

*A UNIVERSAL LANGUAGE AND ITS VEHICLE,—A UNIVERSAL ALPHABET.*

SHALL the world ever see an end of the confusion of tongues? Shall differences of language cease? Or shall, at least, some selected medium of thought be established throughout the world, by which all men may understand each other on occasion, while still preserving their vernaculars for intercourse at home? A consideration of the subject may enable us to answer these questions.

Language in all its varieties is a growth; and every living language is still growing, shedding leaves here, and pushing out new leaflets there, according to its vigor of vitality. The most copious language of to-day was smaller yesterday, and smaller still in every generation through which we can trace its history. We cannot go back to its beginning, for it properly had none: it did not spring from a seed, and so take the definite form of a parent language; but each tongue arose from the crossing and interlocking and blending of shoots from older languages, until they grew together, and became a new stem, from which, in turn, shot other branches, to repeat the process to the end of time.

In the comparative study of languages, and in what we know of human history, we can trace the evidences of this continuous cross-grafting of branch on branch in various directions; and the oldest tongues are those to which some peculiar form of growth can be traced back and back through the greatest number of stages.

If we could follow these oldest languages up to their respective sources, we should find at last a very small vocabulary of simple utterances used to denote an extremely limited number of ideas. But we should find no primitive natural germ of speech from which the first language had sprung into life and shape. The faculty of *expression*, and the instinct of *imitation*, are the only primitive parts of language; but these, at first, were, like primitive creation, 'without form, and void,' until consenting minds agreed on some few associations of sound and sense, and so commenced a form of language.

Any number of different forms may have been thus commenced by isolated families or groups of men. Individual members of different families or groups would occasionally come together, and each would enlarge the other's vocabulary, or modify his methods of expression. Thus one may have previously used only a dual number to indicate plurality;

another, only an indefinite plural: but mutual intercourse would incorporate, in the common language that would be developed, both of these methods of expressing and defining the idea of plurality. Primitive languages may thus have acquired from each other the many words and forms of speech which they possessed in common; while their independent characteristics would increase in the absence of association.

On the same principle, a closer intercourse between modern nations must have an amalgamating effect on their languages, and so tend to produce an ultimate unification of human speech. This closer intercourse is being accomplished in our days by railroads and steamships; and strange ears in all quarters of the world are being familiarized with the languages of visitors and immigrants. The interests of commerce, and the influence of example and of social feeling, lead to a more and more general acquisition of the languages thus introduced; so that, without displacing local forms of speech, other media of wider intercommunication are being gradually extended everywhere. A universal language *is thus growing up*. Whether it will ultimately take the lines of English, French, German, or some other tongue, will depend on the relative fitness of the competing languages for universality. At all events, the fittest will survive, and the survivor will gradually occupy the whole field.

The present diffusion of English over the continents of America and Australia, and among sailors of all nations; its growing acceptance throughout the continental countries of Europe; its establishment in many nuclei in Asia and Africa, and over the vast empire of India, as well as the grammatical simplicity of the language, and its power of incorporation of foreign elements,—all point to English as the probable universal tongue of the future.

The only alternative to such adoption of the fittest among existing languages would be the creation of a new form of scientific speech; but this would require a universal consent among nations, and a combined effort, that may fairly be considered impossible as preliminaries to the institution of such a language. The creation of a new form of speech adapted for universal use is certainly within the power of science and invention to accomplish; but the aid of a pre-existing language, all but universal, would be required for its introduction and establishment. In the far future, such a form of scientific speech may find the world prepared for it, and the medium for its

diffusion in sufficiently general use: but, in the mean time, the confusion of tongues is being gradually reduced by the struggle for supremacy among established languages; and this process will go on until one tongue shall be intelligible, if not predominant, everywhere.

All languages have their physical material in common: they use the same vocal organs, and essentially the same elementary sounds. The voice is susceptible only of a limited number of modifications, and the lips and the tongue only of a limited number of articulative actions; and, from the combinations of these, all the varieties of human utterance result. This elementary simplicity and uniformity are not, however, reflected in the writing of languages. Alphabets are wholly arbitrary; and, although the same letters are used in many alphabets, a different value is, in nearly every case, associated with the individual letters. A universally intelligible method of representing the sounds of speech is a necessary prerequisite for a universal language. Ordinary alphabetic writing is, indeed, as much a hindrance to combined effort for the unification of language as was the confusion of tongues to the building of the tower of Babel. Some method of classifying and representing all known modifications of voice and articulation, if not of discovering all possible modifications, had long been the great desideratum of philologists. Attempts were made to frame a universal alphabet by collating the elements from local alphabets, ancient and modern; but the number of shades of difference discovered among the elementary sounds, and the difficulty of recognizing sounds under varied associations, rendered any complete classification impracticable. So far as the discovery of the entire category of possible sounds was concerned, the object of endeavor was considered to be hopeless; and the attempt to realize it was finally and formally abandoned at a convention of philologists of different countries, held at London in 1854. The declaration of this convention stands on record, that—

“It would be useless and impossible to attempt to find for each possible variety of sound a different graphic sign.”

