child at all before 1;7 and very few of them before 1;11. In the first word tried,  

Cf. note to 368.
Frau 1;7, the consonant cluster was replaced by a glottal stop, which amounts to its omission (as explained in 276 under ?-). The phenomenon repeated itself in Fuss as late as 1;11. Omission and resistance to imitation can of course be explained by difficulties of articulation better than by difficulties of perception.

As to the use of f by the child, there are only two instances of it on record (apart from the equally rare bilabial fricative, 372). The frequent word fall 1;11, which otherwise always sounded w3, appeared once as f3, but the voiceless articulation was in that instance favored by deep breathing resulting from physical exertion. In spite of the diary transcription f, I am not sure that it was really labiodental. (At 2;1 the word occurred again with f.) f also was heard once 1;10 in mouth as a substitute for final 0, in place of the usual substitute f; f was followed by a faint off-glide ç. (Final f was learned 2;6 in knife and have; but in the latter word, with unvoicing due to the end position, the f was probably still bilabial. Labiodental f was clearly observed in finger 2;7.)

376. The voiced labiodental fricative v did not occur in babbling. In speaking, it was regularly replaced by w, under which (373) most of the pertinent facts have therefore been mentioned. The only instance of a v articulated by the child is one variant of Frau 1;8, with v for fr-. I suspect that closer observation might have disclosed it to be really bilabial ç, which occurred occasionally during the same month (372). (The first clearly labiodental v, substituting for f-, was observed in vier 2;11, but ç was used 2;4-5 in funny, for, and even at 3;2 v often continued to be represented by the old w. Medial v was b at 3;2.)

The imitation of words beginning with v started much earlier than that of words with f-; but this is due only to the importance which dogs had for the child, leading to the early active emergence of the nursery word Wawau, 1;1. All other words were as late as those with f-, from 1;8 on.

Thus, both labiodental fricatives were practically absent from Hildegard's sound-system in the first two years. They could not be articulated during most of the babbling stage, because the upper middle front teeth were not developed until 1;0-2. The lack of preparatory practice and their compromise articulation unsuited to the contrast pattern caused

56 Hildegard's friend Jasper did not yet pronounce f at the age of 3½ years. Karla had it in the second half of 1;7, but it was probably bilabial to 1;10; at 1;11, however, it was labiodental (note to 125). Pavlovitch 62: f at 0;10. Ronjat 26: f new at E 1;15, -f E 1;17, -f E 1;10. Grégoire (pp. 67, 97, 204, 250) observed f and v occasionally, not infrequently, in babbling 0;0-11, particularly with his older boy, subsequent to b and w. By 1;11, however, they had become rare; they often resembled w or were bilabial fricatives. He explains their infrequency by the fact that they are acoustically akin to w and therefore a luxury (p. 250).

57 Pavlovitch 62: v > w about 0;7, also regularly 1;1; but soon v and w strictly kept apart. Pollock p. 356: "The w is often more German than English, though she cannot have heard the German w spoken" (1;6); this phonetically abominable formulation, clinging as it does to the spelling, means, strangely enough, w > v. Cf. note to 130. For Grégoire, see note to 375.
them to be felt as difficult even when their pronunciation had become physiologically possible. To be sure, w was also missing in babbling; but the lips had been exercised sufficiently to make this substitute easy.

377. The dentals (273), in spite of their name, depend less on the presence of teeth, since most of them can also be articulated against the alveoles.

The voiceless dental stop t occurred first in babbling at B 0;9, which was the month when the first voiceless consonants were heard after the cooing phase. Among the first spoken words were some containing a precisely articulated t: *pretty 0;10, Tick tack 0;11 (in the latter with strong aspiration, 134, sometimes almost ts at 1;0–3). Early it stood also for k: *kritze 1;1, *kiek 1;1, 1;3, *kitty 1;3. In the latter word the closure was imperfect, resulting in affricates similar to ts or tf. This is less surprising than the fact that t was often articulated so precisely at this early stage. After the stage of prevailingly whispered words, t receded for a while, consonants taking on the voice of the vowels following them. d was therefore much more common at this later stage. t, however, reappeared just before the second half of the year.

There are forerunners of this later development. The important word bitte, which was learned E 1;5 in very deliberate pronunciation with conscious imitation of each syllable by itself, contained a clearly articulated medial t from the beginning; it was rarely assimilated into d later on. Cookie had t from 1;6 in both syllables; the dominant t was that substituted for medial k, since the vowel of the fully reduplicated first form was also that of the second syllable. Final t was first correctly reproduced in the ephemeral word *natt-natt B 1;6. In Bleistift the t of the cluster ft was t at 1;6, but reverted lastingly to d from 1;7. There are a few more cases in the following months, including the frequent word Auto, which had t always from 1;7. In general, however, t was not used often until 1;10, when it became more and more frequent, both as a substitute for other consonants and as a correct representation of standard t. Substitutes, particularly d, were however not yet displaced regularly. Addition of final t, which had previously been generally omitted like other final consonants, also became frequent from 1;10.

T stood for standard t (also tr, ts, tf; st, ft); or; k (also ks, skr, skr, ks; rk, sk); that is, for dental and palatal-velar voiceless stops and for the dental voiceless fricative. Only in final position did it occur for s (in one word, this; 1;8–2;1)88 and g; because of the regular unvoicing of final

88 Karla used t regularly at 1;10–11 for final s (nut, nass) and even for medial s (etite, essen); cf. notes to 169 and 172. Notice that in Hildegard's speech t never stood for f, as it often did in Grammont's observations (p. 71). At 1;6 Hildegard's interjection s, well established since 1;0, often varied to tf and t' (riding motion). I would not dare to call this t' a phonetic equivalent of f. The interjection was in process of being replaced by more specific synonyms, choo-choo among them. t' may be the budding choo-choo 1;7, which recurred in the same form at 1;8, either as a reflection of this new word or as a direct imitation of the sound of a starting train.
consonants, g could become t, just as k often did. Initial t was sometimes aspirated in Ticktack at the whispered stage 1:10-3 and in *kiek B 1;3. Final t was at first aspirated when its addition was still a conscious innovation, especially at 1;10, but also at 1;11. Otherwise t lacked aspiration, although it is, in initial position, aspirated in both English and German.

378. t also formed part of affricates in the child's sound-system. tf occurred syllabically 1;6 as a variant of f indicating a riding motion.68 It was used in final position as a substitute for s in juice 1;7. It was learned 1;8 initially and medially, reproducing standard tf. At 1;10 it occurred once as a substitute for standard final ζ in *weg. At 1;11 it functioned in final position for standard tf and as a substitute for dz, s, and f.

ts occurred accidentally at B 1;10 in over-aspirated t'-t', a rudimentary form of Ticktack. It was recorded at a surprisingly early stage in the whispered word *kritze 1;1-4, it was not clearly distinguishable from tf, however. At 1;3 *killy was imitated as didi or titi, but imperfect closure of the stops resulted often in the affricates ts and tf. In final position, ts stood once for t in bite 1;11 and once for s in whispered *heiss 1;5. Most of these instances (all except heiss) are no more than abortive pronunciations of t, even when they accidentally corresponded to standard ts, since s was missing in Hildegard's phonetic system. tf did not stand for t, but was sometimes a variant of the more frequent substitute f. In other cases, however, it reproduced standard tf; it was really learned, although standard tf was not yet rendered correctly in all instances.

The only other consonant cluster with t which was learned was final xt, if we can trust the scanty evidence.69

379. The voiced dental stop d occurred much earlier than t.60 As an accidental sound it was heard as early as the cooing phase, E 0;1;1. In babbling, d was the first consonant approaching precise articulation, 0;6, three months before t. At 0;7-8 it was the most frequent consonant combined with vowels. At E 0;8 it yielded in frequency to b, but continued

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68 Pavlovitch (61 and 64) observes t during babbling, later than d. By 0;7 it is well established in one spoken word. He describes it as semi-voiced, which probably means voiceless with gentle release. First final t imitated 1;5 in one word, but in the form t'. Ronjat (25) finds t, d and soft t present at B 1;3. Final t was pronounced correctly from B 1;3 (9); previously final consonants had been assimilated to the initial consonant of the same word, a phenomenon which has hardly a parallel in Hildegard's speech. tf was attempted by Pavlovitch's son (69) at 1;1 or earlier (the time indications seem to be garbled) and achieved with approximate correctness by 1;6. ts was much earlier. Grégoire (p. 58) reports tj, ts, tf in babbling (0;10) as consequences of inaccurate articulation of t (likewise dj for d).

60 Stern (pp. 16 ff. and 82 ff.) observes during the first year only d for his daughter 0;9, both d and t 0;7 for his son. In the first spoken words he reports d < t M 0;10, d < d M 0;11 for his daughter, d < d 0;9 (t not until M 1;10) for his son. Grégoire (1933, p. 378 f.) records t and d to be occasional substitutes for p and b from 0;9 in the case of his older child. His younger child used them frequently from 0;8; at 0;11 they were more common than the labials.
without interruption into the speaking stage. It was contained in the first demonstrative interjections, *there 0;10, da 1;0, and in other primitive words. t competed with it to a limited extent from B 0;9, but the position of d was much stronger.

Of the total vocabulary of the two years (377 words), 66 words began with d, nearly as many as with b (71). If we add those beginning with t (11), we find 77 beginning with a dental stop as against 79 beginning with a bilabial stop, nearly the same number. This should be done since the voiceless variant was, for most of the time, in both categories no more than just that, a variant; a deliberate distinction between voiced and voiceless was just beginning to develop at the end of the second year, for the dental stop more definitely than for other stops (309).

Medial d occurred very early in quasi-replicated forms (*Tante 1;1, *Gertrud 1;1); without such an effect from 1;5 (Auto).

Since d was much more frequent than t, the list of consonants for which it served as a substitute is much longer. In addition to the instances in which it rendered standard d (also dr, da, d3), it took the place of t (also tr, ts, tf; st, ft, str), ð, ð (also ør), g (also gl), and k (also kr, kh, skr), that is to say, it stood for voiced and voiceless dental and palatal-velar stops and for both dental fricatives. This list includes nearly all the prototypes of her t (377), but not -s and -g, because voiced d could not stand in final position. In addition, it contains the voiced equivalents. On the other hand, although final t became rather common in the last two months, final d never occurred, nor was standard d in this position ever replaced, with the regular unvoicing, by t; it was always omitted (148).

In addition to its isolated occurrence, d also formed part of the affricate d3. It always resulted from voicing of standard tf and did not occur before 1;8. Standard d3 was simplified to d (145).

380. The dental stop with nasal resonance, n, was acquired late. It never occurred during the pure babbling period. Its first occurrence was at E 0;10 in the scolding interjection *nenene, which had previously had d. This “word” did not continue, nor did its articulation pave the way for the imitation of standard n. The latter was not even attempted before 1;5, and then it was not imitated correctly for about a month, but replaced by substitutes described under ð (396). The correct n was learned 1;6. It was always an imitation of standard n, standing also for the initial consonant clusters kn, sn, fn, the element preceding it being omitted. Only in one word, Onkel 1;8, did it stand medially for standard ðk. Medial n was used as early as initial n in reduplicative words, one month later (1;7) also in the non-replicative word meine; this remained exceptional since medial n was normally omitted (154). Final n, which was regularly dropped, was pronounced a few times, with conscious effort, in mein 1;7 and 1;11 and *nein 1;7 and 1;8. These instances are interesting because they show that the child heard correctly and was able to articulate the final n. The reason for its usual omission must be
psychological, lack of attention to the end of the word or lack of concentration on the articulatory effort; both explanations amount to the same thing: the end of the word seemed less important to the child; a vocalic ending was felt as more convenient (cf. 156). Hildegard's n was not combined with other consonants; it was not used syllabically. 61

381. The dental fricatives need not detain us long. Hildegard never used them during the first two years. (The diary notes that 3 began to be learned at 2;4; but the process was very slow. It was usually replaced by d for another year. At 3;3 d improved to 3 in mother, 62 whereas θ was still replaced by substitutes. 62 At 3;6 3 was correct, at 3;7 also θ, but not yet in initial clusters. θ was the last sound which caused difficulties.) The dental fricatives were obviously difficult for Hildegard, as they are for other children, 63 although they would seem to be physiologically at least as easy as other fricatives after the upper middle teeth are developed.

382. The group of the alveolar palatals (274) is composed of the fricatives s and f and their voiced counterparts z and 3. Of these s and z remained practically inactive, whereas f was very common and 3 not infrequent.

s was articulated once, by accident, in a babbling combination E o;6, whereas f never appeared during that stage. It was not repeated, however, and occurred later, in speaking, only as a by-product of unsuccessful imitations of other consonants, and that rarely. Thus at B 1;0, when f was being learned, s was heard once among the first timid attempts to imitate f. The instances of ts, usually unsuccessful attempts to pronounce t, B 1;0-1;11, are assembled in 378. If we add that ps was heard o;10 among the first experimental imitations of pr in pretty, we have completed the enumeration of the accidental occurrences of s. Note that it was not articulated by itself after B 1;0 in these instances, but only in the clusters ts and ps. The diary reports for 1;4 that s was not used in real words, and for 1;7 that s, approximately correct, was heard occasionally instead

61 Pavlovitch 63: imitative n- correct before o from E o;8, but before a changed to m until 1;7; -n dropped, causing nasalization of vowel (cf. note to 156). Grégoire (1933, p. 382 f.) also reports long use of m before acquisition of n. He found n in babbling, but at first only as a variant of the older m (in his book, p. 71 f., cf. also p. 248).

62 Karla also at 3;3.

63 Grégoire (1933, p. 379) found θ at o;8 among the sounds of a French-speaking child who teether early. Pavlovitch (64) describes an early voiced "interdental" d, which he calls, nevertheless, a stop. As imitative speech-sounds, the dental fricatives are generally very late; cf. Wellman, pp. 57 and 78 (children 2-6 years old). Morrison found θ incorrect in 49% of 218 children 5-7 years old; she characterizes this specifically as not being a speech defect. Röttger uses θ which surprising frequency in his transcriptions of words of 29 German children, one and a half to three and a half years old. I have not much confidence in his phonetic observations. His symbol corresponding to θ probably represents varying forms of imperfect s. Holmes, whose observations are trustworthy, records -θ as early as 1;10 (p. 222 f.), usually as a substitute for other fricatives, including f, at 1;11 (p. 224). Hills (p. 100) found, conversely, f functioning as substitute for θ until age 7. In Davis's analysis (p. 35 f.), difficulties with specific sounds concern primarily θ (and θ?) at the 3½ and 6½ year levels.
of $f$; but no words are given to illustrate it; $s$ remained accidental.

$z$ never occurred at all.

For the comparative chronology of $s$ and $f$, see 384.

383. $f$ was completely missing during the babbling stage. It appeared at the very beginning of the speaking stage among the experimental substitutes for $r$ in *pretty 0;10, more or less by accident. From B 1;0 it began to be learned as an actual imitation of $f$. The sound was presented to the child by itself in a "railroad" game which her grandfather played with her (vol. 1, p. 121). The imitation was at first timid and inaccurate; but by the end of the month the articulation was approximately correct. The sound must be considered as acquired by E 1;0, but it remained restricted to cases like the preceding for several months. At 1;1 $f$ occurred once experimentally in *danke schön, $f$ standing for the whole second word. At 1;6 the interjection $sk$, which came to function like the verb "sleep," was added. $f$ still stood by itself. That is the reason why *shoe, *Schuh was acquired in the form $f$ 1;6, ?if, ?13 1;7, without the standard vowel; the $i$ was no more than a palatal vocalic on-glide developed out of $f$; it also appeared later in fuller-bodied words (385). $f$ could not yet be pronounced in combination with other sounds, apart from renewed accidental occurrences in *pretty at B 1;3. The $f$ in *shoe did not remain stable. From the time when a vowel was introduced after it (1;8), the consonant was voiced to $z$ and often modified to $j$. To the end of the second year $f$ was never used initially before a vowel* (about *tf-, see 378 and 387).

At 1;7 $f$ was learned as a consonant which could be combined with other sounds, but only in final position as a substitute for *$s$, in *Eis, *heiss, and *juice. It occurred frequently from that time on. One month later, it was in this position also the correct reproduction of standard $f$, in *wasch, *wasch(en), *wisch(en). Final $f$ became exceedingly frequent. In addition to rendering $f$ (also *tf), it served as the normal substitute for $s$ (also *ns, *ts), $z$ (also *dz, *nz, *lz), $\theta$, and $\delta$. Occasionally it stood, in addition, for $i$ and $sk$; the latter means, of course, $s$ with omission of $k$. Final $f$ was therefore the substitute for all fricatives articulated with the tip of the tongue, and occasionally even for the voiceless labiodental fricative *.

Medial $f$ appeared at 1;9, but it remained rare. The first instance was a single echo of *weisser. $f$ became medial in *wash 1;10 and *ask B 1;11 in accidental forms because of the fact that the off-glides $i$ and $u$, developed out of $f$, were added after it; these were really variants of final $f$, which also occurred in pure pronunciation in the same words at the same time. Medial $f$ was used in *difs $1;11$, which might be a rendition of *this is;

Röttger, analyzing phonetic representations according to the principles of Gestalt psychology, would undoubtedly say with regard to Hildegard's form $f$ for *shoe, that "the experience concentrates itself into the shape (Gestalt)" of the sibilant (p. 64). While this interesting psychological explanation deserves serious consideration, I am convinced that our physiological explanation (which has, of course, also a psychological background) is, in view of the other examples illustrating the behavior of $f$, more to the point.
but this was late and not the only form of the phrase; besides, this \( f \) could well be called final. The only word in which medial \( f \) was used regularly was jafut, sun-suit, which was learned as late as E \( r; i11 \). Thus medial \( f \), apart from a single echoed word at \( r; 9 \), was not acquired until \( r; 11 \). It functioned as a substitute for \( s \) (also \( sk \)). There is no instance of standard \( f \) remaining medial in Hildegard’s word forms (184).

Before \( r; 11 \) her sound-pattern allowed \( f \) only in final position or unaccompanied by any other sound. That explains a number of striking facts: her speech contained no word with initial \( f \) except the two interjections sch and sh, in which it stood alone; sh was not improved when it had acquired the definite meaning “sleep”; initial and medial \( f \), when it was reproduced, caused the rest of the word to drop off: *(danke) schön \( r; 11 \), shoe, Schuh \( r; 67 \), *Tasche \( r; 10 \), *Hase \( r; 8 \), Füsse as late as the second half of \( r; 11 \) (in the last two words as substitute for \( z \) and \( s \)); most of these words were ephemeral, because their inadequacy was felt and the sound-pattern did not allow improvement; the only lasting word, shoe, Schuh, easy to pronounce as it may seem objectively, struggled painfully toward a more standard form (with reproduction of the vowel following \( f \)), which it reached E \( r; 8 \), but at the sacrifice of an inaccurate rendition of the sibilant and only through the transition-stage \( 3i, j1 \), with a vowel evolved from the sibilant itself.65

384. Thus, even though \( f \) was restricted in its function until near the end of the second year, it definitely formed a part of Hildegard’s sound-system from \( r; 0 \), whereas \( s \) occurred only by accident.

It does not surprise me that \( f \) became active much earlier than \( s \). In Hildegard’s case the acquisition of \( f \) was aided and probably accelerated by its use in the game which was the root of the interjection sch. This game did not necessarily lead to the learning of the sound (cf. the failure of the attempt to repeat the process with Karla, vol. 1, p. 121, note 255), and even without this help \( f \) would probably have been learned first. Whatever the exact articulation of \( s \) and \( f \) may be,66 it seems to be a fact that \( f \) is produced with a broad blade of the tongue and \( s \) with a finer adjustment which requires a severer control of the tip of the tongue; in other words, \( s \) seems to be objectively more difficult than \( f \).67

Nevertheless, children do not always acquire \( f \) earlier than \( s \). In the literature on children’s speech, it is found that they often do;68 but even

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65 Karla’s difficulties with the same word (vol. 1, p. 122, note 258) yield to the same explanation, although her solutions were different.

66 Greatly diverging descriptions are discussed by Viëtor 83 ff. Cf. also Kenyon 189 and 194.

67 The same view is implied in Gutzmann’s description, p. 14. It should be remembered that intoxicated persons are said to replace \( s \) by \( f \).

68 Karla learned \( f \) before \( s \), but first in the form of the substitute \( c \) B \( r; 18 \), \( s \). This was the forerunner of \( f \), clearly more closely related to it than to \( s \); \( f \) was correct first in medial position, in house-shoes M \( r; 111 \). Jespersen (p. 107) lists \( s > f \) among normal substitutions
more often s is both earlier and easier than f. In some cases the chronology is not in harmony with the degree of difficulty which the two sibilants present. This wavering in the sequence of s and f was neatly stated as early as 1895 by Sully. Jakobson was therefore, on the basis of the available evidence, not justified in stating as a universally valid principle that f presupposes the existence of f or s; Hildegard acquired f much earlier than either.

385. By its primary place of articulation, f has a kinship with r, both being palatal sounds produced with a narrow opening. This explains the fact that Hildegard's final f of whatever provenience developed rather frequently a prothetic r, an on-glide due to a momentarily faulty position of the tongue at the beginning of the fricative. In the word shoe, Schuh 1;6, in which f alone was rendered at first (383), this r came to be a stressed vowel 1;7. In the struggle to achieve a more nearly standard form of the word, it was even transposed behind the fricative, which had in the meantime become voiced, 1;8. In all other instances it was a transition vowel fused with the preceding stressed vowel into a diphth.

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at 2;0. Lewis (1938, p. 168) records the substitution s>f for a boy at 2;3. Major (p. 312) reports -s>f in "glass" >"gash" 1;11. Preyer, p. 246 (third Friedemann child): "Kuss" >"kusch" 1;9; "sch generally used instead of s for months." Grégoire's older boy (p. 204 f.): s>f 1;8.

68 Pavlovitch 68: s o;10, s>f to o;11, f 1;6. Schultze p. 35: s before f; he assigns s to the second, f to the fourth of his six stages of sound-learning, but with the proviso (pp. 36, 45) that the recorded material is not yet (1880) sufficient. Grégoire (1933) p. 387: s and z present at o;8. Jegi, p. 247: z>s in all positions, about 2;0. Stern (pp. 322, 338) collects many examples for f>s from the literature and makes the unwarranted generalization that f>s "almost without exception" and that f is one of the latest sounds acquired. Preyer found f to be "often imperfect or wanting" at 2;0 (p. 152), omitted or changed to s 2;2–8 and later (pp. 166, 168, 174, 177-179, 182, 184). It was occasionally correct at 2;5 (p. 177), but still difficult at 2;7–8 (p. 181 f.). His child "very often failed to produce it as late as the first half of the fourth year" (p. 247); cf. also note to 182. Grégoire's younger boy (p. 204 f.), in contrast to the older, replaced f by s, but the s was imperfect and leaned toward f; he learned f from M 1;11. f was relatively rare at the end of the second year (p. 250), whereas s is described as one of the most successfully imitated sounds, next to the stops, especially in the case of the younger child (p. 211). Even for Hildegard it can be claimed that s was earlier than f; it occurred in babbling (once E o;6) whereas f did not, and as a faulty imitative sound o;10 as early as f. The situation is, however, reversed when we consider both sibilants as real ingredients of the active sound-system. I wish to emphasize that Hildegard's sound was almost at once a real f, not a sound resembling c (Karla did use the latter for an extended stage).

69 Bloch (1913, pp. 44–48) observed s (B 1;8) one month earlier than f (B 1;9); but f prevailed later on and displaced s almost completely 2;0–1.

70 P. 152, note 1: "I find according to the notes sent me that the sounds s and sh develop unequally in the cases of different children. Some acquire s, others sh before the other."

71 P. 39. The explanation is probably that Jakobson's grouping of f with the back consonants is not correct. s and f should be kept together in the sound-pattern, as is done in the conventional arrangement, which Jakobson attacks; or, perhaps better, f should be said to partake of the characteristics of both regions and to waver between them.

72 Cf. Viétor 85, notes 1 and 3.

73 No such observation with Karla,
thong. The following are the examples:

\( \text{af} < \text{af} \): wash, wasch(en) at 1;8 (187).
\( \text{af} \): brush at 1;10, toothbrush at 1;10 (187).
\( \text{af} \): much at 1;9-10 (143).
\( \text{as} \): nass E 1;8 (172).
\( \text{aus} \): Maus, mouse at 1;8-10 (172).

\( \text{of} < \text{onz} \) or \( \text{on} + \text{s} \): stone(s) 1;11 (157, 178).
\( \text{us} < \text{us} \): juice at 1;7 (172).
\( \text{us} < \text{us} \): juice at 1;7 (172).

\( \text{uz} \): shoes at 1;11 (177).

\( \text{tfs} \): *church 1;10-11 (143).

For \( \text{urs} < \text{uz} \) see 386.

It may be significant that in two of the three first words in which -s was learned (Eis, heiss), the diphthong af preceded the final consonant in the standard form. This may have led to the establishment of the habit to pronounce an i before the final s, so that the third early word (juice) and many later ones were also made to end in fs. Notice that af was the most frequent combination of this kind. In many cases, these forms were later superseded by corrected ones ending in s without the on-glise. fs was most common from 1;7 to 1;10, but the inaccurate rendition was not yet completely overcome at 1;11. It is surely more than an accident that fs never appeared after a front vowel, with the exception of low front a. All instances of af were, however, corrected before 1;11, whereas fs persisted into the last month after mid and high back vowels. The pronunciation of s was more difficult to hit exactly when the preceding vowel was articulated in a distant place, back or low front. The front vowel e was, however, also affected by a following s, in a different way. In the word dress 1;10, it was first rendered by a, then corrected to e, but returned E 1;10, lastingly, to a, a substitution which was otherwise made only before l (29). The reason might be that the combination af, proceeding from af, had at that time just been learned in a number of words and was, with its span between low and high front sounds, more satisfactory to the child than fs with its more subtle contrast (462).

Once i was an off-glise instead of an on-glise, in ?as, ask B 1;11; this form did not last.

386. s may also have a secondary affinity with u, as claimed by Stumpf. Hildegard once 1;10 said an English sentence containing the word wash with the off-glise u added after the s. The fact that -lz was rendered by uf in balls 1;11 (204) should, however, not be explained by this circumstance. Here the u was derived from the velar l, as is definitely proved by the fact that the first plural form of the word was buuf, with the palatal on-glise for s. The affinity with u did not help to make the pronunciation of Schuh, shoe easy for the child (383).

\( ^{n} \) Quoted by Jakobson, p. 64, note 3.
387. The affricate tʃ has been treated in 378. It occurred in isolation at 1;6, combined with other sounds from 1;8, both a little later than ʃ in the same positions.

388. ʒ, the voiced counterpart of ʃ, was less frequent, but was definitely incorporated in the sound-system. It occurred as a rule only in initial position, where ʃ was not used. Its acquisition was late, the first instance being at 1;7 in ʔ13, a variant of Schuh, shoe at the time when its regular form was ʃ. This form is very unusual, since final voiced consonants did not otherwise exist in Hildegard's sound-system. It is explainable only by the fact that ı was an on-glide; the child was not conscious of its presence. The form was experimental. A month later the prothetic vowel was transposed behind the fricative, which from then on never occurred in voiceless form any more. This was due to the voicing of consonants before vowels which was so frequently observed. The articulation was not quite stable; ʒ often varied to j ı;8–ıı, but ʒ was more frequent. It was always the result of voicing of ʃ, representing standard ʃ, tʃ (church) and possibly ts (zu). Remember that ʒ is rare in standard English and practically unknown in German. 76 (ʒ and j seem to have been felt as one phoneme. At 2;ı even standard j in you was changed to ʒ.)

389. The affricate dʒ, much more common in standard English, also existed in Hildegard's speech, but not as its imitation. Standard dʒ was always replaced by d ı;7–ıı, just like dr and dx (145). Her dʒ represented tʃ voiced before vowels, ı;8–ıı, in initial and medial position (136 and 139).

390. Her clicks (274) were, to be sure, not alveopalatal, but they could be either alveolar or palatal. 77 Usually they were the latter. Other varieties occurred.

Clicks belonged to the earliest babbling sounds. The first palatal click was articulated at the end of the second month. A few days later, B o;2, she twice made clicks with the mouth completely closed. Clicks produced by me for her entertainment interested her. At o;8 she practiced very frequently a vigorous click produced between the hollowed tongue and the upper lip. Immediately after she had learned t, on the first day of o;9, she repeatedly produced a click in isolation at the place of the t, the alveoles or the front palate, and continued it as a game. At o;10 she would occasionally repeat the familiar palatal click when it was pronounced for her, while she refused to imitate new sounds. This playful sound passed over, without interruption, into speech function at the same

76 It is a common sound in French. Grégoire's older boy also was uncertain about its production: j ı;7, s ı;8, j ı;9, ʒ ı;ı , whereas the younger's substitution differed more from Hildegard's: he replaced it rather consistently by z ı;6–ıı (sometimes modified to s) (p. 204 f.) Both ʒ and ʃ were relatively rare by the end of the second year (p. 250). Pollock: ʃ and ʒ ı;6; Pavlovitch: ʒ acquired ı;5–7 (68).

77 Grégoire (p. 100) records alveolar clicks for his older son at o;10–ıı; for the younger at o;9 and o;11.
stage. Without immediate preparation, she used it as a response to the summons, “Call the squirrel,” where adults indeed use the same sound. Thus it had begun to be a “word.” Its later history is found under tsk, tsk (vol. 1, p. 127). It remained active to the end of the second year. Of course, it was never combined with other sounds, because the standard models do not know it except in isolation. In the one word in which it acted experimentally as a substitute for another sound, Ticktack at E o;11, the remainder of both syllables was omitted at the same time so that the word consisted merely of a double click (i34).

391. The category of “liquids” (275) was not yet developed in Hildegard’s speech. I appeared sporadically, but r and r were missing from her speech in the imitative stage.

During the babbling stage, pronunciations reminiscent of I were heard, but in no case were they confidently described as I. The first two-syllable babbling combination a:l ga: o;1 had a first vowel pronounced with some raising of the back tongue that made it strike the ear as something like an I; but that impression was so vague that it was not reflected in the transcription chosen. On the last day of o;1, the front part of the tongue was more active; the babbling combination hilda contained a sound close enough to I to be so transcribed. It was not until o;10, when imitative speaking had already begun, that I was again recorded as heard in babbling, still without confidence. Thus I can hardly be said to have occurred in babbling.

In imitated words I appeared at 1;5, initially and medially, in the two words *klingelingeling and hello, but its articulation was as yet awkward and imperfect. At B 1;6 hello had an I described in the diary as “strongly velar.” The articulation did not reproduce the standard one quite correctly, but it was close enough to English I to consider the latter acquired at 1;6. This does not mean that henceforth standard I was reproduced correctly. Far from it; I was usually rendered by more convenient substitutes (307); but it continued to occur in Hildegard’s speech intermittently for the remainder of the year, and must be recorded as a feeble ingredient of her sound-system. The -I- remained velar for several months, even in the frequent German word alle 1;7. Not until 1;10 was the I of alle described as the correct flat German I; during 1;8–9 the substitute j had been used as a stepping-stone from velar to palatal I.

78 Jakobson (p. 74 l.) says that liquids are more complicated than nasals and therefore much later. Their complex character makes them less suitable for being contrasted with other consonants.

79 Ripman (p. 139) claims that I is an early sound of child speech. Sully (p. 153) recognizes that the articulation of I must involve difficult muscular combinations as it is avoided by “all children alike.” This is an exaggeration. Grégoire (p. 98) found his first boy to use I occasionally and accidentally in babbling o;7–9 and o;11, as a variant of labials during the stage of teething, which favors activity of the front part of the tongue; it was rarer with his second boy (p. 99) o;9–10, but resulted in part from imitation, tr>d; usually I was replaced by j, even in final position. Bloch (1913, p. 46) found I to be in general rather fixed,
tial I, not strikingly different in English and German, occurred sometimes from 1;10.

It is quite in agreement with the as yet uncertain position of the consonant in the child’s sound-system that I, wherever it did occur, reproduced standard I. It was not strong enough to assert itself as a substitute for other consonants. The only instance where I did not stand for standard I is in the word water, which was waɪɪ 1;8, walu 1;11; but here it was not a substitute for t; the word was deflected from its normal phonetic course by associative interference of bottle, balu.

Hildegard never used I in final or syllabic position. Standard I in such positions was either changed into a vowel or made medial by the addition of a vowel (191–194, 202–204), as in the word just mentioned.

392. The uvular r, classified for convenience with the “liquids,” occurred only in babbling, never in speaking, although the German presentation contained it and Hildegard learned to articulate it later in life (beginning at 5;3). It was one of the very first consonantal sounds which she produced 0;1 while lustily stretching her muscles. Most of them were velar and uvular fricatives and affricates, but sometimes they were modified into a uvular r. At E 0;1 the characteristic cooing combination ru: contained it again. Then it was not observed for more than half a year. At 0;8 it was heard once more and recorded as a new sound; upon closer examination it was found to be not a uvular rolling sound, but a velar fricative with vibrations caused by saliva (spit-bubble r). The next and last recorded instance is in the babbling syllable grek, late in the speaking stage, 1;3.

During the speaking stage, the x of the first experimental form kxakxa 1;7 for cracker might be thought of as a fricative variety of r as a substitute for r. I confidently reject this explanation. The affricate was an unsuccessfully articulated stop. The word soon (1;7, 1;10) settled into a form with a stop and no substitute for r. Although I used the word in speaking German for want of a German equivalent, I did not adapt the pronunciation to German speech form by substituting kr for kr, but maintained the English pronunciation.

but noted from B 1;11 a transitory tendency to palatalize (“mouiller”) it; it was velarized only at B 2;10, very rarely. Hildegard’s velarization was thus probably due to the English model. Schultze (p. 35) assigns to l a place earlier than s and f. This is not confirmed by Hildegard’s sound-learning. She used f regularly from 1;0, I not until 1;5 or 1;6, and then not as a well established consonant.

80 R is frequently reported to be among the earliest sounds of infants of different nations. A detailed discussion can be found in Grégoire (1933, p. 376 f. and book, pp. 32, 97, 212 f.). His children used the r much longer, as late as E 1;7; but both lost it for several months before reacquiring it imitatively. Cf. also Ripman 32.21.

81 I have found only one previous description of such a sound: “The saliva running back in the throat is often utilized [by the infant during the first year] to produce a gurgle which it is utterly impossible to represent, but which is continued and prolonged with evident pleasure” (Lukens, p. 435).
393. The tip of the tongue likewise does not appear in the survey 275, because it did not become a regular speech-sound of Hildegard's. It did occur, however, never in babbling, but in imitative speaking in the single word pretty B 0;10–B 1;0. On its first occurrences, the word was slowly and deliberately articulated sound by sound, the r being a "briefly rolled tongue-tip" consonant. It did not remain stable, but soon took the form of a variety of fricatives. r, however, continued to occur in this word, at E 0;10, E 0;11, and B 1;0; at E 0;11 it was sometimes used without the support of a vowel, syllabically (356). Thereafter the r subsided and was replaced by substitutes, particularly w. When finally the word lost its prominence and was not used so often by itself any longer, but became a real adjective pronounced with voice, it fell in line with the child's general speech-habits, and no longer contained any trace of the r.

The word is of interest because it shows that Hildegard was able to hear the sound correctly and to produce it. The reason for the simplification of the cluster pr is neither an acoustic nor a physiological inability; it is due to the fact that consonant-clusters were in general still foreign to the child's simple speech-pattern (407).

394. The palatals and velars (276) of the child present a more varied picture and were used more actively.

During the cooing phase, a pure k was not registered, although g occurred. k was, however, used in the velar affricate kx, which was often lettered by itself very early as an accompaniment of muscle stretching exercises (0;1) and entered into the characteristic combination ukxu: (B 0;2), which has earned the cooing phase its name.

In the later phases of babbling, k was missing for over half a year, since front sounds held the field after the end of the brief cooing phase. At E 0;9 she once uttered the combination ka, the stop of which was specifically designated as the first occurrence of k. This was at the end of the pure babbling stage. The first imitated word occurred on the same day.

k was heard several times in the earliest speaking stage, though now in final position: tak, Ticktack E 0;11 and echoed qank-f, danke schön 1;1. k had entered into the child's articulatory experience, but was not yet integrated into her habitual sound-system. At B 1;3 final k was heard again in the playful syllable gekek; the diary notes on that occasion that

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82 Schultze (p. 35) assigns r (or R?) to the fifth stage of consonant acquisition, earlier than g, k, and g, which are in his sixth and last stage. This is not confirmed by my observations. Karla, however, learned r much sooner than Hildegard. She pronounced a gently trilled tongue-tip r at 1;6 in the name Vira, Sira, much like standard American r, only slightly more trilled. Ripman (p. 139 f. and 32. 21) enumerates r among the sounds which are difficult for most little children and are therefore learned late. Grammont (p. 79) finds r to be very good in all positions at z;0, late, but earlier than Hildegard.

