

## A STUDY IN PHONETIC SYMBOLISM

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The symbolism of language is, or may be, twofold. By far the greater portion of its recognized content and structure is symbolic in a purely referential sense; in other words, the meaningful combinations of vowels and consonants (words, significant parts of words, and word groupings) derive their functional significance from the arbitrary associations between them and their meanings established by various societies in the course of an uncontrollably long period of historical development. That these associations are essentially arbitrary or conventional may be seen at once by considering such a proportion as

phonetic entity 'boy': idea (or reference) 'boy'  
= phonetic entity 'man': idea (or reference)  
'man.'

In passing from the notion of 'boy' to that of 'man' we experience a definite feeling of relationship between the two notions, that of increase in size and age. But the purely phonetic relationship of 'boy': 'man' takes no account of this. So far as the referential symbolism of language is concerned, the words 'boy' and 'man' are discrete, incomparable phonetic entities, the sound-group b-o-y having no more to do with the sound-group m-a-n, in a possible scale of evaluated phonetic variants, than any randomly selected pair of sound-groups, say 'run' and 'bad,' have to do with each other.

This completely dissociated type of symbolism is of course familiar; it is of the very essence of linguistic form. But

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there are other types of linguistic expression that suggest a more fundamental, a psychologically primary, sort of symbolism.<sup>2</sup> As examples may be given the interrogative tone in such a spoken sentence as "You say he's dead?" in comparison with the simple declarative tone of the corresponding "You say he's dead"; further, the emphatically diminutive *ee* of *teeny* as contrasted with the normal *i* of *tiny*. In both of these examples the phonetic difference is undoubtedly felt as somehow directly expressive of the difference of meaning in a sense in which the contrast between say 'boy' and 'man' is not. We may call this type of symbolism 'expressive' as contrasted with the merely 'referential' symbolism which was first spoken of. It goes without saying that in actual speech referential and expressive symbolisms are pooled in a single expressive stream, the socialization of the tendency to expressive symbolism being far less extreme, in the great majority of languages, than of the tendency to fix references as such.

We may legitimately ask if there are, in the speech of a considerable percentage of normal individuals, certain preferential tendencies to expressive symbolism not only in the field of speech dynamics (stress, pitch, and varying quantities), but also in the field of phonetic material as ordinarily understood. Can it be shown, in other words, that symbolisms tend to work themselves out in vocalic and consonantal contrasts and scales in spite of the arbitrary allocations of these same vowels and consonants in the strictly socialized field of reference? The present paper is a preliminary report of certain aspects of a study, still in progress, intended to probe into any such latent symbolisms as may be thought to exist. The field of inquiry is vast and difficult to chart and I cannot hope to have guarded against all the possible fallacies of interpretation. For the present I have limited myself to the meaning contrast 'large' : 'small' as offering the most likely chance of arriving at relatively tangible results.

The main object of the study is to ascertain if there

<sup>2</sup> For the two symbolic layers in speech, as in all expression, see E. Sapir, *Language as a form of human behavior*, *Engl. J.*, 1927, 16, 421-433.

tends to be a feeling of the symbolic magnitude value of certain differences in vowels and consonants, regardless of the particular associations due to the presence of these vowels and consonants in meaningful words in the language of the speaker. The results so far obtained seem to go far in demonstrating the reality of such feelings, whatever may be their cause. It has also become very clear that individuals differ a good deal in the matter of sensitiveness to the symbolic suggestiveness of special sound contrasts.

A number of distinct schedules have been devised and applied in the research. In the early stages of the work the various types of sound difference were studied independently. For instance, the contrast between the vowel *a* and the vowel *i* (the phonetic or continental values are intended) was illustrated in every one of sixty pairs of stimulus words, the subject being requested to indicate in each case which of the two in themselves meaningless words meant the larger and which the smaller variety of an arbitrarily selected meaning. For example, the meaningless words *mal* and *mil* were pronounced in that order and given the arbitrary meaning 'table.' The subject decided whether *mal* seemed to symbolize a large or a small table as contrasted with the word *mil*.

