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A Case of Retarded Speech Development

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A CASE OF RETARDED SPEECH DEVELOPMENT

By ALICE C. HINCKLEY, Columbia University, New York Clearing
House for Mental Defectives

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This child, a girl five and a half years old, was first brought to my notice in the autumn of 1911, when she entered one of the city kindergartens. The expression of her countenance was that of a deaf mute and she seemed unable to utter a word, though she was not deaf. She showed an interest in what was going on by following it with her eyes and smiling pleasantly, but at the end of four months she had not said a word to teacher or child, nor had she voluntarily taken part in any of the activities—indeed, she had not learned to walk or march in a straight line or on the circle.

Physically she was somewhat over-sized and walked with a heavy lumbering movement, mostly of the hips—a spastic gait. Hands were uncertain in movement and grasp;—she could not use scissors with either hand. There was slight lateral curvature of the spine and flattening of the arches; but the reflexes seemed normal, with the exception of a clonus in either ankle. The ear cavity is somewhat peculiar in shape, though the hearing seems normal. The lower jaw protrudes sufficiently to allow her to hold the tips of two fingers within the lower incisors. This habit, which seemed to be an evidence of timidity, for a time disguised the fact that she was a mouth breather. Adenoids and tonsils were removed the following February and I began to work with her for the development of speech.

In my first visit to her home, I saw her romping with the three-year-old sister and heard her make a few babbling

sounds which the family, and especially the little sister, understood readily. Most of her communication, however, was by signs, pointings and leadings. Three weeks after the operation she began definitely to attempt to say words in a whisper, but so indistinctly as to be beyond analysis. The words were saucer, cup, pocket-book, dog, chair, hat, table, bed, towel, man, horse, bird, Washington, spoon (poon), knife (mnī). In fork she had no idea how to get the "f" (besides, she was physically unable to get the lower lip under the upper teeth), but in trying to imitate me put her tongue out between her teeth, as th. At the end of six weeks she began gradually to vocalize. She could now whisper a number of words, the clearest beginning with m, b, t, and p. The first words vocalized were bow-wow (squirrel), mumī (music), and two.

Nearly all of the words given below were first said spontaneously in our games and activities (she was told the names of a few things that she did not know) and afterward repeated incidentally, so that she might hear the correct sound. Not for several months was anything like drill attempted. I have endeavored to reproduce as nearly as possible her first attempts and later efforts in the order in which she gave them. For a long time there was a sort of shadowy m that preceded or took the place of the initial consonant. This seemed to be due to the mechanical, hinge-like way in which her lips opened for enunciation.

Mar. 20. Whispered tā ū—table, too ī—too big, pē th—pencil, bēthe—beads, boo—broom, nthwee—sweep, wāthū—wagon, tī—stick, pāpū—paper; slightly vocalized pēmpū—pencil, wē—red, bō—boy, ort—horse, boo—blue, bō—box.

Mar. 22. In a game she shouted "Yaddy" (ready). The following words were fairly well vocalized: tū—one, two—two, tō—three, tōa—four, tī—five, ūbbū—eraser, bō—board, tī—stick, mūma—ruler, lī—lines, pīppa ū—pick it up.

Mar. 27. Manner extremely shy. In most of these words a labored vocalization in very low tone and pitch: Nā dā dī oo tā—now going to give you tag; a wī, Lilly—all right, Lizzie; Dordie—Georgie; ō oo—you'll look; mā ō—make a house; mā daw—make a saw; pī ā ū—pick that up; tum, Gwaty—come, Gracie; Ätē—Ethel (her own name).

Apr. 16. In a hoarse whisper; power—flower, Mama—Elisabeth, Ēa—Yetta, pēmpa—pencil, mēma—yellow, dā—grass, dē green, wē—red, boo—blue, mnā—chair.

Apr. 18. Mūmī—Susie, Mommy—Polly, too—shoes, mū—girl, mē—yes, bō—boy. Sounded sh separately with effort, but could not connect it.

Apr. 23. Daw—doll, bū—butterfly, tow—cow, dōmthē—

donkey, bāby (whispered), book (whispered), good mor(ning) (whispered). Sang "By-bā-by" (By, baby, by) in low monotonous drawl.

Apr. 25. Dē—desk, thǎ—chair, gǎ—electric bulb, tā—table, dǎ—glass, bō—blocks, mīma—window, pēmp—penti—pencil, Pō i—Polly, Tudy—Susie, mǎmǔ—wagon, boo—book, doo—door.

Apr. 30. Dō tē, Tudy—Go to sleep, Susie; wā ŭ, Tudy—wake up, Susie; donkey—blanket; hē mē—help me; dē—dress; too—shoes; daw—drawer; bū—buttons; ǎmker—handkerchief; pēntǔ—pencil; tha—chair; tō i—stockings.

May 2. Tī-tē—Christmas tree, tǔ—shovel, dongē—domtet—blanket, tītēn—chicken, teep—sheep, mtow—cow, ho—hog, dō—goat, mā—rake, hort—horse, bō—broken, tē—tree, ou—house.

May 7. Tā Tudy—take Susie; hē ō dō—help me to open the door.

A review of words gave the following: nā—nail, tow—cow, boy, hor—horse, mī—pig, tī—chicken, tīta tē—Christmas tree, dǎ—grass, dū—girl, mǎmǔ—wagon, bō—blocks, bī—good-by, pīdda—pillow, dō tē—go to sleep, pī ŭ—pick it up, pīpī bǎ—put it back, dub—gloves, pīta—picture, dē—dress, tā—chair, ō—house, hē mē—help me, boo—book, Āta—Ethel.

May 9. Dongē—domtet, bantel—blanket, hort—horse, mwittē—whistle, o—hole, teep—sheep, āton—apon—apron, pēmpē—penthul—pencil, pu ā on Pō—put apron on Polly, toot—foot, too—shoe, tā—tail, ǐdda—ribbon, pu ǐ ā—put things away, hē mē—help me, bū dē—button dress, cǎ bū—I can't button it, tā ō—take it off, gō bī pēntǔ—goat bite pencil, dō bī mē—don't bite me, lida—lion, tē bǎ—teddy bear, mumty—monkey, ěmbē—elephant, dump—jump, bō nē—broken neck, bow—bounce, pīpy ŭ—put it up, tā ŭ—tā dō—stand up.

May 14. Tām tā tāna—I can play piano; wa ŭ tā, Tudy—walk up stairs, Susie; dō tē, Pō—go to sleep, Polly; tā tāna, Pō—play piano, Polly; dō tē, Pō—go sleep, Polly; domket—bantet—blanket; tītta tē—Christmas tree; dē tīt tō mē—get it for me; ting—string, pāpy—paper, pēntul—pencil; mā ou—make house; dhī mī—I like milk; tārtē—carpet; tīppī—mittī—whistle; date—rake; tūbba—tūbda—shovel; hort—horse; domty—donkey; pī—pig; tiēn—chicken; wun—run; do—dog, bōptēn—broken.