83 Karla never used k E 1;1, whereas g occurred occasionally.
palatovelars occurred in babbling, but not in conscious speaking, with the exception of ɣ. Later 1;3 final k was recorded for both syllables of whispered *Tick-tack*; but this pronunciation remained isolated; the regular form of this frequent word lacked the final consonants whether it was whispered or not, even to the end of the second year. At 1;6 *keke*, which functioned like “candy,” but was probably based on *cake*, contained k. At 1;7 *cracker* contained the velar affricate kx twice. Both forms were experimental and did not last. The affricate kx, strongly articulated, occurred twice 1;7 by itself as a reflex interjection with reference to a bad taste (it occurred 1;10 with postpalatal x). k was still said to be generally missing from imitative words.

During the second half of 1;8 k was at last registered as being used consciously, even with a specific date assigned to its first occurrence. Since then she used the word *cocoa* correctly, the k being unaspirated, like t at the same stage. The learning of k was thus a slow hesitating process; it was not consummated until 1;8, which should be called the month of its acquisition. From then on it became gradually more frequent. It entered into her form for *dunkel* B 1;9, was at once correct in *bacon* 1;9, and appeared B 1;9 in *broke* in final position, here with aspiration. Substitution of final aspirated k for standard t was observed in several words sooner than the well-known substitution of t for k, but the latter also appeared, later 1;9, in *paitte*, *Eiskrem*. For the remainder of the year t (or initially d) and k were both used as representatives of standard k in all positions. k was weakest initially, more common medially, and (just as in its first tentative phase E 0;11–1;3) strongest finally. In fact, initial k was less frequent at 1;11 than in the first months after its acquisition (213). (At 2;7 it was still noted that k was generally correct in the middle and at the end, whereas in the beginning of a word it was regularly replaced by t. At 2;11 initial k was nearly in balance with the t substitute.)

Hildegard’s k stood frequently for standard k in all positions, even normally in final position. This includes occasional instances of k for kr, ɣk, ks. In addition it was occasionally the substitute for medial x, f, tf, frequently for final g and x, and occasionally for final t, st and even p.

For the rare affricate kς, see 397.

395. ɣ was earlier in babbling than k because in the period between cooing and 0;9 only voiced consonants were used by the child. During

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44 Bloch (1913) p. 41 f.: k begins M 1;10, alternating with substitute t, which continues at least until 2;11; children generally have difficulty with k and ɣ, often up to 5–6 years. Schultz (p. 34) includes both sounds in the sixth, hardest stage. Ronjat, p. 17 f.: g and k at first present in both languages; lost 1;2; omitted initially, replaced by glottal stop medially, remainder of second year; reacquired 314. He reports the familiar replacement by d, t after 1;2 on p. 24. Jakobson (p. 40 f.) explains the substitution of k for t as a feature of hypercorrectness and states that k and t at first merge into one phoneme in the development of child language and are later separated into two phonemes. This view appeals to me as a very useful principle; it explains individual discrepancies.
cooing a back sonsonant similar to it had been articulated (ɔːr-B ɔː2), but the movement of the tongue which interrupted vocalic sounds was still so vague that the transcription chosen is g or Γ with no assurance as to the exact manner of articulation. Somewhat more precise voiced consonants were registered ɔː6, among them some which were described as very similar to palatal ɡ. Consonants resembled d and ɡ to ɔː7, but by E ɔː8 ɡ was no longer heard, b having pushed itself into the foreground in the meantime. There was no g for seven months. It was learned anew B 1;2, still in babbling combinations, but by now in precise articulation. It occurred in both palatal and velar position, since it entered into such combinations as gaʌɪ (B 1;2) and grek (B 1;3).

In imitated words g appeared once at the same stage in an ephemeral experimental form of the name *Carolyn E 1;2. It was at once given up in this word and remained in abeyance for about 5 months. Then it appeared again in both syllables of cracker 1;7. The latter month should be considered the month of acquisition; it was one month earlier than the mastering of k. The voiced stop, however, was never a correct rendering of standard ɡ. It was always a substitute for k (also kr). As such it occurred initially in the words candy at 1;10 and Katz at 1;10, but was in both of them later replaced by d. The only words in which it lasted were cake, from 1;10, which had earlier (1;9–10) had the correct k, and cracker 1;7. The latter word, which took the fully reduplicated form gaga, presents at the same time the only example of medial ɡ. The consonant did, of course, not occur in final position. g remained rare.

396. The velar nasal η had a place in Hildegard’s sound-system only for a time 1;6, being a substitute for n until the latter was learned more correctly.

During the babbling stage it was late. The combination pepe was recorded once at 0;9. The same playful form was repeatedly observed E 1;2.

In the meantime it had already occurred in the echoed form ʔanŋj 1;1 for danke schön, but the transcription is marked as approximate, and later the word danke took a much more primitive form. This would be the only instance of η reproducing standard η; but the isolated form deserves no more than passing mention.

At B 1;3, however, η recurred in na-na for *Carolyn as an experimental substitute for k. Then it did not occur again for a month and a half. At the end of 1;5 and in the first days of 1;6 four words beginning with n sprang into very active use, all in reduplicated form based on double expressions by the adults: night, naughty, *nein, and no. The initial sound was first transcribed as n, then described as sounding “half like η,” then transcribed as η, with a notation that correct n had not yet occurred. Finally (still B 1;6) I watched the articulation closely and

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66 Karla also used g earlier than k in babbling. She used g correctly for standard g from B 1;9. Cf. note to 221. For other children, cf. note to 394.
came to the conclusion that it was neither \( n \) nor \( \eta \). The whole front part of the tongue was placed against the hard palate, that is, the correct closure between the tip of the tongue and the alveoli was not yet achieved although that articulation was familiar for \( d \). Probably the point of closure varied from the front to the back of the roof of the mouth.\(^{85}\)

This transition stage did not last long. Correct \( n \) was learned \( r;6 \) and \( \eta \) was discontinued. It occurred once more \( r;8 \) in a reduplicative form for Grandpa, by this time as a real velar \( \eta \). There is only a single diary notation for this important word; apparently it retained its strangely primitive form unchanged to the end of the year. In ironing \( r;8 \) and \( r;9 \), the \( n \) wavered again between \( n \) and \( \eta \). The standard final \( \eta \) was omitted in this word and in all others (even as late as \( 2;1 \)). The child’s \( \eta \) never corresponded to standard \( \eta \); it was always a substitute for \( n \) and infrequently for \( k \) and \( gr \). It occurred most commonly in initial position, where the two standard languages involved reject it, and never in final position, where it is common in both.\(^{87}\) Medially, although both languages use it there, it was restricted to cases of reduplication and to ironing, always based on \( n \).\(^{88}\)

397. Coming to the voiceless palatal fricative \( \varsigma \), which is an important consonant in standard German, we find it missing in Hildegard’s consonant system and restricted to rare accidental occurrences.

Late in the pure babbling stage, we find \( \varsigma \) repeatedly \( o;9 \), during the month when fricatives were added to the stock of consonants.

In the early imitative word \( prett \), \( \varsigma \) occurred \( E \) \( o;11 \) among the many fricative variants of \( r \). Thereafter it disappeared completely, except as a faint off-glide of \( -f \) (for \( -b \)) in mouth, once \( r;10 \), and as a component of the affricate \( k\varsigma \) in drink, once \( r;11 \); in the latter case it was no more than the result of an insufficiently exact release of the closure for palatal \( k \) and therefore also an off-glide. The explanation of the variants \( m\varsigma c \) for \( meat \) \( r;10 \) and \( d\varsigma c \) for \( stick \), once \( r;11 \), is similar. The diary notes specifically at \( r;11 \) that the sound \( \varsigma \) was missing otherwise. \( \varsigma \) never reproduced standard \( \varsigma \). Words containing it were rarely attempted. When they were reproduced \( \varsigma \) was usually omitted, sometimes replaced by substitutes (229–231).\(^{89}\)

398. Much more important is the voiced equivalent \( j \). It appeared late in the babbling stage, in the month of fricatives: \( \text{j}e\text{je} \) \( B \) \( o;9 \), once \( ji \)

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\(^{85}\) Grégoire reports a similar fluctuation between dental, palatal, and velar varieties in babbling and speaking (1933, p. 383 f. and book pp. 71 f., 209 and 248), \( o;9 \), \( r;9 \) and \( r;6 \), initially and finally. They were even interchangeable with \( m \).

\(^{87}\) Karla used final \( \eta \) frequently \( E \) \( r;11 \). It was often based on \( -n \). She did not use \( n \) at that time.

\(^{88}\) Jakobson’s categorical statement (p. 40) that \( \eta \) appears later than \( m \) and \( n \) is not confirmed by Hildegard’s and Karla’s language learning as far as articulation is concerned. It is true that the imitative use of \( \eta \) was late. Jakobson’s rule is over-simplified.

\(^{89}\) \( \varsigma \) played a more important part in Karla’s speech. It was the regular substitute for \( s- \) (also \( sl- \)) \( r;10-2;1 \) and \( f- \) \( r;10-11 \).
The babbling use of \( j \) led over into the speaking stage. It may or may not be accidental that echoed \( ja \) appeared \( i;3 \) with a gliding semi-vowel \( i \) instead of the more fricative \( j \). A few days later (\( B \; 1;4 \)) it had the correct \( j \) and retained it thereafter. The English equivalent *\( yes \), used less frequently, was pronounced with the same sound, \( 1;4 \). These two words remained the only ones in which \( j \) was a correct imitation of initial \( j \) (there were many new ones \( 2;0-1 \)). Medial \( j \) was found correctly imitated much later, \( 1;11 \), in *New York*.

There were, however, many more instances in which \( j \) acted as a substitute for other standard consonants at a later stage, from \( 1;8 \) on and particularly at \( 1;10 \) and \( 1;11 \). Most frequently it took the place of standard \( l \),\(^91\) first in medial position. Interestingly enough, Hildegared first tried a real \( l \) with fair success, but then found \( j \) easier and used it for a few months until she really learned \( l \). In *Helen*, which acquired \( j \) at \( 1;10 \), the gliding \( l \) was used \( 1;9 \). *Alle* had \( l 1;7, j 1;8-9 \), again \( l 1;10 \). *Hello* had \( l 1;5-10 \), but reverted to \( j E 1;10-1;11 \), losing the first syllable at the same time and often reduplicating the second. \( j \) was thus initial for Hildegared in this word, and initial \( j \) for \( l \) had indeed become familiar in many new words \( 1;10 \). In a few words even final consonantal and syllabic \( l \) became medial \( l \) or \( j \) by the addition of a non-standard vowel, in *roll* with \( ju \), *lu \( 1;9 \) (later omitted) and in *bottle*: *\( lu \) 1;8, lu 1;9, ju 1;9, lu 1;10-11*. These abnormal forms must be explained by the fact that \( l \) and its substitute \( j \) had become familiar in medial position and were made medial in these words by the device of adding a vowel. Neither of them was used in final position.

Furthermore, \( j \) was the normal substitute for initial \( s \) (from \( 1;10 \)) and \( sl \) (\( 1;11 \)). Occasionally it represented the \( s \) of initial \( ts \) and in one word, *shoe*, the initial \( j \) (from \( 1;8 \)).

Thus \( j \) was the result of an articulatory simplification of the complicated \( l \) and of the fricatives \( s \) and \( j \), which were rejected in initial position.\(^92\)

In some cases \( j \) alternated with \( z \), namely when it represented initial \( f \) and \( ts \) (at \( 2;1 \) even in *you*, *your*). \( z \) was induced by its voiceless counterpart \( f \), but \( z \) and \( j \) were not yet separated into two clearly distinct phonemes (388). This might be considered parallel to the fact that Hilde-
gard's speech contained no contrast between voiceless $f$ and $s$, since $s$ was missing in conscious articulation.\textsuperscript{93}

399. The affricate $dj$ was heard B o;9, at the stage when fricatives began, in the combination $dj$ja, which reminded the observer of German $ja$, but may as well have been a meaningless babbling syllable. This is the only instance recorded, although the related $d3$ became an active ingredient of Hildegard's speech (386).\textsuperscript{94}

400. The voiceless velar fricative $x$ played a not inconsiderable part in Hildegard's speech utterances, although it cannot be said that it became one of her normal speech sounds.

It was among the back sounds typical of the cooing phase o;1–2; sometimes it occurred in combination with $k$ (394). During babbling proper it was missing until E o;10, when all fricatives occurred, "once even $x$."

Then there was a long pause again. In speaking $x$ was missing until 1;7. From then on it became quite frequent in final position, but usually it was not a representative of any standard sound. It was a non-standard off-glide of final $u$ or $u$ 1;7–11, most frequently following the diphthong $au$, $ou$, in $auf$, $aus$ (out), $bau$en, $Baum$, $blow$, and $soap$. It is most natural in this combination because in the diphthong itself the tongue transcribes a gliding motion, which was simply continued beyond the standard limit. It occurred, however, also after simple $u$ and $u$ 1;7–9 in $Brot$, $Buch$, $book$, and experimentally B 1;11 even after o in $soap$. It varied greatly in intensity; sometimes it was strongly fricative, especially at 1;8; at other times it was faint; the transcription $h$ used for it in $Buch$ at 1;6 should be judged as a precursor of faint $x$.

Although the off-glide $-x$ continued to the end of the year, its sway was coming to an end. In several words it had already subsided. $Brot$ lost it as early as 1;9, as soon as the standard final consonant was reproduced. $Baum$ lost it 1;11, although the $m$ was not yet added. $Buch$, $book$ acquired a final $k$ 1;10. Once 1;10 $buxk$ was heard; this means either that the off-glide emerged once again, followed by the new stop, or that the stop was faultily articulated by accident.

There were, however, two words in which the child pronounced final $x$ in agreement with the standard prototypes: *huch* 1;7 and *hoch* 1;11. *Huch* was an interjection which occurred only once and may have been spontaneous in spite of the fact that there is a German equivalent. The $x$ followed $u$ and may be interpreted as an off-glide; the form of the none-too-standard interjection should be attributed to the same principle.

The situation is different with regard to *hoch*. This word was late and rather frequent, even though it did not become firmly incorporated in Hildegard's vocabulary. It is my judgment that this $x$ resulted from

\textsuperscript{93} Bloch's detailed account (1913, p. 48 f.) also tells a story of intertwined j, $s$, semi-vowel i, and apparently something resembling $dj$ (see below, 399) 1;9–11 for standard j, $s$, and $r$.

\textsuperscript{94} Grégoire (p. 68): $dj$- in babbling o;9, same time as $j$-.
imitation, so much the more as the vowel was lowered to ɔ, which makes it improbable that the fricative was an off-glide. Thus -ɛ was acquired imitatively in the last month of the second year. It was also correct in combination with -i in *Nacht 1;11.

Learning of ɔ- was not to be expected since it is not used in the standard prototypes. -ɛ- is common in German, but only one word containing it was imitated, with a stop substitute (234). No medial ɔ occurred.

Concerning the affricate kx in speaking, 1;7 and 1;10, see 394. Notice that it occurred first during the same month (1;7) in which the off-glide x developed.

401. The voiced velar fricative ɣ did not occur in the standards presented and was therefore not acquired as a speaking consonant. It occurred only in cooing ɔ;1 as a variant of ɣ. This means no more than that the vocalic sounds of early babbling were sometimes interrupted by a raising of the back tongue to approximate or complete closure while the voice continued. There is no record of a velar voiced affricate, ɣɣ.

402. Of the laryngeals (276), h is easy to articulate since it is simply an audible emission of breath accompanied by slight friction in the larynx or in the mouth. It occurred at the beginning of an early babbling combination E ɔ;i, but was by no means frequent. It is listed again ɔ;7 in the reduplicated utterance hæ:hæ:, alternating with æ:æ:; both combinations were described as “not new.”

The occasional h of babbling was not carried over into the period of imitative speaking. The first example of standard h—correctly reproduced is nine months later, in hot 1;4. From then on initial h became common; in fact, exactly the same number of words began with h as with m. It proceeded normally from standard h in many examples; the first form of hat B 1;6 consisted of nothing but h. Besides it acted often as a substitute for fricatives and “liquids” from 1;6 to the end of the year, although for none of them as the chief and definitive substitute, except perhaps for r-. It competed with j, w, and the glottal stop as alternative substitutes. The only consonant of which it took the place regularly before 1;11 was English l, in the single, but frequent word light 1;6; recurrently the h was inaudible in this word 1;7 and 1;8, but the absence of the glottal stop, which otherwise always appeared before initial vowels, is sufficient reason to interpret such forms as variants of initial h. A new word with standard l- at 1;11, lie, had j-, which was the definitive substitute for German and English l-. (h-, however, took a new lease on life as a substitute for l- of both languages at 2;1. The temporary separation of English l from German l must have been accidental and due to the dearth of examples. They were generally treated alike.)

h was a substitute for initial English r in several words from 1;8 (regularly at 2;11), apparently taking the place of the earlier normal substitute, w, which was however, not yet given up (206).

In all other cases it was only an occasional substitute for fricatives. It
competed with the glottal stop in the irregularly handled word *soap* 1;11 as a substitute for initial *s*, which was rarely attempted. In *outside* 1;9, which lost its first syllable, it took the place of *ts*, which was otherwise represented by *j* reflecting the *s*. In one word, *fork* 1;11, it stood for initial *f*, to be replaced later by the more adequate *w*. Thus *h* took the place of nearly the whole range of fricatives occasionally and temporarily. Since *h* is the easiest fricative requiring no careful adjustment of articulatory muscles, its use as a substitute for fricatives is a natural simplification. It was not used consistently in any case because it did not come close enough to the standard consonants to be satisfactory. The situation is similar with regard to the "liquids" of which it took the place.

Medial *h* did not occur. It is not frequent in English and almost non-existent in German. Final *h*, unknown in the standard languages, occurred in *buh*, *Buch* (*book*) 1;0 as a forerunner of the off-glide *χ* (400).  

403. The glottal stop, indubitably a laryngeal, came to play a conspicuous part in Hildegard’s sound-system. Its articulation is easy since it amounts to no more than a momentary stoppage of the breath stream, produced by closing the vocal cords, or, popularly speaking, by holding the breath and then releasing it. It occurred during the first month of life, in the crying stage. The cries themselves were often interrupted by glottal stops or introduced by them. Likewise in silent muscle stretching exercises, the breath stream was often held and allowed to escape gradually, broken up by glottal stops. The mouth was sometimes kept closed so that nasalized glottal stops resulted. This process was purely physiological and had nothing to do with speaking.

After that, glottal stops are not mentioned in the diary for several months. At E 0;6 she amused herself for a while by producing several successive glottal stops in isolation, which gave an effect of coughing. The linguistic character of this game is very doubtful.

Early in the next month, the babbling combination *ʔæʔæ* was heard, alternating with *ha:haː*; both seem to have actually been in use for some time before that. Here the glottal stop was really used linguistically. It continued to be used from 0;7, whereas its competitor *h* was not lastingly acquired until 1;4 (402).

The first "word" used with meaning was the interjection *ʔa* 0;8–1;6, which is listed in the vocabulary under its later form *ʔaʔ*. The vowel-quality varied widely in it, so that the glottal stop together with the high pitch of the vowel was the characteristic element of the word. It was not yet an imitative word. Sometimes it was reduplicated.

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86 Pavlovitch (end of 66) reports that the *h*, although a sound of Serbian, was "not fixed" for a long time. Accidental "noises" similar to it occurred. At 1;1 it was used sometimes as "le reflet phonique de l’effet acoustique de *s,*" until 1;5, in medial position (67). Grégoire (p. 90) observed *h* 0;11 in babbling. It had almost disappeared 1;11, although it is used in Walloon French; but it was not used by the parents (p. 203). In Cornioley’s experience (p. 43) it was acquired E 1;7. Lukens (pp. 451–453) records a wide vicarious use of *h* closely resembling Hildegard’s practice.
The imitation of standard German words with initial glottal stop started at 1;0. It is interesting to note that the interjection *m indicating that something tasted good began B 1;0 without the glottal stop, but acquired it E 1;0; its standing in the standard speech is somewhat dubious. In the meantime, however, the standard interjection *oh had begun to be imitated with the glottal stop. *A-a was imitated at B 1;1 as double voiced glottal stop only.

The number of words with initial glottal stop became larger 1;4-5 and included by that time several purely English words, which do not have the glottal stop in standard sentences, but may well have had it in isolated presentation: eil and up 1;4, apple and Auto (auto) B 1;5, I 1;5. *Hoohoo (hu$h) had no glottal stop 1;5, but was introduced by one 1;6; it may have had the same form in a variant presentation. From 1;6 the number of words beginning with a vowel preceded by a glottal stop became large, and Hildegarde developed the habit of prefixing all such words with the glottal stop, whether they were German or English, isolated or a part of sentences haltingly uttered. (At 2;4 the diary contains the entry that glottal stops before initial vowels were decreasing markedly with improving fluency of speech.)

Glottal stops occurred also medially, usually in reduplicated syllables or proceeding from composition or blending with words beginning with a vowel.

In final position a glottal stop is recorded frequently, but not consistently, in bi², big, from B 1;8. Substitution of a glottal stop for a velar stop (g, or rather, with final unvoicing, k) would not be surprising; it is a phenomenon familiar to linguistic scholars. In Hildegarde's case however, the observation is limited to a single word and cannot be considered certain (see 224). Cf. also Maus, mouse, mo² 1;7 (101); no velar stop is involved in this word.

404. Bare mention will be sufficient for other kinds of laryngeals. Among the very first sounds of 0;1 were fricatives which seemed to be articulated as far back as the larynx. By the end of 0;1 squeezed sounds were produced in the glottis as well as at the velum. All these sounds were speech sounds, however, only in so far as they were produced by the ordinary organs of speech. They were really prelinguistic, and disappeared soon. The babbling period brought sounds closer to the conventional ones into the foreground.

In the "plateau" between 0;3 and 0;6, when linguistic progress was at a standstill, Hildegarde produced for her own amusement high screeching sounds, which might also be called laryngeals. This extra-linguistic sound-game subsided soon, and gave way again to babbling. Ontogenetically it may be considered a preliminary exercise leading to the linguistic use of voice modulations or intonation (cf. vol. 1, p. 19).

405. A brief summary of the child's use of consonant clusters concludes the analysis of her sounds, Although this classification required a
considerable number of sections (313–332) in the analysis of standard consonants, very little needs to be said under this heading here. Since Hildegard generally simplified standard clusters, very few appeared in her speech of the first two years. Those which did occur were mostly affricates, the easiest clusters (314).

Among the affricates, the labial ones were practically missing. Bilabial *pφ for pooh *1,2–4 is the only instance. It was the result of an incorrect release of the bilabial stop.

Palatal and velar dorsal affricates were a little more frequent, but did not represent standard affricates. *kξ was characteristic of the cooing phase 0;1–B 0;2; it stood by itself or interrupted back vowels. At 1;7, it appeared again as an interjection of disgust⁹⁶ and as an incorrectly articulated k in both syllables of cracker. At 1;10 it was observed to be postpalatal in the interjection. The combination *kξ in one accidental form of Buch, book 1;10 might be called the reverse of kξ; it was likewise a faulty articulation of k (235). Palatal *κ occurred for k in drink 1;11; the ζ was an accidental off-glide.

406. All the preceding affricates were produced accidentally; but some affricates produced with the tip of the tongue (dental affricates) really became a part of Hildegard’s sound-system.

*ts, to be sure, also occurred only accidentally as an abortive imitation of simple standard consonants, usually t, once s (heiss 1;5). The facts are assembled in 378. This imperfect adjustment of the tongue occurred most commonly in the early months of speaking, 1;0–4, before t was acquired in more perfect form (1;5). It is noteworthy that *ts never stood in initial position where it is most frequent in the German model. Even in the one instance where it accidentally took the place of initial t, Ticktack B 1;0, the vowel was lost at the same time; syllabic *ts cannot properly be called initial. In the other examples it took the place of medial t, probably even in *kritze, where the prototype happens to have *ts. Final *ts occurred only accidentally for s 1;5 and t 1;11, late because final consonants were imitated late. This affricate did not become a part of the child’s consonant system. Standard *ts was replaced by substitutes (316).

*tf occurred more frequently in all three positions, but appeared later (378). Its first occurrence was at 1;6, in syllabic function. From 1;7 it became more and more frequent, but in many instances it competed with the slightly earlier *f, in medial position also with t. In many cases it was only an inaccurate reproduction of *f, whereas in those instances where it agreed with standard *tf it still had to struggle with less perfect substitutes. In the last month *tf was used with less vacillation for standard *tf and *dz in final position. By this time it represented an improved articulation. At 1;11, perhaps from 1;10, it may be considered to be established in Hildegard’s consonant structure. Standard *tf was, how-

⁹⁶ Jakobson, p. 13 f.: Sound gestures seem to favor unusual sounds. They are expressive by virtue of being unusual.
ever, not yet consistently reproduced accurately. Particularly in initial position the competitors \text{d₃} and \text{z} were stronger because of the tendency toward assimilatory voicing of initial consonants (309).

\text{d₂} did not occur. \text{d₃} was less frequent than \text{tf}, but occurred from 1:8 initially and medially as a substitute for \text{tf}, in the latter position only in words with reduplication. In no case was it the only substitute, but it is considered the normal one initially. Final \text{d₃} was missing. \text{d₅} never stood for standard \text{d₃}, which was simplified by the child. Its position in the sound-system was not strong, but it was present from 1:8.

Since \text{z} and \text{j} were akin in Hildegard’s pronunciation (388), \text{dj} might be expected to appear as a variant of \text{d₃}. This was not the case, however. The only record of it is at the end of the babbling stage (B 0:9) in \text{dja}, which was either an early reproduction of \text{ja} or an accidentally similar babbling syllable (399).

Its voiceless counterpart \text{tc} occurred only once 1:10 accidentally as an inaccurate explosion of final \text{t} in \text{meat}.

407. Consonant clusters which were not affricates were very rare; none of them became established.

The only cluster containing a liquid was \text{pr-} in early over-perfect forms\(^7\) of \text{pretty}, 0:10–B 1:0. It varied from the beginning, the \text{r} being replaced by all sorts of fricatives and glides, \text{z, s, f, w, 0:10–1:8}. This made for an additional assortment of clusters, but all of them, including \text{pr}, disappeared later when the word fell in line with more regular principles of substitution. None of them became lasting acquisitions, but their temporary existence shows that their later absence was not simply due to the child’s inability to hear or pronounce them (393).

Clusters with nasals were missing, with the exception of -\text{nk} in an early over-perfect echo of \text{danke}, 1:1.

There was not a single instance of clusters with a sibilant followed by another consonant. There was one example of another fricative in a similar arrangement, -\text{xt} in *\text{Nacht} 1:11; the observation is a little doubtful.

408. Having concluded the survey of the child’s consonants,\(^8\) we proceed to a tabulation, month by month, of the time when sounds were

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\(^7\) A good characterization of such such forms is found in Holmes, p. 220: The first surprisingly good imitations of words are “mere lours de force,” resulting from mechanical imitation. They are later lost and replaced by “vastly inferior” substitutes. The history of \text{pretty} and some other words in our case fully confirms this view.

\(^8\) Grégoire (p. 253) reports that long consonants were used for an extended period as a form of emphasis, but later dropped. In Holmes’s transcriptions, all kinds of consonants are marked as long very frequently. This feature was of no importance in Hildegard’s language. A few instances did occur, like long \text{m} as an interjection referring to food, or \text{mann}: 1:11 with exaggerated \text{n} due to the unfamiliar end position (comparable to the exaggerated aspiration of final stops when they were first added). Such cases were not out of the ordinary. Grégoire’s observations concern mostly \text{m} and \text{n}, but the range of consonants affected is much wider in Holmes’s account. Cf. 311, note. Concerning aspiration of stops, see 308.
acquired. Here each sound is considered by itself, combinations of vowels into diphthongs (365–367) and of consonants into clusters (405–407) being disregarded because the individual sounds of which they are composed were in every instance learned earlier or at the same time. Acquisitions which did not yet continue in regular use are marked by asterisks. Such sounds appear again at a later date as reacquisitions, or else they did not form part of the active sound-system by the end of the second year. Details can be found in the sections noted after each sound.

0;0  
  a 342  
  *æ (o;0–10) 343  
  *m 371  
  *? 403

0;1  
  a 342  
  *i 346  
  *æ, *A (o;1–B 0;2) 348, 353  
  *u (o;1–2) 352  
  *ə (o;1–2) 355  
  *g (o;1–B 0;2) 395  
  *γ 401  
  *k (o;1–o;2) 400  
  *r 392  
  *k (o;1–B 0;2) 394  
  *l 391  
  *d 379  
  *bw: (o;1–10) 374  
  *c (E 0;1–B 0;2) 390  
  *h 402

0;2  
  ε 344  
  *u 351

0;3–5 No new sounds; loss of cooing sounds

0;6  
  d 379  
  *g (o;6–7) 395  
  *? 403  
  *s 382

0;7  
  b– 370  
  *h 402  
  *? 403

0;8  
  i 346  
  l 390  
  *r 392

0;9  
  i 347

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99 For comparable lists of sound-acquisition see Deville (vol. 23, p. 331, with an important correction, vol. 24, p. 42), o;0–1;8; Conradi pp. 328–333 (summary of literature to 1904).
0;10  e (frequent 1;5) 345
   *p- (0;10–1;8 in whispered words)
   *w 373
   *s 382
   *f 383
   *I (babbling) 391
   *r (0;10–B 1;0) 393
   *ë 400

0;11  *y (E 0;11–E 1;1) 348
   *t 356
   *n 380
   *s 397

1;0  o (frequent 1;10) 350
   *u (sporadically 1;0–6) 352
   *p- (1;0–1) 369
   *s (accidentally 1;0–11) 382
   * syllabic 383

1;1  ë (rare until 1;11) 349
   *ë 354
   *ë (sporadically 1;1–10) 355
   *w 373
   *g (1;1–3) 396

1;2  *g (1;2–B 1;3) 395
   *ê (1;2–4) 372
   -b- 370
   *m 371

1;3  *pw: 374
   *r 392

1;4  -p 369
   *j 398
   *h- 402

1;5  *æ (sporadically 1;5–11) 343
   ã 357
   *-p- 369
   *-l- (frequent 1;10) 377
*u (i;5-6) 396
1;6  u 351
  t- (frequent i;10), *-t 377
  n 380
  -l- velar 391
  *k-, *-k- 394
1;7  u 352
  -f 383
  s- 388
  z 395
  -x 400
1;8  -p- 369
  *b 372
  *v 376
  k-, -k- 394
  *u (rarely i;8-11) 396
1;9  p- (frequent i;11) 369
  *-f- 383
  -k 394
1;10 *f (i;10-11) 375
  -t 377
  l- 391
  -l- flat 391
  *c (i;10-11) 397
1;11 *æ, *ə 348, 353
  ø 355
  -f- 383

409. The preceding list looks very long and complicated on account of the great number of fleeting sounds and their repeated reappearance. Nothing less complicated will do to give a fair impression of the process of sound-acquisition, which is indeed a highly involved process. In the following, another list will be given which includes only the lasting acquisitions. This extract is very much shorter and simpler. It is of use to show the outlines of sound-learning at a quick glance.

  0;0  a
  0;1  a
  0;2  ε
  0;3-5 none
  0;6  d
  0;7  b-, ?
  0;8  i, ċ
  0;9  i

  0;10  e
  0;11  none
Finally, a tabulation of sounds in phonetic arrangement will show for each sound the month in which it was lastingly added to the repertory of sounds and, in parentheses, the first earlier ephemeral occurrence in the crying, babbling, and speaking stages. Sounds which appear themselves in parentheses did not become established in the sound-system at all. (See next page for this table.) The table begins with the most closed sounds (stops) and ends with the most open sounds (wide vowels). From left to right, it is arranged by place of articulation, from bilabial to laryngeal. Position in the word is here not specified. Consonants are entered for the month in which they were first pronounced in any position.

Again we repeat the foregoing information in simplified form, omitting all ephemeral sounds and ephemeral occurrences.

<table>
<thead>
<tr>
<th>Sound</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>1;4</td>
</tr>
<tr>
<td>b</td>
<td>0;7</td>
</tr>
<tr>
<td>t</td>
<td>1;5</td>
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<td>d</td>
<td>0;6</td>
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<td>k</td>
<td>1;8</td>
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<tr>
<td>g</td>
<td>1;7</td>
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<tr>
<td>s</td>
<td>1;0</td>
</tr>
<tr>
<td>z</td>
<td>1;7</td>
</tr>
<tr>
<td>j</td>
<td>1;4</td>
</tr>
<tr>
<td>c</td>
<td>0;8</td>
</tr>
<tr>
<td>w</td>
<td>1;1</td>
</tr>
<tr>
<td>l</td>
<td>1;6</td>
</tr>
<tr>
<td>m</td>
<td>1;2</td>
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<td>n</td>
<td>1;6</td>
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<td>i</td>
<td>0;9</td>
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<td>u</td>
<td>1;7</td>
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<td>e</td>
<td>0;10</td>
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<tr>
<td>e</td>
<td>0;2</td>
</tr>
<tr>
<td>a</td>
<td>0;0</td>
</tr>
</tbody>
</table>

The preceding table allows one to see at a glance when sounds were permanently incorporated in Hildegard’s phonetic system. The expert in phonetics can also see at once which gaps still remained. The missing

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100 Compare with the preceding and following tabulations the tentative norms of sounds mastered by ages from two years up as established by Wellman, pp. 49–56. Sully (p. 151) gives a list of consonants which are difficult, “often at least.” Morrison lists tf, k,
sounds of English and German standard speech will next be enumerated. We begin with a list of the sounds which the child did not use consistently in any position by the end of the second year. Each sound is followed by the number of the section in which it is discussed in detail.

Vowels: \(æ\) 343  
\(ø\) 348  
\(œ\) 348  
\(y\) 348  
\(r\) 348  
\(ʌ\) 353  
\(ʃ\) 356  

Consonants: \(hw\) 373  
\(f\) 375  
\(v\) 376  
\(θ\) 381  
\(ð\) 381  
\(s\) 382  
\(z\) 382  
\(r\) 392  
\(ɾ\) 393  
\(υ\) 396  
\(ẓ\) 397

413. Beside the sounds which were completely absent,\(^{101}\) others did not yet occur in all positions in which they are used in the standard prototypes. Only consonants are affected by this limitation.

The most important rule under this heading is that voiced consonants could not stand at the end of a word (312). English final voiced stops and fricatives were either omitted or unvoiced. English and German final nasals and liquids were either omitted or turned into vowels. Another device was to articulate \(l\) correctly or by substitution of \(j\), but to remove it from the end position by the addition of a vowel (398). Final \(n\) was pronounced a few times in conscious imitation (380), but it remained exceptional and clearly did not fit in the speech pattern of the stage. Final syllabic \(n\) (380) and \(l\) (391) did not exist in the child’s speech. Syllabic \(m\) (371) caused no difficulty; it should, however, not be treated as a final consonant, even in \(hm\).

Intervocally some consonants did not occur: \(ʒ\) 388, \(ɡ\) 395 (only one word with reduplicated form), \(χ\) 400, \(h\) 402 (rare in standard!). That may in part be accidental, but at least in the case of \(g\), the omission of the

\(^{101}\) Not only were these sounds missing, but standard words containing them were often strikingly avoided, even though they were topically important for the child. Cf. vol. I, pp. 168 f. and 172, and \textit{passim} in the sections dealing with the recalcitrant sounds.
standard intervocalic consonant was a definite rule until 1;11, and during 1;11 a dental substitute was introduced for it (223).

Initially, a striking restriction applies to f; it could be used syllabically, but could not open a word (383), whereas it was common in final position and was eventually learned between vowels. This rule, no doubt, is also the explanation for the fact that standard s, for which f was the normal substitute in other positions, was never replaced by f initially. It was at first omitted or replaced by the glottal stop (essentially not a substitution, but omission plus addition of a signal of demarcation) or by h (probably another form of omission; see 248 and 276). Later the substitute was j (248), which was a variant form of s (398) and therefore a closer approximation to f, modified by the voicing characteristic of pre-vocalic consonants. Both j and s were used for the s of ts- (136) and for f- (181); only s for tf- (183). Words beginning with s and f were rarely attempted before 1;10 because the child did not feel capable of a satisfactory articulation. From 1;10, the substitutes j and s must have been satisfactory enough, just as b was felt as satisfactory for p- (105). The initial voiceless stops, however, reached at least occasionally a correct voiceless form, whereas initial f was not achieved before a vowel.