In the first experiments schedules of sixty stimulus word-pairs were used, each of which was divided into two sections. The first thirty word-pairs involved only such sounds as the subject, an English-speaking person, would be familiar with, the second set of thirty word-pairs, while still illustrating the same phonetic contrast as the first thirty, say that of *a* to *i*, also involved sounds that the subject was not familiar with. Each of the two sets of thirty was further subdivided into functional groups: nouns, verbs with reference to large or small subject of verb, adjectives with reference to large or small things, verbs with reference to large or small object of verb, and verbs with reference to intense or normal degree of activity. It is important to note that the words were so selected as to avoid associations with meaningful words and it was the special purpose of the second set of thirty word-pairs to remove the subject still further from the intercurrent influence of meaningful linguistic associations.

If the results obtained from a considerable number of individuals can be relied upon as symptomatic, the influence of accidental, meaningful linguistic associations is less than might have been supposed, for the percentage of responses in favor of one of the two vowels as symbolizing the large object tended to be little less, if at all, in the second set of word-pairs than in the first. For example, Subj. IK found that of the first thirty word-pairs illustrating a contrast between the vowels *a* and *i* twenty-two examples of *a* "naturally" carried with them the connotation "large," five examples

of *i* carried this connotation, and three word-pairs were responded to indifferently. The effective score in favor of *a* as the vowel inherently symbolizing a large rather than a small reference was 22/27 or 81 per cent. In the second set of thirty word-pairs illustrating the same vocalic contrast, 21 of the words involving the vowel *a* were said to connote the large reference, 5 with the vowel *i* connoted the small reference, and 4 were indifferent. Here the effective score in favor of the symbolic value of the vowel *a* as large by contrast with *i* is 21/26 or, again, 81 per cent. In the case of the vowel contrast *a* to *ε* (with the short value of the French *ε*, as in *été*) IK's effective score in favor of the *a* vowel as connoting the larger reference was 24/29 or 83 per cent for the first 30 word-pairs, 73 per cent for the second 30 word-pairs.

The essential points that seemed to appear from these first experiments with individuals were; (1) that vocalic and consonantal contrasts tended with many, indeed with most, individuals to have a definite symbolic feeling-significance that seemed to have little relation to the associative values of actual words, (2) that it made surprisingly little difference whether the phonetic contrast was contained in a phonetically "possible" or a phonetically "impossible" context and (3) that the certainty of the symbolic distinction tended to vary with the nature of the phonetic contrast. The last point, which is important, will be discussed later on in this report.

These earlier experiments with individuals, though revealing, were felt as the work proceeded to be deficient in one important respect, namely, that the simple nature of the vocalic or consonantal contrast in a set of word-pairs might be expected to lead to a too ready systematization of responses on the part of the subject. In other words, the average subject could not help noticing after responding to a few stimuli that a certain consistency in the responses would naturally be expected, and that if the vowel *a*, for example, as contrasted with *ε* or *i*, is felt satisfactorily to symbolize the larger of two objects, all other examples of word-pairs illustrating the same vocalic contrast should be dealt with in the same manner. The primary purpose of the experiment, however, was to elicit spontaneous feelings of symbolic contrast, unrevised by any judgment as to consistency of response. For this reason a further and, it is believed, much more efficient experiment was devised consisting of 100 word-pairs involving every type of phonetic contrast that was investigated. These hundred word-pairs were not arranged

in any logical order, nor was the order of the contrasted phonetic elements in any particular entry necessarily the same as in another entry involving the same contrast. In the table that was finally adopted the first word-pair illustrated the contrast between *a* and *i*, the second the contrast between *e* and *a*, the third the contrast between *z* and *s*, and so on through the list. The contrast between *a* and *i* was illustrated not only in Entry 1 but also in Entries 41, 81, and 87. In this way, it was hoped, systematization on the part of the subject was necessarily hindered, if not entirely blocked, and the responses actually obtained may be looked upon as normally spontaneous feeling judgments following in the wake of an initial suggestion as to preferred class of symbolic response (*i.e.* variations in magnitude).