May 21. Pitta—pillow; dē pu on Pō—dress put on Polly; mbō—block; mēmō—tēpo—teapot; aton—apron; dē tō—dress off; umbuppa—unbutton; nīdow—nightgown; k k toat—pēp-pītote—petticoat; ātter—wrapper; bē ār—bend your arm; hamtit—handkerchief; Pō doo tī—Polly's a good child; mboo—book (nearly a clear b, and just a suggestion of the k).

May 23. Domtĕ—bampton—blanket; dum—drum; tate—plate; itta—whistle; dō—bō—blow (fairly good b); bam—bank; Tān Ta—Santa Claus; ti pān—frying pan; ti—kitty; tauter—saucer; Lĕttĭ dot one—Lizzie got one; bĭ ũ—big one; nōmdi—ninōm—nightgown; loo—look; pupā?—put on?; but it—button it; tie it now.

Classification with reference to reaction to number of syllables. One syllable:

bĕthe, beads	}	whispered
boo, broom		
nthwee, sweep		
tĭ, stick		
tŭ, one		
two, two		
tō, three		
tōa, four		
tĭ, five		
bō, board		
tĭ, stick		
lĭ, lines		
dă, grass		
dĕ, green		
wĕ, red		
boo, blue		
mnă, chair		
mŭ, girl		
mĕ, yes	}	whispered
too, shoes		
bō, boy		
daw, doll		
tow, cow		
book (whispered)		
dĕ, desks		
thă, chair		
dă, grass		
bō, blocks		
boo, book	}	whispered
dō, door		
dĕ, dress		
too, shoes		
thă, chair		
teep, sheep		
tow, cow		
ho, hog,		

dō, goat	}	whispered
mă, rake		
hort, horse		
tĕ, tree		
hou, house		
nă, nail		
tow, cow		
dŭ, girl		
bō, blocks		
bo, boy		
hor, horse		
mĭ, pig		
dă, grass		
dub, gloves		
dĕ, dress		
tă, chair		
ō, house		
boo, book		
ō, hole	}	whispered
teep, sheep		
toot, foot		
too, shoe		
tă, tail		
dump, jump		
ting, string		
dăte, rake		
pĭ, pig		
wun, run		
dō, dog		
mbō, block		
mboo, book		
dum, drum		
tate, plate		
dō, bō, blow		
băm, bank		
loo, look		

Two syllables:

tă ũ, table	}	whispered
too ĭ, too big		
pĕ th, pencil		
wăthŭ, wagon		
păpŭ, paper		
yăddy, ready		
mŭma, ruler		
Dordie, Georgie		

ō oo, you'll look,	}	whispered
mă ō, make house		
mă daw, make saw		
Ātĕ, Ethel		
power, flower		
Ēa, Yetta		
pĕmpa, pencil		
mĕma, yellow		

Mũmĩ, Susie
 Mõmy, Polly
 dõmthẽ, donkey
 baby (whispered)
 tã, table
 mĩma, window
 pẽmpẽ, pentĩ, pencil
 Põĩ, Polly
 Tudy, Susie
 mãmũ, wagon
 donkey, blanket
 daw, drawer
 bũ, buttons
 hẽ mẽ, help me
 pẽntũ, pencil
 tũ ỉ, stockings
 tũ, shovel
 dõngẽ, domtet, blanket
 tĩtĩn, chicken
 bõ, broken
 bĩ, good-by
 pĩdda, pillow
 tĩ, chicken
 mãmũ, wagon
 pĩta, picture
 hẽ mẽ, help me
 Ɔta, Ethel
 dõngẽ, domtet, blanket
 mwĩttẽ, whistle

pẽmpẽ, penthul, pencil
 ỉdda, ribbon
 hẽ mẽ, help me
 lĩda, lion
 mumty, monkey
 tã ũ, tã dõ, stand up
 domket, bamtet, blanket
 pãpy, paper
 penthul, pencil
 mã ou, make house
 tãrtẽ, carpet
 tĩppĩ, mittĩ, whistle
 tubba, tubda, shovel
 domty, donkey
 tiẽn, chicken
 bõptĩn, broken
 pĩtta, pillow
 mẽmõ, tẽpõ, teapot
 ăton, ăpon, apron
 dẽ tũ, dress off
 nĩ dow, nightgown
 ătter, wrapper
 bẽ ăr, bend arm
 dõmtẽ, bamptet, blanket
 ỉtta, whistle
 tĩ, Kitty
 tauter, saucer
 nõmdĩ, ninõm, nightgown
 pup ă? put on?

Three syllables:

ũbba, eraser
 pĩppa ũ, pick it up
 pĩ ă ũ, pick that up
 tũm Gwaty, come Gracy
 bũ, butterfly
 amker, handkerchief
 tĩ tẽ, Christmas tree
 tã Tudy, take Susie

bũ dẽ, button dress
 tã õ, take it off
 dõ bĩ mẽ, don't bite me
 tẽ bã, teddy bear
 ẽmbẽ, elephant
 tĩta tẽ, Christmas tree
 bõ nẽ, broken neck
 pĩpy ũ, put it up

Four syllables:

a wĩ Lilly, all right Lizzie
 by bã by, by baby by
 ga, electric bulb
 mĩma, Elizabeth
 wã ũ Tudy, wake up Susie

pu ỉ ă, put things away
 gõ bĩ pentũ, goat bite pencil
 dẽ tĩt tũ mẽ, get it for me
 dẽ pu on Põ, dress put on Polly
 Lẽttĩ dũ one, Lizzie got one

Five syllables:

Nã dã dĩ oo tã, now going give
 you tag
 dũ tẽ Tudy, go to sleep Susie
 cã bũ, I can't button it

wa ũ tã Tudy, walk up stairs
 Susie
 dũ tẽ Põ, go to sleep Polly
 Põ doo tĩ, Polly's a good child

Six syllables:

pu ā on Põ, put apron on Polly tā tāna Põ, play piano Polly
tām tā tāna, I can play piano

Seven syllables:

Hě ō dō, help me to open the door

A majority of these cases shows the requisite number of syllables accounted for; and in those cases where the number of syllables is incomplete the accented ones have been taken and the unaccented overlooked. There is evidence of response to rhythm of accent or emphasis (but not inflection), the most noticeable instance being that of the seven-syllable, where the first, fourth and seventh were chosen.