Another limitation due to position is the fact that consonants appeared very rarely in clusters (405–407), and those which were pronounced never consisted of more than two elements, practically always homorganic ones.

414. Furthermore, not all sounds which were used by the child had reached the point of being distinct phonemic units. Voiced and voiceless stops were both present in Hildegard’s sound-system, but the voiced ones were acquired earlier and retained a much stronger position in it. The voiceless stops were in most cases no more than variants of their voiced equivalents, particularly in initial position (309). The voiceless stops were on the way toward becoming established. They increased in frequency in the later months and, above all, they were usually employed only where the standard etymon had a voiceless stop. Exceptions, however, occurred even in this respect. Standard medial g, when its omission was superseded by the introduction of a dental substitute 1;11, was rendered by a voiceless stop (223), and even initial g appeared exceptionally as t (221). All final stops were, of course, voiceless.

Another instance is the interchangeable use of j and s (388 and 398). Again they did not coincide completely. s prevailed as a substitute for f, and j was the normal rendering of j-, s- and l. This separation was, however, not carried out consistently (at 2;1 even standard j could be changed to s, 388).

Fluctuation occurred also in the domain of vowels. Both sets of high vowels, i/ı and u/ü, and the mid-back vowels ø/ɔ could still be used interchangeably, although here too the variety corresponding to the standard vowel was favored.

In all these instances it can be said that the child was striving to imi-
tate the standard models accurately, but had not yet achieved the preciseness of muscular control necessary to produce the nicer distinctions with assurance, or, otherwise said, the contrast pattern was not yet broken down into sufficiently fine subdivisions.

415. In taking stock of the phonetic deficiencies still existing at the end of the second year, a word must also be said about the fact that some sounds, while learned and used, were still rare, which must mean that they were not yet fully mastered or were felt as too difficult or did not fit well in the child's phonemic pattern.

Among the vowels, the ɔ, although it had been learned as early as 1;11, played a very minor part until 1;11, when it increased in frequency (349). In unstressed syllables, which received little attention, it was fairly frequent from 1;6, but was there probably no more than a variant of the other mid back vowel, ə. In stressed syllables it was slow in being learned, especially the lowered English ɔ: That is easy to understand; the latter vowel is not a cardinal vowel and is variable even in the American standard.

Among the stops, g remained rare (395). Although it was learned earlier than k and in initial position frequently took the place of standard k (414), both of them were recessive before the dental stop substitutes. Taking all positions into account, we find k to be much better established than g (cf. also 221).

Medial m (371) and n (380) occurred rarely in words without reduplicative form. For m that is probably accidental, since there is no case of it being omitted from a standard word (119). n, however, was regularly omitted in intervocalic position (154). Aside from reduplication, it occurred only in two words, once in meine 1;7, an echo too perfect for the stage, and regularly in ɔino, Onkel 1;8, in which n came to be intervocalic in the child's form. This latter example proves that there was no resistance to the use of n in this position; but there were few cases of it because the omission of standard -n- persisted, perhaps as a form of assimilation to the surrounding vowels.

The only "liquid" used by Hildegard, ʃ, established itself very feebly in the sound-system (391).

The fricative ʒ was not frequent.102

416. In 361–367 we examined the sequence of vowel and diphthong learning and found it to proceed in a neat progression from an undifferentiated one-group system of low vowels in the crying stage through a contrast between two groups, low-high and front-back, into a distinction

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102 j was common enough as a substitute for other consonants (398), but was rarely a reproduction of standard j; ja was the only important word containing it in this function (232). Apparently the acoustic images of standard j and of her own j were not fully identified in Hildegard's mind because the memory of the different sounds heard from others in its place colored the impression of the latter. This interesting side-light should, however, not influence our appreciation of the fact that j was not a rare sound.
of three groups, low-mid-high and front-central-back. A further refine-
ment of the vowel-system was beginning to develop, but the standard
grading of the vowels into 5 or 6 levels was not yet achieved. The two
levels of the front and back high vowels (i/i and u/v) were not yet sepa-
rated clearly and the two levels of the mid vowels coalesced more or less
into one. In the front-back grading, simpler also in the standard, the
central position was as yet weakly represented and the compromise
rounded front vowels were missing.

This development agrees well with Jakobson's theory. I had recognized
the contrast-pattern in the phonemic evolution of the vowel-pattern be-
fore I read his study. Now Jakobson claims that the same principle op-
erates in the learning of consonants, and this is the most interesting part
of his theory. He maintains that, from the first stage of real speaking,
sounds are selected and a phonemic structure is built up according to
strict rules of general validity (p. 15), the absolute chronology being
very variable, whereas the relative sequence is everywhere and always the
same (p. 33). It is less easy to work out a phonemic system of contrasts
and levels for consonants, but Jakobson does it neatly by postulating,
on the basis of part of the literature on child language, a contrast be-
tween labial and non-labial consonants, between stops and fricatives, etc.
(p. 18). The eventual system of three phonemic series would then dis-
tinguish among labials, dentals, and palatovelars, etc.

This theory, if sustained by monographic studies, is eminently suited
to bring order into the bewildering mass of details and the puzzling indi-
vidual differences between children.

It behooves us therefore to examine whether the sequence of Hilde-
gard's consonant-learning bears out this theory. We shall consider chiefly
the time of lasting acquisition, as summarized in 411. This is a sensible
restriction demanded also by Jakobson (p. 18); not consonants produced
accidentally, but only those which enter into the speech structure should
be considered here. Babbling consonants are largely a phonetic, not a
phonemic matter, with no principles of sequence discernible (Jakobson,
p. 15).104

417. At first glance, the months of acquisition listed with each conso-
nant seem to present a chaotic picture. If, however, we look more closely,
we are able to make out lines of development.

Analyzing first the stops, we should disregard the voice. The distinc-
tion between voiced and voiceless has already been demonstrated to be
one of those finer discriminations which were not yet well achieved by
the child (414). Among the dominant voiced stops we find a wide dis-
crepancy between the dates of learning. 8 was very late, 1;7 (although it

103 He claims support for his view from Feyeux, Passy, Ohwaki, Grégoire, Meringer, and
Löbling.

104 But see note to 418.
had been very early in babbling, 0;1), whereas both b and d came
over from the babbling stage and were both used in the very first
imitated words, 0;9–10. This means, of course, that for nine or ten
months the labial and the dental divided the field of stops between-themselves. Standard words with palatal and velar stops were imitated long
before 1;7, especially k (only one example for g- before 1;10, namely
*Gertrud(e) 1;1). Instances can be found from 1;1 on in 213–221. In
nearly every case the substitute was a dental stop.106 Dental and palatal-
velar stops were not clearly separated into two series by the end of the
year (212). Hildegard’s speech had not yet reached the three-series stage
of stops. Labials always remained labials, but the other two standard
series interpenetrated in the child’s word forms. Jakobson’s contrast be-
tween labials and non-labials is therefore fully corroborated by our case.

418. There are a few deviations from the normal progress as postulated
by Jakobson. Usually the earliest one-series stage is dominated by the
labials,106 although exceptions to this rule have been noted before.107
Hildegard’s meaningful words contained two series from the very be-

106 Lukens (p. 451) gives the following appealing reasons for “the ‘t-habit’ of pronunciation,” which serve just as well for d: 1) the mobility of the tip of the tongue, 2) its use as an organ of touch, 3) the fact that in teething, the tongue feels the edges of the gums (really only a special case of 2). Jakobson, who dislikes articulatory explanations, gives instead some acoustic reasons (p. 64 f.): palatales and velars are more “colorful,” more sonorous, more impressive and more audible than labials and dentals, and therefore less suitable to be contrasted with the sonorous vowels. Lewis (p. 169 f.) also finds a large preponderance of front consonants, in German, French, and English, during the first half of the second year. It decreases during the second half, but remains larger than in the speech of adults.

107 Schwitzke stated the usual sequence: labials, dentals, palatales and velars as early as 1880 (p. 34), Meringer in 1908 (Pavlovitch 75). Cj. Grégoire (1933), p. 378. O’Shea (p. 6) places “gutturals” before dentals, but with reference to babbling and not on the basis of careful observation. Explanations for the preponderance of labials vary greatly. Schwitzke explains it by their ease of articulation, Rötter by the “increased weightiness” they gain through the effort necessary for their production! (Jakobson, p. 9, note 1.) The visual prominence of the labials has often been added as a reason. Grégoire (book pp. 37, 39
note 1, 40 note 2) calls this notion “inane” and chides Ronjat and Delacroix severely for accepting it. He adopts Preyer’s explanation that the lips have been exercised by sucking and is rebuked just as roundly as the proponents of the visual prominence theory by Jakobson (p. 53). Jakobson does not admit the validity of any articulatory explanation and considers Schwitzke’s principle of the least effort and its residue in the later literature as “completely refuted.” I think he goes too far. It must be conceded that the criteria for difficulty and ease of sounds are hard to establish and variable from one child to another. Even Jakobson’s theory of contrast and of progression to ever nicer discriminations is, however, no more than a new, valuable criterion of difficulty. The child learns only gradually
to make the fine muscular adjustments required for exact imitation of the standard model and must, for a time, be satisfied with coarser phonemic distinctions. This limitation may be in part psychological, but it goes hand in hand with physiological obstacles. Bilabials are not only a satisfying contrast to vowels, but at the same time, in spite of Rötter, objectively easy to produce. As Lukens points out (p. 450), they require no adjustment of speech organs, not even necessarily a control of lip muscles, merely a simple motion of the jaws.

107 Ripman (p. 139) claims that labials are relatively late, m and b later than 0, g, n, d. As a general statement this is certainly not correct.
ginning. If we wish to decide the question of priority, we must go back into babbling, and there we find d established one month earlier (o;6) than b (o;7). The labial, however, soon became dominant. The rule does not apply to babbling, at least not with full force.\textsuperscript{108} Besides, Jakobson himself states (p. 17) that occasionally the dental can function as the representative of the single series.

Any consonant, being a checked sound, forms a contrast with any vowel, a free sound. The extreme contrast is that between the fully open and fully voiced a and the completely closed and voiceless bilabial p. Stops contrast best with vowels. That is why stops are learned first after the essentially vocalic crying stage.\textsuperscript{109} The fact that Hildegard’s stops were for a long time predominantly voiced does not seem to be typical of children’s sound-learning.\textsuperscript{110} It is explainable by the polar opposite of the urge for contrast, namely by the tendency to reduce the difference between successive sounds, or assimilation,\textsuperscript{111} which modifies the contrast without eliminating it. When voiceless stops established themselves, the bilabial did come first (r;4), followed soon by the dental (r;5), whereas the palatal-velar did not become fixed until r;8, after long experimenta-
tion r;6–7.

The glottal stop, which has a kinship with the velar stop,\textsuperscript{112} should appear as late as the latter. Actually it was used uninterruptedly from o;7. This striking discrepancy, however, does not militate against the theory since the glottal stop can hardly be called a real consonant in Hildegard’s speech. It was merely a by-articulation of vowels in certain positions (241).

\textbf{419. The contrast between vowels and stops is, according to Jakobson, the first to be learned by the child.}\textsuperscript{113} The next is said to be that between oral and nasal stops (pp. 34 f., 53, 56), antedating the distinction between vowels as well as that between buccal stops. It is supposed to apply particularly to the contrast between the oral and the nasal labials.\textsuperscript{114}

This postulate is not confirmed by Hildegard’s language learning. In this connection it is useful to consult the chronological survey of word acquisition (vol. 1, p. 151), keeping in mind the child’s forms for the standard words listed there. If we concentrate our attention on the real imitated words, we find from o;9 to o;11 only bilabial and dental stops as constructive consonantal speech elements. This condition really con-

\textsuperscript{108} Jakobson does not apply it to babbling at all. Even though the babbling child is not trying to pronounce a predetermined sound, I am inclined to think that the great step forward from a to ba and da at least has something to do with it. Cf. Jakobson, p. 56.

\textsuperscript{109} Jakobson, p. 54 f.

\textsuperscript{110} Jakobson, p. 55.

\textsuperscript{111} Jakobson fails to bring out this polarity in all its importance; but he does reckon with the effect of assimilation (p. 17). Cf. 430 below.

\textsuperscript{112} Jakobson, pp. 48, 66.

\textsuperscript{113} Obviously already in the babbling exercises.

\textsuperscript{114} Jakobson operates with the old idea that “mama” and “papa” must make up the earliest linguistic stock (pp. 58, 69). This has been shown to be an untenable generalization, but his theory as a whole is not affected by it (cf. 426 below).
tinues during the following months. m, to be sure, appears at 1;0, but only syllabically in an interjection. It cannot be said to contrast as a structural speech element with others. The form mama existed at the same time (E o;9-1;1) in a similar function, and here the m was consonantal; but it had no intellectual meaning and cannot be considered to be a semantic alternate of Papa, which was learned with real meaning at 1;0. Mama with the standard meaning was not learned until 1;3, and only then could a phonemic contrast between m and p or b be said to exist.

Looking at the table of sound-acquisitions (409), we find a contrast between d and b existing as early as o;7 in babbling; it continued into the speaking stage. In the table of lasting acquisitions, b and m are not found in use at the same time until 1;2.

The phonetic tabulation (410 f.) also shows the nasals to be late. The opposition between labial and dental stops definitely preceded the opposition between buccal and nasal consonants in Hildegard’s case, reversing the order postulated by Jakobson. The opposition between low and high vowels also antedated this distinction, again contrary to Jakobson’s contention; it existed at least at 1;0: ba, Ball and by, Bild.

Jakobson’s theory, as applied to our case, seems to be too rigid, but our observations so far do not invalidate it in its essential features.

If we examine the contrast pattern with regard to opposition of one nasal to another, the theory works again quite satisfactorily. From the time when m became established (1;2), it had only one other nasal to compete with it. Up to 1;6 this was n, the position of which was not definitely fixed; it varied between palatal and velar articulation (396). At 1;6 n was learned and n receded. In the few instances in which it continued to occur, it functioned as a non-distinctive variant of n. It was not strictly true in Hildegard’s speech that n was learned later than m and n, as Jakobson postulates (p. 39 f.) Her early n was more than an experimental or babbling sound, considering the lateness of its sway. The later development, however, fell in line with the theory. m and n were active at the end of the year; n was not learned as an imitation of the standard sound.

Hildegard thus operated, during the whole of the speaking stage up to the end of the second year, with two sets of nasals. There was no stage of a single nasal in the sense that m could be used interchangeably with other nasals, as Grégoire observed.116 On the other hand, she did not yet achieve the finer discrimination among three concurrent nasals. This confirms Jakobson’s thesis that the limitation is functional, not articulatory. Demonstrably Hildegard was physiologically capable of articulating at least three nasals, although her velar nasal was never very precise.116

115 Cf. note to 396, above.
116 Ripman’s remark (p. 139) that nasal consonants are early because the velum has in them its natural relaxed position is not confirmed even for babbling. He did not see that
421. If nasal consonants stand in double opposition both to vowels because of the stop features of their articulation, and to buccal consonants because of their nasal resonance,¹¹⁷ fricatives are clearly an intermediate step between fully closed stops and fully open vowels. This opposition is less complicated. It is merely a question of a graded elevation of the tongue. For an early stage it is too difficult to control the muscles of the tongue accurately enough to raise it just a little higher than the highest vowels and yet not high enough to produce a stop.¹¹⁸ It is easier to produce a sharp contrast than finely graded, intermediate steps. Just as mid-vowels were later than low and high vowels, we expect fricatives to be later than stops (cf. 308 and note).

This was true for Hildegard if we consider stops as a category; that is to say, stops were learned much earlier than fricatives, but not all varieties of stops, particularly not the voiceless ones (refer again to 411x). The earliest fricative¹¹⁹ was ñ; but it was for a long time only used syllabically. Not until 1;7 did it function as a consonant, at the end of words (383). It became very frequent in this position. Just as mid-vowels were favored in unstressed end position (363), the intermediate quality of fricatives was also felt as suitable for the end of words, which received subdued attention and was not subjected to the urge for contrast. The other voiceless fricative, ð, also developed at 1;7, in the same position. Intervocalic ñ was not learned until 1;11; initial ñ and medial ð remained in abeyance.

The voiced fricatives, which were used in prevocalic position, were acquired almost at the same time. j is listed for 1;4, but occurred at that time and for several months after only in the frequent and important words ja and *yes, in which it was learned by mechanical imitation in premature perfection. It did not become frequent until 1;8, as late as voiceless k and after all varieties of vowels had been learned (398). ñ was only used syllabically at 1;7. One month later it also became a real consonant (388), but was not frequent and not sharply distinguished from j.

ease of articulation is not the only principle of sound-acquisition. Even the babbling child articulates with effort, just as it moves its arms and legs with a muscular effort and does not always take the easiest positions. But cf. 308, above: nasals, although not early, are easy and less subject to variation and substitution.

¹¹⁷ Jakobson, p. 56.
¹¹⁸ Passy (1891) 562: "Il est plus facile d'appuyer deux organes l'un contre l'autre... que de les rapprocher juste assez pour que l'air passe à frottement." Gutzmann, p. 70: "Die Reibelaute wird das Kind meistens erst spät lernen, weil für die Reibung ein Festhalten der Artikulationsorgane in einer bestimmten Stellung erforderlich ist, während die Verschlusslaute nur ganz vorübergehend die Berührung dieser Teile erfordern." Cornioley, p. 42: first mostly stops, until E 1;3; then fricatives. Cf. 308 above and Jakobson, p. 73. Röttger (p. 168) postulates an entirely different sequence of importance: lips—back tongue—front tongue, and front fricatives before front stops. This sequence of importance certainly does not agree with the usual sequence of acquisition.

¹¹⁹ We disregard, of course, the babbling fricatives, which were especially common at 09–10 (340).
The labiodental fricatives, the strictly dental fricatives, s, and the voiceless palatal fricative were not learned at all.

The only fricative which was early was h 1;4. It is not a fricative in the same sense as the others (402). It is interesting to note that it was, in spite of its easy articulation, much later than the glottal stop (o;7).

We disregard the clicks, which occurred only by themselves, not as real consonants.120

422. w, often classified as a fricative, but by us placed in a class by itself as a glide, was learned comparatively early, at 1;1. Not phonetically, but functionally it might be grouped with the fricatives since Hildegard used it regularly as a substitute for the labiodental fricatives, exclusively so 1;1–4 (373). Then we find the fricatives to be represented by a single labial 1;1–3 or rather 1;1–6,121 to which were added at 1;7 the alveolarpalatal j and the velar x and at 1;8 the alveolarpalatal z and the palatal j. f and x were used practically only in end position, w, z and j only initially. Since z and j were still used interchangeably, we should probably consider the fricatives to have reached the two-series stage. Initially, one series was labial and the other non-labial. At the end, the situation is different. At 1;11 we have f and x, two series, for in Hildegard’s speech they were kept strictly apart, but not a labial and a non-labial one.

If we consider the situation before the last month, before final x was used in agreement with the standard language, we find f to be the only final fricative, functioning as the representative of all standard fricatives, namely alveolarpalatalals, dentals, and even labiodentals, but not palatalals and velars. Thus we might say that in final position the single-series stage lasted almost to the end of the second year, the back fricatives still remaining unrepresented. There is in our case no evidence that s and z functioned as back fricatives, as Jakobson claims they do.122 The existence at this stage of a single dental (alveolarpalatal) fricative in end position is possible according to Jakobson, since fricatives do not, as the stops do, require the existence of an opposition dental/labial (p. 39, note 3) nor the acquisition of the labial before the dental (p. 72). The labiodental fricatives, the only labial variety possible in final position, remained indeed below the threshold.

121 This is contrary to Jakobson’s postulate. For fricatives he reverses the order (p. 72): “the labial phoneme cannot arise or exist without a corresponding dental phoneme”; but he is thinking of f and s, not of w, which he does not mention. In line with his own method of reasoning, we should expect, at any rate, a purely labial fricative to evolve in contrast with a dental before the compromise labiodental can be learned in opposition to both. This might be a real bilabial fricative (Φ or Φ) as well as the bilabial glide. Karla’s case presents evidence for this alternative. She had a single-fricative stage in which Φ was even the substitute for s and f, cf. 372, notes. There is no doubt that Hildegard’s w was functionally a consonant.
122 P. 38. Cf. above, 384, note. On p. 41 f., Jakobson recognizes that s and f are not always sharply distinguished, but seems to consider this possible only when fricatives are restricted to a single phoneme.
Jakobson's contention (p. 39) that \( f \) cannot be learned before \( s \) or \( f \) is disproved by our case (end of 384). At best it holds true in initial position.

423. The substitution of stops for fricatives, common in child language before the latter are learned,\(^{123}\) existed only in traces in Hildegard's speech. There was no case of \( f \rightarrow p \) or \( z \rightarrow s \); only one word with \( s \rightarrow t \) \( 1;8-2;1 \) (172); one with \( s \rightarrow k \) \( 1;11 \) (184; but also one with \( s \rightarrow t \) \( 2;1 \)); one with \( x \rightarrow k \) \( 1;10-11 \) (234; favored by initial \( k \), in *Kuchen*); two with \( \chi \rightarrow k \) \( 1;10-11 \) (235).\(^{124}\) Note that all these instances are later than the acquisition of fricatives (1;7). They cannot figure as examples of a principle of substitution, but as lapses from a difficult pronunciation into an easier, simplified one. The fact that they became fixed in certain words does not invalidate this explanation. Later utterances were regularly influenced by memory residues of earlier ones—motor rather than acoustic ones since the latter can be assumed to be overshadowed by acoustic impressions received from standard speakers. Only one set of fricatives, \( \theta \) and \( \delta \), was regularly changed into stops initially (but not finally).\(^{125}\) These purely dental fricatives never occurred in the child's speech even experimentally, as the bilabial and labiodental ones did.

424. The affricates, or stops combined with homorganic fricatives, need especially careful consideration. As previously stated, they are easy to produce (314) and are therefore the earliest consonant clusters to enter into the child's speech (405). They are found very early in Hildegard's linguistic development, \( k\chi \) in the cooing stage (0;1–2), others early in the speaking stage (1;0–4). Most of those which occurred in imitated words were, however, accidental, that is to say, they did not correspond to standard affricates. They were either stops in which the explosion was not executed energetically enough, or fricatives in which the narrow opening between the tongue and the roof of the mouth, or between the two lips, was not at once formed successfully (405 f.). This condition continued to occur to the end of the second year.

In addition, however, Hildegard had some affricates which resulted from more or less adequate reproduction of standard affricates. This is true of \( d_3 \), which was the voiced form of standard \( ts \), from 1;8, and of \( ts \), which reproduced standard \( ts \) correctly in the last two months (406). The voiceless variety was again later than the voiced. \( ts \) differed from the simple fricatives in being used in all positions; \( d_3 \), of course, did not occur finally.

Jakobson's contrast principle can be applied only to the imitative category. According to him (pp. 42 and 77), affricates contrasting with the corresponding stops are not acquired until after the fricative of the same

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123 Jakobson, p. 38.
124 Karla had stops for fricatives much more frequently. Her examples are given as notes to the same sections. She also had \( f \rightarrow p \), 127, note.
125 The striking difference in the treatment of initial and final fricatives is not mentioned by Jakobson.
series has been mastered. This is confirmed by our case, although the
distance is only one month (1;7/1;8) if we consider tf/dʒ a unit, as we
should (414). Actually dʒ and ʒ were learned during the same month
(1;8). The span is greater if we take the voiceless sounds by themselves:
f/i;7, tf/i;10. Jakobson says (p. 42) that affricates are replaced by one of
their components before they are mastered. This too is well confirmed by
our findings (314 ff.).

425. This leaves only the “liquids” to be considered. Their compli-
cated manner of articulation makes them difficult to learn or, in Jakob-
son's terminology (p. 74 f.), unsuitable to be contrasted with other con-
sonants at the earlier stages of speaking. They were indeed very late.¹²⁸
Varieties of r occurred only experimentally. I was learned at 1;6 after
rather unsuccessful attempts to imitate it at 1;5 (391). This is the only
sound in which the bilingual situation produced a special effect on the
child’s sound-learning, and it has been shown (402) that the bilingual
differentiation did not last. The first l was produced with a raised back
tongue, which is characteristic of the English velar l, and this l was
promptly (1;7) used even in the very common German word alle. The differ-
ence between the English and the German l would have to be classified
as one of the finest distinctions in the realm of sounds. Naturally it was
much too early for the child to learn such a disquisition.

The palatal l, lacking the elevation of the back tongue, was also learned
imitatively some months later (1;10). Both varieties of the consonant
had, however, such a feeble foothold in her sound-system that we cannot
assume them to have become separate phonemes. In the majority of in-
stances standard l continued to be represented by simplified substitutes.
Prevocally the usual substitute j emphasized its consonantal features.
In final position the vocalic qualities of l were isolated from it and re-
produced alone (307), the bilingual presentation leaving traces in the
quality of the vowels chosen.

The fact that r-, r- was represented by w might be due to the two-series
pattern of fricatives in her speech (422); but the two standard liquids
were not regularly kept apart; sometimes the same substitutes functioned
for both r and l (307).¹²⁷

426. Summarizing the phonemic analysis of consonant learning, we
find Jakobson’s contrast theory confirmed in most of its phases. The child
began with coarse distinctions and progressed step by step to finer dis-
criminations without as yet attaining very fine ones. The situation is
exactly parallel to the progress in the learning of vowels (361–367).

The points in which our findings disagree with Jakobson’s postulates
are the following. The contrast between buccal and nasal consonants

¹²⁸ Not all observers agree on this, however; cf. note to 391.
¹²⁷ The relationship between the two kinds of “liquids” (cf. 206) is illustrated by Steven-
sen, p. 119: “One child I knew of regularly interchanged the trilled spirants (sic!), as in ‘I
rost my ling’ (= I lost my ring).”
was not among the earliest, but came rather late, about 1;2, later than
the distinction between two sets of stops and two levels of vowels (419).
This seems more natural because of the relatively complicated nature of
nasals, which, according to Jakobson’s own theory, should move them
up into closer proximity to the complicated liquids, with which nasals
are classified by phoneticians and historical linguists. Jakobson’s error,
if it should prove to be one, seems to stem from his uncritical acceptance
of the traditional view that Mama and Papa are both among the earliest
spoken words. This view is, to be sure, confirmed by many studies of
child language; but nearly all of them were published by laymen without
linguistic training, who are under suspicion of having mistaken the
babbling combination mama for the spoken word with standard mean-
ing. This problem will have to remain under observation until we have
more records by competent linguistic scholars.

Another discrepancy is the fact that the bilabial glide w (422), omitted
by Jakobson, was learned early, 1;1, and functioned like a fricative. If
this assumption is correct, the postulate that dental fricatives must come
before labial ones is not sustained. Furthermore, it will not do to sepa-
rate f as a back fricative from s as a front fricative (384, especially last
note). Even the available literature shows that the acquisition of f does
not necessarily presuppose the existence of s. Finally, the different be-
havior of fricatives in prevocalic and in end position (422) must be rec-
nized. By neglecting the position of consonants in the word, Jakobson
distorts the picture, at least as far as Hildegard’s speech is concerned.

Again this problem should be watched in future records of child language.
Further observations might well lead to the conclusion that closure is
suitable for the beginning, openness for the end of words. This theory
might, in Hildegard’s case, account for the fact that most words began
with stops, buccal or nasal (but the frequency of initial b and w causes
difficulties); that she prefixed vocalic beginnings with the glottal stop
(403); that words usually ended in vowels for an extended period (312)
and that final fricatives became established earlier (1;7) than final stops
(1;9-10; 409), apart from the easy -p in one word, up 1;4 (112). The re-
sistance of f to use in initial position and its frequency in final position
(383) is the strongest argument in favor of such an assumption (cf. end
of 312).

Another important correction is the fact that the desire for contrast
is not the only principle operating in the building of children’s sound-sys-
tems. The tendency is counteracted by the urge for economy of effort in
successive articulations (cf. the following chapter). The need for con-

129 Cf. also the diverging treatment of k in different positions (310-312, 394): voicing and
dentalization initially, but not in final position. Jakobson’s phonemic sequence was revised
and made less rigid by Velten.
trast is not felt in unstressed syllables (cf. also notes to 363).

In points such as those enumerated Jakobson's theory may need re-
finements. I do not propose to make corrections in any definitive form.
His phonemic analysis is a valuable guide through the maze of phonetic
details. I have used it as a preliminary yard-stick and checked my own
observations against it for agreement or disagreement. If future observers
will do the same, we shall have a common denominator. This should lead
us to an improved yard-stick and make it possible to progress along a
well-marked trail.\textsuperscript{130}

As a note we append the observation that the bilingualism of our case
did not have any significant influence on the process of sound-learning.
The sounds of English and German are too similar to produce differentia-
tions in the child's early rough imitation. Those in which they differ (for
example English \( \theta, \theta \), German \( \varphi, \aleph, y, r \) belong to the latest sounds
learned by monolingual children, and had not yet entered into Hilde-
gard's store of sounds. Their omission should not be imputed to the
bilingual situation. Theoretically bilingualism places a greater number
of phonemes at the child's disposal. The selection from the large number
of possible sounds is eventually less restricted than in the case of a mono-
lingual child. The standardization of sounds had however not yet pro-
gressed far enough in Hildegard's speech to show this effect. Although we
have often kept German and English prototypes separate in our analysis,
we have found a distinction only between German \( l \) and English \( l \) (391);
but even there the distinction was wavering and not yet lasting (402).\textsuperscript{131}

As in the field of vocabulary (vol. 1, pp. 161, 179) the child was still
trying to weld two linguistic systems into one unit. The enlarged sphere
of experience, which was to result from bilingualism phonetically as well
as lexically, syntactically, and semantically, was still a matter of the
future.

\textsuperscript{130} The trail will be beset with difficulties. Cf. Williams's summary concerning the
"range of difficulty" (p. 28), which agrees only in part with Jakobson's theory and our
findings: the position of consonants in words affects the difficulty, finals being "significantly
more difficult than either initial or medial"; nasals are slightly less difficult than stops;
fricatives are decidedly more difficult than either, in all positions.

\textsuperscript{131} Cf. also the absence of imitative \( \varsigma \), possibly due to a predominantly English basis of
articulation (305), and the presence of a glottal stop before initial vowels, conceivably
due to a pronunciation habit prevailing in German (403).
General Phonetic Problems

427. All preceding chapters were concerned with an effort to establish principles of sound-reproduction and substitution. In the course of our examination, we found frequent cross-currents, which deflected the normal phonetic development. The more important of these will now be summarized systematically, and this analysis will be followed (465 ff.) by a discussion of such general phenomena as stress and pitch, which are definitely phonetic in character, but do not concern individual sounds.

428. The most effective force thwarting regular substitutions is assimilation, the polar opposite of the striving for contrast which dominates the earlier stages of the child's endeavor to master distinctions between sounds. As in standard languages, we find a tendency to reduce the span in the successive utterance of sounds and to economize on articulatory effort. The result is a partial or complete accommodation of articulatory features of one sound to those of a neighboring sound in the word. The assimilation of one sound to a contiguous one was usually partial in our case. The assimilation to a distant one, usually in another syllable of the same word, was often complete.

429. Sentence phonetics (Sandhi), or the treatment of sounds according to their position not in a word but in a group of words, plays a very minor part in our considerations. At the end of the second year, Hildegard still spoke haltingly, uttering each word separately, or at best small groups of words. The incipient sentence had not yet become a free-flowing stream, but was still a succession of ripples. Perhaps in such an early game-sentence as *I see you 1;5, learned in mechanical imitation as a unit, the point of view of sentence phonetics should be applied, and this has been done tentatively in the treatment of the s as intervocalic (169). *Da ist es 1;4–5 is another example of the same type.

Later on, such combinations as *komm mit 1;8–10 and come on 1;10 were treated as a unit. This had no phonetic effect on the German phrase except for the fact that the verb was suppressed as a pretonic syllable (476). The effect was more striking in the case of the English synonym, in which the pretonic syllable remained likewise unrepresented, but the m was reproduced as the initial consonant of the second syllable.

Compound verbs like pick up 1;9 and wake up 1;10 would seem to fall in the same category. Actually, however, the child pronounced these combinations with the glottal stop prefixed to up, a feature of word-phonetics. This is best regarded as a kind of re-composition, the child recognizing in the combination the long-familiar word up (1;4).

For the omission of the -s of eins in counting, see 157, 174 with note, 323. In such cases the Sandhi modification may have taken place in the presentation.

1 For all forms of assimilation, cf. Grammont, pp. 68–72, Wundt, p. 316.
Assimilation is thus in Hildegard's language on the whole a feature of word-phonetics. By far its most important phenomenon is the outstanding fact that initial consonants were prevailingly voiced in her word-forms (414). The principle of contrast would call for a voiceless stop to precede a vowel in the earliest consonant-vowel sequence, because absence of voice is as important as closure to produce the greatest contrast with the fully voiced and open vowel; the contrast between vowel and consonant arises in successive articulation, according to Jakobson (p. 56). Both in babbling 0;6–8 (340) and in speaking (410 f.), Hildegard used voiced consonants sooner in the consonant-vowel sequence, and they remained dominant to the end of the second year, even where the urge for contrast was supported by the presence of voiceless consonants in the prototypes. This fact can be explained only by the operation of assimilation, which is due to the tendency toward economy or ease as opposed to that toward contrast or clarity.²

The explanation is confirmed by the interesting history of the word *pretty. It had both stops in correct voiceless articulation during the long time that it was whispered, 0;10–1;8. They continued voiceless during 1;9 when the word was at last said aloud, because of the long habit; but at 1;11, when it became frequent again after a lapse, both stops were voiced. The full voice of the vowels had asserted itself and had been extended to the consonants by assimilation. A similar development took place, less clearly, in the word *piep–piep, which had b for a while 1;4 after the vowel had become voiced. In Ticktack, to be sure, the stops were never voiced; but this word showed other features of prematurely perfect imitation; it is not representative for normal phonetic processes. All consonants were voiceless during the whispering stage (359), even those transcribed with b and d, which had gentle release. The tendency toward assimilative voicing of initial consonants asserted itself as soon as words were uttered aloud. It continued, although at the end with decreasing force, throughout the first two years. It also operated on medial consonants preceding vowels (309), but less decisively.

Voicing of consonants before vowels is the most important form of anticipatory contact assimilation. It is a partial assimilation.

There are other instances of partial anticipatory assimilation of sounds in contact, but not very many. This is due to Hildegard's conservative inclination to avoid the imitation of words if she did not feel sure of being able to reproduce them with satisfactory accuracy. In the common phrase all well, the adverb ə was sometimes 1;8 varied to əau, which means simply that the glide of the following w began a little too early. The same was true at 1;8 in wauwi, whether its etymon was Milwaukee or far away or a blend of both. The diphthong in noise 1;11 was pronounced either with both components open or both closed. The latter

² Cf. note to 363. Cf. Ronjat, p. 49: "cri" > "almost" ɡri 2;10, likewise explained as anticipatory assimilation.
variant, which does not correspond to the presentation, must be due to an assimilation of ɔ to ɪ (tentatively accounted for, vol. 1, p. 115). The fact that a occurred instead of ɔ more frequently in the diphthong ɑu than in ɑɪ (97) is also easily explained as a contact assimilation.

More instances of consonant-assimilation would undoubtedly have occurred if Hildegard had added final consonants earlier, as her sister Karla did.³ In their general absence, particularly in the interior of words, there was little occasion for such assimilations.

432. Complete anticipatory assimilation is illustrated by the nasalization of low vowels preceding a standard nasal consonant, which remained itself unrepresented in the child’s word form (357). Otherwise complete contact assimilation was not a conspicuous feature of Hildegard’s language. Possibly, however, a contact assimilation of one element to another is also hidden in the treatment of intervocalic nd (332) and ld (325) and of final nd and nt (323) (cf. also 434).

Anticipatory assimilation at a distance was much more important (437 and 450); but first we must examine another type of partial contact assimilation.

433. Sometimes the span between two sounds in contact is diminished by the lingering of a feature of articulation, which is carried over into the following sound and modifies its pronunciation. Such a persevering assimilation could also be observed in a few instances. The word Augenblick is an illustration. The second syllable was dropped consistently. The bl was at first (B i;7) omitted or rendered in the regular way by b. From 1;8, however, it appeared irregularly as w, at 1;8 also as ß. The latter substitute might stand for b with assimilative modification, the half-open fricative being more similar to the open vowels surrounding it than the closed stop. The w could represent a further opening of the consonant or an unetymological glide from the high back vowel u to the high front vowel i, with omission of the interrupting consonant cluster. In either case w and ß are due to assimilation (115).