For this second experiment 500 subjects were employed, most of them students of the University of Chicago High School. The subjects were eventually analyzed into the following groups; 6 cases of 11-year-old children, 30 of 12 years, 86 of 13 years, 94 of 14 years, 124 of 15 years, 81 of 16 years, 33 of 17 years, 10 of 18 years, 21 University of Chicago students, 8 adults who were not students and 7 Chinese. The subjects were provided with forms in which there were blank spaces for each of the entries, and they were carefully instructed to check off the first of the two stimulus words announced by the investigator as to whether it symbolized the larger or the smaller reference. If the response was indifferent, no check was to be entered in either the large or the small column. Very little difficulty was experienced in explaining the conditions of the experiment, which seemed to be enjoyed by the great majority of the subjects as a rather interesting game. It is believed that the results obtained are as reliable as material of this kind can be, every precaution having been taken to arrange conditions favoring simple and unambiguous responses and only the investigator himself pronouncing the stimulus words, in order that all confusion due to slight variations of pronunciation might be avoided.

The phonetic contrasts may be classified on phonetic and acoustic grounds into five main groups. There are also two minor groups which are of lesser interest. In the first group the contrasting vowels belong to the series *a*, *ä*, *ε*, *e*, *i*. The pronunciation of these vowels, as of all other vowels, was *quantitatively uniform in a given pair* in order that the independent symbolic suggestiveness of quantity differences as such be ruled out of consideration where quality alone was being studied. The phonetic values of these vowels were respectively those of *a* of German *Mann* (*a*), *a* of English *hat* (*ä*), *ε* of English *met* (*ε*), *e* of French *été* (*e*), *i* of French

*fini* (*i*). It will be observed that the phonetic contrast is gradually lessened within the scale as one moves from *a* to *i*. Thus, *a* to *i* affords the greatest objective contrast, *ā* to *i* or *a* to *e* a lesser contrast, *ε* to *i* or *a* to *ε* a still lesser one, and *a* to *ā* or *ā* to *ε* or *ε* to *e* or *e* to *i* a minimal contrast. In other words, on purely objective phonetic grounds, one might imagine that the responses would tend to be further removed from a purely random or 50-50 distribution the greater the contrast between the vowels. It was therefore of great interest to determine not only whether there were preferred symbolisms, but also whether the varying percentages of response bore a fairly close relation to objective differences in the sounds themselves as determined on phonetic and acoustic grounds.

The second group of word-pairs illustrates the contrast between vowels on the scale *a*, *ɔ*, *o*, *u*, *i.e.* a scale with progressive lip-rounding. The third group illustrates contrasts between rounded back vowels (*u*, *o*, *ɔ*) and unrounded front vowels (*i*, *e*, *ε*, *ā*). In the fourth group of word-pairs there was illustrated the contrast between voiced and voiceless consonants, *e.g.* between *z* and *s*, *v* and *f*, *b* and *p*. The fifth group illustrates the contrast between stopped consonants and spirants or fricatives, *e.g.* between *f* and *p*, *x* (*ch* of German *Bach*) and *k*.

It would be quite impossible to report on all the details of the experiment in this place. I shall content myself with giving two selected tables. The first shows the distribution of responses for the word-pairs illustrating the contrast between *a* and *i*, classified according to the groups of subjects (11-18 yrs, university students, adults and Chinese).

TABLE I  
PERCENTAGE OF RESPONSES SHOWING PREFERENCE FOR *a* VS. *i*  
TO SYMBOLIZE 'LARGE'

Entry no.	Obs. Age	6	30	86	94	124	81	33	10	21	8	7
		11	12	13	14	15	16	17	18	Univ.	Adlts.	Chin.
1.....	83.3	86.7	90.6	92.3	83.1	84.0	78.8	80.0	85.0	100.0	100.0	100.0
41.....	100.0	70.0	82.7	78.0	76.4	71.6	69.7	50.0	95.2	100.0	85.7	85.7
81.....	83.3	93.3	74.7	72.2	81.8	80.0	77.4	100.0	70.0	85.7	85.7	85.7
87.....	83.3	83.3	84.1	86.0	91.8	86.1	72.7	80.0	90.0	100.0	42.9	42.9
Ave....	87.5	83.3	83.0	82.1	83.3	80.4	74.6½	77.5	85.0½	96.4	78.6	78.6