This ‘impossibility’ has, however, been since accomplished with completeness and simplicity, in the system entitled ‘Visible speech,’ the principles of which will now be explained. In this system no sound is arbitrarily represented, but each letter is *built up* of symbols which denote the organic positions and actions that produce the sound. The let-

ters are thus physiological pictures, which interpret themselves to those who have learned the meaning of the elementary symbols of which they are composed.

The first letter of our ordinary alphabet, which we call *a*, is known in other countries as *ah*; but we discover, in using the letter, that it represents both *a* and *ah*, and a variety of other sounds in our own language, the letter *a* being employed for the six diverse vowels in the words *ale*, *air*, *an*, *agree*, *ah*, and *all*. In Visible speech each of these sounds has a separate letter, and each letter explains to the eye the organic means by which its sound differs from other sounds. For example:

The letter for the vowel in the word *ale* tells the reader to—

*Advance the front of the tongue towards the front of the palate, so as to leave a channel of medium breadth for the passage of the voice.*

The letter for the vowel in *air* tells him to—

*Place the tongue in the same position as before, but to expand the back cavity of the mouth.*

The letter for the vowel in *an* tells him to—

*Broaden to the utmost degree the channel between the front of the tongue and the palate, and at the same time expand the back cavity of the mouth.*

The letter for the sound of *a* in *agree* tells the reader to—

*Place the tongue in a neutral position,—neither advanced nor retracted, raised nor depressed,—and expand the back cavity of the mouth.*

The letter for the sound *ah* tells him to—

*Depress the tongue backward as far as possible, and expand the back cavity as before.*

The letter for the vowel in *all* tells him to—

*Place the tongue in the same position as for *ah*, but compress the back cavity, and round the corners of the lips.*

All these directions are perfectly conveyed at a glance in the different letters; and yet the letters, so far from being complex, consist of forms more simple than the letters of the Roman alphabet. Here, for example, are the symbols,—four in number,—from the combinations of which, not merely the sounds above illustrated, but every vowel in every language, can be expressed to the eye, so as to be at once pronounced with exactitude by the reader.

#### ELEMENTARY SYMBOLS OF VOWELS.

| + • a

These symbols have the following invariable meanings:—

1. The straight line means *voice*.
2. The bar across the line means contraction or rounding of the *lips*.
3. The solid point means *compression* of the back cavity of the mouth.
4. The open hook means *expansion* of the back cavity of the mouth.

The position of the point or hook on the straight line denotes the position of the tongue in reference to the palate. Thus:—

- a. When on the right side, the meaning is, that the tongue is advanced towards the *front* of the palate.
- b. When on the left side, that the tongue is retracted towards the *back* of the mouth.
- c. When on both sides, that the tongue occupies a *middle* position between front and back.
- d. When at the top of the line, that the tongue is *raised* towards the palate.
- e. When at the bottom, that the tongue is *depressed*.
- f. When at both ends, that the tongue occupies a *middle* position between high and low.

Nothing could be simpler than these elements, the meanings of which are remembered by every person after a single explanation; yet from these four elements alone the entire series of normal vowels, thirty-six in number, are built up. Two diacritic signs extend the possible number of shades of vowel-sound, which these four elements can be made to represent, to the largely superfluous total of one hundred and eighty.

The English alphabet contains only five vowel-letters, while our speech makes use of at least sixteen vowel-sounds, without including diphthongs. No wonder, therefore, that the relation between letters and sounds is one of irreconcilable confusion. A purely phonetic alphabet, in addition to the common system of letters, is a necessity for the intelligible writing of English alone; much more is it indispensable for the writing of all languages intelligibly to all readers.

The system of Visible speech is the ready vehicle for a universal language, when that shall be evolved; but it is also immediately serviceable for the conveyance of the diverse utterances of every existing language. No matter what foreign words may be written in this universal character, they will be pronounced by readers in any country with absolute uniformity. The means have been explained by which *vowels* are represented for this purpose. The principles are now to be shown on which *consonants* are written with the same effect.

#### ELEMENTARY SYMBOLS OF CONSONANTS.

Five elementary symbols furnish letters for all the consonant actions of the lips and tongue. These symbols are—

C   ε   |   §   ∷

As with vowels, so with consonants: all the elements of each class have one symbol in common. The vowel-symbol was shown to be a straight line: the consonant-symbol is a *curve*; and the direction in which the curve is turned denotes the part of the mouth by which the consonant is formed. Thus:—

- a. The curve turned to the right denotes the *lips*.
- b. The curve turned to the left denotes the *back* of the tongue.
- c. The curve turned archwise, with its end down, denotes the *top* of the tongue.
- d. The curve turned with its end up denotes the *point* of the tongue.

The five radical symbols have the following meanings in every combination:—

1. The first (C) is the sign of a part of the mouth used to form a *consonant*.
2. The second (ε) is the sign of a part of the mouth which *divides* the breath.
3. The third (|) is drawn across the ends of a curve to denote a consonant that *stops* the breath.