The surprising substitution of k for p in the puzzling word soap was tentatively explained as an assimilation to the preceding back vowel (vol. 1, p. 89).

A clear case of persevering contact assimilation is the form by for Bild o;9–1;0 and for pieks i;1. The lip rounding of the bilabial stop was carried over into the following vowel. A slight rounding of the vowel is recorded in the diary also for the vowel ɪ of bimbam at 1;1. This assimilation ceased after E 1;1 (348), when the articulation became more precise.

434. We find a case of complete persevering assimilation in the occasional absorption of the second element by the first in the diphthongs ar (94) and au (100 f.). This explanation is less compelling for ar, where

³ Assimilation of n to b in sandbox, ˈsæmbə(k) ɪ;10; cf. vol. 1, p. 94, note 173.
a dissimilation (461) on the part of the child or even of the standard speakers seems nearly always to be involved. In the case of au, however, assimilation is generally the only explanation for the reduction to a, which occurred quite frequently,⁴ although it was in nearly all instances superseded by an improved diphthongal pronunciation.

The possible complete assimilation of nd, nt, and lid was mentioned in 432. Persevering assimilation is more plausible than anticipatory for the voiced clusters.

435. There is a good number of instances in which an intervocalic voiceless consonant was voiced by partial assimilation to the surrounding vowels. Such cases cannot be assigned to either persevering or anticipatory assimilation. They should be interpreted as a combination of both, although the anticipatory element prevails perhaps. The child simplified the articulation by not interrupting the vibration of the vocal cords which is essential for both vowels, an assimilation which has ample parallels in the history of Romance standard languages. Examples are ʔaba for apple 1;5, ʔabu for open 1;8-11 (later standard p, but at 2;1 again assimilated b), ʔada for Auto 1;5 (voiceless consonant 1;7), paba for Papa B 1;11 (voicing of the initial p overcome, but retained for the intervocalic p). Since assimilations which are not sanctioned by the standard models always represent an imperfection of the child’s imitation, they are doomed to eventual disappearance, and we cannot expect them to occur consistently. It is not surprising to find that often medial voiceless consonants were not voiced (309). On the other hand, the omission of medial consonants, which was very common particularly in the earlier stages (261 and 311), should perhaps also be understood as a form of complete assimilation. It lasted beyond the second year for the non-labial voiced stops d, n, g, ɳ, also for r. In standard French, assimilation has commonly gone to the same extreme (omission), particularly in the case of buccal stops.

The raising of e to i in cake, once 1;9, may be a similar instance of partial assimilation to surrounding sounds.⁵ In this case a vowel would be influenced by the tongue position of the enclosing consonants (347). (bau for bell 1;11 was assimilated into bə at 2;1, 29. The compromise vowel which developed in standard English from the same diphthong, is also the result of a complete assimilation, anticipatory and persevering combined, without the influence of surrounding consonants.)

436. This concludes the systematic survey of contact assimilations. Assimilations at a distance occupied a much more prominent place in

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⁴ I would not trace this reduction to pronunciations of standard speakers, but it occurs in careless colloquial English too; cf. the common misspelling of “our” as “are,” often found in letters, and in written exercises of school children and even of college students.

⁵ A blend with the Low German word kie̱k, which had been in her vocabulary six months before, is entirely improbable. For the raising of the vowel before k, cf. neck, nik 1;10-11. The same form nik, along with nek, is reported for Pidgin English by R. A. Hall, p. 199.
Hildegard's language and, I am tempted to generalize, in child language in general. Many such assimilations result in reduplicated or quasi-reduplicated word forms. Their discussion will be reserved for the sections on reduplication (440–455). Here we take up the less numerous instances of assimilation which did not produce reduplicative forms.

Anticipatory assimilation at a distance is not essentially different from the same phenomenon affecting sounds in contact. The speaker, whose mind runs ahead of his tongue, faultily executes an articulatory adjustment needed later in the word a little too early. The difference is only that the span of anticipation is greater in the case of assimilation at a distance, another sound intervening which need not participate in the assimilation.  

Instances of partial anticipatory assimilation are the following. The pronoun I, which normally had the form ʔai, appeared as au in the first imitation of the phrase I do i;ii by anticipation of the vowel u in the verb; it was soon corrected. Handschuh was hadʒu at i;io, but haudʒu at i;ii; the raising of the back tongue, required for the second syllable, was anticipated at the end of the stressed vowel instead of waiting for the completion of the affricate. In the same manner hatu, based probably on Handtuch, but meaning Taschentuch, was pronounced also hautu i;io.

A consonant was affected in gek i;ii for cake. Of course, g is regular for k, but gek is the only lasting word beginning with g (213), which must be due to the final k (cf. 437). Otherwise dental substitutes were normal.

The regular unvoicing of final voiced consonants has been explained as an anticipation of the stoppage of voice at the end of the word (312). This would not usually be called an assimilation, but essentially it is the same process.

437. There are a few instances of complete anticipatory assimilation at a distance. The adjective all, usually ʔa, had an assimilated form in ʔau bau, all balls, at i;ii. The adverb all, which had as a rule the same form, appeared in a variant form in ʔa da, all gone, at i;ii. In both cases the complete identity of the vowel elements may be accidental. As we have seen (436), the former assimilation could also have taken place if the following vowel had been simple u; and the latter one coincided with a normal improvement of the form of all (2;1 ʔa). Yet it is reasonable to assume that the resulting rhyming forms, which are akin to reduplicated forms, favored the assimilation in both instances.

In the form hata for her name, Hildegard, i;ii, subsequent to the better form hita, the first vowel can only be explained as a total assimilation

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I disagree with those linguistic scholars who think that such an assimilation must also affect the intervening sound. They recognize apparently only contact assimilations. Psychologically there is no reason to believe that anticipation cannot jump over obstacles. Nor do I believe in the fleeting existence of unattested transitional modifications of assimilated consonants, of which Ronjat speaks, following Grammont (Ronjat 13 ff.).
to the second one. In bitte, in which both vowels were very variable, the first one was often lowered by partial assimilation to the second and sometimes at 1;10 took exactly the same form, bete, which stood experimentally also for button at 1;10. New York 1;11 anticipated the stressed vowel in the pretonic syllable, nojok.

A consonant was perhaps affected in kik 1;9 for cake (gek 1;11, cf. 436). The first k corresponds to the standard, but initial k usually became d.8

438. The examples for persevering assimilation at a distance usually show complete assimilation. Few of them concern consonants. Patsch 1;11 was pronounced with p or b, and the choice seemed to depend on the initial consonant used in Papa, which always preceded it and which wavered itself between voiced and voiceless stop during the last month; paba patf or haba batf. The faulty form of oatmeal, only once 1;11, with final t may be due to an assimilation to the preceding medial t, if it was not an accidental blend with meat. In either case it was no more than a slip of the tongue; but slips of the tongue are often assimilations. Whether the medial dental of doti, doggie 1;11 was at all due to the initial dental is hard to decide, since dentals were normal substitutes for g; intervocalic g was, however, regularly dropped in other words (223), none of which began with a buccal dental. This assimilation would not be quite complete on account of the voicelessness of -t-.

439. Vowels were affected more frequently. The first form for Auto, ?ata 1;5, owed its final vowel partly to persevering assimilation (47). The word Lscher, rarely said at 1;11 on account of its difficulty, had the form loko with persevering assimilation; the variant joke shows a more regular form of the unstressed vowel. In haba, hoppe 1;11 the second vowel may be due to assimilation, but it is not quite impossible that it is a substitute for a (86). In witi, Liebling, once 1;11, the second vowel is apparently a continuation of the first; but the form did not evolve regularly. In Joey's kimona 1;10, only the first word took a regular form; the second was progressively assimilated in a complicated manner (see vol. 1, p. 114) and was finally made to rhyme with the first, doi noi.9 The name Helen was haja from 1;9; the second vowel harmonized with the first. The same is true for apple, ?aba 1;5, ?apa 1;8. These instances stand as examples for a certain tendency to give unstressed vowels a quality identical with or similar to that of the preceding stressed vowels. It was observed particularly in the substitute vowels used for final syllabic n (151) and l (191-193). It usually amounted only to a partial assimilation, front vowels following front vowels and back vowels following back vowels. Whether complete or partial, the leaning toward vowel

7 Cf. Karla's form pot'o for pillow 1;11, note to 51.
8 Cf. "fork" > "kork," Tracy, cited by Wellman, p. 12 (wrongly called "duplication" and coupled with a case of semi-reduplication; cf. 450 below).
mony, faint though it was in Hildegard’s case, is nothing but a type of persevering assimilation at a distance.⁰⁰

⁴⁴⁰. Assimilation at a distance plays the most conspicuous part in those word forms of the child which took reduplicative form or a form strongly resembling reduplication. Not all reduplicative forms fall under the heading of assimilation, although the psychological explanation of reduplication may not be far removed from that of assimilation (⁴⁵⁴). Since reduplication is an outstanding feature of child language, we treat all phenomena pertaining to it or resembling it together, whether they be based on assimilation or not.

⁴⁴¹. Repetition of syllables started rather late in the babbling stage.¹¹ The first cases occurred at 0;7, dada, baba, ?æ;?æ; hæ:hæ. At E 0;8 babababa was still the most common combination. At the very beginning of 0;9 tæ tæ and dæ dæ were heard, and da da da developed self-expressive connotations. bajaja, with a slight assimilatory modification of the medial consonant, should nevertheless be called reduplicated. jeje was clearly so. At E 0;9 mamamama was heard for the first time. It remained frequent, also with back â, two or three syllables, but did not have the standard meaning until 1;3. Even the phrase mama papa occurred 0;10 without meaning. At 0;11 reduplicated babbling combinations receded with the exception of mama, but jajajaja was heard at the end of the month.

In the meantime the first imitative words had been learned, and for a while it was characteristic that these did not have genuinely reduplicated form. In fact, it might be said that absence of reduplication served to set off consciously imitated words from effortless sound-games. This distinction was in part defeated by the fact that nursery words were often presented in reduplicated form with or without ablaut and naturally imitated in a corresponding form as a rule.

Partly as a consequence of this condition and partly as a result of the child’s own inclination to continue the babbling practice of repeating syllables, the impression was at B 1;3 that reduplication was characteristic of Hildegard’s speech.¹² The nearly perfect whispered pretty, which resulted from parrot-like imitation, and the word baby, semi-reduplicative in the presentation, were thought to be the only exceptions. In the light of later tabulation (vol. 1, p. 151 f.), this was not quite true, but the impression recorded at the time should mean at least that reduplicated words were frequent and dominant at that stage. As more and more

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⁰⁰ Karla had a curious case of combined anticipatory and persevering assimilation: lemonade, nem'nem E 1;10–B 1;11; only the second m is regular, the other two are due to assimilation. At E 1;11 the word was changed by a new anticipatory assimilation into nem/nem, resulting in a semi-reduplicative form.

¹¹ Wundt (p. 286) makes the same observation.

¹² Mrs. Hall, chapter V: The first 6 words were reduplicated. Lewis (1936) p. 8: 46% of “the first half-dozen conventional words” were reduplicated (three children).
words were learned, reduplication became less conspicuous, but it continued to play an important part. Words presented with reduplication and words clothed in reduplicative form by the child will be separated in the following.

442. A list of words which were always or often presented to the child in reduplication and learned in the same fashion will show how large was the number of such words. It may not even be quite complete.

Words with one-syllable reduplication, with the month in which they were learned: Papa 1;0, Mama 1;3, by-by (reinforced by “winke, winke” for the same purpose, although the latter was not learned) 1;3, Dodo 1;6, ätsch 1;6, A-a 1;i, hoppe 1;i, cocoa 1;8, nein 1;6, night 1;5, quak 1;i, nait-nait 1;6, no 1;6, m-m (negative) 1;6, sch (riding motion) 1;0, ls, ts, o;10, Wawau 1;i, Welkheh 1;i, rock 1;8, choo-choo 1;7.

Two-syllable words in repetition: bitte 1;5, hacke 1;11, watschel 1;11, kitty 1;10, naughty 1;5.

Many of these words retained their reduplication through the second year, especially those which were always reduplicated in the presentation. Others lost it later as the presentation gave up the adaptation to infantile needs.

A few examples need some discussion. When Papa was first learned it was articulated as two separate syllables with level stress, E 1;0-M 1;i, a feature which did not correspond to the usual form of presentation. I interpret it as a subconscious effort to distinguish the imitated word from the previous meaningless babbling combinations. This would mean that there is no uninterrupted stream from babbling reduplications to imitation of standard reduplications. At E 1;i, however, the pause in the middle of the word was discontinued, and by E 1;2 the phrase had clearly become a reduplicated word with a single initial stress.12 It is legitimate to assume that by then the previous and simultaneous practice of babbling reduplication had taken hold of the word, which was no longer spoken with effort. Mama, which acquired meaning more than two months later, went through the same stages during 1;3. In the case of this word it might be thought that the level stress and pause reflected the previous efforts to teach the child to say the name (vol. 1, p. 102). This explanation is however not convincing if we consider that Papa had gone the same way earlier without any efforts to teach it. At 1;6 the name Dodo was learned at once with the standard stress distribution; but the split form do-do also occurred at first, even at this late stage (vol. 1, p. 105). Some of the models had level stress, but not these three (cf. 443).

Hoochoo 1;5 can also be listed as a reduplicated form of the child, although it consisted only of an overlong vowel, with or without an introductory glottal stop. The vowel of this shout was split into two halves by a change in pitch, just as in the presentation, which really contains no medial h either.

The child’s pi-pi referring to birds o;i-1;9 is difficult to assign to any

12 Cf. Hoyer 7: /pal/pa/pa>/papa, etc.
one category because it answered to several presented forms. In so far as it corresponds to piep-piep or its English equivalent, it belongs here. It corresponded however also to Piepvoel and to the canary’s name Piepcchen and then represented a genuine child’s reduplication of the stressed syllable. It had level stress early and late, but occurred also with initial stress, although standard piep-piep has level stress.

One last remark: a standard reduplication was not necessarily reproduced as such (we shall see another example under semi-reduplication, 448) or reproduced at all. Papa had usually reduplicated form, to be sure; but at the time (1;11) when the initial consonant began to be nearly correct, the intervocalic consonant retained the form b (105). The urge to voice the consonant was stronger than the pleasing effect of a perfect reduplication. The favorite game cue “guck-guck” was not learned in spite of its satisfying reduplicated form, but ignored in favor of competing synonyms (vol. i, pp. 118, 124). In a few cases the predilection for exact reduplication was counteracted by dissimilation (461 ff.). As a rule, however, the child adopted standard reduplications readily, since they appealed to her.

443. Since both the habit of reduplication established in babbling and reduplicative nursery words of the presentation (themselves based, of course, on children’s babbling practices) favored the doubling of speech elements, it is not surprising to find that Hildegard frequently doubled whole words which were not so used in the presentation.

We consider first the instances in which a word was said twice with level stress. Each part retained its identity. It was not transformed into one word with two identical syllables of which the first one was stressed. This is not yet reduplication in the technical sense, but it is doubling.

Monosyllables: German Ball at 1;1 (vol. i, p. 43); this at 1;10 repeated several times as a running start for a statement; ʔaʔ a 1;0 as a call to dogs (became genuinely reduplicated a month later); ja 1;5 in fourfold, two days later in twofold repetition (also without reduplication); mehr 1;10 urgently repeated as a wish for more to eat (vol. i, p. 107); mea, mea?au 1;10, repetition of the pretonic syllable of miau because it was linked with the word mehr by child etymology. (When you was new at 2;1, it was sometimes said twice, with a stress on the second element, vol. i, p. 123—essentially the same type of repetition although the stress was not level.)

Dissyllables: dicken, dicken Bauch 1;10; alle, once at 1;8 repeated enthusiastically after single presentation (therefore not based on the double presentation commonly used in nurseries in the same sense, “all gone”; I did not say “alle, alle”).

The early transformation of standard reduplicated words into forms with level stress (442) is related to this type of pre-reduplicative doubling (“pre-reduplicative” not necessarily in a chronological sense).

444. In cases where a monosyllabic word was doubled and by the test of stress treated as a single word, we have genuine primary reduplication.
Instances of this type were not numerous, but there are some. Instances of *dada* said in an unorthodox way when handing over objects, 1;4–5, may not really go back to *thank you*, but represent reduplicated German *da*, which is suitable for the purpose. The early form of *cake*, *keke*, 1;6 and 1;10, was certainly a reduplication of the form which still lacked the final consonant; it was perhaps favored by the attempt to pronounce the latter (ephemeral form *kik* 1;9); later the reduplication was dropped. The call for dogs, *?a ?a* 1;0, became one reduplicated “word” at 1;1. *Ride* was reduplicated at 1;8, *hahah*—the clearest example; it lost the reduplication at 1;10. The verb *rock* had real reduplicated form at 1;8 (succeeding doubled *rock, rock* at B 1;8, 442). 14

445. The pattern of reduplication set up by these various categories of doubling led to the development of another type of genuine reduplication, which we shall also consider a primary reduplication. It consists of the imitation of a standard two-syllable word by a two-syllable form, of which however only one, usually the stressed one, is evolved regularly from the model, whereas the other one is a simple repetition. 15 It satisfies the feeling for rhythmical agreement with the prototype and is used at a stage when the powers of concentration do not yet suffice to attempt the exact reproduction of both syllables. This type comes closest to what is usually called reduplication in the philology of standard languages. Forms of the exact type of Latin “tetendi” from “tendere” did not occur and can hardly be expected, because word forms of more than two syllables were still rare in Hildegard’s vocabulary.

When the second syllable is sacrificed in this manner, we have a persevering reduplication. The name *Carolyn*, much too complicated for exact imitation, was simplified to *dada* 1;3; it had at first a variant of the same type, but with level stress, *ga-ga*; *Dada* became frozen because the family adopted it as a nickname for the maid. A homonym *dada*, also 1;3, based primarily on *thank you*, secondarily on *danke*, remained stationary without such support. *Tante* 1;1 did not last long enough to become stabilized, but the reduplicative *da-da*, with level stress on account of the early time, occurred among the experimental imitations. *Cracker* appeared at 1;7 in various reduplicated forms like *kxakxa*, *gaga*, of which the latter became established and fixed; the reduplicative origin is proved by the irregular second vowel (90); the second *g* might be a regular substitute for -*k* (216). *Marion, *meme>* meme 1;4, may have been partly induced by the fact that the girl’s sister had a name with reduplication in adult usage, *Dodo*; Hildegard lapsed into level stress *me-mem* at least once 1;6. *Grandpa* stopped with the very infantile form *gægæ* from 1;8. *Rita* was *wiwi* 1;5–11. *pipi* 1;1 belongs here in so far as

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14 Karla had a few cases too, for instance *bebe* for *back* from 1;5 (vol. 1, p. 42, note 24).

15 “Parareduplication” is the term coined by Chamberlain “to designate . . . the tendency . . . to reproduce as equi-branched disyllables many words coined from their elders.” What is meant is more clearly shown by the example given, “paper”>“bëbë.” They found the tendency at its height at 1;6–8.
it stood for *Piepchen* and *Piepvogel*, but it is intertwined with *piep, piep*, which explains the prevalence of level stress in the child’s forms (442). *Milwaukee* was *wau* at 1;8 with or without repetition (blend with *Wauwau*)?

Exact reduplication occurred even a few times for *Tickstak*, the ablaut of the standard reduplication being given up, at 0;11 (double click), 1;0 (double aspirated *t*), and 1;7 (whispered *t’it’i’*).

Concerning the complicated process leading to experimental *neno* for *kimona*, see 446.

446. Anticipatory reduplication was rare, which is not surprising since both standard languages are Germanic and have initial stress.16

*Hello* imitated both syllables fairly faithfully at 1;5, but reverted to reproduction of the second (stressed) syllable alone at 1,10 and this syllable was usually used in reduplication from E 1;10. Since the child put the stress on the first syllable of the reduplicated form, it is very doubtful whether this case should be called an anticipatory reduplication. The first form of *all right, ?ai?ai* 1;8–9, is not regular with regard to the first 1. The first syllable may be reduplicative; but since the form had initial stress, it was probably also due to a persevering reduplication of the type “right-right.” It lost the reduplication at 1;10. The situation may be similar with regard to *Opa* at 1;1. The first syllable, although stressed, was omitted, the second sometimes doubled.

There are however a few instances in which the second syllable undoubtedly served as the basis of the child’s reduplicated form even though it did not bear the stress. Both the number of syllables and the stress distribution were retained; the first syllable of the child’s form was stressed. *Cookie* was *titi* 1;6–7 and remained fixed for a while. At 1;10 it was still *didi*, but then it gave way to a form with a better stressed vowel. To be sure, the consonants were both regular, and the modification of the first vowel is an anticipatory assimilation to the second (437); but the fact remains that a fully reduplicated form resulted, which was no doubt felt as satisfying and in turn reinforced the tendendy toward reduplication. That is why cases resulting in reduplication were excluded from the foregoing survey of assimilations. The word *Papier, paper* is puzzling. The child’s forms seem to be a blend of the two prototypes with their wide discrepancy in vowels and stress; but it cannot be doubted that the first syllable of her forms *bubu* 1;10 and *bubu* 1;11 (which superseded the semi-reduplicative form *babu* 1;8) anticipated the second vowel, which proceeded from the unstressed syllable of the English model. The consonants are regular so that the case is similar to the preceding one. Both

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16 We can expect to find more such reduplications in French. Cf. Feyeux, p. 164: “chemise”>“mimise”; “c’est là, persistance du langage des premiers mois, trop souvent entretenue par l’entourage.” This explanation is only half correct. We have here at the same time a reproduction of the pretonic syllable in assimilated form. Sully (p. 156 f.) cites from Pérez “chapeau”>“peau-peau.” He is in error when he assumes that the second syllable is unstressed in French. Concerning anticipatory reduplication in pretonic syllables in Hildegard’s later language, see end of 476.
cases do not represent a real doubling of a syllable, but the result is nevertheless a fully reduplicated form.

After this analysis we see that there is probably no instance of genuine anticipatory reduplication, but there are cases in which the resultant word form appears descriptively as its equivalent (cf. 447).

The experimental form nono for kimona 1;10 shows indeed anticipatory assimilation of the consonant, but persevering assimilation of the vowel. If we assume the consonant assimilation to precede the latter (as we did, vol. 1, p. 114), we have a persevering reduplication.

447. The situation is similar with regard to a few instances of perfect reduplication, which also did not result from real doubling of one syllable, but from regular development of each sound of both syllables abutting in accidental identity. I should like to call this phenomenon secondary reduplication. It is probably advisable to extend the same term to the cases of cookie and Papier, paper discussed in 446, where we also found no real doubling, but regular development plus anticipatory vowel assimilation. Again the satisfaction derived from reduplicative forms can be assumed to have contributed to the formations since the rules of substitution did not necessarily lead to complete identity of the two syllables. Kitty 1;3 was either didi or titi. Each sound was a normal substitution, but each could also have appeared in a slightly different form. At a later stage, when faithful imitation became more satisfactory than reduplication, the complete identity was progressively given up, didi 1;10 > diti 1;11; only the initial consonant was eventually still different from the standard. Sticky had the form titi 1;6-7. All sounds are regular, but for the initial consonant d would be more normal on account of the prevailing assimilatory voicing. We might attribute the choice of both sounds of the first syllable to anticipatory assimilation; the case would then fall under 446. The effect is the same: a reduplicated form results, which satisfies.

448. We have reached the end of full reduplication. A similar device to link two syllables of a word is identity of consonants with ablaut of vowels. To shorten the term we call this phenomenon semi-reduplication (also quasi-reduplication).

This device is used in the standard languages, again particularly in nursery words, which fact alone proves that it appeals to children. Words of this form are nearly as easy to imitate as full reduplications; attention is needed only for the modification of the vowel in the repeated syllable.

The first standard word of this type to be imitated was Ticktack (tick-tock) 0;11. Hildegard at first succeeded only in imitating the second syllable alone, but the onomatopoetic semi-reduplication asserted itself immediately after. From then on the word always had reduplication, usually with level stress. The ablaut was sometimes sacrificed and at other times both vowels were omitted, but the doubling of the consonant symbol was always preserved, with one exception: atrophied t’ā reappeared temporarily at 1;7.
Only the first syllable of *bimbam* was imitated at 1;1, but the ablaut lingered in her ear and was produced from memory at 1;2.

*Baby* is a real word, but it is of the same type. It is not surprising that it was one of the earliest words learned, 1;2, also one of the earliest reproduced consistently in perfect pronunciation (cf. vol. 1, p. 165). Its first forms had level stress or even the stress shifted onto the second syllable; but soon the stress was correct. Its standard form and its adoption in German are presumably influenced by child language.

*Kritze-kratze* was not imitated in this form 1;1-4, probably because the pattern was restricted to a total of two syllables; *kritze* alone was reproduced.

449. The pattern of semi-reduplication being available in the presentation and its appeal to children being proved by its use in nursery words, we are not surprised to find it cropping up quite frequently in the child's word forms. In contrast to full reduplication there is no case in which an unetymological syllable was added with ablaut. All dissyllables of semi-reduplicative form are attempts to reproduce standard words with two or three syllables, either with regular sound-substitutions or with assimilation of consonants at a distance. In both cases a resulting semi-reduplicative form was adopted as pleasing until a later stage when the discrepancy between it and the authoritative standard form became felt.

We enumerate first instances in which normal substitutions resulted in semi-reduplicative forms. *Pocketbook* babu 1;8 (middle syllable dropped; closer to standard at 2;1); *Papier, paper* babu 1;8 (fully reduplicated 1;10); *stocking dadi* 1;7; *Gertrud(e) de(:)da, da:di* 1;1 (too primitive to be regular, but the consonants seem to agree with the standard); *street-car dida* 1;11; *Tante dr-dae*, possibly da-da 1;1 (along with reduplicated da-da; also primitive in vowels); *kitty didi* 1;10-11 (superseding full reduplication 1;3; later unreduplicated diti 1;11); *peekaboo br:bu* 1;8-11. *Cookies tutif, dudif* 1;10-11 also belongs here because the plural ending was beginning to be felt as a morphological addition, which probably did not destroy the feeling for the semi-reduplicative character of the base (earlier, full reduplication 1;6-10).

Wherever both reduplicative and semi-reduplicative forms existed, the former represented the earlier stage, as is to be expected. The only exception is her form for *Papier, paper*, which suffered from the blend of the two prototypes and did not develop regularly.

450. The fact that the semi-reduplicative pattern had become a speech pattern for the child is best proved by the cases in which the repetition of the consonant did not proceed from the standard word by regular substitutions, but in which one of them was entirely changed in character by anticipatory or persevering assimilation to the other. Only consonants preceding the vowel need be considered in this pattern; the open ending of syllables was still the rule. (In the somewhat premature *Tic-tack* 448 the final *k* was sometimes reproduced, characteristically not in the later, but in the earlier months, to 1;3.)
Anticipatory assimilation is found in buba for toothbrush 1;6 (four months later no assimilation but level stress, indicating re-composition); dadi for Bleistift 1;7 (after the better form bari 1;6, on account of the great merger described vol. 1, p. 66); dadi for Nackedei 1;7 (after dai 1;6; not regular; participated in the same merger). Kuchen kuko 1;10 may be based on anticipatory or persevering assimilation, more likely the former (duko 1;11).

Persevering assimilation took place in Carolyn gega 1;2 (fully reduplicated from 1;3); Jasper dadi 1;7 (merger); Milwaukee wauwi 1;8; buggy babi 1;6 (regular form bara 1;10, without semi-reduplication); Theresa tita, dida 1;11 (t, d < -s- can only be explained by persevering assimilation, 169); maemi 1;6 for Marion (dissimilated from the usual reduplicated form).

In Tante dri-dae 1;1 (also fully reduplicated) and Taschentuch dadi 1;7 both consonants are regular, but the irregular form of the vowels follows the semi-reduplicative pattern, in the first case because of infantile fluctuation of vowel quality, in the second with the help of the dadi merger.

In experimental noni for kimona 1;10, the consonant is due to anticipatory assimilation, the second vowel is the result of blending (vol. 1, p. 114).

451. We are at the end of the sections on reduplication and semi-reduplication. These phenomena are of great importance as cross currents often destroying the operation of regular substitutions. In the analysis of the child's substitutions we have often found that intervocalic consonants did not behave as such when the second syllable was the same as the first. In words like Dodo or choo-choo for instance, the identity of the syllables was recognized and preserved by the child, because the reduplicative pattern was also a pattern of hers; the medial consonants were therefore treated as if they were initial. It is necessary to discount this influence if we wish to discover the mechanism of regular sound-substitution.

Complete or partial reduplication is in many cases a special type of assimilation, which sometimes goes so far as to make all sounds of one syllable identical with those of the other (in the vast majority of instances, only one consonant and one vowel are present). Before we re-

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17 Karla used much less reduplication than Hildegard. A case of anticipatory semi-reduplication is Vatt i:a:t'1;8 (a:ti 1;10). Cf. Preyer, p. 147: "Jena" > "nena" 1;10; Cohen p. 114 f.: "tomer" > "bomber" until 1;10. Holmes (p. 222) found a scarcity of reduplications in his case, namely only two "syllabic repetitions" at 1;6 in addition to those corresponding to standard forms. Children differ in the use of reduplication as in other features of speech; it is sufficient to find some even with children who are not given to the use of reduplications.

18 Cf. "kawkee" < coffee, "duplication of the easier sound in preference to the use of the more difficult one"; Tracy, cited by Wellman, p. 12.

19 Grégoire (p. 260 f.) rejects Stern's use of the term assimilation, particularly for examples of semi-reduplication culled from Deville. He says they are reduplications. I have no quarrel with the partial identification of the two phenomena.
turn to the less specialized discussion of assimilation, some general remarks on reduplication are in order.

452. Observers agree that children like reduplication.20 Semi-reduplication, a feature not emphasized up to now in the literature on child language, can be assumed to participate in this predilection. An esthetic pleasure in it can readily be understood if we remember that rhyme of initial consonants is an artistic device, cultivated especially in the early Germanic languages. It is as natural for these languages with their initial word stress as is the end rhyme for languages with the stress toward the end of the word, but both types of rhyme have come to be used in both types of languages to some extent. Semi-reduplication as reminiscent of alliteration can therefore be placed side by side with the agreement of vowels, of which we also found traces in Hildegard’s speech (437 and 439), as reminiscent of end rhyme. Full reduplication combines, in a sense, both types of rhyme.

This should not be taken to mean, however, that the esthetic enjoyment is the primary cause for the creation of reduplications. One of their roots is undoubtedly in the habit formed by the use of combinations of this type in babbling21 (441). The babbling reduplications and those used in speaking are explained by “the impulse to go on doing a thing, and the pleasure of repetition and self-imitation,”22 or the pleasure always felt in repeating the same muscular action until one is tired.23 Delacroix (1930, p. 283) tries a psychological explanation of the joy derived from repetition, not speaking of linguistic acts; “la répétition de certains mouvements” takes place “comme si l’acte laissait après lui un état d’excitation, qui déclenche sa reproduction; processus analogue à la persévération, à la stéréotypie,” proceeding first by self-imitation, later similarly in the imitation of others. This explanation means motor repetition of the baby’s own productions. A very similar view is taken by Decroly (pp. 91 and 230), who, following Guillaume, speaks of the rhythmic tendency of neuro-muscular activity24 and of the stimulation lingering in the speech apparatus of the child. Allport (p. 185) emphasizes the repetition of what the baby hears himself say and applies to it his formula of “fixation of circular responses.”25 Both acoustic and motor repetition and fixation of motion are probably involved, with the accent, I am inclined to believe, on the latter, since at least the earliest babbling reduplications are likely to be no more than an application of muscle exercises to the

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20 Cf., for example, Sully, p. 158, Spitzer, p. 91, Delacroix (1930), p. 308.
21 Sully, p. 156 f.
22 Sully, p. 156 f. Most of his examples do not concern genuine reduplications, but simplified imitations of dissyllables (445 above).
23 Jespersen, p. 108. Cf. also Wundt, p. 313.
24 Wundt (p. 286) speaks of the general psycho-physical predisposition of certain organs of motion toward rhythmical functioning.
25 Latif (p. 63, note 28) credits S. T. Bok (1917) with the discovery of the “reflex-circle” and accuses Allport of making use of the principle without mentioning the original source. But Lewis (pp. 59, 79) traces the hypothesis of “circular reaction” to Baldwin (1895), whose disciple Allport is.
specific muscles of the apparatus later used in speaking. The sound resulting from these muscular exercises strikes the child’s ear of course, and the acoustic pleasure contributes secondarily to the practice. Several of the preceding views are contained in the explanation of Lukens (p. 449), who deals with reduplication as a motor difficulty and sees in it the combined effect of assimilation and attraction (which I would also call assimilation). “When the organs are in position for a sound, they naturally will tend to repeat that sound or its cognate” (= homorganic sound), he says. This sounds like an explanation restricted to persevering reduplication; his examples, however, contain anticipatory reduplication just as often, and his explanation could be corrected to cover such cases as well. The same defect is inherent in most of the other explanations cited in this section. Since anticipatory reduplication undoubtedly exists (see note to 446), the situation is a little more complicated than these writers think. This observation, however, does not invalidate their arguments.

453. The preceding discussion has been concerned with the psychological and physiological origin of reduplication, and the explanations quoted aimed at showing that this form of vocal utterance is easy to produce. If this were the only way of looking at it, reduplication would be an infantile feature, which would be overcome by later developments. While this is largely the case and the beginnings of the recession are observable even in our record before 2;0, the fact remains that some use is made of this device in the standard forms of the better-known languages and that certain standard languages build it up into a linguistic device of importance.26 There must be linguistic potentialities inherent in the device of reduplication, and other writers stress indeed its expressive value for children. Bloch (1921, p. 698) characterizes the doubling of syllables as partly mechanical, partly intensive and emotional. Delacroix (1930, p. 308) says: “La réduplication est facilité mécanique et plaisir; elle a aussi valeur expressive et elle sert à insister ou à marquer fortement.” Jakobson (p. 69) emphasizes only this latter aspect with a different slant: “durch die Silbenreduplikation wird in den Anfängen der Kindersprache die sprachliche Geltung des Lautes, bzw. die Abgeschlossenheit einer sprachlichen Einheit signalisiert.”27

454. Grégoire’s polemic (pp. 261–263) against Stern’s explanation of reduplication as a manifestation of inertia (Trägheit) (Stern p. 348 f.) misses the point. In part his objection is perhaps due to a misinterpretation of “Trägheit” as laziness (“nonchalance”). He says that, on the con-

26 Cf. Spittner’s observations on Turkish, especially p. 91. In this connection he makes interesting remarks about children’s reduplications, particularly those with labials, with the usual arguments for the prominence of labials. I have the impression that Japanese makes extensive use of this and other features characteristic of child language, but would like to be checked on this point by a linguistic scholar who knows Japanese.

27 Meringer (p. 218) explains reduplication physiologically: both halves of the brain give linguistic impulses in early childhood.
trary, it represents an effort for the sake of practice; both use Preyer's observation of his son opening and closing the lid of a pot 79 times in succession. I see the situation as follows. The early babbling reduplications originate because elements in the child's physiological and psychological make-up favor repetition and make it natural, easy, and pleasant. At the same time, when a new sound is involved, reduplication helps the effort necessary to become used to it and provides opportunity for practicing it; this might in our case apply to j at 0;9 and 0;11 (44). There is no essential opposition between the two aspects. In Preyer's lid operation (I made a similar observation, vol. 1, p. 26), the child repeated the same motions with effort and with a desire to practice and learn; but at the same time the repetitions made these motions easier each time, easier certainly than would have been the inception of entirely different motions. If, by trial and error, the child modified the motions slightly on repetition, we might even compare the result with the ablaut of semi-reduplication. (This simile is lamer than most similes, but it helps to show the kinship between muscle exercises and early vocal utterances.)

Playfulness, the joy of repetition and phonetic harmony, enters into the process. This esthetic urge naturally asserts itself more strongly in child speech than in the language of adults, although it is an element of the latter as well. It is one of the psychological conditions that make reduplication easy.