It will be observed that the percentage of responses in favor of *a* vs. *i* ranges all the way from about 75 per cent to about 96 per cent. For the largest group of subjects, the 124 fifteen-year-olds, the percentage is as high as 83, while the small number of 11-year-olds reach the figure 87.5. It is obvious that, regardless of infinite differences of an individual nature as to the general symbolic value of this phonetic contrast or as to its specific value in particular cases, English-speaking society does, for some reason or other, feel that of these two vowels, *a*, by and large, is possessed of a greater potential magnitude symbolism than the contrasted vowel *i*. The same feeling seems to be illustrated by the small number of Chinese cases. Furthermore, within the English-speaking community there seems little reason to believe that there is a significant growth in the firmness of the symbolic feeling after the age of 11. The case of the eight adults is not really significant because they consisted of high school teachers of English who answered the forms at the same time as their classes. They would naturally have a more self-conscious attitude toward the problem of sound symbolism than individuals selected at random. In other words, however these symbolisms are fixed, it is probable that they are so fixed at a rather early age and that familiarity with literature is not likely to count as a heavy factor in the situation. These general considerations are borne out by all the other findings, and it is of particular interest to note that the Chinese evidence is nearly always in the same general direction as that of the English-speaking subjects. Further work needs to be done on responses of this kind from younger children and from other groups of foreigners before the age and language factors can be properly evaluated or dismissed as irrelevant.

The second table is an attempt to show the differential symbolic value of the vocalic contrasts in the *a* to *i* series. Four age-groups (13-16), involving 385 subjects, are represented in this table. It was found in comparing the responses to the different vocalic pairs that they tended to arrange themselves roughly into four distinct groups (A, B, C, D).

TABLE II

CONFIGURATED DISTRIBUTION OF "a : i" RESPONSES IN AGES 13-16

	Age 13 (86 cases)	Age 14 (94 cases)	Age 15 (124 cases)	Age 16 (81 cases)
Group A	$a : \epsilon$ (2 steps) 86.0 $\bar{a} : i$ (3 " ) 84.7 $a : i$ (4 " ) 83.0 $\epsilon : i$ (2 " ) 82.0	$a : i$ (4 steps) 82.1 $\bar{a} : i$ (3 " ) 80.3	$a : i$ (4 steps) 83.3 $\bar{a} : i$ (3 " ) 80.0	$\bar{a} : i$ (3 steps) 87.0 $\epsilon : i$ (2 " ) 81.8 $a : i$ (4 " ) 80.4
Group B	$\bar{a} : \epsilon$ (1 step) 76.4 $*a : \epsilon$ (3 steps) 75.3	$\epsilon : i$ (2 steps) 78.2 $a : \epsilon$ (2 " ) 76.9 $\bar{a} : \epsilon$ (1 " ) 74.9 $*a : \epsilon$ (3 " ) 73.1	$\epsilon : i$ (2 steps) 76.8 $a : \epsilon$ (2 " ) 72.8 $\epsilon : i$ (1 " ) 72.7	$a : \epsilon$ (2 steps) 75.7 $\bar{a} : \epsilon$ (1 " ) 74.8
Group C	$\epsilon : i$ (1 step) 67.8 $a : \bar{a}$ (1 " ) 62.5	$\epsilon : i$ (1 step) 67.5 $\epsilon : \epsilon$ (1 " ) 60.3	$\bar{a} : \epsilon$ (1 step) 69.5 $*a : \epsilon$ (3 steps) 68.6	$*a : \epsilon$ (3 steps) 70.7 $\epsilon : i$ (1 " ) 70.2
Group D	$\epsilon : \epsilon$ (1 step) 53.6	$a : \bar{a}$ (1 step) 56.5	$a : \bar{a}$ (1 step) 59.0 $\epsilon : \epsilon$ (1 " ) 58.3	$\epsilon : \epsilon$ (1 step) 60.4 $a : \bar{a}$ (1 " ) 58.7