Omitted syllables and words are in every case, except "I," the unaccented:

bī, goodbye
tī tē, Christmas tree
bū dē, button dress
cā bū, I can't button it
tā ō, take it off
tē bā, teddy bear
ěmbě, elephant
bō nē, broken neck
by bā by, by baby by
Mīma, Elisabeth

pū ĭ ā, put things away
nā dā dī ōo tā, now going to give
you tag
dō tē Tudy, go to sleep Susie
dō tē, Põ, go to sleep, Polly
Põ doo tī, Polly's a good child
pū ā on Põ, put apron on Polly
tām tā tāna, I can play piano
tā tāna Põ, play piano, Polly
hě ō dō, help me to open the door

Words and syllables of equal emphasis give the most regular return:

2-2, dē tō, dress off
2-2, nīdow, nightgown
2-2, bē ār, bend arm
2-2, nōmdī, nightgown
2-2, nīnom, nightgown
2-2, pūp ā? put on?
3-3, pīpā ū, pick it up
3-3, pī ā ū, pick that up
3-3, tum, Gwaty, come, Gracy
3-3, tā Tudy, take Susie
3-3, dō bī mē, don't bite me
3-3, pīpy ū, put it up

4-4, a wī, Lilly, all right Lizzie
4-4, wā ū, Tuddy, wake up, Susie
4-4, gō bī pentū, goat bite pencil
4-4, dē tīt tō mē, get it for me
4-5, dē pū on Põ, dress put on
Polly
4-4, Letti dō one, Lizzie got one
5-6, nā dā dī ōo tā, now going
give you tag
5-5, wā ū tā, Tudy, walk up
stairs, Susie

Two out of three syllables are given in seven instances:

amker, handkerchief
tī tē, Christmas tree
bū dē, button dress
tā ō, take it off

tē bā, teddy bear
ěmbě, elephant
bō nē, broken neck

Three out of three, 1.

tīta tē, Christmas tree

Three out of four, 2.

by bā by, by baby by

pū ĭ ā, put things away

Three out of five, 2.

dō tē, Pō, go to sleep, Polly

Pō doo tī, Polly's a good child

Three out of seven, 1.

hě ō dō, help me to open the door

Four out of five, 1.

dō tē Tudy, go to sleep, Susie

Four out of six, 2.

pū ā on Pō, put apron on Polly

tā tāna Pō, play piano, Polly

Five out of seven, 1.

nā dā dī oo tā, now going to give you tag

Two out of two, 51.

tā ũ, table
pēthe, pencil
wāthū, wagon
pāpū, paper
yaddy, ready
mūma, ruler
Dordie, Georgie
Ātē, Ethel
power, flower
Ē a, Yētta
pēmpa, pencil
mēma, yellow
Mūmī, Susie
Mōmy, Polly
dōmthē, donkey
mīma, window
Pō ĭ, Polly
māmū, wagon
dongē, blanket
pēntū, pencil
tō ĭ, stockings
domtet, blanket
titten, chicken
pidda, pillow
tauter, saucer

māmū, wagon
pīta, picture
Āta, Ethel
dōngē, blanket
domtet, blanket
mwittē, whistle
aton, apron
apon, apron
pēmpē, pencil
penthul, pencil
tārtē, carpet
tīppī, whistle
mittī, whistle
tūbba, shovel
tubda, shovel
domty, donkey
tī ēn, chicken
bōpten, broken
pitta, pillow
ātter, wrapper
domtē, blanket
bampet, blanket
ittā, whistle
ūbbū, rubber

There is not a single instance where an unaccented initial syllable is sounded, though few such words appear in the exercise. On the other hand, only twice is the initial accented syllable or word omitted and that appears in tām tā tāna (I can play piano) and cā bū (I can't button it), which is probably due to the fact that she does not use I and has not learned to say it.

The initially accented are classed with reference to the number of syllables sounded:

One out of two, 7.

tā, table
daw, drawer
bū, buttons
tū, shovel

bō, broken
tī, chicken
tī, Kitty

One out of three, 1.

bū, butterfly

Of these eight words, five were later given two syllables:

tā ū, table
būppa, buttons
tūbda, shovel

bōpten, broken
titten, chicken

Classification with reference to reaction to consonant sounds: m prefixed to initial b and w, in block—mbō, book—mboo, whistle—mwittē.

make house—mā ō
make saw—mā daw

monkey—mūmty
milk—mī

Internal m.

Christmas tree—tī tē
help me to open the door—
hē ō dō

Christmas tree—tīta tē
help me—hē mē
jump—dump

Final m.

broom—boo
arm—ār

come—tūm
drum—dum

Initial b.

broom—boo
boy—bō
blue—boo
box—bō
board—bō
butterfly—bū
by-baby-by—by bā by
blocks—mbō
book—mboo
blanket—donkey
dongē
domtet
bantet
domtē
bamptet
buttons—bū
broken—bō

boy—boy
blocks—bō
back—bā
button dress—bū dē
bite—bī
bear—bā
broken neck—bō nē
bounce—bow
broken—bōpten
block—mbō
bend your arm—bē ār
book—mboo
blow—dō—bō
bank—bam
big—bī
button it—būt ī
beads—bēthe (whispered)

Internal b.

table—tā ū
too big—too ī
table—tā

goodby—bī
ribbon—īdda
unbutton, umbuppa

No final b.

Initial p.

pencil—pě th (whispered)
 paper—pāpū
 pencil—pěmpū
 pick it up—pīppa ũ
 pick that up—pī ā ũ
 Polly—mommy
 pencil—pěmpě
 penti
 Polly—Pō ĭ
 pencil—pěntū
 pillow—pidda
 pig—mī
 pick it up—pī ũ
 put it back—pīpī bā
 picture—pīta
 pencil—pěnthul
 put apron on Polly—pū ā on Pō

put things away—pū ĭ ā
 goat bite pencil—gō bī pentū
 I can play piano—tām tā tāna
 put it up—pīpy ũ
 go to sleep, Polly—dō tē Pō
 play piano, Polly—tā tāna Pō
 paper—pāpy
 pencil—pentul
 pig—pī
 pillow—pitta
 petticoat—k k toat
 peppitote
 Polly's a good child—Pō doo tī
 plate—tate
 pan—pan
 put on?—pūp ā?

Internal p.

help me—hě mē
 help me to open the door—hě
 ō dō
 apron—āton, apon

walk up stairs—wa ũ tă
 carpet—tārtě
 teapot—mēmō—tēpō
 wrapper—ätter

Final p.

sheep—teep
 up—ū
 jump—dump

stand up—tā ũ—tā dō
 sleep—tē

Initial w.

wagon—wāthū (whispered)
 window—mīma
 wagon—māmū
 whistle—mwittě
 walk—wa

whistle—tīppī—mīttī
 wrapper—ätter
 wake—wā
 one—tū

Internal w.

sweep—nthwee
 flower—power
 drawer—daw

put things away—pū ĭ ā
 gown—dow
 nightgown—nīnōm

Final w.

cow—tow

now—now

Initial y.