4. The fourth (§) is the sign of emission of breath through the *nose*.

5. The fifth (∷) is added to the ends of a curve to denote simultaneous modification by two parts of the mouth.

These elements, combined into *six* forms of letters, suffice for the whole series of consonant actions of the lips and tongue. The six forms turned in the four directions, as above, yield twenty-four letters; and the uniform addition of one sign for *voice*—a straight line in the centre of the curves—converts the twenty-four into forty-eight letters.

Every part of every letter has thus a meaning legible at a glance; and the most complex letter in the alphabet—combining four of the elementary symbols to exhibit the sound of *m*—is as simple in form as the common Roman letter for the same consonant. Thus:—

Ϣ M, m.

The following are the four symbols combined in this letter:—

1. A curve to the right, which denotes the *lips*.
2. A centre straight line, which denotes *voice*.

3. A waving line, which denotes *nasal* emission.

4. A line closing the curve, which denotes *stoppage* of the breath.

The letter thus says to the reader :—

*Stop the breath by means of the lips, and sound the voice through the nose.*

It must be obvious that such directions, conveyed without words, will be uniformly interpreted by readers of any nationality who have simply learned the meaning of the radical symbols. All the Visible-speech letters are formed in this way, by synthesis of two or more out of a total number of nine elements. Such letters, consequently, make up an alphabet adapted for universality, because independent of explanatory language; also because its symbols are physiological pictures, and because the writing, even of unheard foreign tongues, is self-explanatory to the reader's eye.

Visible speech was first published sixteen years ago (August, 1867); and it has been very generally studied by philologists, and adopted in theoretical works as a necessary exponent of linguistic phonetics. It has also been widely utilized in America for the teaching of articulation to the deaf. But its popular uses for the teaching of vernacular languages to children and illiterates, and of foreign languages in schools and colleges, as well as for the literation of hitherto unwritten Indian and other tongues, have not yet been correspondingly developed. People generally do not take the trouble to investigate the nature of the characters, but suffer themselves to be repelled by fancied difficulty,—as if what is strange must needs be difficult. But the difficulty is only to eyes unacquainted with the principles of the symbolization. When these are known, there is no comparison, in point of simplicity, between Roman letters and Visible-speech letters. To children and illiterates, all letters are equally strange. To one who can already read, the eye is simply prejudiced in favor of established letters. In the present exposition the *letters* of Visible speech have not been made the basis of illustration, but only the rudimentary symbols from which all the letters are derived. This mode of treatment will, it is hoped, leave no room for prejudice to act.

In this stage of the world's history we do not need to concern ourselves about a universal language: that will develop itself in due time. But a universal medium for the communication of languages is a practical necessity, which every day renders of more and higher importance. Without a universal alphabet there never could be a universal lan-

guage; with a universal alphabet the progress of the fittest language towards universality will be enormously accelerated. At present, English seems the most likely to achieve this distinction; but its natural fitness is antagonized by its defective and irregular system of letters. Give English the advantage of an alphabet simple and phonetically perfect, and, whereas it is now the most difficult of all tongues for foreigners to learn, it will become by far the easiest.

In the system of Visible speech a universal alphabet is for the first time attained: the system is of English birth. Let its native language have the benefit of this instrument of diffusion, and the world-wide predominance of the speech of Britain and America will be assured.

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## LETTERS TO THE EDITOR.

### Variations in butterflies.

BETWEEN the 20th of June and the 10th of July, I obtained three hundred and eighty *Vanessa Antiopa* from caterpillars fed on swamp willow. Twenty-five of these were varieties, and the balance were of the usual form. Two of the varieties were *Lintneri*, from which all the blue had disappeared. The third had the primaries *Lintneri*, while the secondaries had the usual blue spots. The fourth had the secondaries *Lintneri*, while the primaries bore the blue spots. In the remaining twenty-one, the whole upper surface of the wings had a mottled appearance, showing that the colors had been disturbed. They retained the blue spots, but the spots were much smaller than usual.

The veins in the twenty-five varieties remained soft for several days; not becoming firm and hard, like the veins in the others, although treated in the same manner. I have also found this softness of the veins in the varieties of *Turnus*, where the red is suffused, and in the rust-colored specimens.

All the *Vanessa Antiopa* which I have seen this season have the yellow of a much deeper shade than I have ever before noticed.

*Colias Philodice* is also remarkable this season in this respect.

S. LOWELL ELLIOT.

New York City, 3d August, 1883.

### Function of the colorless blood-corpuscles.

The interesting abstract of Zawarykin's important investigations into the function of the leucocytes in the absorption of fats from the intestinal canal (*SCIENCE*, ii. 192) calls to mind an investigation by Franz Hofmeister, into the absorption and assimilation of the peptones, which will be of interest in connection with the abstract referred to.

In a series of papers published in 1881, Hofmeister<sup>1</sup> comes to the interesting conclusion, that "absorption of peptones in the intestinal canal is, accordingly, no simple mechanical process of diffusion or filtration, but is rather a function of particular living cells, the colorless blood-corpuscles; and these play, in the nutrition of the organism, a similar rôle to that of the red corpuscles in respiration."

In his discussion he calls attention to the presence

<sup>1</sup> *Zeitschr. phys. chem.*, v. 151,