In the first group, typically illustrated by the contrast between *a* and *i* and *ā* and *i*, the percentage of a response in favor of the vowel nearer *a* of the scale ranged from 80 per cent upward. The second group of responses was found to be somewhat set off from the preceding one by a marked decrease in the percentage of responses favoring the vowel toward *a* of the scale. This group is typically illustrated by the contrast between *a* and *ε*, the percentage in favor of the 'larger' vowel running from about 73 per cent to 78 per cent. The third group, illustrated by the typical contrast *e* to *i*, ranges from about 60 per cent to 70 per cent. The last group, that of minimal psychological contrast in the *a* to *i* set, runs below 60 per cent in favor of the vowel toward *a* of the scale.

The table has been arranged chiefly from the point of view of the internal 'hiatus' between the percentages of response within each age-group. It is noteworthy that the 'configured distribution' of the responses runs fairly parallel in the four age groups both as to the stepwise discriminations which seem to be felt by many of the subjects and as to the actual order of the specific vocalic contrasts when evaluated by means of percentages in favor of the vowel toward *a* of the scale. Naturally, the reality and normal limits of these stepwise discriminations need to be tested by a careful examination of the individual records, supplemented by further experiments.

On the whole, it will be observed that the symbolic discriminations run encouragingly parallel to the objective ones based on phonetic considerations. This may mean that the chances of the responses being to a high degree determined by actual word associations of the language of the subject are slim, the meanings of words not being distributed, so far as known, according to any principle of sound values as such; and, further, that we are really dealing with a measurably independent psychological factor that for want of a better term may be called 'phonetic symbolism.'

One vocalic contrast, however, falls out of the expected picture. This is the *a* to *e* set, which is starred in the table.

Though the *a* vowel is judged prevailingly 'large' as contrasted with *e*, there seems to be present some factor of hesitation which lessens the value of the contrast. If we go by objective distances between vowels, the *a* to *e* contrast, being a '3-step' one, should have fallen into Group A, instead of which it actually either comes last in Group B or falls even as low as Group C. I believe that a very interesting and sufficient reason can be given for this curious fact. The short vowel *e*, as in French *été*, is not native to the English language. Subjects hearing the vowel *e*, when pronounced in the proximity of *a*, which is acoustically far removed from it, would tend not to hear what was actually pronounced, but to project the characteristic long 'e-vowel' familiar to us in such words as *raise* or *lake*. In other words, the qualitative symbolism would tend to receive a revision in the opposite sense because of an intercurrent quantitative symbolism. This example is suggestive as illustrating the importance of the linguistic factor vs. the merely phonetic one, though not in the sense in which the term 'linguistic factor' is ordinarily understood. What skews the picture here is probably not the associative power of particular English words but the *phonetic configuration* of English as such.<sup>3</sup> That even this configuration, however, is of limited importance in interpreting the experiment is shown by the fact that in word-pairs illustrating the contrast *e* to *i*, *ε* to *e*, the acoustic nearness of the two vowels prevents the unconsciously imputed quantitative interference from making itself felt in the symbolic response.

These and many other similar results need interpretation. One's first temptation is to look about for some peculiarity of English speech, some distribution of sounds in actual words, that would make the results we have secured intelligible. A simple associational explanation, however, is not likely to prove tenable. The weighting of the responses is altogether too much in accordance with an absolute phonetic

<sup>3</sup> For the significance in language of 'sound patterns' or 'phonetic configurations' as distinct from sounds as such, see E. Sapir, *Sound patterns in language*, *Language*, 1925, I, 37-51.

scale to make it possible in the long run to avoid at least some use of 'natural' or 'expressive,' as contrasted with socially fixed verbal, symbolism as an explanation. It is difficult to resist the conclusion that in some way a significant proportion of normal people feel that, other things being equal, a word with the vowel *a* is likely to symbolize something larger than a similar word with the vowel *i*, or *e*, or *ε*, or *ä*. To put it roughly, certain vowels and certain consonants 'sound bigger' than others. It would be an important check to amass a large number of randomly distributed meaningful words, to classify into the two groups of 'large' and 'small' those which could be so classified without serious difficulty, and to see if in sets in which equal numbers of phonetically contrasted words are found the meaning classes were or were not correlated with the sound classes and to see further, if they are so correlated, if the distributions are of the same nature as those studied in the experiments.