Yetta—Ē a
 yellow—mēmma

yes—mě

Final y.

boy—bō

Initial t.

table—tā ũ
too big—too ĭ
two—two
three—tō
tag—tā
table—tā

tree—tē
tail—tā
take—tā
teddy bear—tē bă
teapot—tē pō
tie it now—tie ĭ now

Internal t.

stick—tī
Ethel—Ātē
Yetta—Ē a
butterfly—bū
buttons—bū
stockings—tō ĭ
Christmas tree—tītta tē
help me to open the door—hē ō
dō
dress put on Polly—dē pū on Pō
get it for me—dē tīt to mē
go to sleep, Susie—dō tē, Tudy
go to sleep—dō tē
pick it up—pī ũ
put it back—pipi bă
picture—pīta
Ethel—Āta
whistle—mwītē

put things away—pū ĭ ā
button dress—bū dē
I can't button it—cā bū
take it off—tā ō
goat bite pencil—dō bī pentū
put it up—pipy ũ
stand up—tā ũ—tā dō
walk up stairs—wa ũ tă
Kitty—tī
button it—būt ĭ
tie it now—tie ĭ now
whistle—ītta
Santa Claus—Tăn Tă
nightgown—nīdow
unbutton—umbuppa
whistle—tīpī—mittī
string—ting

Final t.

all right—a wī
pick that up—pī ā ũ
blanket—donkey
dongē
goat—dō
blanket—domtet
bantet
put—pū
foot—toot
elephant—ēmbē

pot—pō
blanket—domtē
bampet
plate—tate
got—dō
petticoat—k k toat
peppitote
nightgown—nīdow
carpet—tārtē

Initial d.

doll—daw
donkey—dōmthē
desk—dē
door—doo
dress—dē

drawer—daw
dōn't—dō
donkey—domty
dog—dō
drum—dum

Internal d.

window—mīma
handkerchief—āmker
goodby—bī

teddy—tē
handkerchief—hamtit

Final d.

red—wē
board—bō
good—goo

stand—tā
bend—bē
good child—doo tī

Initial n.

now—nä
nail—nä

neck—ně
nightgown—nī dow

Internal n.

pencil—pě th (whispered)
pempü
pentü
pentĩ
penthül
lines—mli
donkey—domthě
domty
morning—mô
window—mĩma
blanket—dongě
domtet
domtě
bantet
bamp̄tet

handkerchief—amker
buttons—bü
don't—dō
monkey—mumty
elephant—ěmbě
broken neck—bō ně
bounce—bow
stand up—tä ü—tä dō
I can play piano—tām tā tãna
bend—bě
Santa Claus—Tãn Tã
tie it now—tie ĩ now

Final n.

one—tü
green—dē
wagon—mãmü
broken—bō
chicken—titten
open—ō
chicken—tĩ
apron—āton—apon
button—bü
broken—bō
can—tam
chicken—tĩ ěn

run—wun
broken—bōpten
on—on
unbutton—umbuppa
nightgown—nīdow
frying pan—tĩ pan
big one—bĩ one
nightgown—nōmdĩ
nĩnōm
put on?—püp ä?
button it—but it

Initial l.

lines—mli
Lizzie—Lilly
look—oo

lion—lida
Lizzie—Lětti
look—loo

Internal l.

ruler—mũma
flower—power
Elisabeth—Mĩma
yellow—měma
blue—boo
Polly—Mommy
Pō ĩ—Pō
butterfly—bü
glass—dã
blocks—mbō
go to sleep—dō tē
blanket—dongě
domtet
domtě
bantet
bamp̄tet

help me—hě mē
help me to open the door—hě ō
dō
pillow—pĩdda
gloves—dub
play—tä
walk—wa
I like milk—dhĩ mĩ
pillow—pĩtta
block—mbō
child—tĩ
plate—tate
blow—dō—bō
Santa Claus—Tãn Tã
elephant—ěmbě

Final l.

all—a
 you'll—you
 Ethel—Ätē
 pencil—pempa—pentī—pentū—
 penthu
 girl—mū—dū
 doll—daw

table—tā
 shovel—tū—tūbda
 nail—nā
 whistle—mwittē—itta
 hole—ō
 tail—tā

Initial s.

stick—tī
 saw—daw
 Susie—Mumī
 Tudy
 sleep—tē

stockings—tō ī
 string—ting
 Santa Claus—Tān Tā
 saucer—tauter

Internal s.

pencil—pēmpū
 pēmpē
 pentī
 pentū
 pentul

Gracie—Gwaty
 desk—dē
 Christmas—titta
 whistle—itta

Final s.

horse—ort—ō
 house—ō
 grass—dā
 blocks—bō

dress—dē
 horse—hort—hor
 house—ou

Internal z.

Lizzie—Lilly—Lettī
 Elisabeth—Mīma

Susie—Mumī—Tudy

Final z.

beads—bēthe (whispered)
 lines—lī
 shoes—too
 buttons—bū

stockings—tō ī
 gloves—dub
 Santa Claus—Tān Tā

Initial sh.

shoes—too

shovel—tū—tubba—tubda

Initial r.

right—wī
 red—wē
 rake—mā—date

ribbon—īdda
 run—wūn
 wrapper—ätter

Internal r.

broom—boo
 three—tō
 board—bō
 Georgie—Dordie
 Gracie—Gwāty
 girl—mū
 good morning—goo' mor'
 dress—dē
 handkerchief—āmker

Christmas tree—tī tē
 horse—or
 broken—bō
 tree—tē
 girl—dū
 grass—dā
 horse—hort
 apron—aton—apon
 put apron on Polly, pū ā on Pō

stairs—tă
string—ting
carpet—tărtě
broken—bōpten

Final r.

paper—pāpū
four—tōa
eraser—ūbbū
ruler—mūma
flower—power
chair—mnā—thă—tă

Initial f.

four—tōa
five—tī
flower—power

Internal f.

butterfly—bū

Final f.

handkerchief—amker
take it off—tā ô

Initial v.

None

Internal v.

shovel—tū
gloves—dub

Final v.

five—tī

Initial th.

three—tō
that—ă

Internal th.

Ethel—Ătě—Ăta

Final th.

Elisabeth—Mīma

Initial y.