The element of practice and effort is of reduced importance in the reduplications and semi-reduplications of the speaking stage. They are predominantly the outcome of the urge for economy of linguistic effort and of the motor and acoustic satisfaction derived from repetition and congruence of sound. Economy is an impulse of vast importance in all language. It is at the root of all assimilations in the widest sense of the word, therefore also of reduplications and semi-reduplications. Economy is in part the linguistic equivalent of inertia (Trägheit) as understood by physicists and psychologists, but does not entirely coincide with it. Reduplications after the babbling stage do not all constitute a lingering of an articulation; particularly the semi-reduplications are often the result of anticipation of a consonant which follows. Certainly, inertia should linguistically not be taken as a synonym of laziness, with the moral opprobrium attached to the word. Of course, in standard languages limits are set to the operation of assimilations (and other processes resulting from the urge for economy) by the necessity of being understood. The pole of intelligibility is not yet a strong check in a child's "little language" (as French writers sometimes call it), because the immediate environment knows the child's speech so well that understanding does not suffer seriously. Child language, for instance, allows the existence of

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28 Concerning the theory of polarity in language, see my article listed in the bibliography, and the note to 363 above.
numerous homonyms (458 f.), but they have no chance to survive very long, and economical formations which are not homonyms also recede, because greater conformity with the standard improves the intelligibility and therefore furthers the objective of speaking.

To a limited extent, however, even early reduplications take the hearer into account in addition to serving the convenience and pleasure of the young speaker. This holds especially for real primary reduplications (443 f.). Just as reduplications presented by the standard (442) are impressive and appealing to the child and eagerly seized for imitation, the new formations following the same pattern serve well to express the child’s intensity of feeling concerning the object or action referred to.29 The speaking child usually wishes to impress the listener in one way or another with his vocal utterances, and the forceful shape of reduplications makes them appear especially well suited to influence the hearer in the desired way.

In the case of the word this repeated several times as an introduction to a statement (443), the greater difficulty of the word to follow, increased by the emotionalism of the young speaker, induces the lingering of the easy word.

The standard languages to which Hildegard was exposed do not favor the retention of reduplication. It was therefore recessive in her vocabulary. This course of development cannot be expected to be the same in the case of children learning a language which itself utilizes the linguistic potentialities of reduplication for purposes of emphasis, not so much because the device is easy as because it is effective.30

455. For some of the word forms of reduplicative character, the problem arises: why was the assimilation involved sometimes anticipatory and sometimes persevering? Which principle determined the choice between the two possibilities?

This problem does not concern the reduplications taken over from the presentation, nor those with regular consonant substitutions, nor the types of genuine primary reduplication. In the first two of these categories, no assimilation was involved; in the third it was naturally persevering because a syllable evolved from the presentation was set twice. That leaves only the examples of semi-reduplication not corresponding to the standard (450). In them the two types of assimilation are approximately in balance, with a slight preponderance of the persevering type. If we are right in viewing semi-reduplication as a variant of full reduplication, the persevering type is the natural one since we are dealing with a form of repetition. In that case the anticipatory reduplications

29 Cf. Stern, p. 348 f.

30 I think Spitzer is not objective enough when he calls reduplication in standard Turkish “primitive et presque enfantine” (p. 90). While this is genetically correct, we have no right to call an effective linguistic device infantile just because the languages with which we are most familiar choose to relegate it to nurseries. He would probably not call the emphatic repetition of adjectives and adverbs in Italian “almost infantile.”
must be of a different character. They do not show a dominance of the syllable with main stress, the consonant of which is, on the contrary, subdued by that of a following syllable bearing less emphasis. Perhaps these cases should be segregated as mere anticipatory consonant assimilations at a distance, a semi-reduplicated form being achieved by accident, but satisfying the child in the same way.

It has been postulated that a mechanical phonetic principle dominates the choice, the "duplication of the easier sound in preference to the use of the more difficult one."\(^{21}\) The list of our examples is really too small to vindicate or refute the claim. It seems to apply quite well to the cases of persevering semi-reduplication. The consonants sacrificed were l (Carolyn), sp (Jasper), k (Milwaukee), g (buggy), s (Theresa); all of them were indeed among the sounds resisting imitation. Of course, as we have said, persevering reduplication is natural; but then there were enough two-syllable forms which showed no persevering assimilation and had no semi-reduplicated form. Perhaps the child resorted to this device only in words the sounds of which presented difficulties for better imitation. The objection to this is that in some words the same sound was not modified in this manner; for instance k was reproduced correctly in bacon (1;9), pocket, backe, dicken (1;8!), hacke, in part just as early (cf. Milwaukee with w for k 1;8).

Among the instances of anticipatory semi-reduplication, the assimilation of t to the b of the second syllable in toothbrush 1;6 yields to the postulated rule, since t can be considered more difficult than b. This consideration is however rather too theoretical; t had been acquired before, and the normal substitute d presented no difficulties whatsoever at this stage. The child would have had no trouble in articulating tuba or duba. Besides, the b was conquered by the following t in Bleistift 1;7; this instance runs diametrically against the rule. It is much more plausible that we have in both instances cases of an anticipated articulation, the tongue yielding to the quicker tempo of the mind. In the case of toothbrush, the anticipatory assimilation is aided by the fact that brush was already in the vocabulary, while "tooth" was not and received therefore less attention. In Bleistift, the assimilation was favored by the fact that its result was dadi, a word form which seemed to obsess her mind during 1;7. This applies to Nackedei as well. That leaves only Kuchen, a word in which the k conformed to the substitute for ɔ if it is a case of anticipatory assimilation. This is certainly not a convincing example of a harder sound giving way to the easier.

The outcome of our examination is that Hildegard's case does not con-\(^{21}\) Tracy, as cited by Wellman, p. 12; according to the examples, non-redunductive assimilation at a distance (fork > kork) is included. Schultze (p. 49) postulates the same principle for assimilation in general. Foerster (p. 217 f.) claims the opposite: the child anticipates the most difficult sound, French "t-ante" being explained, contrary to the usual practice, in the same way as the child form t-ötl<"oncle." This interesting theory finds no corroboration in Hildegard's language.
firm the phonetic rule, but cannot be used either to disprove it conclusively. On a monographic basis it is more appealing to seek the basis of semi-reduplication in the lingering of the articulation of a syllable (lingering because we are dealing with Germanic languages, in which the stress is usually on the first syllable). Anticipatory assimilation at a distance is a contributing element which belongs here not for genetic reasons, but only because its descriptive result is also often a semi-reduplicated form, which affords the child the same satisfaction as one originating in repetition with ablaut.

We shall come back to considerations of this kind when we examine the rules of assimilation in general (460); but first we shall look at a few special types of assimilation which operate less extensively than reduplication.

456. Haplography, being the omission of a syllable which should occur in repetition (the variant term "haplography" illustrates a haplography if it is based on the latter form, which is the accepted one), might appear as the opposite of reduplication. It can be called an instance of dissimilation in so far as its operation destroys an existing identity or similarity of two syllables. It is also possible, however, to classify it as a special kind of assimilation, because a fusion of two articulatory elements is the extreme form of complete assimilation.

There are few examples of haplography in Hildegard’s language, and those which do occur are only special cases of the tendency to suppress one syllable in a sequence of more than two syllables, a tendency which operated extensively and reduced most words in her vocabulary to a two-syllable maximum (478 ff.). There is no single word shortened by haplography, because no word in which it could be applied occurred in her vocabulary, but there are a few phrases in which its operation is obvious. The first words of the nursery song, "Rock-a-by, baby" became her word for a rocking-chair at 1;10. Its first form, \textit{wok bebi}, consisted of two words; she singled out the two stressed words \textit{rock} and \textit{baby}, both of which were in her vocabulary, for imitation (cf. 487). At 1;11 however, the form was coalesced into one word, \textit{woka'bebi}, which evidently was an attempt to reproduce the whole phrase, from which the "by" was eliminated because three syllables beginning with \textit{b} in succession were apparently too much for the child at this late stage, when reduplication no longer gave so much pleasure. This is not a case of haplography in the strict sense, since the suppressed syllable was not identical with any of the others. It can legitimately be called an example of dissimilation.

A better instance is the sequence of the names of three cousins, \textit{Marion—Dodo—Joey}, which was given in full at 1;7, \textit{meme, dodo, doi}. When the recital of the series had become mechanical, the second name was regularly omitted, even in the face of criticism, 1;7–8. The reason cannot

\begin{itemize}
\item \textsuperscript{22} Eckhardt (51) does explain it as a form of dissimilation.
\item \textsuperscript{23} Cf. Karla's case in the following note.
\end{itemize}
have been psychological; Dodo was much more important for her than the boy cousin, who was less interested in her. That leaves only a mechanical phonetic hapology as a plausible explanation; the sequence do-do may have reminded her too much of her earlier infantile babblings, and the second name had less prominence in the rhythm of the series. It is quite possible, of course, that the omission struck instead the second syllable of Dodo and the first of Joey. That would explain why she did not insert the second name even upon request. She was perhaps not conscious of having omitted any of the names. At any rate it seems incontestable that this is a case of genuine hapology.

There is a bare possibility that the forms dita, difa for this in the last half month conceal some instances of hapology if any of them stood for “this is a” or “this is the”; the only recorded combination, however, is “this is mine.”

457. There were a considerable number of cases in which the phonetic form of one word interfered with the regular sound-substitutions of another. Blends transcend the ordinary definition of assimilation; but in so far as the process makes the forms of two words identical or similar, it is at least related to assimilation. Phonetic analogy is an accepted term for comparable phenomena; but it is not usually applied to cases in which two complete words become similar to each other. We restrict the term to instances in which there is apparently no semantic kinship involved.

Blends come about easily when a semantic relationship exists between two words. Sometimes, however, the attraction is purely phonetic. The habitual sequence of articulation of an established word form exerts a mechanical influence on a new word form, which ought to be slightly different by the rules of substitution, but is actually drawn into the familiar path. The two types of examples cannot always be separated with assurance. The child may feel a semantic connection where the adult sees none. We must not forget that the processes of the child’s mind are not accessible to direct observation, but can only be inferred tentatively

44 Chamberlain (vol. 11, p. 453): “Dit-a” < this is the. Karla had a more striking case of hapology in kap, cover up 1:10. The vowel, which should stand twice, was simplified by complete contact assimilation, the middle syllable remaining unrepresented. In cases like this, hapology should doubtless be interpreted as a form of assimilation. For Hildegard, cf. also the possibility of hapology in bobby-pin, 485.

45 Cornioley (p. 14), also describing a case of five words merging into one form at 1:3, says: “Durch die lautliche übertragung erreicht das kind eine bemerkenswerte vereinfachung des wortsschatzes, bei aller entwicklung des begriffsschatzes, durch verdichtung der hauptlaute sämtlicher ähnlicher wörter auf eine neubildung, die allen gehörten vorbildern gleichermassen nahe und auch fernsteht (sic).” Bloch (1921, pp. 701-704) states that blends were very frequent and usually mechanical. Wundt (p. 399 f.) calls them rare. Karla furnished proof of the fact that similarity of sound can conjure up semantically unrelated words from the memory. On her third birthday I used the German word “Hammer.” She reacted with the statement, “I was sinking (thinking) ‘harmonica’.” The phonetic resemblance between these two words is much fainter than in any example where I have ventured to assume phonetic analogy in Hildegard’s language.
from objective evidence. Besides, blending is often suspected where no better explanation for irregular phonetic treatment is at hand. Phonetic analogy can never be proved. It is always a speculative explanation.

The most striking case of blending is that repeatedly referred to as the dadi merger. Of the five standard words which took this form at 1;7, only one, stocking, developed regularly into dadi, and this meaning was indeed the first one attached to the form. Then its easy and pleasing semi-reduplicative shape induced four other words to take the same form. None of them was likely to become dadi without such a phonetic analogy, although a somewhat similar form could have come about without its help. The influence was purely formal; in meaning the five words had nothing in common. Bleistift had had a much better form, batti, at 1;6; but with the help of assimilation at a distance, it could be transformed into a hypothetical dardi, which was close enough to dadi to be absorbed by it. The first syllable of the ephemeral name Jasper had to become da; the second syllable is no more than its repetition with ablaut, the specific shade of this ablaut being determined by the favorite combination dadi. Nackedei was dai at 1;6; reduplicative insertion of another d changed it to dadi; possibly the second d reflects the standard d, and the first d is assimilated to it from n; in that case the vowel of the second syllable must be explained by blending. Finally, the first syllable of Taschentuch could also become da; the second was likely to be dropped, but the third could certainly not result in di by regular substitutions; the word occurred once in this form, adding a semi-reduplicative syllable which was also determined by the pet form of the month. Three of the words involved clung to the form dadi to the end of the year, namely stocking, Bleistift, and Nackedei (the latter changed abruptly into nakadaí soon after the turn of the year); the other two were lost for reasons which had hardly anything to do with the homonymy.

Other examples of blending can be disposed of briefly. Reference is made to the discussions in the Vocabulary (vol. 1).

Phonetic analogy: Mary Alice was deflected by miau (p. 104). Milwaukee in its early reduplicated form wauwau 1;8 (p. 132) was possibly influenced by Wauwau. The strange form dada instead of dada for thank you at 1;4 (p. 65) probably came from by-by, which had progressed a little earlier from baba to babai. ?oku'bebi, Onkel Peter (p. 117) was certainly blended with baby, probably even with rock-a-by, baby. ?ari, Alex, with its irregular second syllable, must be the effect of the homonymous alley, in spite of the complete absence of semantic contacts (cf. 87). The form of drink of water 1;11, at least its distribution of stress (473), leaned toward that of dicken Bauch (p. 73). Doubtful: the variant bia for Bär, bear may be influenced by spielen, which was normally bia (p. 51); witi, Liebling 1;11 (and witi, fishes 2;1) by witi, Fritzchen (p. 137 f.); the first experimental forms of button 1;10 by bitte (p. 49). jaka, once 1;11, klappet seems to have suffered interference of klappert (p. 95). jai, write 1;11, the
only case of j<r- (206), might be due to formal blending with lie and slide. Improbable: blend between Buch, book and boat, Boot (p. 59).

Blends supported by semantic contacts: ätsch deflected in (p. 80), a most striking case; I feel very confident about its explanation. Handtuch, hatu, hautu was absorbed by Handschuh, haud3u (p. 89); this explanation is much more convincing than the attempt to trace hatu to a blend between handkerchief and Taschentuch; the etymon for hatu should have been given as Handtuch, despite the meaning “handkerchief” with which the child used it. Bottle influenced the form of water (p. 129; semantic contiguity). The term of endearment Schnucks must have been associated in some way with the word coat, if our explanation of the puzzling form nuk (p. 115) is correct. The name Joey 1;7 transformed the word kimona 1;9, both in the semi-repetitive form noni and in the rhyming form noii (relationship between an object and its former owner, p. 114). The ephemeral interjection bu::, used with reference to thunder, may be a blend of the interjection bu, bums, which was appropriate for sudden thuds, with the interjection bu, pooh, which expressed distaste; the onomatopoeic fitness probably contributed (p. 60). At the stage when she did not succeed in imitating Mama but said baba instead 1;1–2, the difficulty was probably not phonetic, but an interference of the earlier, semantically related name Papa. Whether a blend was still involved in the playful variants maba, bama 1;4 cannot be decided (p. 102). There is a possibility that the recessive form drit for this at 1;10–11, with the exceptional substitution of t for s, was a blend with the practically synonymous that (p. 74). The semi-repetitive form wauwi for Milwaukee in its vague meaning may contain traces of (far) away (p. 132). If the reduplicated form ?a?a used 1;0–2 to address dogs was not an onomatopoeia (468), it may have been influenced by Wauwau, which began to be imitated 1;1 (p. 32). The irregular form dik for sticky may have had something to do with stick (cf. 67, note). Whether the nonce-word oatmeal with its final t was influenced by meat (both are foods) cannot be decided (p. 117). The tentatively assumed blends between toast, cake, and Kuchen (pp. 77, 84) have been rejected as improvable.

Here belong also the cases of child etymology, like miau > mehr auf (p. 107; cf. 443); Leona > mehr Oino, possibly with an additional formal interference of miau (p. 105); and pretty coat < petticoat (pp. 77, 120). The confusion of in with ätsch, just mentioned, can also be called a child etymology.

Blends of bilingual synonyms also rest on a semantic basis, the meaning being completely identical. Papier and paper were amalgamated into one form which took phonetic elements of both (p. 61); the forms bubu and bubu might be traced to paper alone with the help of anticipatory assimilation of the stressed vowel; but one of the first forms, babu 1;8, does

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26 For other examples of child etymology, cf. Macdougall, p. 35 and Stern’s last chapter.
not correspond to either etymon alone. *Broke*, in the temporary form *buk* 1;9, seems to have its vowel from the synonymous *kaputt* (p. 58), which may inversely have been influenced by its English counterpart. The synonyms *zu* and *closed* may have been blended (p. 123). German *Bad* 1;3–9 may have influenced English *bath*, from 1;9, in so far as the verb form was also used as a noun, because in German the vowel does not differ between verb and noun (p. 42); but such a transfer could, of course, also be made without a model at a stage when parts of speech were not yet well distinguished. A blend between *soap* and *Seife* is improbable (p. 89 f.). Whether *Liebling* was deflected from its regular course by a formal blend with *Fritschen* or by a semantic bilingual blend with *sweetheart* (p. 137) or even *sweetie* (cf. 195) remains in doubt.

To these cases should be added the numerous instances in which the English and German prototypes resemble each other so much that they are both assumed to be the etyma, like *Buch*, *book*, etc. Sometimes it was possible to untangle the strands, as for German *Auto* and English *auto* (p. 40), but more commonly no such attempt could be made.

In view of the fact that Hildegard's speech mixed English and German words freely, it is rather surprising that each individual word usually retained its phonetic identity wherever German and English differ and that more cases of phonetic bilingual blending are not found.

There is one example in which apparently two successive forms of the same word were later blended, namely her own name, *Hildegard*. Its first form B 1;11 was *hita*, regularly developed from the model; the second, *hata*, showed anticipatory assimilation. From then on the form was usually *hata*. It is either a blend of the two earlier forms, or a blend between the still current form *hata* and the model with its conspicuously different vowel. An interference of *ata*, *high-chair* is suggested (p. 87) as a possibility, with trepidation; but it cannot be ruled out. Who could follow a child through the maze of its imperfectly disciplined mind? The association which we claim between *Schnucks* and *cool* is even more far-fetched.37

458. Since blending often resulted in formal identity of words, we have approached the topic of homonymy so closely that we shall dispose of it at this point. This does not mean that all homonyms were the result of assimilation. Most of them were the accidental outcome of the regular operation of sound rules. If there is thus little connection between

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37 Bloch (1921) found a “singulière abondance” of “croisement de mots” and analogy, usually purely formal analogy, at all stages (p. 701); he gives many examples for the “mobilité de l’image verbale” (p. 704). “Un seul mot très employé peut déclencher toute une série de modifications analogiques” (p. 706); “les mots voisins de forme réagissent extraordinairement les uns sur les autres” (p. 53). Some striking assimilations are also revealed by his examples: “bouillie” > “bijl,” *i.e.*, the first vowel anticipates the articulation of the stressed one, or is modified by contact with the sound-complex *j* (p. 56). Blending and phonetic analogy played a much greater part with his three children than with mine. Stern (pp. 346–348) gives numerous examples, but only one of them antedates 270.
assimilation and homonymy genetically, the aspect of similarity, in fact, formal identity, is descriptively a link between these two linguistic categories. Cases of homonymy, like those of assimilation, show how relatively unimportant phonetic disquisitions demanded by the standard languages were as yet to the child. All standard languages allow a number of homonyms to exist side by side without serious disturbance of the mechanism of communication. This tolerance goes much farther in child language; the number of homonyms is much greater. If the restricted environment of the small child did not know the child and his speech so well, this situation would be unbearable. Sometimes utterances of the child were misunderstood even under these favorable conditions, and the number of homonyms was consequently reduced steadily as the child's word forms developed more and more toward the standard form.

In the following we enumerate, in alphabetical order, the instances of homonymy which occurred in Hildegard's language. Most of them existed simultaneously. Identical forms with different meaning which were not in the vocabulary at the same time (successive homonyms) are less interesting unless we assume that a subconscious memory of word forms once used still lingered on in the child's mind; but they are included for the record. Cases of homonymy are not all immediately revealed by the alphabetical Vocabulary in vol. 1, because it lists the last form, so that only homonyms surviving at the end of the second year appear there side by side. There were many more in the course of the development of words. If I have not succeeded in catching all of them by a careful examination of the vocabulary, the following list still gives an adequate idea of the extent to which homonymy existed in the child's language.

459. Homonymy can be found even in babbling combinations as soon as they acquired rudimentary meaning. *dadada 03* (listed under *dididir*, vol. 1, p. 72) indicated both dissatisfaction (scolding) and comfort, two entirely different emotions, which were distinguishable only by the tone. All of the following examples, however, belong to the stage of imitative speaking, during which the phonetic form of the word meant more to the child.

*?a* was from 1;10 the equivalent of *all* both as adjective (1;10) and as adverb (1;5). This homonymy exists in standard English (not in German: "alle" and "ganz") and is therefore not surprising. *?a, arme*, was probably not felt as different; it coexisted at 1;7 with *all* as adverb. *?a, andere or other*, is only slightly different; it also occurred once 1;7.

*?a?*a was an address for dogs 1;9–2 and stood in the same form for *A-a* from 1;3, after the earlier use had been given up (successive homonymy).

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38 Cf. Bridges.
39 Cf. Jakobson, p. 69. It is worth noting that standard homonyms caused more misunderstandings than would occur with adult hearers, because the child sometimes recognized a word without understanding the context. Such instances are recorded in vol. 1 for the words *?ai, ei, eye* (p. 32 f.), *iron* (p. 34), *kiss* and *Kissen* (p. 73), and *train* (p. 124).
?aɪ meant at 1;11 both Alex and alley. The irregular form for the name is probably due to attraction to the form of the more common word alley (blending).

?aɪ, ei from 1;4, I from 1;5, Ei from 1;7, eye from 1;7, all coexisting from 1;7, homonymous as in standard speech. This homonymy had to be endured although it proved to be a great difficulty (see vol. 1, p. 32 f.). At 1;11 eins was added to the list, but it occurred only in counting.

?aɪf, Eis 1;7 (once), eins 1;11. Successive homonymy, and besides eins usually lacked the final fricative.

?ap, up from 1;4, but once 1;11 also ab.

?au, auf 1;6–9, aus, out 1;6–11, Auge once 1;7, au 1;8–11.

?aux, auf and aus, out 1;7–11.

ba, Ball (1;0–8; also ba), box 1;6 (–9?), Bauch 1;6–10, block 1;7–8, Paul at 1;8, baden at 1;8, Zwieback once 1;9, piano 1;11. In addition, ba; baden 1;3–9.

baba, Papa 1;1–11, Mama 1;1–2, Ball at 1;1 (with reduplication), Opa at 1;1 (with omission of the first syllable and reduplication), by-by at 1;3.

babu, Papier, paper at 1;8; babu, pocketbook from 1;8.

bar, Ball 1;3–9 (also baː어, bar, baː), buggy from 1;6, buy 1;11. Misunderstanding (see vol. 1, p. 45).

barʃ, heissen and brush at 1;10.

bart, bite from 1;10, bike at 1;11.

bak, block from 1;10, box from 1;10.

bake, pocket at 1;10; boko, backe 1;11. Successive.

baut, Baum from 1;8, ball and bauen from 1;9, aboard at 1;10, bell and powder-puff 1;11.

baw, bauen from 1;9, Baum at 1;10, blow at 1;11. It never stood for Bauch, in spite of its homonymy with this standard word.

bea, pail 1;11, one form of Bär 1;11.

bek, break at 1;10, bake 1;11. Successive.

bi, Bild 0;9–1;8, pieks at 1;4, Spiegel at 1;8(?), please 1;9–11, peas from 1;10, spielen at 1;11.

bia, pillow, spielen, Bär, all at 1;11.

bij, please from 1;10, piece 1;11.

bitʃ, beach, beads, Brief, all at 1;11.

bok, broke at 1;9 and from 1;10, Brot at 1;9, Boot, boat from 1;10, Buch, book 1;11; also bok, bug 1;11.

bu, Blumen at 1;0, 1;7, and 1;11, Brot 1;7–9, spoon from 1;9, balloon from 1;10, pooh 1;11. buː, Butler once 1;9. buːː: for thunder 1;11.

bu, Brot 1;7–9, bums at 1;9, put 1;11.

bux, Buch, book at 1;9; bux, Brot 1;7–9.

by, Bild 0;9–1;0, pieks at 1;1. Successive.

da, da from 1;0, down from 1;4, Jack at 1;9, cover, John, and tragen 1;11. Sometimes in two meanings in the same sentence.
dada, Carolyn 1;2-10, thank you, danke from 1;3; da-da, Tante at 1;1 (dadada at 0;9 scolding and comfort).
dadi, five simultaneous meanings 1;7, see 457.
da‘i, dolly from 1;6, candy from 1;10.
dar, cry, drei, dry, all from 1;10.
dak, duck from 1;6, obscure form meaning Bleistift at 1;10. Misunderstanding resulted once from the homonymy.
daf, crash and dress from 1;10, Glas, glass (once), Katz, and kratzen, scratch 1;11.
dat, forgot 1;11, that (one day) 1;11.
dik, drink and stick from 1;10, variant of sticky 1;11.
do, cold, comb, go, and door from 1;10, throw, dog, and donnert (once) 1;11; go away and throw away were homonyms at 1;11.
do, gone from 1;10, call at 1;11.
doda, Dodo from 1;6, dunkel at 1;8.
dot, toast at 1;9, coat and don’t 1;11.
du, June at 1;8, too and two from 1;10, do, Zunge, and through 1;11.
duko, dunkel from 1;10, Kuchen at 1;11.
duf, juice and Kuss 1;11.
?et, ütsch at 1;10; ?et‘, in from 1;10 (blend, 457).
?a, a and of experimentally at 1;11; earlier ?a?, demonstrative interjection, much more emphatic, 1;3-6.
ha, hot from 1;4, hat from 1;8.
har, heiss at 1;5, light 1;6-8, ride from 1;8, outside at 1;9, high 1;11.
hat, hot and hat from 1;11 (aspirated t 1;11, unaspirated 2;1).
haudzu, Handschuh 1;11, Handtuch (Taschentuch) 1;11 (blend, 457).
hö, home 1;11, holen (once) 1;11 (ho, hole 2;1).
jar, lie, slide and write from 1;11 (2;1 also like and first syllable of sidewalk).
(ju, Zunge at 1;11, you, your 2;1; successive. Cf. ju, shoe at 1;8, juf, shoes at 1;11.)
ma, man from 1;5, come on 1;11. ma, Mann from 1;6, Mack at 1;7. (mā, man 1;5-2;1; mū, come on 2;1.)
mat, my, mine, mein from 1;6, money 1;11; even the two combined.
mauf, much 1;9-10, Maus, mouse at 1;10 (also mauf at 1;8), meins at 1;11.
mauf, mouth from 1;10; mauf, Maus, mouse 1;11.
mir, mitten 1;6-8 (mi: at 1;5), milk, Milch at 1;6, mit at 1;8; mi, mitten 1;6-10, milk, Milch 1;7 (-9?), mit at 1;9. Thus, from 1;6 to 1;9, one form always stood for at least two of the three words involved, even if we take the indication of half-length and shortness strictly at face value.
mo, more at 1;6, come on at 1;10. Successive.
na, now from 1;9; na:, banana, Banane (once) 1;11.
naɪ, naughty 1;7 (-10?), nein at 1;9. Perhaps successive; there is no record of naughty between 1;7 and 1;11.
nainai, nein nein at 1:7 (nair-nair at 1:6), night night 1:7-10.
narf, nass at 1:8, nice from 1:10, knife (one day) at 1:11.
no, snow 1:6-10, no from 1:8; no; nose (once) 1:8.
noi, snowing and kimona at 1:10.
noi, snowing at 1:8; noi, naughty 1:11. Successive.
gair-gair, night night 1:5-6; gair-gair, nein nein at 1:6.
(pu, pooh and poor at B 2:0.)
ʃ, sch 1:9-6, sh from 1:6, shoe 1:6-7.
(3u, shoe from 1:10, you and your 2:1, you and shoe in the same sentence.)
guf, shoes and zu 1:11.
t't, Ticktack at B 1:0, choo-choo at 1:8. Successive (t' also for sch, riding motion, at 1:6).
titi, cookie 1:6-7, sticky from 1:7.
tu, through and two 1:11, too at 1:10 (and 2:1).
CC, tsk, tsk from 0:10, Ticktack at E 0:11.
wu, water at 1:7, walk at 1:8; wa, Frau at 1:8.
war, why at 1:10, zwei from 1:10, fly 1:11.
was, wash from 1:8, watch from 1:9.
wu, wau, Frau from 1:8; wau, flower 1:11.
wauwau, Wauwau from 1:6 (with a 1:7-8); wauwau, Milwaukee at 1:8 (see 457).
wau, Wauwau at 1:6, rock at 1:8. Successive.
we, away from 1:6, way from 1:7, wet 1:7-8, wake at 1:10, where 1:11.
we?ap, way up from 1:7, wake up at 1:10 (457).
wek, weg at 1:10, wake from 1:10.
weit, wet 1:10-11, wait 1:11.
wi, feet at 1:10, three from 1:10, feed and read 1:11; wiwi, Rita from 1:5.
weis, wischen and Fuss 1:11.
wa, rollen from 1:9, fall 1:11.
wak, rock at 1:10, walk 1:11. Successive.

The existence of numerous homonyms in child language has, of course, been noted before, but no such extensive and detailed list has ever been compiled to my knowledge.

460. Before we leave the discussion of assimilation and related phenomena, a word is necessary concerning the distribution of anticipatory and persevering assimilation. Stringent phonetic rules have sometimes been postulated. The problem has already been discussed for our instances of reduplication (455). The scanty examples of assimilation without reduplication (436-439) do not shed any further light on the situa-

41 Ronjat 13 ff., with references to Wundt, Brugmann, Grammont, Meringer; Schultze, p. 40.
tion. Taking both sets together, we can state that in Hildegard’s speech the examples of persevering assimilation are a little more numerous than those of anticipatory assimilation, particularly with regard to consonants. The difference is, however, slight, and I would not dare to deduce any phonetic laws from the material. Both anticipation and perseveration are easily explainable on a psychological basis, and I am quite satisfied with the observation that both operate in Hildegard’s language. Their opposition represents a form of polarity in a restricted field and helps to create, in a modest way, some of the tension which lends vitality to language.

461. A polarity exists also between the larger categories of assimilation and dissimilation. Both operate in the development of standard languages, with a heavy preponderance, to be sure, of assimilation. The same is undoubtedly true in child language. We cannot expect to find a great many examples of dissimilation, but there should be some. There are indeed a number of irregular substitutions which can be explained by dissimilation.

Our most convincing case is ice-cream 1;11, ụati> ụati; the ụ was eliminated from the diphthong on account of its similarity with the vowel of the second syllable. Here we have an opportunity to check: the nearly identical German Eiskrem was always ụarte 1;9; the ar was not simplified because the vowel of the second syllable was not similar. Most of the other instances of ar>a (94) can also be explained by dissimilation. It was undoubtedly sometimes performed by the adults themselves in a careless pronunciation of the first syllable of by-by, which became reduplicated baba 1;3, babar 1;4, reduplicated babar or dissimilated babar from 1;5 (even after 2;0). Bleistift was bati at 1;6, but became dadi from 1;7; it can be explained by dissimilation of the diphthong and anticipatory assimilation of the initial consonant, but blending (457) induced these changes. (At 2;1 the pronoun I often took the form ụa. This can be explained by dissimilation only in cases like ụa jak, I like. Otherwise the contraction, also taken over from careless adult pronunciation, should be explained as a complete assimilation of the second element of the diphthong to the first; see 434.)

We find the opposite situation, a>a, in dada, thank you 1;3 becoming dada, ephemerally E 1;4. This might be due to a dissimilation of the reduplicated form, but, in view of children’s predilection for reduplications, it is more plausible to explain it by the influence of the simultaneous babar, by-by (457). Hildegard, hata> hata, might be called a partial dissimilation, if it is not rather the result of some type of blending (457).

The diphthong au was often reduced to a, ọ (100 f.). This is due to assimilation (434). It was characteristic of the earlier stages of speaking, but Auto 1;5 had a along with au again as late as 1;11. One might see in

42 Bloch (1921, p. 698) calls it “très rare.”
this a dissimilation from the back vowel of the second syllable o, sometimes still o; but it is much more likely that the English prototype auto, with a simple vowel, asserted itself at that stage.

The strange omission of the second vowel in dik 1;11 for sticky was tentatively explained by dissimilation, but not with conviction; perhaps it is due to a blend (457). (?o: dau instead of ?o: do; all gone 2;1, might be a dissimilation.)

The raising of the vowel of bia, bia 1;11, traced to Bär, was explained (vol. 1, p. 51) as an attempt to make the German word less similar to the English bear, which has a lower vowel. This would be a special category, dissimilation of bilingual synonyms; but it is not convincing. If it was more than an accidental phonetic variant (36), its explanation as a blend (457) is more appealing.

The semi-reduplicated variant maumi 1;6 for the usually fully reduplicated Marion 1;4 cannot easily be explained by anything but dissimilation, which in this case affected both vowels, spreading them apart by moving both, in opposite directions.

462. A few more instances of irregular vowel change would not usually be called dissimillations, but are related in character. The long vowels a: (21) and o (45) were quite frequently split into the diphthong au, au, the glide being sometimes continued to u in the case of final o. If we call the contraction of a diphthong into a simple vowel an assimilation (434), it is perhaps permissible to call the reverse phenomenon a dissimilation. If we look at the long mid back vowels as composed, in duration at least, of two short vowels, the dissimilation becomes fairly clear; the two components are made as dissimilar as possible, the first being lowered and the second raised practically all the way.

In dress 1;10, the sequence af was felt as more satisfactory than es, in spite of the acoustically less faithful reproduction (385). We might explain this by the fact that there is more contrast between a and f than between e and s. The lowering of the tongue position for the vowel would then also amount to a contact dissimilation. Perhaps the lowering of e to a before l (29) is comparable, although the phonetic explanation is not so simple.

463. All preceding instances of dissimilation concerned vowels. A few examples of irregular consonant development can also be accounted for by dissimilation, but they leave even more room for doubt than the cases of vowel dissimilation.

Shoe 1;6 had initial s or j from 1;8, but the correcter s prevailed by 1;10 (388). When the plural ending was added in the form of s B 1;11, j was chosen as the initial (vol. 1, p. 123). This may have been accidental, since j and s were used interchangeably (398 and 421 f.); but it is not improbable that dissimilation determined the choice. If so, it was not a strong impulse, for suf was said soon after jusf.

The fact that the semi-reduplicative forms for Theresa 1;11 were later given up in favor of dita can be attributed to dissimilation with regard
to voice. This is not certain because voicing of initial t is normal. Since the intervocalic t is not a normal substitute (169), but is definitely due to reduplication (450), it is, however, probable that dita was still felt as a semi-reduplicative form slightly modified by dissimilation and did not represent an improved articulation based on the standard form. The change from kuko 1;10-11 to duko 1;11 for Kuchen and from keke 1;10-11 to gek 1;11 for cake shows dissimilation with regard to voice (both) and place of articulation (Kuchen) and a waning of the predilection for reduplication. In both words we find a successive effect of assimilation (436 f. and 450) and dissimilation. The somewhat surprising voiceless t in doggie, doti 1;11 may be dissimilated from the initial voiced dental. Another speculative case of dissimilation is mentioned in 317.

Dissimilation with regard to the place of articulation contributed to the prevailing choice of final k for (s)t in toast 1;9-11, a substitution which was otherwise rare and obsolete by 1;11 (141). The urge to dissimilate was again not strong. dot was the first established form 1;9, and the same form was used without hesitation for coat and don't 1;11. (witif for fishes E 2;1 may be another case, 184; medial and final f in succession never occurred.)

Concerning haploglogy, see 456.

464. Dissimilation and assimilation are opposite phenomena, but both serve the convenience of the speaking individual. Reducing the discrepancy between successive articulations means a saving of muscular energy and the resulting similarity or repetition (in the case of assimilation at a distance) is pleasing to a certain extent. On the other hand, uniformity can become tiresome and therefore difficult (think of “tongue breakers”!), and then dissimilation makes utterances easier and more pleasing. The tug in opposite directions is a fact, and it is not surprising. Naturally, assimilation, patently serving the urge for economy of physiological effort, is much more frequent.

465. Metathesis is so generally discussed by linguistic scholars in conjunction with assimilation and dissimilation that we had best take up the few observations belonging into that category at this point. It belongs here in so far as its operation also results in word forms which do not submit to the normal phonetic rules.

The presence or absence of metathesis seems to vary greatly from child to child.44 Hildegard, with her generally cautious speech habits, had few of them. There are two instances which I would certainly explain as metatheses; the others are very uncertain.