The reason for this unconscious symbolism, the factor of linguistic interference being set aside for the present, may be acoustic or kinesthetic or a combination of both. It is possible that the inherent 'volume' of certain vowels is greater than that of others and that this factor alone is sufficient to explain the results of the experiment. On the other hand, it should be noted that one may unconsciously feel that the tongue position for one vowel is symbolically 'large' as contrasted with the tongue position for another. In the case of *i* the tongue is high up toward the roof of the mouth and articulates pretty well forward. In other words, the vibrating column of air is passing through a narrow resonance chamber. In the case of *a* the tongue is very considerably lowered in comparison, and also retracted. In other words, the vibrating column of air is now passing through a much wider resonance chamber. This kinesthetic explanation is just as simple as the acoustic one and really means no more than that a spatially extended gesture is symbolic of a larger reference than a spatially restricted gesture. In discussing some of the results with the children themselves, who seemed very much interested in the rationale

of the experiment, the impression was gained that the subjects differed somewhat in the psychological basis of the symbolism, some being apparently swayed entirely by the acoustic factor, others by the acoustic factor only or mainly insofar as it was itself supported by the kinesthetic factor.

The tabulated results, of which we have given a brief sample, have the disadvantage of drowning out significant individual variations. For a preliminary report such a method of presentation is at least suggestive; but it would be important to know to what extent individuals differ significantly in their ability to feel symbolism in sound contrasts. The schedules need to be gone over from the point of view of working out individual indices of 'symbolic sensitiveness' to sounds.

Meanwhile a third experiment, intended to bring out individual idiosyncrasies, was carried out with a number of selected subjects, chiefly adults. The results were interesting.

In this experiment an artificial 'word' was taken as a starting point and assigned an arbitrary meaning by either the investigator or the subject. The subject was asked to hold on to this arbitrary meaning and to try to establish as firm an association as possible between the imaginary word and its given meaning. Some phonetic element in the word, a vowel or a consonant, was then changed and the subject asked to say what difference of meaning seemed naturally to result. The answer was to be spontaneous, unintellectualized. The process was kept on for as long a period as seemed worth while, the saturation point of meaningful and interested responses being reached very soon in some cases, very late in others. In the case of certain individuals more than 50 distinct 'words' were found to build up a constellated system in which the meanings were rather obviously the results of certain intuitively felt symbolic relations between the varied sounds. In the case of other individuals actual word associations tended to creep in, but on the whole there was surprisingly little evidence of this factor. The subjects were found to differ a great deal in their ability to hold on without effort to a constellation once formed and to fit new meanings into it consistently with the symbolisms expressed in previous responses. Some would give identically the same response for a stimulus word that had been—so it was claimed—forgotten as such. In its imaginary, constellated context it evoked a consistent response. Others lost their moorings very rapidly. It is hoped to discuss these interesting variations of sensitivity to sound symbolism, *i.e.* to the potential meaningfulness of relations in sound sets, in the final report of these investigations.

In the present purely preliminary report we can do little more than give a few examples of the responses of two of the subjects, KP and JS. The word *mīla* was arbitrarily defined as 'brook' by the subject KP. Fifty-three responses were obtained from her, starting with this nucleus. The following excerpts from the material will be illuminating.

1. *mīla*: "Brook."
2. *mīla*: "Smaller brook."