Yetta—Ě a
yellow—mēm̃ma

Final y.

boy—bō

Initial j.

jump—dump

Initial ch.

chair—mnă—thă—tă
chicken—titten—tī—tīēn

bend your arm—bě är
handkerchief—hamtit
frying pan—tī pan

door—dō
drawer—daw
bear—bă
for—tō
paper—papy
saucer—tauter

foot—toot
for—tō
frying pan—tī pan

dress off—dě tō
handkerchief—hamtit

shovel—tubba
tūbda

give—dī

things—ī

yes—mě

Georgie—Dordie

child—tī

Internal ch.

picture—pīta

handkerchief—hamtit

Initial k.

cow—mtow

can—tam

Christmas—tīta

carpet—tärtē

cow—tow

kitty—tī

can't button it—cā bū

Internal k.

pick it up—pīppa ũ

chicken—titten—tī

donkey—domthē

picture—pīta

blanket—dongē

monkey—mumty

domtet

donkey—domty

domtē

chicken—tī ēn

bantet

broken—bōpten

bamtet

petticoat—k k toat—peppitote

handkerchief—amker

handkerchief—hamtit

stockings—tō ī

Santa Claus—Tān Tā

broken—bō

Final k.

stick—tī

rake—mā

box—bō

take—tā

look—oo

back—bā

make—mā

neck—nē

pick—pī

walk—wa

book (whispered)

I like milk—dhī mī

desk—dē

rake—date

blocks—bō

block—mbō

book—boo

bank—bam

wake—wā

look—loo

Initial g.

going—dā

girl—dū

give—dī

go to sleep—dō tē

Gracie—Gwāty

goodby—bī

grass—dā

gloves—dub

green—dē

go—dō

girl—mū

get—dē

goo' mor (ning)

good—doo

glass—dā

got—dot

goat—dō

gown—dow

Internal g.

wagon—wathu (whispered)

māmo

Final g.

too big—too ī

pig—mī—pī

hog—hō

dog—dō

Final ng.

string—ting

SUMMARY OF REACTIONS TO CONSONANT SOUNDS:

Initial out of	error	Internal out of	error	Final out of	error
M.— 4- 4		2- 5	(omission)	2- 4	(omitted)
B.—28-28		1- 7	" & d substit.	None	
P.—32-32		2- 7	" & t substit.	2- 5	(omission)
W.— 3- 8	(omis., m & t)	2- 6	"	2- 2	
T.—12-12		5-34	" or made initial	4-15	"
D.—10-10		0- 5	"	0- 6	"
N.— 4- 4		6-18	" & m	6-22	" & m
L.— 5- 6	"	0-25	" d & t	0-12	"
S.— 0- 8	t	0- 5	" & t	0- 7	"
R.— 0- 6	w, m, d	3-25	"	2-12	"
F.— 0- 6	t, p	0- 1	"	0- 4	"
V.—None		0- 3	" & b	0- 2	"
Th.— 0- 3	" & t	0- 1	t	0- 1	"
Y.— 0- 3	m	None		0- 1	"
J.— 0- 2	d	None		None	
Ch.— 0- 3	t, n	0- 2	t	None	
K.— 1- 7	t	1-15	" & t	0-20	"
G.— 2-19	d	0- 2	"	0- 4	"
Labials—m, b, p, w,		Initial 67-72	Internal 7- 25	Final 6-11	
Linguals—t, d, n, l, r,		" 31-32	" 14-107	" 12-67	
Gutturals—k, g,		" 3-26	" 1- 17	" 0-24	
Correct—Labials—		" 93%	" 28%	" 55%	
" —Linguals—		" 97%	" 13%	" 18%	
" —Gutturals—		" 11%	" 6%	" 0%	

LABIALS

Initial	m	was given	m	4 times or all
Internal	m	"	0	3
"	m	"	"	2
Final	m	"	0	2
"	m	"	m	2
Initial	b	"	b	25
"	b	"	m	4
"	b	"	d	5
Internal	b	"	0	3
"	b	"	d	1
"	b	"	b	2
Initial	p	"	p	24
"	p	"	m	2
"	p	"	t	3
"	p	"	k	1
Internal	p	"	0	3
"	p	"	t	3
"	p	"	p	2
"	p	"	m	1
Final	p	"	p	2
"	p	"	0	3
Initial	w	"	m	4
"	w	"	t	2
"	w	"	w	3
Internal	w	"	0	2
"	w	"	w	4
Final	w	"	w	2

(progressive assim.)
(regressive assim.)

LINGUALS					
Initial	t	was	given	t	12 times
Internal	t	"	"	0	18 "
"	t	"	"	t	14 "
"	t	"	"	p	4 "
Final	t	"	"	0	11 "
"	t	"	"	t	7 "
Initial	d	"	"	d	10 "
Internal	d	"	"	0	5 "
Final	d	"	"	0	6 "
Initial	n	"	"	n	4 "
Internal	n	"	"	0	9 "
"	n	"	"	m	10 "
"	n	"	"	n	9 "
Final	n	"	"	0	12 "
"	n	"	"	m	2 "
"	n	"	"	n	9 "
Initial	l	"	"	m	1 "
"	l	"	"	0	1 "
"	l	"	"	l	4 "
Internal	l	"	"	0	22 "
"	l	"	"	m	5 "
"	l	"	"	d	1 "
"	l	"	"	t	1 "
Final	l	"	"	0	18 "
Initial	r	"	"	0	2 "
"	r	"	"	m	1 "
"	r	"	"	d	1 "
"	r	"	"	w	3 "
Internal	r	"	"	0	18 "
"	r	"	"	r	7 "
Final	r	"	"	0	12 "
"	r	"	"	r	2 "

(3, progressive assim.)

GUTTURALS					
Initial	k	was	given	mt	1 times
"	k	"	"	t	5 "
"	k	"	"	k	1 "
Internal	k	"	"	0	5 "
"	k	"	"	p	1 "
"	k	"	"	th	1 "
"	k	"	"	g	1 "
"	k	"	"	t	11 "
Final	k	"	"	0	19 "
"	k	"	"	t	1 "
Initial	g	"	"	m	1 "
"	g	"	"	d	15 "
"	g	"	"	0	1 "
Internal	g	"	"	th	1 "
"	g	"	"	m	1 "
Final	g	"	"	0	4 "
"	ng	"	"	ng	1 "

(progressive assim.)