At 1;11 Opa was heard with transposed syllables as whispered pe-e once

44 Blech (1921, p. 698) declares it to be “absolument absente” in his case. Sully (p. 155) records a small number of striking metatheses, both contiguous and distant. Preyer says that metathesis is rare, but lists three cases of transposition of sounds at 210, 214, and 215 (pp. 124, 172, and 177) and two cases of transposition of whole syllables at 1;10 and 2;6 (pp. 149 and 178). Cf. Ament pp. 67 and 69-71. Stevenson p. 119: “Transposition... is not uncommon.”
(cf. note to 298). At 1;8 the unorthodox form 13 for Schuh, shoe changed to 31, ji. The latter instance was not even a metathesis by comparison with the standard form; on the contrary, it may have been a device to bring the child's form into somewhat closer conformity with the structure of the prototype. Genetically, however, it must doubtless be classified as a metathesis, particularly because the quality of the vowel did not resemble that of the standard word until the end of the month. The child's unetymological on-glide was transposed into a position which agreed better with her speech pattern (no voiced final consonants!).

Great care must be exercised in judging other instances. For example, the experimental forms *dutf* and *duts* for juice at 1;7 look like a transposition of the affricate articulation from the first consonant to the second. Actually, however, the examination of sound-correspondences discloses the facts that initial *d5* became d invariably (145) and that the normal substitute *f* for final *s* was often mispronounced as affricate *ts* (172); the regular *f* appeared indeed later 1;7 and remained stable. We are therefore confronted with regular substitutions; no metathesis is involved. *nui* for *kimona* from 1;10 looks like a transposition of the last consonant to the beginning of the stressed syllable. The previous history of the word (vol. 1, p. 114) luckily contains earlier experimental forms 1;10 which show conclusively that the *n* is due instead to anticipatory assimilation at a distance. *nuk* for *coat* 1;10 might conceivably be due to metathesis, the dental *n* standing for dental *t* (but there is no parallel for such a substitution) and the *k* being saved for the end. Since this is not very convincing and does not account well for the vowel, we decided to trace the word instead to the entirely different etymon *Schmucks*.

This leaves a few more examples of puzzling forms which defy the ordinary rules of substitution and can tentatively be solved by resorting to metathesis. There are three words beginning with *st* and *ft* in which the fricative of the initial cluster was omitted in agreement with the rule, but an unetymological *f* was added at the end, *stone*, *steht*, and *story* 1;11. Among the desperate attempts to explain the anomaly is the hypothesis that the fricative was transposed from the beginning to the end. This would mean that it was heard correctly, but misplaced in the reproduction because the cluster was still too difficult to articulate. The tracing of *juf*, *3uf* (which might also be a bilingual blend, 457) to *zu* with the help of metathesis is still more desperate, because it would mean normal rendering of the affricate by a fricative plus repetition of the fricative part of the affricate at the end.46

46. With regard to the explanation of metathesis, Sully (p. 155) is undoubtedly right: "The explanation seems to be that the right group of sounds may present itself to the speaker's consciousness without any

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46 Karla had one more striking case of metathesis. At 1;9, when *please* was in her vocabulary as *pi*, she was induced to repeat the German equivalent *bitt*, which she pronounced once *tspo*. For other children, cf. Grammont pp. 72-74, Stern pp. 344-346, Decroly p. 230.
clear apprehension of their temporal order." It is a problem of concentration. The sequence of sounds may not be remembered accurately or it may present too many obstacles for correct imitation. That is why Hildegard, who was unusually conscientious in her attempts at reproducing standard words, rarely succumbed to the pitfalls of metathesis. Metathesis of syllables, of which she produced only one very early instance, Opa at 1:1, is rather natural in echoed words. The last syllable, just heard, is remembered best and may be reproduced alone (as in Zwieback, once 1:9) or take priority over the first syllable if the memory span is long enough to include both (cf. 477).

467. Another phenomenon, also known in the history of standard languages, is what Jespersen calls "metanalysis" (p. 132 f.), or the unetymological division of words. It cannot be included among the cross-currents counteracting the normal phonetic development. On the contrary, it is the application of phonetic rules to groups of words in defiance of standard divisions and occurs where the individuality of standard words is not recognized correctly. Nevertheless, it has also the effect of distorting words considered by themselves. The only example in Hildegard's language is the phrase come on, in which the second word was not recognized as identical with the familiar on. The phrase was instead treated as a unit. It lost its pretonic syllable by a purely phonetic process (476) and appeared therefore as an item beginning with m, 1:10.47

468. We have concluded the survey of features which disturb the regular phonetic processes and of related phenomena. We now come to the consideration of some problems which are phonetic in character, but do not concern the fate of individual sounds.

By way of introduction a word should be said about onomatopoeia. In so far as such formations are not based on standard prototypes (secondary onomatopoeias), but are the child's own invention on the basis of non-linguistic experiences (primary onomatopoeias), they differ from other words in that they introduce sounds not learned from other speakers, but produced as direct reflexes of physical stimuli.

Children again seem to differ greatly in this respect, but the picture is often distorted in the literature because authors do not make a sufficiently clear distinction between primary and secondary onomatopoeias. The latter do not differ from other words taken over from standard speech. They are bound to be favored on account of their directness, usefulness and emotional appeal. The question whether these standard

46 Cf. also Stern p. 345 f.
47 Metanalysis loomed larger in Karla's less circumspect speech. She developed the pronouns ɪnt and ɪnet instead of it and that. They originated in wrongly analyzed phrases like button it, ɪbat ɪnt E 1:11 and open it, ɪp ɪnt B 2:0, but became independent: fɪt ɪnet ɪfix that and ɪk ɪnet, look (at) that 2:0 (in the last two examples she also used the better form ɪdet at the same time). At E 2:0 even tek ɪmav, take 'em out.
onomatopoeias, usually nursery terms like choo-choo, were themselves originally children’s coinages (Sully, p. 143 says they are, and it seems plausible; at least their form was chosen to appeal to children), is of no concern to the individual language learner who encounters them in ready-made shape.

Primary onomatopoeias were very rare, perhaps totally absent in Hildegard’s speech. At 1;8 she used, along with the secondary onomatopoeia tfutfu, the sounds t’! t’! t’! with reference to a train; at 1;10, tf, tf, tf. These sounds are rather striking imitations of the noise of a starting train, with the steam escaping in slow, emphatic rhythm. The trouble is that the diary record does not reveal whether the sounds were produced spontaneously by the child or, as is quite likely, based on the mother’s imitation. Even a linguistically trained observer does not always foresee which of the thousands of details that he records will later have special importance in the systematic digest. Another item which might belong here is the interjection buuu, accompanied by a frequentative gesture of the hand, which referred to thunder 1;11. I have tried to explain this term as a development from the secondary onomatopoeia bums 1;9, perhaps with the aid of pooh 1;2–4, 1;11. This hypothesis has plausibility, I believe. Still, it is no more than a hypothesis, and the possibility that this is a direct onomatopoeia cannot be ruled out. The situation is similar with regard to ?a?al used to talk to dogs. I prefer to explain this “barking” as a development of the interjection ?a!. The doubling might be an onomatopoeia, but secondary rather than primary, perhaps induced by the semantically related Wauwau. The latter word was itself disturbed by several secondary and possibly primary onomatopoeias (100).

The symbols ?m: from 1;0 and kx at 1;7, referring to good and bad taste of food, are direct phonetic reflex reactions to physiological stimuli and therefore related in character. They fall however outside the definition of onomatopoeia, which is restricted to the reaction to physical stimuli, in fact only acoustic ones. Thus we have discovered no certain primary onomatopoeia.

469. Onomatopoeia, if it is primary, is imitation of sounds, but not of standard speech sounds presented to the child. The complex of phenomena next to be discussed concerns again speech features which have to be learned from speakers of standard language, but are not individual sounds: the distribution of accent devices. These phenomena are divided

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9 Freyer, p. 90: “Absolutely original onomatopoetic words are very rare with children.” At 2;1 he finds all such terms to be second-hand (p. 160). Yet he discovers examples (some very unconvincing to me) of primary onomatopoeias (p. 91) and claims that every child has an inclination to produce them (p. 160). He ranges echolalia with this phenomenon (p. 160). While conceding a measure of kinship, I refuse to include echolalia here, because it is definitely linguistic imitation. Sully (p. 144) believes in the presence of “invention of new or onomatopoetic sounds” (his formulation is inadequate). Cf. Decrolly, pp. 102–105, Stern, pp. 374–384, Ament (see his index). Stevenson (p. 120) found no original onomatopoeias.
into dynamic accent, or emphasis produced primarily by pressure of the breath stream,\textsuperscript{50} which we shall call stress; and pitch accent, or the musical rise and fall of the speech melody, which we shall call intonation. The former is much more important for Germanic languages, with which we are dealing.

\textbf{470}. The child seemed to be indifferent to stress during the earliest stage of sound-production without meaning. During the crying and cooing stages, combinations are listed with the stress on the second syllable\textsuperscript{51} (o;\textsuperscript{c} \textit{p?apa}; o;\textsuperscript{r} \textit{a\textasciiacute}ya; and variant, o;\textsuperscript{r} \textit{uk\textasciiacute}xa;), but stress on the first also occurred (o;\textsuperscript{r} \textit{hilda}; o;\textsuperscript{r} \textit{eg\textasciiacute}bw;). Thereafter stress on the last syllable subsided. At o;\textsuperscript{r}7–8 two and three-syllable combinations (o;\textsuperscript{r}7 \textit{dada}, \textit{baba}, \textit{p?e?ae}; \textit{ha:hae}; o;\textsuperscript{r}8 \textit{bababa}) were recorded without stress mark; the stress on the first syllable was, however, not prominent; it is safe to assume that the stress was nearly level.\textsuperscript{52} At o;\textsuperscript{r}9, the month in which imitative speaking began, stress distinctions apparently became more marked. Certain babbling combinations (t\textit{ae} t\textit{ae}, \textit{dae dae}, \textit{da da da}) were for the first time written each syllable by itself, which means level stress enhanced by a pause between the syllables. The old-type two-syllable combinations continued at the same time (\textit{jeje}, \textit{ba\textasciiacute}a; the latter shows its two-syllable character plainly by the assimilatory modification of the repeated consonant). One-syllable babbling utterances occurred sparsely at all stages. It is important that the child was by now prepared for one-syllable utterances by themselves and in sequences as well as for two-syllable combinations (also three syllables, \textit{bababa} o;\textsuperscript{r}8, \textit{mamama} o;\textsuperscript{r}9). The first imitated word, \textit{Bild} o;\textsuperscript{r}9, had one syllable, the second, \textit{pretty} o;\textsuperscript{r}10, had two, the third, \textit{there} o;\textsuperscript{r}10, again one.

The child was thus able to imitate one- and two-syllable words, the latter even when they were of a non-renduplicative type. The word \textit{pretty} was, however, premature in form, its imitation somewhat mechanical, as proved by the fact that it took a more primitive form later when it fell in line with the rest of the vocabulary. Otherwise, the two-syllable words had, from o;\textsuperscript{r}10 to as late as 1;4, nearly all reduplicated or semi-reduplicated form, which was at that stage more natural for the child, or they were reduced to one syllable (\textit{Blumen} 1;\textsuperscript{r}, \textit{bimbam} 1;1, \textit{peekaboo} 1;4). That may be the explanation for the fact that Hildegard had unusual difficulties with the non-renduplicative name \textit{Opa} 1;\textsuperscript{r}–1 and made unusual attempts at overcoming them.

In fact, the one-syllable form was obviously felt at first as the most

\textsuperscript{50} Cf. Kenyon 105.
\textsuperscript{51} Karl Bühler (1935, p. 412) reports that the three children observed all stressed at first the last syllable of their babbling combinations. They withdrew the accent after a few months, under the influence of the environment. Hoyer (8), however, found stress on the second syllable to be rare and to occur only at a later stage.
\textsuperscript{52} This is not characteristic of children growing up in surroundings with French speech, as Grégoire thinks (p. 254). The matter is different at a later stage, when speech utterances fall in line with the language of the environment.
suitable one for imitated words. The majority of the words learned 0;9–1;4 were monosyllables (see the list, vol. 1, p. 151 f.) and their number was increased by the dissyllables which were reduced to one syllable. Besides we have observed (442 f. and 448) that many of the reduplicated and semi-reduplicated word forms began with a stage of level stress, even when the standard reduplicated form had initial stress.52 We have characterized this modification as a stage preceding real reduplication genetically (443) and conjectured that the child attempted to set off imitated words from spontaneous babbling utterances (441). Undoubtedly the level stress moves reduplicated words structurally into the proximity of monosyllables.64 This phase, however, did not last long and reduplication, practiced in babbling, reasserted itself soon and impressively. The babbling in separate syllables at the very end of the pure babbling stage (0;9) had been a prelude to the monosyllabism and level stress of conscious imitation.

471. From then on, initial stress became normal. This can legitimately be attributed to the influence of the initial stress prevailing in the two Germanic languages to which Hildegard was exposed. The child begins presumably with level stress, or with indifference to the distribution of stress, both in babbling and at the outset of speaking. Then the stress habits of the community assert themselves quickly and decisively.

The overwhelming majority of imitated words present therefore no problem with regard to the stress. It agreed with that of the presentation. There were however certain exceptions to the rule.

In the first place, in a few early instances the stress was shifted to the end, certainly not in agreement with the presentation. The first case was baby, which was learned with level stress B 1;2 and with the correct initial stress E 1;2, but occurred often B 1;3 with end stress. It was surmised that the child subconsciously contrasted the dissyllabic, semi-reduplicative form of this word with the prevailing reduplicated word-forms, which were monosyllables in repetition. The effort which was needed for the reproduction of the unfamiliar phonetic structure may be reflected in the emphasis placed on the syllable containing the modified vowel. The strikingly clear articulation noted for the first form with level stress is another testimony for the deliberate character of the first imitations. By E 1;3 the word had become familiar and lost its unorthodox stress. A similar instance is found in the history of by-by. At E 1;3 it was learned in reduplicated form with initial stress and simplified vowels. At B 1;4 it had the diphthong in the second syllable (not in the first) and end stress. Thereafter the first syllable was stressed correctly.65 (A reoccurrence...
rence of shifted or level stress seems to be involved in her form of pegboard 2;1, since I misunderstood it as the adjective big followed by an unidentified noun.)

The situation is slightly different in bubu bau, paper ball 1;11. This form was not an imitation, but an original compound invented by the child to designate a ball of tin-foil. The second word probably had the main stress because it was more important; paper was more in the nature of an adjective. When it appeared again for a real paper ball it had conventional stress. Concerning rock-a-by, baby, which had the main stress on the last word, see end of 472.

472. Furthermore, level stress in place of initial stress occurred again later in the second year in a few compound words. The earlier use of level stress marks the struggle for the mastery of disyllables. Level stress at the later stage has a different origin, psychological rather than phonetic. Toothbrush, first imitated 1;6 by a semi-reduplicative form much simplified by anticipatory assimilation of the first consonant to that of the second syllable, but with correct initial stress, became tuf baf 1;10, which yielded 1;11 to the correctly stressed form tufbaf. Mickey mouse, which she heard with secondary stress on the second word, always had level stress 1;10–11. The level stress in both words is due to the child’s recognizing the second element as a familiar word which existed by itself in her vocabulary, a phenomenon called re-composition in linguistic science. Baby-bottle, a self-formed compound 1;9 (vol. 1, bottom of p. 52), had level stress even more naturally; the origin in two separate words was more obvious in a synthetic compound than in a ready-made standard one. Analysis of a standard compound required a certain degree of linguistic maturity, which Hildegard had not reached at 1;6 when she imitated toothbrush phonetically as buba without paying attention to the meaning of the components. In the phrase rock-a-by, baby, the first and last words were reproduced at 1;10, with level stress, which corresponds to the standard accentuation; at 1;11 the combination was amalgamated into a single word; the first syllable had then only secondary stress.

473. Occasionally the Germanic initial stress asserted itself in Hildegard’s speech in phrases where standard speech did not emphasize the first element because it had less semantic importance. All right, which can well be considered a single word, but always retains the stress on the second component, withdrew the accent to the first syllable in the early reduplicated form 1;8–9 (cf. 446). At 1;10 the standard stress was used in an improved form. All sticky was imitated at 1;7 as a three-syllable word with initial stress. In both cases the shift may be due to the fact

(p. 221, note 1) finds his older boy stressing the French word “trompette” energetically on the first syllable at first, 1;1.

56 Karla said mama mini, Mama’s drink, meaning “Mama’s glass,” with initial stress at 1;9; but as late as M 1;11 she generally used level stress in compounds with main and secondary stress; even as an echo, “water bug” became “water bug.” At E 1;11 her form for automobile was 1?ato ’bi, one or two days later 1?a ’bi.

57 Level stress was also characteristic of Hildegard’s early two-word sentences.
that the phrases were sometimes presented with a pitch accent on the first element. The musical accent was more impressive for the child than the dynamic accent which disagreed with it, and was transformed by her into a dynamic accent. In this way, high pitch and emphasis were harmonized, which is indeed the prevailing condition in Germanic languages.\(^{58}\)

*Dickens Bauch* 1;11 (–2;1) and *drink of water* 1;11 with the main stress on the first syllable, although the presentation gave it secondary or, at best, level stress, must be explained differently. Both were felt by the child as units of signification and therefore coalesced into single compound words. In the former, the adjective was the chief bearer of the meaning, as proved by the fact that the noun was sometimes omitted or the adjective doubled 1;10. That is why the earlier, more standard practice of keeping the two words apart 1;10 was abandoned at 1;11; the semantically subordinated noun was also subordinated in stress. *Drink of water*, the first two syllables of which also took the form *dika* in her rendition, simply followed suit in its rhythmical configuration, a form of phonetic analogy (457).

474. Stress is involved in one bilingual blend (457). One of the first forms of *paper*, *babu* 1;8, cannot be explained without assuming interference of the German synonym *Papier*, on account of the first vowel. Since the two languages exceptionally disagree in stress in this cognate, German preserving foreign stress on the second syllable, we must look upon the first vowel as taken over from the German without observance of the German stress condition.

475. The prevalence of initial stress and its firm establishment in Hildegard's speaking habits had important consequences in her word forms. The treatment of unstressed syllables does not always yield to the principles of phonetic reproduction and substitution. Particularly in the earlier stages of speaking, unstressed syllables were often left unrepresented. In the earliest stages even syllables with secondary stress could be subjected to this neglect (see, for instance, *bimbam* 1;1). The first unstressed syllables to be learned were the final ones, following the stress, although even these were sometimes still missing at the end of the second year (cf., for example, *da*, *cover* 1;11). Initial and medial unstressed syllables, however, generally remained unrepresented throughout the period under consideration. This had a considerable effect on the vocabulary; it shortened the words affected. The numerous instances of disyllables in which the second syllable was not rendered phonetically but replaced by a repetition of the first syllable (445) are related to this phenomenon since they also indicated a (less thorough) neglect of the dy-

\(^{58}\) The same principle may well serve to explain some shifts of stress to the last syllable (471) like Preyer's "bitte" with end stress. "Bitte" can be said with high pitch on the second syllable in a polite, friendly intonation. Our own examples, *baby* and *by-by*, are however hardly susceptible of this explanation.
namically subordinated part of the word, although the rhythm of the prototype was not destroyed in this category.

The explanation for the neglect is undoubtedly the selective attention of the child. Psychologists know that even adults proceed selectively in their attention. We remember only those things which force themselves on our attention with their significance for us. In matters of language, the control of the speaking community is powerful enough to enforce a fairly rigid adherence to the speech habits of the (smaller or larger) group. This social control does not yet operate with the same force on the small child, and his limited powers of attention and memory bring about greater mutilations of the linguistic material. Just as the young child, in his drawing exercises, will simplify a model by reproducing roughly only its outstanding characteristics, he also simplifies words (and sentences, for that matter) by imitating only the salient features of the prototype. As learning progresses, more and more features become important. The rough outlines of the word-picture are filled with more and more details, until a satisfactory imitation is achieved.

476. Omission of unstressed syllables is practiced most generally and lastingly at the expense of those preceding the word stress. This phenomenon is so wide-spread in standard languages that linguistic scholars have felt the need of a special term for such syllables. They are called pretonic syllables.\(^{59}\)

We consider first the omission of pretonic first syllables ("aphaeresis"). The number of examples is limited because not many standard words of this type occurred as yet in Hildegard’s vocabulary, but there are enough of them to show that the principle was important in the child’s imitation of words. The unstressed first syllable was always omitted in *aboard* 1;10, *forgot* 1;11, *outside* 1;9, *banana* 1;11, *kimona* 1;9–10, Milwaukee (two forms and meanings) 1;8–11, (Anita B 2;0). It was sometimes omitted, sometimes represented in all right (omitted 1;8–9 in a reduplicated form, cf. 446; represented from 1;10), *kapull* (omitted or represented 1;10; always omitted 1;11), *away* (omitted 1;6–11, represented 1;8–11), *hello* (represented 1;5–10, omitted 1;10–11).

The omission was more striking in the two examples in which two words were involved, which however formed a unified phrase and were probably not even recognized by the child as consisting of two words: *come on* 1;10–2;1 (the regular phonetic omission of the first syllable made the final consonant of the first word function as the initial consonan-

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\(^{59}\) For the layman, a few examples of their omission in English: bishop < episcopus, lone < alone, fend < defend, dropsy < hydropsy, story < historia; colloquially: coon < raccoon, cute < acute; popularly (very frequent): skeeter < mosquito, varsity < university, taters < potatoes, arithmetic < arithmetric, Rita < Margarita, Nita < Juanita, etc. An example going beyond the limits of intelligibility is attributed to the people by H. G. Wells in his fantastic story, “The Invisible Man”; they are supposed to call him the “'Visible Man'!” Similarly, in Fritz Reuter’s “De Reis' nah Belligren” (chapter 21), the veteran speaks of “insubordination” as “Subornatschon.”
nant of the child's form, *ma, ma* and *komm mit* 1;8–10 (the first word was suppressed entirely by the operation of the phonetic principle).

The last example leads us to cases in which a whole word was omitted because it preceded a more strongly stressed word, which gathered all the attention upon it: (good) *night* 1;10–11 (sometimes suppressed by adults), (gute) *Nachta* 1;11 (likewise). If we think this principle through, we understand why a number of unemphatic words which precede a stressed one still remained unexpressed or appeared only rarely. The definite article was completely missing. The indefinite article *a* probably never occurred (it was learned at 2;1, but was still rare). The adverb of degree, *too*, before adjectives and adverbs remained unexpressed until 1;10. The little connective *of* in such phrases as *piece of cake* was suppressed, but began to leave a trace occasionally and uncertainly in *piece of toast* and *drink of water* 1;11; even *piece* itself was, in such common expressions, omitted before 1;11, in spite of its secondary stress. The same principle explains the lateness of attributive adjectives, of personal pronouns, possessives, etc.

The lack of attention given to pretonic syllables is proved even by those instances in which their presence was felt, but their form distorted by child etymology: *miao* > *mehr auf* 1;8–11, *Leona* > *mehr Oino* 1;11, *Mary Alice*, blended with *miao* 1;11.

To present a faithful picture, it is necessary to state that the pretonic syllable was not regularly overlooked. In addition to the instances already mentioned in which it was sometimes imitated, it appeared always in the following words and phrases: *New York* 1;11, *roll up* 1;11, *fall down* 1;11, *too* before adjectives and adverbs (*too hot, too much*) from 1;10. All these examples are late; but in the mechanically imitated sentence *I see you*, the pretonic *I* was reproduced as early as 1;5. There are further examples of pretonic words with secondary stress, which were a little more apt to be rendered: *all aboard* 1;10, *right da* 1;11, *rock-a-bye, baby* 1;10 (but unstressed pretonic *by* suppressed, mostly by reason of haplology, 456), *Onkel Baby* (for *Onkel Peter*) 1;11. *Onkel* was even learned alone 1;8, the stressed name which followed it in the presentation being neglected. The child's only possessive, *my*, became quite frequent; it was first learned with a strong stress in a game 1;6, but was also used without stress from 1;8. Of the personal pronouns, that of the first person singular, again the most useful one, was learned at 1;10. After all is said, however, the only single words of the child the last form of which contained an unstressed pretonic syllable are *all right, Leona, Mary Alice, meow*, and *New York*, and most of these are not even strictly single words in the presentation. (Pretonic first syllables did not become regular until much later. *Milwaukee* had it sometimes at 2;1; but not until 3;3 did the addition become systematic: *umbrella, pajama*. At 3;6 anticipatory assimilation appeared in them, giving the effect of reduplication as it is found in standard languages (cf. 445): *zozain* < *design, zozat* < *dessert*. At
4;2 the pretonic syllable was still missing in potato-chips, at 6;6 in Erkältung.)

As a last item concerning the treatment of pretonic first syllables, there are a few instances in which the vowel was omitted, but not the consonant. Balloon was rendered from 1;10 in a form which disregarded the pretonic vowel, so that it was treated like a monosyllabic word beginning with bl (115). Such a pronunciation may have been heard in the careless speech of adults. 40 I am certain that Hildegard’s mother pronounced the name Theresa slurring the pretonic vowel, so that for the child the word began with tr. The only case in which the child was certainly responsible for the omission of a pretonic vowel while she preserved the consonant is piano. This is probably due to the fact that it functions in this word more like a consonant (54); it was treated like I in the cluster pl (107), that is, omitted. 42

477. Occasionally the first syllable was omitted even though it bore the main stress, in favor of a last syllable with less stress. This phenomenon is not so surprising since it occurs in standard languages as well; cf. English bus < omnibus, van < caravan, wig < periwig. 43 It is due to the fact that the retention of the syllable last heard is favored by the short-spanned memory. Illustrations are ba < Zwieback, 44 once 1;9, “Tack” < Ticktack 0;11, 1;0, and again 1;7, Mann < Hampelmann and Weihnachtsmann 1;7 (cf. 483), pa, pa-o, and papa < Opa 1;0–1 (cf. 466), and perhaps dar < Nackedei 1;6. The reproduction of Onkel alone instead of the following, more highly stressed name, from 1;8, belongs here parenthetically, because it also represents an abnormal victory of the weaker stress over the stronger; it is, however, not an example of omission of a stressed first syllable.

478. Words with a pretonic first syllable are a minority in English and German, and the number selected by Hildegard for active acquisition was small. The concentration of her attention on the stressed syllable had, however, a striking effect also on the overwhelming majority of words in which the stress lay on the first syllable, and on the remaining parts of those words which had been made to conform to this stress pattern by the dropping of the unstressed first syllable.

40 That such a careless pronunciation was not always used is proved by the fact that Karla, after a monosyllabic form B 1;9, had a disyllabic version M 1;9.

41 Daniel Jones lists pijenov as the preferred pronunciation in the South of England.

42 Concerning apharesis of pretonic first syllables, cf. e.g. Ament, p. 68, Pavlovitch, 58 f., Ronjat, p. 44, Stern, p. 334 f., Jespersen, p. 169 (names). It is much more fatal in French words with their end-stress, but operates there as well, cf. Feyeux, p. 163, Bloch (1921) p. 704, Grégoire, p. 230 f., Passy as cited by Viétor 144, note 1. In part it affects only the consonants of pretonic syllables, which are either dropped or assimilated to the consonant of the stressed syllable, cf. Grammont, p. 74 (also p. 76), Grégoire, p. 230 f. and note 2 (examine the examples; no statement of principle).

43 Some of Jespersen’s examples of child forms for names (p. 169) fall in this category.

44 Ament has two cases, p. 68.

45 Clearly the same shortening, O’Shea, p. 44.
Feyeux (p. 54) believes, contrary to Vendryès and Rousselot, that the child is more conscious of words than of syllables and destroys the syllabic structure of words. This was true of numerous words in Hildegard’s early vocabulary. I do not think, however, that Feyeux is right in assuming that a feeling for the syllable is only acquired by adults. I see clear indications of the growth of syllable-consciousness in Hildegard’s speech as her linguistic skill improved and her attention became capable of embracing more than the rhythmic peak of the model.

It has been stated before (470) that the child felt the monosyllable to be the most suitable form for words at the beginning of imitative speaking, although polysyllables had been more common in the babbling exercises. Hildegard’s words remained predominantly monosyllabic until 1;10, when dissylables began to increase markedly. Words with more than two syllables remained exceptional even during the last two months of the year.

The bridging of the gap between monosyllables and dissylables had however begun long before 1;10. The first step had been the repetition of a monosyllable with pause and level stress (443) and the imitation of standard reduplicated words, in part also with level stress (442). Genetically, though not necessarily chronologically, the next step was the creation of original reduplications with initial stress (444). The imitation of standard dissylables without reduplication by means of a reduplicated child form (445) can be assumed to reveal already a feeling for the two-syllable rhythm of the prototype, although the imitation still remained in the neighborhood of monosyllables phonetically. The instances in which such a reduplication resulted from regular sound substitutions in a word not having standard reduplication (447) supported this category. Semi-reduplicative words, in which the two syllables were no longer quite identical on account of the ablaut involved, represent a further step toward dissyllabism, both when they had this form in the presentation (448) and when they assumed it in the child’s rendition (449 f.). From this point no great advance was needed any more to reach word-forms with two disparate syllables, as they exist in profusion in the German presentation, whereas standard English favors monosyllabism itself, particularly on the child’s level of interest.

479. Looking at the number of syllables in standard words in detail and examining what becomes of it in Hildegard’s language, we find a con-

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66 Holmes: dissyllables existed from 1;10 (p. 223) and represented the maximum span at 1;11 (p. 224). Before 1;10 even reduplications were still treated as two words: Kitty > tr-ti, > tii 1;10. The latter transformation has no parallel in Hildegard’s speech. Ament states that children’s word forms aim first at monosyllabism, later at dissyllabism. The illustrations are closely parallel to ours.

67 Aronstein (p. 26) has counted out the percentage of monosyllabic words used by the following writers of literature: Macaulay 75% (not counting repetitions: 53%), Dickens 72.5% (61.8%), Shelley 76% (66.6%), Tennyson 82.4% (70%).
siderable part of the disyllables reduced to one syllable.\textsuperscript{67} The reasons for the shortening vary. Very commonly the second syllable has an unstressed vowel which shows neglect even in the standard form, having less distinct quality, commonly ə.

In other instances contraction is caused by the rule which calls for the omission of a consonant separating two vowels. What interests us here is the fact that the original syllable structure was destroyed in the child’s imitation. Examples of disyllables shortened to monosyllables are *mitten > mi \(1;5\)–\(10\) (dissyllabic \(2;1\)), *measles > mia \(1;10\), *(ba)nana > na: once \(1;11\), Florence > wof \(1;11\), money > mar \(1;11\), naughty > na: \(1;7\) (dissyllabic \(1;11\)), *Tasche > ta: once \(1;10\), *Hase > ha:j once \(1;8\) (in the latter two examples the rule that \(\text{f}\) had to be in final position, \textsuperscript{384}, applied), water > wa \(1;7\) (very ephemerally; at once also disyllabic forms), *Piepchen > pi: pi:p \(1;1\) (ephemerally; settled into a reduplicated form, which was supported by blend with piep, piep), piano > ba \(1;11\) (cf. end of \textsuperscript{476}), buggy > bai \(1;10\)–\(11\) (after dissyllabic semi-reduplicative form \(1;6\)), *Blume(n) > bu \(1;9\), i\(7\), i\(11\), *Butter > bu: once \(1;9\), pudding > bu: i\(11\), cover > da \(1;11\), *donner > do once \(1;11\), *Zunge > du, ju \(1;11\), pretty > pr at \(0;10\) (rudimentary variant of the usual premature disyllabic form), *Spiegel > bi once \(1;8\) (doubtful). To these examples could be added all dissyllabic German infinitives, in which the ending \(\text{en}\) was regularly omitted; they probably did not proceed from the infinitives, however, but from the endlessless imperative forms, even when they were used like infinitives.

These examples show that monosyllabism contrary to the standard was by no means overcome by the end of the second year. It was supported by the large number of German and particularly English monosyllables which made up the bulk of the child’s vocabulary. It is probably significant, however, that the majority of the shortened disyllables, particularly those acquired earlier than \(1;11\), were either improved before the end of the year or lost from the active vocabulary (as indicated by asterisks). This fact may safely be attributed to a growing consciousness of the syllabic structure and rhythm.

\textbf{480}. An intermediate step between monosyllabism and disyllabism is represented by the instances in which a standard non-reduplicative word was rendered by means of a reduplication of the stressed syllable. The form was then disyllabic, but did not yet have the disparate syllables of the prototype. As early as \(1;1\) *Tante was imitated by reduplicated da-da and by semi-reduplicated di-da; the level stress, to be sure, kept these forms from being real disyllables. *Piepchen, also at \(1;1\), was first reduced to one syllable, but settled at once into the real reduplicated form pipi; in this case, however, the blend with piep, piep obscures the picture. *Jasper was semi-reduplicative dadi \(1;7\).

\textsuperscript{67} Grammont (p. 65) observed a tendency to avoid monosyllables, which he claims to be rather general. It may be for French-speaking children. It is not confirmed by our case.
The situation is different with regard to reduplicated forms which resulted from actual imitation of both standard syllables although the standard disparity of the syllables was not yet achieved. *Kitty was reduplicated didi, titi at 1;3 and was reacquired as semi-reduplicative didi at 1;10; the latter form appeared again at 1;11 (but eventually the child achieved two disparate syllables, diti). Buggy had the semi-reduplicated form babi at 1;6 (from 1;10 it reverted to the rhythmically more primitive, but phonetically more regular form bai). Stocking became semi-reduplicative dadi 1;7 by regular substitutions; *street-car > dida 1;11 likewise. Toothbrush was buba at 1;6 (reacquired 1;10 in unassimilated form, but with level stress; 1;11 initial stress). Cookie was reduplicated titi 1;6–7, didi 1;10; its plural was semi-reduplicated tuti, dudi 1;10–11. Semi-reduplicated dadi 1;7–11 for Bleistift succeeded the better form bati 1;6 on account of blending.

481. If we examine the vocabulary as a whole, we find the instances of shortened dissyllables as well as those with reduplicative simplification to be a minority. There is a large number of dissyllables which retained their rhythmic structure unaltered, too many to make an enumeration serve any useful purpose. They simply show that dissyllabism was no longer foreign to the pattern of Hildegard’s speech in the later months, although condensations into one syllable continued to occur here and there. Very few dissyllables with disparate parts occurred before 1;7; most of them belonged to the last two months. Let us mention and discuss only the few earlier examples. Pretty usually kept close to the original from 0;10 on, but its prematurely good form has been traced to mechanical imitation. *Opa tried to preserve its dissyllabic structure by means of a metathesis of syllables as pa-o, once 1;1, but the level stress showed that it was too early for genuine dissyllabism, and so did the more common simplifications to pa, ba, simple or reduplicated. *Danke schön was once echoed 1;1 as two mutilated syllables. tutti as the remnant of *kritze-kratze 1;1–4 belongs in the category of mechanical imitation. So does the word bitte, the result of social drill; it had level stress 1;5, but became a real dissyllable at 1;6.

It is also worth noting that the second syllable did not usually render the standard vowel faithfully, a fact which again shows the reduced attention which was paid to unstressed syllables. Full and more or less correct vowels appeared, rather naturally, in compounds of two monosyllables, where the second bore some measure of secondary stress, like Bleistift 1;6, sandbox and Handschuh 1;10, sun-suit, airplane, and street-car 1;11.

The central vowel ə, which is so common in final syllables in English and German, did not occur often before the end of the year. In *kritze 1;1–4 it was decidedly premature. At 1;7 it was heard experimentally in water, but did not last. As late as 1;9 it occurred only once in echoed *weisser. At 1;10 we find it in *pocket. Not until 1;11 did it become more
frequent: *hackle, dicken, backe. An important word which had it frequently (not regularly) from as early as 1;8 or even 1;7 was bitte, which, by reason of its importance in social training, was in a class by itself. Alle 1;7, not a taught word, but also one of great emotional value to the child, had θ prevailingly from the beginning; its consonant was likewise imitated in good articulation earlier than in other words. Cf. 355.

There is even one instance in the second half of the year in which the budding disyllabism turned a monosyllable into a form with two syllables (apart from reduplications, of course). This was due to phonetic reasons, to be sure, with the aid of analogy; but it shows that the child no longer offered any resistance to disyllabic structure: oil 1;6 had varying forms, all with two syllables at least from 1;7. Possibly *haba 1;11 belongs here too if it came from hop; but the etymon is too uncertain to serve as a convincing illustration.