3. *māla*: "Larger brook; nearer a river; swifter; no longer thought of as part of the meadow landscape."
4. *māla*: "Larger, not so flowing; large lake like Lake Superior."
5. *mela*: "Little lake for fishing."
6. *mela*: "Smaller brook than *māla*, larger than *mīla*."
7. *māla*: "Larger than brook. Perhaps water running through a ravine; mixed up with the scene."
8. *mīna*: "Water trickling down in a ravine through the rocks scattered on the side."
9. *mēna*: "A little larger but still diminutive. Water travels through a gravel pit."
10. *mēna*: "Deep, narrow, swiftly moving stream rushing through a cut in the rocks."
- . . . . .
14. *mīni*: "Tiny but swift stream spurting out of the rocks like a jet of water."
- . . . . .
18. *mūla*: "Fairly large, rather rambling brook at night."
19. *mōla*: "Ocean at night."
20. *mōla*: "Ocean in the daytime."
21. *māla*: "Bright ocean."
- . . . . .
- 2<sup>1</sup>. *mīla*: (21st response after 2): "A little brook." (The jump back to the earlier response was made at once, without hesitation.)
- . . . . .
- 14<sup>1</sup>. *mīni*: (15th response after 14): "Spurt of water from the rocks, small but swift."
- . . . . .
48. *wīla*: "Can be wet, but water is more like dew on wet grass after rain. Belongs to the same set."
49. *wīla*: "Wet trees after a rain. No feeling of a body of water. General dampness, a 'larger' feeling than *wīla*."

Not all subjects by any means were as responsive as KP; but a surprising number showed a very definite tendency toward the constellating of sound symbolisms. A few responses from JS, based on the same stimulus word, will be interesting for purposes of comparison. The meaning 'brook' was assigned by the investigator and accepted as satisfactory by the subject.

1. *mīla*: "Brook."
2. *māla*: "Seems to sort of broaden out. Brook got much calmer."
3. *mīla*: "Got to chattering again; smaller brook; stones visible, which make the noise."

4. *m̄la*: "Brook gets stagnant with rushes growing in it. The rushes hold the water back so it forms pools. The flow is in the middle; relatively stagnant at the edges."

5. *māla*: "Almost like a lake. An uninteresting lake."

6. *māla*: "More color in it. May have been shallow before; now has greater depth of color, greener shadows; still a lake."

7. *mela*: "Pools taken out at the side from 4. Regains a little of its chattering. Sort of tiny. Less cheerful and chirpy than 3. No great difference as to size between 7 and 3. Merely has a deeper note."

. . . . .

6<sup>1</sup>. *māla* (4th response after 6): "Nice broad pool with all nice colors in it. Shadows and water rich green, as of tree shadow in pool."

. . . . .

1<sup>1</sup>. *mīla* (11th response after 1): "Rather nice chattering brook."

. . . . .

17. *mīle*: "A little splash of water. Tiny stream hit a rock and splattered out in all directions."

18. *mīli*: "Water has gone. A bit of rather dense woods with lots of moisture. Water not evident, but obviously somewhere. You don't see water but you know it is there. Rather soggy to walk around."

. . . . .

6<sup>2</sup>. *māla* (23d response after 6<sup>1</sup>, with much material in between that was definitely removed from suggestions of 6): "Quick sweep of water view over a lake. Not just a pond. A few islands, but they look like dots. The sun is setting. There are nice black shadows this side of the island. The scenery is darkest where I am. I am interested in the distant brightness."

A comparison of these excerpts from the two schedules shows certain interesting resemblances and differences. Both subjects constellate their responses; but KP does so more rigidly, 'geometrically,' as it were. With JS the underlying 'geometry' of response is enriched by imaginative overtones. Incidentally, it will be observed by the attentive reader, a considerable number of the responses here quoted from the third series of experiments check some of the magnitude symbolisms independently obtained from the first and second. This is true of most of the schedules in this set and is significant because neither magnitude variations nor any other class of variations in the responses had been suggested.

It is believed that studies of this type are of value in showing the tendency of symbolisms to constellate in accord-

ance with an unconscious or intuitive logic which is not necessarily based on experience with the stimuli in their normal, functional aspect. In the realm of articulate sounds, to take a specific type of perceptive field, it is believed that the experiments here referred to give cumulative evidence for the belief that unsocialized symbolisms tend to work themselves out rather definitely, and that the influence of specific, functional language factors need not be invoked to explain these symbolisms.

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