Consonants correctly sounded:

M.

mũnty, monkey
 tũm, come
 dũm, drum
 dũmp, jump

mĩ, milk
 môm, morning
 mē

B.

bĩ, big
bẽ, bend
bã, bear, back, black
bãm, bank
bãmtet, blanket
bõ, box, block, bounce
bũ, button

book
bũ, blue, broom
bẽ, beads
bĩ, good-by
bõ, broken, board, blow
umbũppa, unbutton

P.

pĩ, pig, pick
pĩdda, pillow
pĩtta, picture
pẽmpa, pencil
pẽppytote, petticoat
pãn

apon, apron
Põ, Polly
pũp, put
pãpũ, paper
teep, sheep
dump, jump

D.

dẽ, desk, dress
dõ, dog, doll, drawer

dõmthẽ, donkey
dõ, don't

T.

tĩ, stick
tẽ, teddy
tã, tag, stairs, stand
tõ ĩ, stocking
tẽ, tree, sleep
tẽ põ, teapot
tã, table, tail, take

too
toot, foot
dot, got
bãmtet, blanket
tate, plate
pĩtta, picture

N.

nẽ, neck
nõ, now
nã, nail
nĩdow, nightgown

bõpten, broken
tiẽn, chicken
wũn, run

W.

wa, walk
power, flower

wã, wake

K.

amker, handkerchief

G.

goo' mor', good morning

Gwaty, Gracie

Ng.

ting, string

Mp.

dump, jump

Final consonants enunciated.

t. (8, right; 3, wrong.)

domtet }
bãmtet } blanket
bãntet }
dot, got
pẽppitote, petticoat
date, rake

toot, foot
but it, button it
tate, plate
hamtĩt, handkerchief
ort, horse

p. (2, right.)

teep, sheep

dump, jump

b. (1, wrong.)

dub, gloves

n. (7, right.)

bōpten, broken

bí one, big one

tiên, chicken

on

wun, run

tí pan, frying pan

apon, apron

m. (2, right; 3, wrong.)

bām, bank

nīnōm, nightgown

tām, can

tūm, come

dūm, drum

ng. (1, right.)

ting, string

Vowel sounds enunciated. (All fairly correct.)

ī, 59 times	ā, 25 times	ä, 16 times	ow, 9 times
ū, 44 "	ē, 22 "	oo, 16 "	or, 6 "
ē, 39 "	ō, 18 "	ô, 13 "	a(ô), 7 "
ä, 28 "	a(ū), 17 "	o(ū), 12 "	
ö, 24 "	ī, 14 "		

MISPLACED CONSONANT SOUNDS:

t for sh	in shovel, tubba, tubda; sheep, teep
" " f	" foot, toot; for, tor; handkerchief, hamtit
" " s	" pencil, penti; saucer, tauter; horse, hort
" " sl	" sleep, teep
" " pl	" play, tay; plate, tate
" " p	" piano, tana; put, pup; apron, aton; wrapper, atter
" " k	" can, tan; blanket, bantet; Christmas, tita; donkey, domty; monkey, mumty; kitty, ti; carpet, tartē; petticoat, peppi-tote; chicken, titten
" " l	" pillow, pitta
" " str	" string, ting
" " wh	" whistle, titta
" " ch	" chicken, tien; child, ti; handkerchief, amtī
" " fr	" frying pan, ti pan
" " p	" wrapper, atter
" " st	" stand, ta
" " z	" Lizzie, Letti
d " bl	" blanket, donge; blow, do
" " b	" ribbon, idda
" " j	" jump, dump
" " g	" go, do; got, dot
" " r	" rake, date
" " dr	" drum, dum
m " t	" teapot, memo
" " n	" blanket, bamtet; donkey, domty; unbutton, umbuppa; can, cam; bank, bam; nightgown, ninom
" " wh	" whistle, mitti
" " w	" window, mimo
" " d	" window, mimo
th " s	" pencil, penthul
w " r	" run, wun
b " v	" shovel, tubba

So that t has done duty for sh, f, s, sl, pl, p, k, l, str, wh, ch, fr, p, st, z; d for bl, b, j, g, r, dr; m for t, n, wh, w, d; th for s; w for r; and b for v.

Classification according to phonetic lapses:

Progressive assimilation:—pěmpŭ, pencil; Mĭma, window, Elisabeth; Mŭmĭ, Susie; Mommy, Polly; māmŭ, wagon; nā dā dĩ oo tā (the vowels of first two syllables) now going give you tag; with substitution—tĭtten, chicken; pĭpĭ bā, put it back; tĭppĭ, mittĭ, whistle; mēmō, teapot; nĭnōm, nightgown; with omission—tārtě, carpet; tām tā tāna, I can play piano (c as t set off the action).

Regressive assimilation:—in first impulse, with metathesis in second and third, kĕkĕtoat, petticoat.

Metathesis:—lĭda, lion; nōmdĭ, nightgown; with omission—Ātĕ, Ethel.

Omission:—tā ŭ, table; too ĭ, too big; tē, tree; boo, blue; tĭ, stick; pāpŭ, paper; nā, nail; bō, boy; bō, box; oŭ oo, you'll look; mā, make; pĭ ā ŭ, pick that up; Ēa, Yetta; ô, horse; dō, doll; bū, butterfly; tā ŭ, tā dō, stand up; bū, button; pĭta, picture; goo' mor', good morning; pu, put; dē, dress, desk; apon, apron; gā, gas; tā, table, tail; bō, blocks; Pō ĭ, Polly; boo, book; wā ŭ tā, walk up stairs; dō, door; teapō, teapot; gō, goat; daw, drawer; wā ŭ, wake up; mĭ, milk; hē mē, help me; bĭ, bite; tō ĭ, stockings; bū dē, button dress; hō, hog; bō, broken; nē, neck; hō, house; hē ō dō, help me to open the door; bĭ, goodby; tē bā, teddy bear.

Substitution:—bēthe, beads; Dordie, Georgie; daw, saw; tum, come; Gwaty, Gracie; power, flower; mēma, yellow; tow, cow; dōmthē, donkey; Tudy, Susie, dō, go; teep, sheep; mā ō, make house; pĭ ā ŭ, pick that up; aton, apron; toot, foot; too, shoe; dump, jump; tam, can; tā, play; dō tē, go to sleep; ting, string; dāte, rake; wun, run; pĭtta, picture; hamtit, handkerchief; tauter, saucer; dot, got.

Omission and substitution:—pĕthē, pencil; thwee, sweep; wāthŭ, wagon; wē, red; ort, horse; nā dā dĩ oo tā, now going give you tag; a wĭ, Lilly, all right, Lizzie; Āta, Ethel; dā, grass, glass; dē, green; tĭ pan, frying pan; mnā, chair; tĭ, kitty; mŭ, girl; dŭ, girl; mē, yes; ātter, wrapper; too, shoes; Tān Tā, Santa Claus; thā, chair; tā, chair; pĕntĭ, pencil; aton, apron; tē, sleep; nĭdow, nightgown; donkē, domtet, bantet, blanket; amker, handkerchief; dub, gloves; tĭ tē, Christmas tree; tŭ, tŭbda, shovel; ĭdda, ribbon; dō, goat; tō, for; mā, rake; tĭ, chicken; bōpten, broken; ěmbē, elephant; dō tē, go to sleep; wĭttē, whistle.