482. In one very exceptional instance a standard disyllable acquired an additional syllable: *oatmeal 1;11 was reproduced once as *otamit. The form was a failure in more than one respect; but it helps to show that even during the last month the child’s feeling for syllabic rhythm was not yet reliable.

483. Trisyllabic words underwent various kinds of shortening, but a stressed syllable always survived. Usually it was the syllable bearing the main stress, but sometimes the secondary stress asserted itself more strongly, no doubt because it came later in the word and caused the syllable on which it fell to be remembered better.

The following words retained only one syllable: *powder-puff > bau 1;11, peekaboo > bi 1;4 (from 1;8 the syllable with secondary stress was also reproduced, sometimes even the middle syllable), *Piepvogel > pip 0;11 (reduplicated 1;3–9, but intertwined with other similar terms). Nackedei was dar 1;6; one cannot be sure whether this form reproduced the third syllable (with secondary stress) alone or represented a contraction. The use of the equivalent for Mann with reference to both Hampelmann and Weihnachtsmann 1;7 may be a victory of the syllable with secondary stress (477). More likely the cause of the simplification was semantic: the general term Mann was used for varying specific applications. Even in that case, however, the phonetic difficulty of the trisyllables contributed to the simplification.

484. The use of disyllabic reduplicated or semi-reduplicated forms for trisyllables represented slight improvements in reproduction. *Carolyne 1;3–10 was tried first as semi-reduplicated gege and then settled quickly into fully reduplicated forms, dada emerging as the victorious version. *Piepvogel, after the monosyllabic forms of 0;11, was rendered

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68 There was a similar instance in later years (4;4). Mahlzeit became ma:lasat. This case was discussed with Hildegard and she proved to be quite unconscious of the difference between her form and the model. The semivocalic character of m and l may have something to do with the strange irregularity of these words. Cf. 498, note.
by reduplication of the first syllable 1;3-9. Marion reduplicated the stressed syllable consistently from 1;4, with one semi-reduplicated variant 1;6. *Taschentuch appeared once at 1;7 as semi-reduplicated dadi.

Here, where we are concerned with syllable and stress conditions, we again segregate those semi-reduplicative forms which resulted from regular substitutions and were thus based on two different syllables of the model. Nackedei assumed from 1;7 the semi-reduplicative form dadi, peekaboo was bu:bu: from 1;8 (also trisyllabic), *pocketbook was babu at 1;8. babi from 1;7 rendered bobby-pin in an unusual way.

485. The trisyllables which were rendered by two disparate syllables were handled in the same manner. Most of them belong to the last two months, when real disyllabism was firmly incorporated in the child's rhythmic patterns. Peekaboo improved 1;11 to pikbu. Her name, Hildegarden, appeared as hta, hata 1;11. *Radio was wea 1;10. *Augenblick always lacked the middle syllable 1;7-11; at 1;8 it had a noticeable secondary stress on the last syllable. (Leopold>hepot 2;1). Cf. also the phrase *all aboard, a bau at 1;10.

The principle operating in these contractions is clear. The syllables with main stress and secondary stress were reproduced; the unstressed middle syllable was dropped.69 This amounts to an application of the rule that pretonic syllables were omitted (476) to unstressed syllables preceding the secondary stress. The principle is confirmed by the fact that *pocket was acquired 1;10 with the second syllable represented, whereas the same syllable in the compound pocketbook was omitted (484) (also, the syllable with secondary stress in Hildegard, always present when the name stood alone, was sometimes suppressed as soon as it was followed by the main stress of the family name, Leopold, 2;1).

The only example which does not follow this principle is bobby-pin> bābi 1;7-11 (484). It is possible to consider the form as regular if we assume that -bi did not stand for -by but for pin. The parallel of powder-puff> bau 1;11 (483) makes it, however, just as plausible that the syllable with secondary stress was neglected in favor of the more distinctive first component, particularly in view of the early acquisition of the word.

*Wheelbarrow> wibau 1;11 is in a class by itself in two respects. In the first place the secondary stress is here on the second syllable, which naturally makes for a different type of imitation.70 In the second place the child's form is disyllabic, but no syllable is sacrificed entirely; the unstressed syllable following the secondary stress is represented in the second component of the diphthong.

69 There are many examples of the same process in the passing of French words into standard English: gouvernement>government, cheminée>chimney, maréchal>marshal, nourriture>nurture, couvre-feu>curfew; phantasy>fancy.
70 Karla had an interesting case. When she replaced the child word bike, bark with the more grown-up bicycle B 1;11, it took the form barks. The secondary stress should be on the second syllable of the standard word. Actually, however, it can colloquially fall on the syllabic final consonant, which makes the rhythm easier.
While the child's word pattern did not yet favor trisyllabic words, they were not completely absent. Some trisyllables were reproduced as such, which proves that their rhythm was not beyond her ken.51 Surprisingly early, at 1;5, the same sentence *I see you as well as the emotional statement *da ist es were imitated trisyllabically (with considerable phonetic mutilation, to be sure) in the exact rhythm of the presentation. Being mechanical imitations, they did not maintain themselves in the vocabulary. From 1;10, however, a few trisyllables became established. Peekaboo sometimes had the middle syllable even as early as 1;8, but not consistently. *Leona 1;11 was even rendered with the pretonic syllable, which was however much distorted, a fact which proves that it received only subdued attention. *A story 1;11, if it was correctly understood, had a good pretonic syllable, but a garbled noun. Dicken Bauch was amalgamated 1;11 into a single trisyllabic word, contrary to the presentation and with a reversal of main and secondary stress. Cry-baby had exactly the same main and secondary stress as in the presentation at 1;11. (Nackedei, shortened since 1;6, was suddenly correct 2;1. Nobody was correct 2;0.)

Other words however, while preserving their three syllables, paid tribute to the prevailing disyllabism by having level stress. Choo-choo train, with standard secondary stress on the last syllable, was dʒudʒu 1;11. *Mickey-mouse, once 1;10, presented in the same rhythm, underwent the same modification (so did Wiedersehen, wiːdɪ fe (5e) 2;1; but a few days later it was, more correctly, 1widiʒe). In the phrase way up high 1;11, the rhythmically subordinated up was not suppressed because it had been familiar as a word by itself since 1;4 and as part of the phrase way up since 1;7; way up high was only a modification of the latter phrase.

Words of more than three syllables were all shortened. The four-syllable name Mary Alice lost the unstressed syllable preceding the main stress and the syllable following it, making the resulting form meaʔa disyllabic, 1;11. Of the four syllables of automobile, three were represented in 1ʔato,biː 1;11, but the first unstressed middle syllable was preserved only through the influence of the familiar ʔauto, which she had used for six months.72

The five-syllable phrase rock-a-by, baby, the beginning of a nursery rhyme which developed into a single verb and noun, was trisyllabic wok, bebi E 1;10, rendering the two syllables with the strongest stress and the unstressed syllable of the familiar word baby, with level stress. During 1;11 the least stressed syllable was added, but the syllable im-

51 Preyer (p. 143) observed the first echoed trisyllables at 1;9, designations for the grandparents.
72 This fact showed more clearly in Karla's forms: 1ʔato ʔiː 1;11, but one or two days later 1ʔa ʔiː. The latter form was the result of a regular phonetic development; the former was due to the same blend as with Hildegard. The level stress was more primitive than Hildegard's correct imitation of the stress (cf. note to 472).
mediately preceding the main stress was still suppressed although it had a light stress in the presentation; haplology contributed to the simplification (456). The resulting *wakolbebi was the only four-syllable word in Hildegard's vocabulary before 2;0. (The six-syllable combination of her name Hildegard Leopold was reduced to 3 or 4 syllables 2;1; cf. 485.)

488. If we reverse the view, we find that the child's monosyllables came, in addition to standard monosyllables, from shortened disyllables (476 f. and 479) and trisyllables (476 and 483). Reduplicated monosyllables came from standard monosyllables (443 f.), reduplicated monosyllables (442), disyllables (480), and trisyllables (484). Disyllables of a less infantile type came from words with two (481), three (476 and 484 f.), and four syllables (487), exceptionally also from monosyllables (481). Trisyllables came from words or word groups with three (486), four, five, and six syllables (487); one exceptional instance lengthened a disyllable (482). One word and one combination of four syllables were contracted from five and six standard syllables (487). With negligible exceptions the syllabic structure of the child's words was therefore the same as in the presentation or the number of syllables was reduced.72 In the process of contraction the stressed syllables generally maintained themselves. Syllables with secondary stress were sometimes sacrificed in the earlier months, but usually asserted themselves later. Unstressed syllables were learned better and better, but remained unstable to the end of the second year. Even when they were represented, they often suffered from phonetic indifference (cf. you > a in *I see you, pa'eria 1.5) or associative distortion (*Alex, pa·i 1;i after alley), both signs of reduced attention. The persistent misunderstanding of Zehen (tsean) as Zähne (Northern German colloquial tsean) and vice versa, observed at 1;8 (2;i, 5;i and later), confirms the impression that her attention was concentrated on the stressed syllables, which is a matter of course to psychologists (cf. 475).

489. With regard to the musical accent, the same observation can be made as with regard to the dynamic accent. Hildegard generally imitated it faithfully.74 Intonation is less important than stress in Germanic standard languages; but being the carrier of emotional attitudes it was by no means unimportant to the child.

We assemble here a number of observations concerning the intonation of words and word groups which are scattered over the diary and the Vocabulary chapter.

In the early stage of speaking, at 1;i, she tried to imitate bimmel bam-
mel beier. Phonetically she succeeded very imperfectly; she pronounced only the first two sounds. This syllable, however, had exactly the same pitch as in the prototype of the interjection, which was used to accompany the swinging of objects on a string, with a musical intonation. At

72 Reduction of polysyllables in French is illustrated by Feyeux, p. 163.
\(^{75}\) At \(r;3\) she used the original demonstrative interjection \(\text{e}\) with falsetto voice and interrogative intonation for the purpose of uttering wishes of all kinds. Its most common later form was \(\text{e};\) to \(r;6\) it retained high pitch. The use of interrogative intonation to express wishes, later applied to sentences consisting of more than one word, leads over into the syntactic functions of intonation. At \(r;3\) a differentiation of function was observed, which was indicated by different intonations. Both \(\text{e}\) and \(\text{a}\) with rising intonation still meant request, but in a high level tone they revealed wish-free interest and were pure demonstratives, loaded with emotion, to be sure, but a different kind of emotion; \(\text{da}\) was frequently long and had falling intonation in this function at \(r;4\). At \(r;4\) the new word \(\text{da};, \text{down}\) seemed to be distinguished by rising intonation from the old word \(\text{da};, \text{da}.\) The word by-by had two standard functions distinguished by intonation: as an equivalent for going for a walk it was presented with approximately level intonation and falling stress; as a farewell greeting it had level stress but strikingly falling intonation. This latter intonation was exactly reproduced by the child in the same situation at \(r;4.\) Most of the other occurrences of the word refer to the other situation, going for a walk, and had therefore no significant musical interval between the two syllables. The shaming interjection \(\text{ätsch}, \text{ätsch},\) which I pronounced with a high level tone, was imitated in the correct pitch at \(r;6\), although Hildegard reproduced only the vowels. From \(r;6\) she entertained herself often with a stereotype conversation which consisted of the names of her two girl cousins in Milwaukee in interrogative intonation, the answer to the question following in the form (far) away. At \(r;6\) the name \(\text{Dodo}\) had a curiously rising inflection on both vowels—nearly the only instance of an intonation not corresponding to the standard.\(^{76}\) Apparently the rising inflection of the query was incorrectly given to each vowel separately instead of being applied to the word as a whole (a form of assimilation). At \(r;7\) there was a sort of game, questions being asked by the adults with a striking fall of pitch on the last syllable or syllables (type: "Who wants a bath?” also in German: "Wer will schlafen gehn?"). to which she would answer \(I\) in low pitch as the maid had taught her to do; so still at \(r;9.\) At \(r;10\) \(\text{my}\) took over the same function and pitch. At \(r;11\) she was taught to answer \(I \text{do},\) with strongly falling intonation. \(\text{Arme} r;7\) and its later replacement \(\text{poor} r;10,\) both followed by a name-equivalent, were said with an expression of compassion which was largely facial, but was also reflected in the low pitch. From \(r;8\) she said \(\text{dada}\) with a strikingly falling intonation which came from \(\text{thank you}\)

\(^{75}\) Karla learned the same word at \(E \text{e};11\), but at first did not reproduce the intonation presented. She imitated the musical accent from \(r;7.\)

\(^{76}\) K. Bühler (1922, p. 80 f.) believes that certain types of intonation, e.g. cajoling, are not learned, but are instinctive.
rather than from *danke*. Also at 1;8 she made the contrasting statement, "this (is) Dodo's (shoe and) this (is) Dodo's (shoe)" and a number of other statements of the same pattern with a high pitch on the first, and a low pitch on the second group of words—a syntactic use of intonation. *Wau*, simple or reduplicated 1;8, traceable to *Milwaukee* but meaning "far away," had, rather originally, a strong fall in pitch; it was said very emphatically and sometimes accompanied by a gesture symbolizing great distance. When I taught her the game of rolling on the rug 1;8, with the cue *rollen*, she repeated the word exactly in the same pitch. *All right*, presented with falling intonation, was imitated from 1;8, more faithfully with regard to the considerable musical interval than with regard to sounds. At first the stress was drawn on the high pitched first-syllable (cf. 473), but stress and intonation were separated 1;10. In the sentence *bitte* (*give me the*) *dolly*, stress (on the last word) and intonation (falling) were already independent of each other at 1;8. At 1;11 she liked to jump with the announcement "one-two-three"; the numerals she used were a hodge-podge of English and German (*three-two-zwei*), but both stress and intonation reproduced the presentation exactly. She started the sing-song of the nursery rhyme "*Backe, backe Kuchen*" in the correct pitch, but was interrupted after the first word.

We have included a few examples of syntactic use of intonation. In sentences of one word or several words, intonation was often a device to characterize an utterance as a question or a wish, as marked in the first volume by question marks. This is, however, not the place to discuss all the syntactic uses of intonation.

490. A word should be said about intonation in the pre-speaking stages. In the very first diary entry it is stated for 0;11 that Hildegard disliked loud speaking, did not pay any attention to the sounds of words, but was receptive to the emotional appeal of timbre and intonation. I observed nothing worth noting during the babbling stage. More specifically, there was no instance of imitation of adult sentence intonation carried by meaningless babbling sounds, which is so often reported in the literature and which I have myself observed with other children. Some writers assume that this phenomenon is general. This belief is disproved.

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77 Same observation with Karla 1;8.
78 Cf. K. Bühler (1922) p. 81 f.
80 It was not observed with Karla either.
The Process of Learning Sounds

491. We are at the end of the consideration of general phonetic phenomena. There remain to be discussed a few problems of a still more general nature which have a direct bearing on the processes of sound-acquisition.

Even when we disregard the tremendous problems of meaning which the small child faces in trying to find order and system in the chaos of linguistic phenomena with which it is confronted and which it must learn to understand, assimilate, and reproduce, all this being only a small sector of the overwhelming variety of life which rushes in on the child and clamors for organization—even then the task is greater than it may seem at first glance. Not only must words be isolated from the great blur of sounds heard (such must be a child's first impression of speech). The sounds of which a word is composed must be perceived, their complex manner of production grasped, their articulation reproduced with growing skill of analysis and muscular control. Beyond that, the phonemic grouping of sounds must be mastered little by little; the rough contrasts must be made finer and finer until the delicately balanced linguistic mechanism of the presentation is learned in all its minute ramifications. The lay observer is likely to overlook the fact that the difference of sounds in a standard language does not always have the same functional importance. It makes no difference to the hearer whether the "n" of "income" is pronounced n or j; both pronunciations are common; yet a person without phonetic training is not usually conscious of the fact. The same distinction, on the other hand, is of considerable importance when a difference is to be made between the words "win" and "wing." By the method of trial and error, the child learns which differences are important and which are negligible. No wonder that substitutions satisfy for a time, until finer phonetic discrimination and improving skill of articulation help to lessen the span between presentation and imitation.

492. This study being a monograph, no attempt is made to correlate the observations on sound-learning and the use of substitutes with all the findings of other investigators of child language. None of them has published an examination which approximates this volume in fullness and exactness of detail (Grégoire's book of 1937, which could well be compared with it in both respects, has much to say about the progress of sound-learning, but does not elect to present the patterns of substitution

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1 The momentous importance of the acquisition of speech and the magnitude of the task are well discerned and formulated by Macdougall, pp. 29 and 34.

2 Cf. Herrmann s a. The very good remark of which part of the text above is an adaptation is found among other views of the sound-learning process which strike the specialist in the study of child language as naïve—as are so many casual references of linguistic scholars to child language. Jakobson's contrast theory articulates, of course, perfectly with the remarks about this phonemic difficulty.
systematically). There are, however, numerous less exhaustive accounts, some of which are here briefly passed in review as a supplement to the piecemeal references given in footnotes throughout this volume.

Early records, although some of them are valuable in other respects, often lack the most elementary phonetic insight. They discuss letters instead of sounds, and this is not simply a question of terminology; some of them measure, in addition, the phonetic difficulty of a word merely by that of the initial letter. Objections of this kind apply to the pioneer investigations of Holden (1877), an astronomer in Madison, Wisconsin, and of Humphreys (1880), a professor of Greek in Vanderbilt University, which is in several respects much better. Holden’s method was followed too long by such observers as Jegi (1901), Heilig (1913), Bateman (1914 and 1915), Hull (1919), after Tracy’s well-known book (1893), which several of them cite, had already improved the procedure.

Preyer, whose study (1882) remains a model in meticulous care and exactness, chose the chronological method of diary presentation and gave no systematic summary of sound-treatment; besides, sensible as his account is in every respect, he had no phonetic training and ran into errors of judgment with regard to sounds.

The excellent investigation of Sully (begun in 1880, finished in 1895) does not use phonetic transcription, but shows, for a layman (he was a professor of “philosophy” in London, actually a psychologist), good appreciation of phonetic facts; he speaks of sounds, not of letters. He does not recognize any principles of sound-substitution; “at the early stage more particularly almost any manageable sound seems to do duty as substitute” (p. 151). Nevertheless, his examples reveal substitutions which generally follow easily recognizable phonetic principles. He gives no tabulation.

Tracy (1893) uses a fairly satisfactory system of phonetic transcription and observes phonetic facts rather carefully. His study is the first to give a systematic survey (pp. 152–156) of the dropping and replacement of sounds, divided by their three positions in the word. He uses no observations of his own, but all published records and a considerable number of unpublished ones.

Lukens (1894–96) has a “table of mispronounced initial sounds” (between pp. 450 and 451). The limitation to initial position is unsatisfactory.

Ament (1899) cóördinates the sound-treatment of several printed and many unprinted records in an extensive summary (p. 42 ff.), incorporating his own observations made particularly on one small cousin. The young philosopher is fully appreciative of the need for exact phonetic studies of child language (p. 44), but his own phonetic approach and linguistic insight are deficient.

Of the more recent studies, the following deserve notice. Bergmann presents, in a monographic study of his children (1919), a few pages
(184–188) on selected substitutions and the operation of general phonetic principles. Bloch (1921) records carefully his own observations of phonetic facts, rules, and principles (p. 697 ff.), but gives chief characteristics rather than a complete record (p. 712). He does not use phonetic transcription and does not explain his spelling of child forms. His investigation is nevertheless one of the most important for child phonetics. The careful observations of Hoyer (1924), dealing mostly with the first year, naturally include few substitutions (p. 378). Stern’s book (1927), fundamental as is its importance for nearly all aspects of child language, is admittedly weak and scanty on phonetics. Yet it has a chapter on “mutilations of words” (pp. 331–350), which contains much material that can be coördinated with this volume. The study of Wellman and associates (1931) is the only investigation of the sounds of a large group of children (204 preschool children, age 2–6 years) by the test method. Phonetic transcription (I P A system) is used. Consonants are correctly separated by the three positions in the word and in clusters. The presentation is statistical and establishes norms. Great variability is reported. Decroly (about 1933) gives a detailed account of consonant substitutions (p. 225 ff.), but with only one example for each. Williams (1937) reëxamines the material of the Wellman study, focusing attention on selected sounds and “characteristic substitutions.” I P A transcription is used. The results are valuable, but in two important respects the method is less good than that of the Wellman study: sounds are often considered in only two positions (initial and final) instead of three (Wellman distinguishes also medial position), and the observations are arranged without any distinction by age, which varies from 2½ to 6½ years—a most serious defect, because it obliterates the genetic point of view and falsifies the results. Passy (1937) lists briefly the average substitutions of many children. The book of Lewis (1936), which deals with child language in general, is interested in phonetics, and uses I P A transcription; but it is more satisfactory to psychologists than to linguistic scholars.⁴

493. Beyond the tabulation of substitutions lies the problem of the principles which the child follows in making them. Some observers see nothing but chaos and accident; Sully (1895) was quoted in 492 in this sense.⁶ Early, however, attempts were made to recognize principles of substitution.

The best-known early theory is that of the philosopher Fritz Schultze (1880). His famous, much-discussed “principle of the least effort” applies primarily to the chronological sequence of sound-learning (pp. 27–36),

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³ Cf. Irwin, p. 281.
⁴ Cf. Grégoire, p. 15.
⁶ Meringer’s warning not to take every slip of the tongue as an example revealing a sound-substitution is a different matter. This caution should especially be applied to nonce-words. He proves that slips of the tongue are as frequent with children as with adults (see his chapter I B and p. 223).
but is used also to explain substitutions (p. 37) and assimilations (p. 40). Schultze (p. 37) discerns in the substitutions quite definite laws of sound-shift, by which the child unconsciously performs the transformations, replacing a difficult sound by the most closely related one of less physiological difficulty; by “related” he means similar in place or manner of articulation (p. 39, note). He realizes that the term “difficulty” is relative and varies with different nations (p. 27, note). Physiological difficulty means to him the difficulty of producing sounds (p. 27), but occasionally he also refers to impediments of exact perception (cf. p. 37). The study remains a remarkable early attempt to reach down to the roots of child language; its defects are largely due to the paucity of available records, about which Schultze complains repeatedly (pp. 36 and 45). In spite of the proviso which he makes on this account (p. 36) he cannot be spared the reproach of having generalized when the time for generalization had obviously not come.

Criticism of his theory started early (with Preyer, 1882) and remained lively; but it continued to be used as the pivot of discussion. The chief points of attack were “the impossibility of determining the degree of ‘physiological effort’ required for each separate sound in the child” and the reckless use Schultze made of heredity for explaining variations (p. 27, note; cf. Preyer, pp. 240 and 242). On the first point, not much progress was made until the appearance of Jakobson’s study (1941), which allows a reinterpretation of Schultze’s theory in a less one-sidedly physiological sense. Germs of Jakobson’s theory can be found in Schultze’s own words (p. 30). Preyer, in criticizing Schultze, is guilty of a confusion of babbling and speaking sounds which cannot be imputed to the latter; neither is a very good phonetician. Improved phonetic analysis should help to further our insight into the process of sound-learning.

A few years later (1888), Noble tried a similar systematization, but he was much less well equipped and his reasoning much less sound than Schultze’s. His “law of mispronunciation” tries to prove definite laws of substitution, “easy” and “obvious” “letters” being favored; “obvious” sounds are those easy to perceive (p. 48). His decisions are arbitrary and poorly explained. The paper has historical interest as an early investigation of this type, but must be termed worthless. Kirkpatrick, who in 1891 approached the study of child language with better common sense and good methodological suggestions, showed interest in Noble’s “law” (p. 176), because he saw children’s sounds “sometimes following a regular system of substitution,” but cautioned wisely against generalization on the basis of insufficient material. He realized the special difficulty of sound-clusters, recognized, in 1916, the modifications caused by neigh-

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6 Preyer, p. 239.

7 I do not see in Jakobson’s theory a “complete refutation” of Schultze’s, as Jakobson himself does (p. 9).

8 Cf. Jakobson, p. 16.
boring sounds, and called attention to the effect of careless pronunci-
ations used by adults. These observations of an educator are worthy of
respect. It is regrettable that he had no phonetic training; otherwise he
would assuredly have avoided mistakes and come to more significant
conclusions.

Stevenson, in his judicious brief sketch (1893), stated: "The mispro-
nunciations of children may seem arbitrary and altogether irregular to
the casual observer, but in reality nearly all of them can be readily classi-
fied and arranged under law . . . he pronounces the easier sounds rather
than the difficult."

Gutzmann, whose field was medicine, rates as a very competent pho-
netician. In 1894 he tried to vindicate Schultze’s principle against Preyer’s
criticism and to establish the relative difficulty of consonants on a
phonetic basis. He accepted Schultze’s principle again explicitly in 1899
and went further into the problems of relative difficulty, consciously
pushing aside the opposition to the principle as a whole (p. 29). This
path, however, did not lead much farther; he also had to admit that there
was no definite measure of difficulty (p. 37).

Wundt (1900) again rejected Schultze’s explanation, citing Preyer’s
and Ament’s criticism. He did not believe in substitution for reasons of
articulatory difficulty, but in a shift of the basis of articulation from back
to front (p. 315), caused by imperfect acoustic and optical apperception,
and he saw the effect of assimilation to neighboring sounds (p. 316).
These explanations mean also, of course, that substitutions make the pro-
nunciation easier, but do not endorse Schultze’s rigid emphasis on arti-
culatory difficulties. Wundt also observed correctly that the child often
articulates sounds which he is unable to produce imitatively, a fact
which indeed weakens Schultze’s argument.

Grammont (1902) thought that many of the “bizarre” features of
child language were the effects of accident (p. 61), but saw, on the other
hand, neither incoherence nor accident in the selected phenomena (ass-
imulation, etc.) in which he was interested, phenomena which might seem
particularly irregular to the observer without linguistic training and
which can certainly not be explained simply by the articulatory difficulty
of the individual sounds affected.

Grammont’s position, that accident rules most of the substitutions
made by children, is an extreme one. Many more observers believe in a
certain regularity, although they have difficulty in coördinating the in-
dividual divergences of different records. Among the more recent in-
vestigators, Jespersen (1922) is a believer in regularity, although these
discrepancies prompt him to formulate his conviction cautiously (p. 107):

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9 Pp. 233–237, according to Wellman, p. 12.
10 The philosopher Cassirer (1933) went so far as to say that no coördination is possible;
cf. the quotation, vol. 1, p. viii. Meringer (p. 207 etc.) also believes that there is no such
thing as “child language,” that each child’s language stands by itself (1908).
"There is generally a certain system in the sound substitutions of children, and in many instances we are justified in speaking of 'strictly observed sound-laws'... Sometimes it requires a phonetician's knowledge to understand the individual sound-laws of a child."

Röttger (1931) not only gives many valuable observations, but endeavors to organize his materials and find the great driving forces operating in them. He looks at the phenomena of child language from the point of view of Gestalt psychology. The aim has thus some kinship with phonemic analysis.11 His study may be valuable to psychologists. The linguist, however, has the uncomfortable feeling that he is faced with good materials, organized with good method, but drowned in a welter of abstractions which fail to become meaningful to him. Although Röttger had some contact with linguists and prides himself on his good phonetic observation (p. 2), the study is linguistically and even phonetically not satisfactory. He recognizes that sounds are not mutilated haphazardly, and is convinced that the processes affecting them follow definite rules (p. 155). The rules which he deduces, however, remain in the obscurity of Gestalt terminology. They show points of contact with Jakobson's findings, but are often questionable when tested by linguistic experiences and other observations. The aim is good, but the results are disappointing.

Jakobson (1941) took a real step forward from Schultze and all his critics and defenders. He detached the analysis of child language from the consideration of individual sounds and found a footing of more general validity in the examination of the phonemic structure. He realized that the child's phonemes are at first much coarser, so to speak, than those of adult speakers of a standard language and approach the latter gradually by a process of linguistic refinement. There were germs of this theory, of course, in many earlier studies,12 but nobody had carried out the structural analysis so consistently. The theory of contrast between phonemes is really a new departure. It does not tell the whole story, and the theory needs improvement in details, as has been pointed out on several occasions in this volume; but Jakobson's study is admirably suited to become a stepping-stone leading forward to more valid generalizations on child language than have prematurely been attempted heretofore.

The present investigation does not aim at generalizations, but offers an exact record of one child's language-learning as a contribution to the collection of materials which is still needed to reduce the speculative element in theorizing,13 from which even Jakobson's book still suffers. It

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11 Cf. my review of Jakobson's study (see bibliography).
12 Lukens, in his sensible investigation of 1894, for instance, can be said to have dimly seen the truth. He stated that children's early sounds are vague rather than wrong (p. 453). It is no more than natural that their sounds should at first be as vague and coarsely differentiated as their meanings, and that in both respects conformation to the standard should require a process of slow and gradual refinement of linguistic ability.
13 Meringer's complaint (p. 238) of 1908 still holds good: "Man beobachtet zu wenig und phantasiert zu viel."
shares the opinion of most previous writers that there is method and system in a child's substitutions, which are apt to seem chaotic to the linguistic layman. It agrees with Jakobson in the conviction that the principle involved is phonemic rather than phonetic, and that the rules of substitution are not always so strict as are sound-laws which have been found to operate in the development of standard languages—not even in the record of a single child, much less so in those of many or all children. For the individual child, however, the variation is so reduced that rather strict rules of substitution can generally be established for certain sounds in certain positions. The bulk of this volume is devoted to the demonstration of regularity in the handling of sounds.

494. The sequence of sound-acquisition, treated in 408, is closely linked with sound-substitution. Schultze's principle holds primarily for the chronology of sound-learning. Gutzmann (1894) set up six consecutive stages, each containing several sounds learned by children at that stage. Author after author tried such tabulations, by groups of sounds or by individual sounds. Although certain similarities can be detected in such lists, no two of them agree in all details. By now it should be clear that no universal list of the kind can be established; the individual differences between children are too great. The only way out of the impasse is the phonemic approach, for which Jakobson has done the pioneer work. Phonetic records are indispensable as a basis, but cannot lead to generalized solutions as such.

495. Several observers have pointed out the important fact that children are not conscious of making sound-substitutions. As an example I quote the statement which Delacroix (1924) makes about the little child's language in general (p. 16): "La pratique le porte à croire qu'il sait sa langue maternelle et qu'il parle comme tout le monde. En réalité, il la parle à sa manière et il ne le sait jamais." Gutzmann (1894), on the other hand, claims (p. 14, also p. 71 f.) that children know of the defects of their pronunciation, specifically when they omit a sound. He himself, however, gives the best illustration of the contrary by quoting from the Low German classic writer Fritz Reuter a conversation between Lining and Mining (p. 21 f.): "'Du seggst jo immer Pück (for Low German Prück, High German Perücke), du möst—Pück seggen', säd Lining, denn—sei kunn ok noch nich mit dat r farig warden." This means that the child heard deviations from the normal in others, but was not conscious of them in her own pronunciation (cf. 498).

The discrepancy is easily resolved. The child makes substitutions unconsciously, and does not notice the divergences between the standard and his own reproduction (cf. 415, note). I myself have made the experiment of speaking to Hildegard in her own type of speech and received nothing but a blank stare as her response. At a later stage, however, an

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14 An example is final s, for which Hildegard substituted f, Karla t. The substitution was not the same for both children, but was made with equal consistency.
improved phonetic appreciation induces revision of the articulation, as evidenced by the continual progress toward correctness. This process is still largely unconscious, but it presupposes the discovery of a difference between what is heard from others and what is heard from the young speaker’s own mouth. Perhaps the process becomes conscious only when the environment corrects the child’s pronunciation, as implied in Gutzmann’s statement (p. 72); this happens occasionally in any child’s language-learning unless the principle of not teaching language is pedantically overdone.16

496. The progress toward phonetic perfection is continual, but not always steady and even.16 We have often had occasion to observe that words retained a primitive form for long periods, although the sounds composing them had in the meantime reached an improved representation in other combinations.17 The explanation is, no doubt, that the acoustic, and particularly the motor memory of the child’s own production asserts itself more strongly in such cases than the acoustic impression of the model. It should be emphasized, however, that this situation is the exception, not the rule. Self-imitation is only a retarding element. Imitation of the sounds heard from others is a much more powerful force in the normal speaking development.18

Occasionally there are even retrogressions in the development of particular words. Take for instance the word toast. Hildegard pronounced it dot at 1;9, a form which represented the nearest approach to correctness which her normal phonetic habits of the second year allowed. A week later she said duk’; both the vowel and the final consonant were less good. At 1;10 the form duk showed a slight improvement in the quality of the vowel at the expense of its quantity. dok was the last form 1;11; the vowel had reached its original adequate rendering again, but the final consonant remained imperfect. The explanation is that no clear phonemic separation of the mid and high back vowels and of the dental and velar stops had as yet been achieved. The relative perfection of the early

15 Cf. in this connection the interesting example from Karla’s speech, 332, note.
16 Cohen (p. 113) rightly emphasizes that phonetic improvement does not result from gradual evolution, but (often, I would add) represents the abrupt replacement of a more primitive word-form by a more perfect one—really a relearning from renewed presentation with the help of a better apprehension aided by growing articulatory skill.
17 For examples, see the following words in vol. 1: aus, p. 40 (final consonant experimentally rendered 1;10, omitted again 1;11), Bates, p. 51 (once with the dental stop 1;7, without it 1;7–8), down, p. 64 (da 1;7–11 resumed after isolated improved dau). Karla’s improved form for ice-cream M 1;11, ʔaːni ʔkim, p. 37, note 15, combined in an interesting way the memory of her own imperfect form ʔaːni ʔ9–11, which contained already a rendition of the cream part, with the memory of the form heard, its second part being added in better reproduction, with no concern about the double representation. Cf. also Bloch (1913) p. 38, and the comments on open, 45 above.
18 Cf. Bloch (1921) p. 695: “‘L’impression auditive chez l’enfant est plus forte que celle que lui laisse sa propre prononciation.’ This formulation is not perfect (cf. 498 and note), but the fact is correct.
form dot was accidental. Or take her own name, Hildegard. The form hta B 1;11 yields easily to rules of substitution. In the later forms hata and hasta, assimilations and blendings interfere with the processes of phonetic improvement. Eventually, however, particularly if we do not stop at the arbitrary two-year limit, the model asserts itself in the normal speech-development and overcomes all temporary impediments.

The observation just made that an early form is sometimes by accident better than later ones is an important aspect in the evaluation of phonetic progress. Even more important is the fact that certain early words are learned by mechanical imitation with a degree of perfection which does not correspond to the simultaneous phonetic practices of the child in other words. It can then happen that the word later becomes detached from the special circumstances in which it is used mechanically, takes its place among other real words in the vocabulary, and submits to normal rules of substitution. The best example in our case is the word pretty, which for a whole year had a correct p and an r or a substitute for it while it was used as a vague emotive, but lost the r and voiced the p in agreement with the prevailing phonetic practice as soon as it became an attributive adjective. If such instances are not segregated, they will work havoc with the attempt to establish a regular progression in the practices of sound-reproduction.

It should also be kept in mind that the child is not always in dead earnest while learning to speak, although the energetic determination, unconscious of course, which is displayed in the efforts deserves respect. Playfulness, so characteristic of the small child, is not kept out of language, and many variations do not reflect any striving toward improvement, but only aimless toying with the sound-material.

When we keep all these restrictions in mind, it becomes clearer and clearer that the child's handling of the standard sounds is far from arbitrary. Definite phonetic rules for correct reproduction, substitution of other sounds, and omission can be established for the individual. In some cases, several choices exist even at the same stage, but in the majority of instances, a rigid practice is adhered to at each stage, with successive improvements in the direction toward the standard sound. Phonemic rather than phonetic evaluation becomes necessary when the practices of different children are to be coördinated; it helps to understand variations in individual substitutes.

A last remark about the relative position of pronunciation in the child's

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19 A good example for the halting progress is the word drink in Karla's language learning. It was ninin B 1;8 (garbled almost beyond recognition, at least for the layman in phonetics), nin M 1;8 (monosyllabism asserts itself, an improvement), mini 1;9 (lapse into the convenient reduplicated form), nguk B 1;10 (sudden considerable improvement, but persistence of the assimilated initial), digk 1;11 (relatively correct).

20 Lukens (p. 453) has a good passage on accidental correctness long before the "sure shot"; he uses the learning process of a beginner in target practice as a simile.
linguistic progress is important: there is not necessarily a close chronological correlation between the learning of sounds and the rate of progress in other language-areas. The pronunciation may still be imperfect while the child may be making great strides in grammar or vocabulary, as has been pointed out by a few observers. In Hildegard’s case, the vocabulary at age 2 was good, the grammar rudimentary, the pronunciation still rather imperfect.