F. L. Wells in a monograph on "Linguistic Lapses" calls attention to the fact that a lapse is the involuntary modification

of any linguistic sensation or movement; that the process itself is always central, no matter what its source of excitation; that theoretically such modifications might take an infinity of forms, but in practice nearly all may be referred to the types of assimilation, dissimilation, omission, substitution and metathesis, the second named being practically confined to the sensory processes; that lapses are not only involuntary, they are for the most part also unconscious, *i. e.*, there is no awareness of them until their primary memory has been lost. For this reason the subjective content of the mutilated complex does not differ, in motor lapses, from the content of the unmutilated one, for the simple reason that the higher centres are not aware of the mutilation, and thus the lack of lapse appreciation is hardly of essential significance.

He thinks the most probable explanation of metathesis lies in the physical mechanism of co-ordination. The easier movement is anticipated simply because it travels over the synapses faster. One instance in the case under inspection disagrees with the view that the easier movement is the one anticipated. In *kě kě toat* (petticoat) metathesis occurs in the second and third syllables; *k* is among the most difficult letters, and she has succeeded in sounding it in only two other words, but it is anticipated in the first syllable of this word and substituted for *p*. This really brings the influence of the *k* from the third to the first syllable.

The substitution is a product of the same general processes as the assimilation, the distinction being merely that in the assimilation the effectively associated element is taken from an immediate body of linguistic elements, and is so taken principally, if not solely, on account of its spatial or temporal contiguity with the assimilated element or complex. In substitution the lapse is less directly dependent upon physical conditions, and more upon the higher principles of association, as similarity, contrast, etc. In the expression *tā tāna, Pō* (play piano, Polly) is found almost the only failure of the initial *p*; and that is due to association with the expression *tām tā tāna* (I can play piano) which preceded it immediately in the same lesson.

A. M. Bell in his "Science of Speech" designates articulative defects as the substitution of one organ for another, or of one mode of organic action for another, and names these as the most common:

1. Guttural instead of lingual vibration of *r*.
2. Divided, instead of centre, emission for hissing sounds, as *th* for *s*.

3. Point, instead of back, shut positions, as t for k.
4. Non-vocal, instead of vocal, formations, or vice versa.
5. Nasal instead of oral emission.
6. Obstructed nasality, etc.

He further gives as a principle of organic action that a consonant consists of two parts, a position and an action; the position, one of conjunction—the action, one of separation; and both are necessary to perfect articulation. This principle is particularly applicable in this case to the passive formation of m, b and p. (2), (3) and (4) are the prevalent defects.

Conradi, in a dissertation on the "Psychology and Pathology of Speech Development of the Child," has brought together numerous observations and the interpretations that different workers in the field have made of the language development of the child both normal and abnormal.

The vocal language of the child probably begins with the first cry after birth. Crying forcibly expels the air from the lungs, produces deep inhalations as they could not be produced in any other way and thus develops the whole respiratory system. It is even a rudimentary language itself since a skillful nurse can interpret the needs and moods of the child by its cry. It has, moreover, been graphically shown that the muscle innervation of the respiratory system, developed during the early cry period, is the same as that used in ordinary speech.

During the early babble period the child plays with its vocal and articulatory organs and makes new sounds for the pleasure they give him; the activity of the speech-producing organs is automatic, just as is that of the legs and arms. A great number of sounds are produced which are not found in our language, some of them so complicated that we cannot produce them; among these are the so-called vomitive sounds and the cluck-like sounds, found among some primitive peoples but not in our language. Dr. Hall says, "It would be difficult even with Bell's phonic notation, or with a phonograph, to classify the first vocalizations of an infant." Preyer thinks that all sounds necessary for future language are now produced, whereas Ament thinks the number of possible sounds is infinite, and that it is only with difficulty that the child sinks from this wealth of sounds to the meager level of his mother tongue. Gutzmann is still more conservative than Preyer: he says the sounds developed during this period are labials and dentals, *i. e.*, the sounds produced in the first and second articulatory systems. Wundt says the tendency to utter such a great variety of sounds has been inherited physiologically through a long series of speech-using ancestors, that soon after

birth association tracts begin to develop which make articulation possible, and adds that with sufficient data collected from the early la-la period it might be proved that, due to hereditary causes, the early sounds of children vary somewhat with nationality. As a suggestive illustration he quotes sounds uttered from the twelfth to the fourteenth week as recorded by Preyer and by K. C. Moore. *German*: am, ma, ör, rö, ar, ra, hu, na, om, in, ab, la, ho, mö, nä, na, an, mg, mb, gr, ha, bu, me, nt. *English*: eng, gr-r-r, bo-wo, ang, diddle, ing, bow-wow, th, udn, pop-pä-pä-bä, udu, bob-bä, um-go, good, momä.

The order of development of the different sounds in the child as recorded by different observers shows some general agreement though there are variations in detail. According to Schultze's principle of least effort the vowels ought to develop in the following order, ä, a, u, o, e, i, ö, ü; and the consonants thus: (1) p, b, m, f, w, d, n; (2) l, s; (3) ch, j; (4) sch; (5) r; (6) ng, k, g. Preyer does not agree with this; he says he observed the vowels to appear in this order: u, ä, a, ö, o, ai, ao, i, e, ü, oeu (French), au, oi. He thinks that the sounds do not develop in the same order in all individuals and that the order of development is certainly not due to the influence of heredity. The consonants he observed in the following order: m, g, r, t, h, b, l, n, k, j, d, p, w, s, z, f, q, x. He suggests that some of these sounds were undoubtedly uttered sooner but that he failed to observe them.

Sigismund gives the following order: (1) vowels; a, ä, u, ei, o, i. He says ö, ü, and äu are not spoken purely by children. (2) Consonants; b, m, n, d, s, g, w; f, ch, k are learned with some difficulty, and l, sch, and r, are the last to be spoken correctly. Löbisch gives the following order: m, b, p, am, ma, ba, pa (but not ab), d, t, l, n, f, s, ch, g, k. Vierordt gives this order during the third and fourth months: mam, ämma, fu, pfu, ess, äng, angka, acha, erra, hab. Preyer did not hear pf and ss so early and doubts whether f can be pronounced distinctly owing to lack of teeth. Gutzmann has heard pf so early but the f was not pronounced as an adult would pronounce it. Tracy examined seven hundred cases of mispronunciation and on the basis of this investigation arranges the following order of difficulty: b, p, m, h, a, w, o, k, d, q, n, t, f, e, j, s, ch, g, y, sh, v, th, l, r. He found what per cent the number of mispronunciations of a letter was of the total number of times the letter was found in the child's vocabulary.

Oltuszewski has observed the order of the consonants as follows: b, m, p, t, n, d, l, c, dz, ch, k, j, s, z, f, w, g, z, r, t, sz, z, cz. That f, w, l, appear much earlier with Preyer's child, he thinks, may be because there are more words in

German that begin with those letters, or that they appeared simply temporarily as transitory noises. His observations, he says, contradict Preyer's statement that all sounds used in later language develop so early, but that they confirm the physiological principle of Thausing's natural system of classification. Thausing, namely, holds that beginning with *a* all simple sounds are formed by deadening the sound of *a* seven stages in three directions. His system is arranged in the form of an inverted cone as follows: *m, b, p, f, w, u, o, A, e, i, j, ch, k, g, y*; then from *A* he drops this series at right angles, *l, r, s, ss, t, d, n*. The three letters equally distant from *A* have similar relations to *A*. Oltuszewski says, if we begin with *a* and narrow the vocal cavity forward we get *o, u*, and all the consonants of Thausing's labial and dental series, but if we narrow the vocal cavity backward we get *i, e*, and the consonants *k, g, ch, j*. He then constructs a system similar to Thausing's but leans the dental series obliquely toward the labial series and adds to the former the Polish *z*-compounds not found in German or English.

From the above we see that some letters generally appear early and others late; what is the cause of this? Schultze explains the order of development by the following law: The sounds appear in a series which proceeds gradually from those which are made with the least to those which require the greatest physiological effort. He adds, however, in a foot note that this series need not necessarily be the same with all peoples and all races, nor even with all families, owing to the influence of heredity. This he offers as an explanation for the fact that Preyer's observations do not verify this law.

Gutzmann supports this law in the main but holds that there are manifold individual variations. He agrees to Preyer's objection that the degree of physiological effort cannot be measured, but says that the study of stammering children leads one to believe in the law. He points out that the muscle action in the three articulatory systems, lips, tongue and teeth, and palate increases in difficulty in the order given. And, moreover, that those sounds which are the easiest for the child are most often repeated and are thus fixed in the motor speech memory, therefore they are more readily used when learning to speak. These difficulties, he says, cannot be measured in a scientific way, but they can be noted in a general way by observing the muscle action. In speaking of the difficulty in the third articulatory system, he says: Evidently the muscle sense is less developed in the rear of the mouth than in the fore part. People can readily move their lips and the tip of their tongue into any desired position, but not so with

the body of the tongue; and their muscle sense fails completely when they try to move their soft palate without uttering a vocal. Franke thinks the law is valid in the main during the period of voluntary imitation and decidedly valid in the combination of sounds.

Dr. Hall says: The child's linguistic development does not proceed from the easy to the hard, according to any adult standard, but the hard, and often the very hard, may precede the very easy. Rzesnitzek says Schultze's law cannot be accepted as a fact since by the law of *senso-motor* association difficult sounds may come early. Some sounds which the child makes playfully give it pleasure and it repeats them. When thus the attention is drawn toward the sounds the intensity of the sensation is increased, and this in turn sets free an increased amount of energy of the motor centers. If Schultze's theory were true, he says, it ought to hold in the instruction of deaf mutes, which it does not since some produce difficult sounds early, and moreover, all pupils would have to make the same progress, which they do not. However, he admits that labials and linguals are physiologically easier and adduces as proof that many primitive people have hardly any other sounds. Ament also thinks that a categorical statement like that of Schultze is not tenable. He says: The orderly succession of the sounds is for the time being a secret which can only be solved by exact phonetic investigations in the future. He supports the following principle: The labials and dentals occur oftener than the gutturals among the first sounds of the child because they have a physiological preference. Ma, ba, pa, are first because the organs that produce them are active in feeding. Moreover those animals that swallow their food without chewing and thus have a vigorous palate often cry with gutturals. Among birds, for instance, the cock crows "kikeriki," the hen says "gagag," the cuckoo "kuku," the raven "krahkrah." Those animals, on the other hand, that seize their food and chew it before swallowing often use labials in forming their cries. Among mammals, for instance, the dog says "wau wau," the sheep "bäh, mah," the cow "muh," the cat "miau," etc.

Schultze, Preyer, Sigismund, Gutzmann and others ascribe the early appearance of labials and dentals partly to the preparation the child gets through the sucking movements while nursing. Preyer furthermore says: The position of the human foetus is such that long before birth the hands easily may touch the lips, and that the swallowing of the nourishment causes it to flow over the edges of the lips and the tongue thus causing repeated excitement of the nerve endings of those

organs. He, however, holds that the order of succession in which the sounds of speech are produced is different with different individuals, and consequently is not determined by the principle of least effort. It is dependent upon several factors—brain, teeth, size of the tongue, acuteness of hearing, motility, etc. Only in the later intentional sound formations and attempts at speaking does that principle come under consideration. Oltuszewski agrees with the above named authors as to the importance of the exercise the lips and the tongue get in sucking, and adds that the gutturals and labio-dentals appear so late on account of the complicated mechanism involved in producing them. Sully also thinks that Schultze goes too far with his principle of least effort. He says the very variability of this order in the case of different children, shows that there is no such simple correspondence as this.

It has been noticed by many observers that some sounds are made early and later forgotten. From the order in which the letters were learned we see that some sounds uniformly appear later than others. The letter *s* is used late and has a tendency to remain imperfect often for years. Deaf mutes especially have trouble with it; though they learn it early they must be corrected again and again, whereas *r*, a very difficult letter to learn, is not forgotten after the deaf mute child has once succeeded in pronouncing it. These facts Rzesnitzek takes as a basis for the following rule: "The stronger the motor sensations necessary to produce a sound the less danger there is that the sound will be forgotten after it is once learned." This principle, he thinks, explains Treitel's facts which he found in the Kindergartens of Berlin where out of 180 children examined, 3 to 6 years of age, 34.5% lisped.

It is not feasible to draw any conclusions as to the order of development of vowel sounds in the case in question, on account of the protracted babbling period before she was subjected to observation. The order of the consonants may safely be accepted as *m*, *b*, *p*, *t*, *d*, *n*, *l*, *k*, *g*; the first five being very well established, the remaining four varying in degree of certainty in the order named. Beginning with *m* as the only recognizable consonant sound (and that caused by the closing of the mouth and incidentally bringing the lips together), the other sounds have gradually emerged and freed themselves of the overshadowing *m* that at first preceded them, or introduced them as it were.

One of the most serious drawbacks to the overcoming of retardation in speech development is the fact that members of the family, and especially children and playmates, learn the language of the defective one and by responding thereto satisfy

the need which language supplies. This in turn prevents conscious effort at improvement (or a consciousness that improvement is necessary or desirable) as the result of lack of attention to details and so of comparison and discrimination. When others repeat or make use of the sounds and gestures of the defective language, they tend to fix it as a medium of communication.

Wells calls attention to the fact that the vast majority of assimilations and substitutions are recorded as lapses merely because of the transitory character of their exciting cause; when this is constantly present not only in the individual but in the entire linguistic community, its frequent occurrence gives the laws of imitation full play, the more so as it is probably an economizing process, tending to the elimination of inessential differences. The lapse then establishes itself in language or disappears according to the frequency of its occurrence and economic value; in a word, its naturalness.

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