497. In a final chapter, we look a little more thoroughly into the problem of ease and difficulty of sounds, which we have mentioned frequently and which has vexed students since the inception of child-language studies.

The broad historical outline of theory given in 493 reveals, upon closer inspection, a struggle between those who see the root of phonetic difficulties in the obstacles to the correct production of sounds, and those who emphasize the child’s handicaps in their correct perception. Phrased in other terms, ease and difficulty of sounds are seen as depending either on the articulatory skill and the degree of perfection reached in motor control, or on the accuracy of acoustic and visual perception of standard sounds. Both explanations are physiological.

Since Schultze launched his principle of the least physiological effort, the emphasis has been on the physiological difficulties of sound-production, although Schultze himself was not completely one-sided in his approach (493). Sully (p. 153) states emphatically: “children’s defective reproduction” is the “result of inability to produce certain sounds and not due to the want of discrimination of the sounds by the ear.” Bloch (1913) likewise traces the variability of early sounds definitely to the lack of articulatory skill, to which he also attributes the prevalence of assimilation (p. 39). Delacroix (1930) links the difficulties of articulation with other difficulties of motor control (p. 324): “L’enfant qui dessine doit vaincre les mêmes difficultés musculaires que l’enfant qui apprend à parler; son inhabilité motrice, sa mobilité, son incapacité initiale

21 Bloch (1921) p. 697; Wellman, p. 3. Grégoire (p. 201) calls attention to the fact that the articulation can be surprisingly advanced in comparison with the muscular control of other parts of the body. Wellman and associates (p. 79), on the other hand, claim the existence of coordination between motor control and correctness of sounds. Because speaking is in part a muscular activity, I am inclined to believe that a certain correlation is likely to exist; but it is quite possible that at times one set of muscles be favored by exercise over another. I should not be surprised if children showed individual differences in this respect as in others, some developing, say greater manual, others greater lingual dexterity.

22 Schultze’s phonetic learning was in general faster than Hildegard’s.

2 Schultze was not the inventor of the term. The formulation (“loi du moindre effort”) goes back to Maupertuis (1746), was first applied to children’s sound-learning by Buffon, and fully utilized by Pérez (1878). Cf. Richter, p. 36 f. Schultze’s championship of the principle had however the strongest effect on later studies of child language. Richter (p. 66 f.), summarizing the argument for and against Schultze’s law to 1927, came to the conclusion that the problem was “noch nicht völlig geklärt . . . Die Kindersprachforschung hat das Problem weiterzuverfolgen.”
à organiser des groupes de mouvements." Cornioley (p. 40) accepts the "law of the least effort," of "economy of effort" as the dominant rule of speech-acquisition. Williams finds for vowels (p. 32) and consonants (p. 29) a "definite tendency" "toward the substitution of easier sounds, but the difference in difficulty between the groups is surprisingly small." Kirkpatrick (1891) sees a difficulty not in pronouncing, but in combining sounds (p. 176); a little linguistic training would have helped him to avoid the over-emphasis on a simple linguistic point which his keen insight allowed him to discern; his basis also is articulatory.

I have no doubt that articulatory difficulty and ease play a very considerable part in the sequence of sound-learning and in the use of substitutes. Jakobson's phonemic analysis has opened the way for a more sensible appraisal of articulatory difficulties. They are not due entirely to physiological reasons; psychological considerations enter into the explanation (500). On the other hand, I am not inclined to accept his tenet that physiological difficulties play no part at all. The delayed acquisition of the "liquids," for instance, can be explained just as well by their complex articulation as by the lack of contrast with other consonants, which is the consequence of it; in fact, I would say that these are only two different aspects of one and the same phenomenon.24 Certainly, Hildegarde's reluctance to learn the word Frau (vol. 1, p. 130 f.) was not due to handicaps in sound-perception; the f-, which was obviously the stumbling-block, cannot be said to be difficult to hear or to see. The difficulty must be articulatory (let us remember that she did not learn the labiodentals by the end of the second year), no matter whether the sound was physiologically hard to pronounce (lack of preliminary practice in the babbling stage because of absence of teeth) or did not fit in the phonemic pattern for psychological or phenomenological reasons. The omission of the "liquid" in the combinations consonant + liquid may indeed be due to the fact that the successive contrast between two different consonants was still too subtle to master; but physiologically speaking, the liquid was also usually the more difficult sound; where the cluster consisted of two difficult consonants, as in ðr, the representation wavered between the first and the second component (324). This proves at least that the child heard both consonants.

In addition to the omission of sounds and the use of substitutes for them, the avoidance of standard words and the selection from standard synonyms can also be explained by a consciousness of articulatory difficulties (cf. vol. 1, p. 172). The reluctance to use the word radio, displayed by both Hildegarde and her sister, may be due to it; not so much the individual sounds as the way in which they are combined would have to be blamed in this case. Hildegarde preferred da to there, high to hoch, ja to

24 Jakobson himself (p. 73) speaks, with regard to certain complex consonants, of the articulatory "work" necessary to pronounce them. "Physiological effort" would seem to be a synonym.
yes and chose bike instead of “tricycle,” “Rad,” or “Drei Rad”; she took up hotley at once and rejected “horse” and “Pferd.”

Articulatory difficulty may not be the only reason for the choice in all these cases (cf. 312, note), but it is very likely to be an important contributory reason, if not the chief explanation.

On the other hand, it is equally clear that we cannot explain all substitutions by articulatory difficulties. For instance, Hildegard replaced initial dʒ regularly by d at 1;8, but at the same time she used dʒ as a modification of standard initial tʃ. Thus she was perfectly able to pronounce dʒ-, and handicaps in muscle control cannot be blamed for the deviation from the models beginning with the same affricate.

The possibility remains that she did not hear standard dʒ- correctly. We therefore examine next the arguments for difficulty and ease of sound-perception.

498. We have already shown (493) that Noble and Wundt were representatives of the theory that the difficulties of sound-imitation are lodged in perception rather than in articulation. Wundt specifically mentions both acoustic and optical difficulties.

Imperfections of audition are stressed especially by Bloch (1913). Speaking of the learning of vowels (p. 51 f.), he claims that lack of skill is not a major reason for their variations. Imperfect hearing, he says, is difficult to demonstrate, but convincing proof of it is nevertheless possible. Some of the examples he gives for this purpose concern consonants. Later (1921), he modified his acoustic explanation and explained imperfect hearing by deficient attention (p. 702; cf. p. 704: “mobilité de l’image verbale”). He noted that children do not misunderstand sets of words which become homonyms in their language (p. 705). Thus, the physiological difficulties of hearing were turned into a psychological matter, and Bloch undoubtedly came closer to the truth by this modification. He still emphasized auditory obstacles, however, as against articulatory difficulties. In agreement with this view, he pointed out also (p. 695) that the auditory memory is stronger than the motor memory; when words temporarily lost re-emerge, they have improved form, and thus follow the auditory, not the motor memory stimulus. I would agree with him, but caution against the one-sided emphasis. The fact that words which are not lost often resist phonetic improvement for a longer or

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25 Karla also preferred ja to yes. She learned Ei sooner than egg, although her vocabulary was almost entirely English.

26 Wundt (p. 315) also calls attention to the fact that the child uses sounds which he cannot imitate; cf. 493.

27 This explanation is rejected however; see note at end of 500.

28 Cousinet’s theory concerning the selective attention operating in children’s analogies (especially p. 165) can be cited as a parallel. Children notice only what is important to them and overlook the rest.

29 He means the auditory memory of the sounds of the presentation. He overlooks the fact that the child also hears what he says himself and might have an auditory memory of it.
shorter period and lag behind the phonetic development (496) tends to prove that the motor memory also plays an important part in the process of learning to speak.  

If we look for evidence of defective hearing in Hildegard’s language, we do not find many incontestable instances; but there are enough to show that this explanation should not be disregarded. At the very beginning of understanding and reacting to spoken stimuli (o;8) the question, “Where is daddy?” produced the same reaction as the question, “Where is the baby?” (vol. 1, p. 22). At this early stage, greater phonetic difference was apparently required to enable the child to hear words as different from each other; this was achieved by replacing “daddy” with “papa.” A year later, at r;8, she had difficulty in hearing the much smaller difference between German “Zähne” tseña and “Zehen” tsean (vol. 1, p. 127); misunderstanding of these two words continued for years. Two months later, she misunderstood “Fuss” as “tooth” in a clearly spoken question; apparently only the long high back vowel registered a clear impression, and the more familiar word was apperceived instead of the less familiar one, which, however, was not new to her. The most convincing argument is the fact that unstressed syllables were at first omitted (475 ff.) and that it took a long time, long after the turn of the second to the third year, before they were all learned, even though they presented no articulatory difficulties. Take the place-name, Milwaukee; initial m was regularly correct in the many words with a stressed first syllable (118); but in this word the whole pretonic syllable was suppressed from 1;10 (and sometimes still at 2;1). The reason for this practice, which operates extensively and is by no means restricted to child language, is undoubtedly auditory, though not necessarily acoustic in the physiological sense. Unstressed syllables are less well heard and therefore seem less important, and less attention is bestowed on them. They are not unheard in a physiological sense, at least at later stages, as proved by the fact that some unstressed syllables were reproduced and many others left their trace in a reduplicative adaptation (445).  

\[20\] Koehler’s and Stumpf’s purely acoustic examination of linguistic sounds is applied to children’s phonetic learning by Jakobson (pp. 58–68).  

\[31\] Much later (4;4), when she was able to analyze her linguistic experiences, there was an interesting incident which proved that auditory imperfections exist. She said ma:l:sat for Mahlzeit. I corrected her pronunciation, which astonished her: “Other times you say ma:l:sat; I heard you say ma:l:sart.” Shortly after, at the end of the meal, I said again Mahlzeit. “You said ma:l:sart!” she exclaimed triumphantly, thinking she had caught me. Her form was therefore not an unskilled approximate imitation, but what she had heard. She heard the t of ts as a pause, which she rendered by a without noticing the increase in the number of syllables (this is perhaps a contribution to the theory of the syllable). Cf. 482. An early example of Karla’s is much less certain. A friend called her “Dick sack”; she answered with her equivalent for “tick tack” (1;4). It would be rash to conclude that she had heard no difference between the two words. All we can claim with assurance is that the new stimulus resembled the familiar one sufficiently to release the customary reaction, which was not a faithful reproduction anyway (it consisted of a threefold repetition of the
Other examples from Hildegard’s speech show conclusively that not all difficulties and imperfections of sound-imitation can be charged to auditory reasons. Her form for *Ticktack*, then consisting only of the second syllable, ended distinctly in *k* once at E 0:11. From 1:0 to 1:11 the final consonant was always missing. The reason is not auditory. The one previous pronunciation is sufficient to prove that she heard the final stop. Until E 1:2 she made no active distinction between *Mama* and *Papa* (vol. 1, p. 102), yet she had no difficulty in distinguishing the two names acoustically. The obstacle was the initial *m*, which she began to learn 1:2 (first in *moo*); the *b* of *baba* was easier for her to articulate. The frequent word *pretty* had all sounds in approximate perfection in the extended stage of its isolated use, but all consonants changed when it became a real adjective freely used in varying connections instead of being a mechanically imitated emotive. Again it is clear that the child heard all sounds correctly; the deviations from the standard were not due to auditory imperfections (cf. 430).32 The reluctance to use the word *Frau*, based on the difficulty of the initial consonant, was not due to acoustic reasons (497). With regard to the hearing of both consonants in clusters consisting of fricative and liquid, cf. also the remark concerning 3r at the end of 497.

Occasionally the negative side of auditory reasons for phonetic imperfections is brought out in the literature on child language. Jakobson affirms (p. 10 and note 3) that the child hears differences between sounds which he does not distinguish in his own articulation, citing examples from the literature in which two words are homonyms in the child’s active speech, but not in his passive language. He grants only a minor rôle to acoustic inaccuracies, although he admits that they exist in the beginning. He says (p. 28 f.), quoting Sully, that children can often hear and even imitate sounds correctly, but return to the habitual imperfect articulation of words containing them, because the sounds in question do not yet fit with ease into the articulatory pattern. The anecdote from Fritz Reuter, cited in 495 for a different purpose, also neatly demonstrates the fact that children hear sounds which they themselves are unable to produce; since Reuter is known and admired for his keen power of observation, I have no doubt concerning the authenticity of his reference to child language. Grammont (p. 63) admits that some difficulties can be traced to auditory imperfections, but calls this phenomenon gen-

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32 In Karla’s speech, the word *beach* affords a clear illustration (vol. 1, p. 58, note 71). Upon specific demand she tried to imitate the final affricate, which she heard therefore at least when her attention was directed to it; but in spontaneous use she continued to omit it, 1:9. At E 1:10 she substituted *t*. *t* was an articulatory difficulty for her; even at 2:11 she pronounced *catch* as *kets*; it was misunderstood as *cats*. Cf. note to 332.
eraly negligible. Wundt's emphasis on the effect of imperfect acoustic and visual apperception (p. 316; cf. 493) must indeed be called exaggerated. His claim (p. 409), "Worte, die ein Mensch nicht korrekt aussprechen kann, vermag er wegen der mangelhaften Wirkung der Artikulationsempfindung innerhalb der Wortkomplikation auch nicht richtig zu hören," convincing as it sounds, is not confirmed by the study of child language, at least not in its full extent. Auditory difficulties are only a minor reason for phonetic imperfections and substitutions in the light of our experience.

499. Visual impediments, the other aspect of perceptual considerations, are much less frequently blamed for phonetic deviations from the standard. Wundt is probably the chief representative of the theory attributing them to perceptual immaturity; he names optical deficiencies along with acoustic ones. Gutzmann (1894, p. 9), like Preyer and other students, observed lip-reading (0;7). He says that children use the eye much more than the ear in the first months. That is probably quite true as a general observation, but I doubt that it has much to do with the sound-learning process. There is greater validity to Grégoire's hypothesis (p. 41) that blind children are retarded not because of their inability to watch movements of the lips, but rather because the emotionally important and helpful expressive facial gestures accompanying the sound remain hidden from them.

It is a common practice to attribute the difficulties of learning palatal and velar consonants to the fact that their articulation takes place in the back region of the mouth and is not easily accessible to visual observation. Jakobson (p. 53) rejects this optical explanation (for which he cites Passy, Wundt, and Meumann as representative authorities) in favor of his theory that the striving for contrast between labial and non-labial consonants dominates the child's sound-learning. He could very well have used visual reasons to explain the early instability of back consonants and the lack of contrast between labials and palatovelars, within the frame of his phonemic theory. Instead he leans one-sidedly on Koehler's and Stumpf's acoustic arguments (p. 58 ff.), to my mind the least convincing part of his study.

At any rate, nobody tries to explain all phonetic difficulties by visual arguments. The often-observed lateness of ʃ, for instance, could not possibly be so explained (cf. again Hildegard's resistance to the acquisition of the word Frau, 497 ʃ). Attention to the lip-movements of the standard speaker was very rarely observed with Hildegard. She seemed to rely almost entirely on her ear. I would not venture, however, to claim complete absence of visual reasons for the defects of her pronunciation.

500. It would seem to be the wisest course to accept all physiological difficulties, articulatory and perceptual, as causes of substitutions and explanations for the sequence of sound-acquisition. The most important of these are, at least in Hildegard's case, the articulatory difficulties.
Numerous writers take this compromise course. Schultzze himself, in spite of the rigid formulation of his articulatory rule, recognized the existence of perceptual difficulties (p. 37), as mentioned before (493); he seems to have in mind the vagueness of auditory perceptions. Emphasis on these two aspects is found with other authors. Williams (p. 32) interprets ease and difficulty of sounds in a motor sense, but allows a contributory influence to acoustic causes “within the limitations imposed by the tendency” to make substitutions on the basis of articulatory difficulty and ease. In addition to articulatory limitations (p. 113 ff.), Cohen registers one case of confusion resulting from defective auditory perception (p. 115 fl.). Bloch (1913) is specific: the difficulty of consonants is determined by the articulation, that of vowels by audition; I am not inclined to follow him in this division. Grégoire (p. 33, note 1) sees merit in Schultzze’s articulatory principle in the face of Stern’s and K. Bühler’s attacks. He would like to see the physiological element defined more exactly, with better phonetic competence than any of these writers had. On the other hand, he emphasizes that this is not the only element, without stating what the other elements are. Passy (1937) leaves articulatory difficulties out of his discussion, and poses the question, which to him is an embarrassing one, whether children imitate sounds acoustically or visually. He does not consider the possibility that the answer might be: both, and that substitutions and difficulties can be explained in other ways. Delacroix (1930) makes the acquisition of sounds depend on both acoustic perception and skill of articulation, and adds to these physiological elements the psychological ones of attention and memory (p. 306). Lukens (p. 445 fl.) gives equal weight to sensory causes of mispronunciation and motor difficulties; specifically he traces the incorrectness of vowels to both unprecise hearing and “motor inexpertness,” thus disagreeing with Bloch’s later opinion cited above. The five observations on mispronunciation enumerated by Pérez imply both auditory and articulatory considerations.

The basis is, however, still too narrow, even when all three of the common physiological arguments (articulatory, auditory, and visual) are used. A further argument which might be called physiological is that of heredity. Schultzze (493 above) and Meringer (p. 146 for example) are among the strongest believers in the effect of heredity on language-learning. I have no faith at all in this hypothesis. Furthermore, while heredity might have some influence on the sequence of sound-learning if it has any, it would not affect the deviations from the standard language. Therefore, the hypothesis deserves no further consideration here.

It is more important to add psychological arguments. After all, speaking is not a purely physiological process. The mind constantly exerts a

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33 According to the summary given by Wellman, p. 12.
34 I do not stop to define the “mind.” I leave an opening for the “mechanists” among linguistic scholars to decry the “mentalistic” flaws in my analysis of the mechanism of sounds.
controlling and even a decisive influence. It has already been mentioned that Bloch (cf. 498) and Delacroix added the psychological element of attention\(^{35}\) to the discussion of physiological difficulties. It should be said also that the very use of the terms auditory and visual instead of acoustic and optical shifts the discussion from the purely physiological to the psychological plane, although no point was made of this distinction above.

The study of Gale (p. 50 f.) emphasizes the fact that phonetic ease and difficulty are not by any means the dominating principle of the child's selection of words. The child's interest, in a much wider sense, determines the choice, and the limelight does not always fall on the phonetically easier words. This element, amply discussed in vol. 1, should indeed be remembered as a background while the discussion is focused on the sounds.

Gehlen (p. 292) gives a psychological slant to the physiological, articulatory aspect by stating under the heading, "Leben des Lautes": "Wie bei der Tastbewegung wird auch hier jede Bewegung sinnlich zurückgegeben und damit Reiz zur Fortsetzung ihrer selbst." This observation is useful for the explanation of such disturbances of the even phonetic development as reduplication and the delaying persistence of earlier stages, or linguistic plateaus (496). It is similar to what Allport calls (cf. above, 452) "fixation of circular responses." Allport goes so far as to say (p. 184 f.)\(^{36}\) that there is no real imitation at all, but only "touching off of previously acquired speech habits by their conditioning auditory stimuli." He is thinking of babbling and the first words, but he states very categorically and without limiting the scope of application (p. 185): "Only sounds which have been already pronounced in random articulation can be evoked by the speech sounds of others." It seems to me that it would be difficult to apply this view to all details of the sound-learning process at later stages.

Thus the interpretation of physiological facts by means of mechanistic psychology does not lead us to a satisfactory explanation of all the difficulties of sound-imitation either. All these considerations contribute something to the understanding of the involved process of learning to speak, but they do not tell the whole story. We get much farther when we add the simple, non-technical psychological insight that the fine differentiation of the adult's phonetic system does not correspond to the child's capacity in early stages; that he simplifies the delicate phonemic mechanism into a much simpler, coarser pattern of contrasts, which becomes very gradually more and more refined as the rough outlines of the child's early picture of the world acquire more and more detail; that the child, often

\(^{35}\) Macdougall (p. 89) makes the good point that the child's attention is not primarily directed to sound, but to sense.

\(^{36}\) The passage is also quoted by McCarthy (1936) p. 137. Cf. Bloomfield's succinct and lucid paraphrase and extension of the principle (pp. 29-31); he considers only the beginnings of learning to speak, like Allport.
quite able to hear and even to imitate certain complicated sounds and combinations of sounds, rejects their regular use because a simpler system of sounds is as yet more congenial to his state of mind.

For example (not to use the illustration *pretty*, 498, again), Hildegard imitated *Katz* at first with a correct *k*, which was sometimes voiced, but later she fixed this name with the substitute *d*, which was less satisfactory from the adult's point of view, but undoubtedly more satisfactory to the child, considering her phonetic habits of that stage (213); certainly the facts disclose that she was able to hear and articulate the initial consonant correctly. The observation that she always omitted final *d*, but sometimes rendered final *g* by *k* (264) surely can not be explained by visual, auditory, or articulatory difficulty and ease, since the dental is presumably easier on all three counts. It must be due to her sound-pattern, although the problem how to reconcile the fact with the details of Jacobson's theory is still another matter.\(^{37}\)

Jakobson's phonemic analysis of the child's evolving speech-pattern is a decisive step forward. It is an invaluable aid in appraising an individual child's sound-learning and a precious tool enabling us to coordinate the observations made on many children with all their glaring individual differences. I would maintain against the author that this new approach does not invalidate the older physiological and psychological explanations, but appreciate his method, objections in detail notwithstanding, as a means of gaining a more enlightened understanding of them.

\(^{37}\) The fact that difficulties remain should not be veiled. The avoidance of standard *d3*- while substitute *d3*- was in use (end of 497) cannot even be explained by the phonemic pattern, unless we assume that a persevering earlier pattern prevailed in the treatment of standard *d3*, while a later one determined the substitute for *tf*. Auditory impediments are not a plausible explanation; one would expect *d3* to be no more difficult for auditory perception than *tf*. 

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References

A complete bibliography is not intended, nor is reference to all items of even the more important literature necessary in a monograph. The following list identifies only the studies to which reference is actually made in the text, but those given in volume 1 are not repeated. It is far from being a complete list of all works consulted; nor are all the references which are included works on child-language or bilingualism. Where several items of the same author are given, the reference in the text is identified by the year of publication unless otherwise noted here.


Aronstein, Philipp: Englische Wortkunde. Leipzig-Berlin, 1925. 130 pp. (Several examples illustrating linguistic processes have been taken from this book. It does not deal with child-language.)


———: “Two children’s progress in speech.” Same journal 6 (1915), pp. 475–403. Continuation of preceding to 3;0. One chapter on first year of younger daughter. Cf. 492. Abstract in National Yearbook, p. 497.)


Bergmann, K.: “Beiträge zur Untersuchung der sprachlichen Entwicklung des Kindes.” Zeitschrift für pädagogische Psychologie 20 (1919), pp. 183–188 and 238–244. (Selective record of his two children’s language over ten years, sounds, creation of words, and syntax; purely monographic. Cf. 492.)

Bloch, Oscar: “Notes sur le langage d’un enfant.” Mémoires de la Société de Linguistique de Paris 18 (1913), pp. 37–59. (Thorough systematic discussion of selected phonetic phenomena for his daughter to 2;3. Transcription system not explained.)

———: “La phrase dans le langage de l’enfant.” Journal de Psychologie 21 (1924), pp. 18–43. (Very good investigation of his three children’s syntax during the first three or four years. Transcription improved and explained. Abstract in National Yearbook 1928, p. 499. Additional information from Bloch is given by Marcel Cohen, B S L P 27, 1927, p. 203 f.)

———: “Les premiers stades du langage de l’enfant.” Same journal 18 (1921), pp. 693–712. (Good examination of chief characteristics of the early language of the same three children and two others; much about their sounds, in the earlier, inferior transcription; not much about first year.)


Bühler, Karl: “Einleitung” to “Forschungen zur Sprachtheorie.” Archiv für
die gesamte Psychologie 94 (1935), pp. 401-412. (Introduction to co-operative studies which include child language.)

———: "Vom Wesen der Syntax." Idealistische Neuphilologie, Festschrift K. Vossler, Heidelberg, 1922, p. 54-84. (Psychologist's approach to syntax, with repeated references to child-language and an appeal for collaboration addressed to linguistic scholars.)

(———, without indication of the year of publication, refers to the book listed in first place in vol. 1. I used the fifth edition in both volumes.)

Cassirer, Ernst: "Le langage et le monde des objets." Journal de Psychologie 30 (1933), p. 18 ff. (Philosopher's approach to language, with references to child-language.)

Chamberlain, A. F. and I. C.: "Studies of a child," I-IV. Pedagogical Seminary 11 (1904), pp. 264-291 and 452-483, 12 (1905), pp. 427-453, and 16 (1909), pp. 64-103. (Comprehensive study with much material on language. Approach is not meant to be linguistic and is linguistically unsatisfactory. Incomplete and unsystematic discussion of haphazardly selected phenomena, but still much valuable material, carefully observed. Absence of transcription in I inspires regret; transcription used from II on, but remains unsatisfactory. Mostly on third and fourth years of daughter; first year and a half summarized in mere six and a half pages, III, 435-442. Abstract of II and IV in National Yearbook, p. 502 f.)


Cornioley, Hans: Die sprachliche entwicklung eines kindes von ihren anfängen bis zum 3. lebensjahr. Bern, 1935. 48 pp. (Lively popular lecture on first three years of daughter, mostly second year. Detached observations in chronological order. Has linguistic training; sporadic phonetic explanations good. Popular transcriptions are insufficient. Child learns only the Swiss dialect of German, knowledge of which is taken for granted.)

Cousinet, R.: "Le rôle de l'analogie dans les représentations du monde extérieur chez les enfants." Revue philosophique 64 (1907), pp. 159-173. (Theories on extension of meanings.)


REFERENCES


Diamantaras, Achille: “La langue des enfants de Kastellorizo (Turquie d’Asie).” Mémoires de la Société de Linguistique de Paris 13 (1905), pp. 67–70. (Sketchy account of a few early spoken words; but interesting for comparison of sounds. Modern Greek basis.)


Foulke, Katherine and Stinchfield, Sara M.: “The speech development of four infants under two years of age.” Pedagogical Seminary 36 (1929), pp. 140–171. (Good, thorough record of one of the children studied. Some attention to sounds. No phonetic transcription, but phonetic knowledge.)


Gehlen, Arnold: “Das Problem des Sprachursprungs.” Forschungen und Fortschritte 14 (1938), pp. 291–293. (New approach to the problem of the origin of language: biological view of the child’s effort to learn to speak as a specifically human achievement. Theory only.)


Grammont, Maurice: “L’assimilation.” Bulletin de la Société de Linguistique de Paris 24 (1923), pp. 1–109. Also separately, Paris, 1924. (The most thorough treatment of assimilation as a linguistic problem; not specifically on child-language. References are to the child-language study listed in vol. 1, unless identified by the year 1923.)


Grégoire, Antoine: L’apprentissage du langage. Les deux premières années. Liège-Paris, 1937. 288 pp. (The most thorough study of the first two years. Minute chronological analysis of the sounds of his two boys, French in Walloon dialect community of Belgium. Late speakers, therefore largely babbling. Admirable phonetic method; transcription very similar to I P A. Detailed psychological explanations in non-technical terms. This book is meant by all references, unless the earlier study listed in vol. 1 is specifically identified by its year, 1933.)

book is meant by all references, unless the following title is identified by its year.)


Hall, Winfield S.: "The first five hundred days of a child's life." Child Study Monthly (Chicago) 2 (1896–97), in instalments. (Very careful and detailed study of a child's total development to 1;5. I have seen only instalment IV, pp. 522–537. Abstract of instalment V on language in National Yearbook, p. 513 f.)


Hermann, Eduard: Sprache und Erkenntnistheorie. Göttingen, 1940 (Gesellschaft der Wissenschaften). (Only incidentally on child-language. Good insight, but also untenable traditional views on child-language. Cf. 491, note.)

Hills, E. C.: "The speech of a child two years of age." Dialect Notes 4 (1914), pp. 84–100. (Brief, but excellent study of spontaneously used words, determined by ten-day observation, with comparisons at ages 3, 5, and 7. Phonetically good; transcription fairly satisfactory. Rarely more than one form for each word. Substitutions, 1/4 p. Abstract in National Yearbook, p. 514.)


Holmes, U. T.: "The phonology of an English-speaking child." American Speech 2 (1927), pp. 219–225. (His daughter to 2;0. Careful fragmentary observations of a linguistic scholar. Complete list of words at 1;6 in phonetic transcription, sometimes two variants; includes a few phrases. After 1;6 a few lines for each month. Abstract in National Yearbook, p. 514.)

Horn, Wilhelm: "Neuere Erscheinungen in der Lautgebung des Englischen." Archiv für das Studium der neueren Sprachen 177 (1940), pp. 86–92. (Not on child-language.)


Humphreys, M. W.: "A contribution to infantile linguistic." Transactions of the American Philological Association 11 (1880), pp. 5-17. (Valuable, but very concise early study. Consonant substitutions and word list at age 2, written six weeks later. Preyer, p. 255 ff., accuses Humphreys of using Holdén without mentioning him, but calls his study "very remarkable, and ... in part ... unique." About defects of method, cf. 492. Abstract in National Yearbook, p. 517.)


Jakobson, Roman: Kindersprache, Aphasie und allgemeine Lautgesetze. Uppsala, 1941. 83 pp. (From Språkvetenskapliga Sällskapets i Uppsala Förhandlingar, 1940-1942.) (Phonemic analysis, which opens a new way to generalizations, cf. my review below. Open to criticism in details, which is given in several places in this volume, but invaluable as a new basis of discussion. Six pages of bibliography in various languages, limited in scope, but valuable especially for Slavic items and for aphasis. Cf. 493. Cited as Jakobson without further identification.)


Jegh, J. I.: "The vocabulary of a two-year-old child." Child-Study Monthly 6 (1901), pp. 241-261. (Author is no linguistic scholar, but his observation is very good, the discussion sensible, and the method fairly satisfactory. Compares results with Tracy. Includes some phonetic observations. Abstract in National Yearbook, p. 517.)


——: "Das System der Association phonétique internationale." Berlin, 1928. (From Lautzeichen und ihre Anwendung in verschiedenen Sprachgebieten, ed. M. Heepe, pp. 18-27.) (Brief, but thorough presentation of the IPA transcription system, outdated in a few small details. Not on child-language.)

Kenyerés, Elemér: "Les premiers mots de l'enfant et l'apparition des espèces de mots dans son langage." Archives de Psychologie 20 (1927), pp. 191-218. (Diary about his daughter to 7.5, Hungarian. Mostly chronology of acquisition of grammar. The abstract in National Yearbook, p. 518, does not cover the article adequately.)

Kenyon, J. S.: American pronunciation; a textbook of phonetics for students of English. Ann Arbor, Mich., *1945. (Not on child-language. Sometimes *1926 is cited for the "earlier editions" of the book, which was entirely rewritten in *1935.)


——: Die Sprachstämme der Erde. Heidelberg, 1931. 257 pp. (Not on child-language.)

383 pp. (Not seen; cited from Wellman. Abstract in National Yearbook, pp. 233–237. Language is only one of many factors studied; chapter 15 deals with vocabulary. Cited as 1916. Cf. 493.)

———: “How children learn to talk.” Science 18 (1891), p. 175 f. (Very sensible general approach to the study of child-language, preliminary to the examination of individual records, for which he calls. The lack of linguistic training has deplorable effects on the endeavors of this able student, cf. 493, 497.)


Krötzsch, W.: “Material zur Untersuchung der sprachlichen Entwicklung des Kindes.” Zeitschrift für experimentelle Pädagogik 11 (1910), pp. 164–193. (Detached samples of his son’s speech to age 5, well observed. No phonetics. No characterization of the presentation, which may have had a Saxon dialect tinge.)

Kurath, Hans and others: Handbook of the linguistic geography of New England. Providence, R. I., 1939. (Not on child-language.)

Latif, Israel: “The physiological basis of linguistic development and of the ontogeny of meaning.” Psychological Review 41 (1934), pp. 55–85, 153–176, 246–264. (Theoretical study by an East Indian scholar, worth reading. Child-language, explained by means of “mechanistic” psychology, as the basis of “advanced” linguistics. Much use made of old literature.)


———: “The infant’s approach to the forms of adult speech.” Speech (British) 1 (1936), pp. 7–9. From Proceedings of the Second International Congress of Phonetic Sciences. (Good succinct examination of the rules of three children’s sound-learning, based on personal observations and those of Deville and Stern. References to “Lewis 1936” mean this article.)

———: Infant speech. A study of the beginnings of language. London, 1936. XII, 335 pp. (Cf. 492. This valuable book with its rich materials should be consulted for most of the topics treated in this study. Few individual references to it are given.)


Macdougall, Robert: “The child’s speech.” Journal of Educational Psychology

McCarthy, Dorothea: "The vocalization of infants." Psychological Bulletin 26 (1929), pp. 625-651. (Part I of this study, pp. 625-636, gives a good survey of the international literature on children's early sounds. 68 items of bibliography; faulty especially in German titles. Cf. 338, note.)


National Society for the Study of Education, 28th yearbook, Preschool and parental education, ed. by G. M. Whipple. Bloomington, Ill., 1929. 875 pp. (Pp. 495-568 and 727-736. Good abstracts of books and articles on child language 1876-1929, useful for quick information, but far from complete. Mostly American studies, some English and French, no German. The gaps are amazing; some of the most important studies in foreign languages and in English are missing. Cited as National Yearbook.)


———: "yn kastjō ūbarāšt:t." Le Maître phonétique 52 (1937), p. 14 f. (Acoustic or visual imitation? The author was a leading phonetician.)


Pollock, F.: "An infant's progress in language." Mind 3 (1878), pp. 392-401. (An English jurist's observation, following Darwin's and Taine's example, of a girl to 1:11; sober, but very incomplete. He has "no pretensions to skill in phonetics"; he uses a consistent notation, which is however not very satisfactory. An interesting early study. Abstract in National Yearbook, p. 527.)


Röttger, Fritz: Phonetische Gestaltbildung bei jungen Kindern. Munich, 1931. 217 pp. (Aim comparable to Jakobson's, but the study is much less successful. Valuable materials and well organized observations on the language of 29 children with varied social background; good psychological method, statistics, etc. Would be more useful if it were not clothed in the difficult jargon of Gestalt psychology, with many obscure abstractions; difficult to understand for the layman. Looks phonetic through generous use of phonetic transcriptions, but is phonetically not satisfactory, despite the services of competent linguistic advisers. Makes very limited use of literature. Cf. 493.)

Sapir, Edward: Language; an introduction to the study of speech. New York, 1921. 258 pp. Also Russian translation, Moscow, 1934. (Not on child-language.)

Seth, George and Guthrie, Douglas: Speech in childhood; its development and disorders. London, 1935. 224 pp. (Not cited; not very useful for this study, but included here to recommend it as a good, simple introduction to phonetics and psychology of speech for non-linguists. I P A transcription. Generally sound and sensible brief survey of the development of child-speech, not rich in details; no original observations; based on international research. The authors' fields are psychology and medicine.)


Spitzer, Léo: "En apprenant le turc." Bulletin de la Société de Linguistique de Paris 35 (1934), pp. 82-191. (Children's reduplications mentioned for the sake of comparison with standard Turkish.)


Stevenson, A.: "The speech of children." Science 21 (1893), pp. 118-120. (A scanty, but very competent early Canadian study of several children. Wide range of selected phenomena, including a brief list of consonant-substitutions for one child by place and manner of articulation, one example each, compared with standard shifts.)


REFERENCES


Trager, G. L. and Bloch, Bernard: "The syllabic phonemes of English." Language 17 (1941), pp. 223-246. (Not on child-language.)


Velten, H. V.: "The growth of phonemic and lexical patterns in infant language." (First study based on Jakobson, modifying his conclusions. Slow sound-learning of his daughter o;10-2;1r favors phonemic analysis. Not much on vocabulary patterns; some multilingualism.)


———: "A qualitative analysis of the erroneous speech sound substitutions of preschool children." Ibid., pp. 19-32. (Both studies are concerned with sounds. Modification of Wellman sound-test; selective analysis of Wellman's data with emphasis on substitutions. Method linguistically in part less good than Wellman’s, cf. 492.)
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The children's words are printed in Roman type, topics and names of authors in *italics*. Karla's words, when they correspond to Hildegard's, are treated in footnotes at the same places and are not indexed separately. Entries in parentheses refer to Karla's speech alone. Entries in *bold face* are Hildegard's babbling combinations. Items which appear in text and footnotes at the same place are indexed by section only. A section reference with added "n" means that the item is found only in one or several of the notes to the section.

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