I therefore decided to return, trusting all the time that at some future camp a better opportunity for making an ascent would present itself, and the summit be reached. Across this ravine was a bare, rocky peak, very clearly defined, and known to us as the south-west of the Twin Cones. The upper part of this was devoid of vegetation, the steep beds of rock only allowing a few grasses and heaths in one or two spots to exist.

The greatest altitude reached by us, after being worked out and all corrections applied, was 10,677 feet above the sea. The altitude of the snow-peak above this would probably be about 6,000 feet, making the mountain, say, 16,600 feet high. This, though, is not the highest peak in the Ruanzori cluster. With the aid of the field-glass, I could make out the form of the mountain-top perfectly. The extreme top of the peak is crowned with an irregular mass of jagged and precipitous rock, and has a distinct crater-like form. I could see, through a gap in the near side, a corresponding rim or edge on the farther, of the same formation and altitude. From this crown of rock, the big peak slopes to the eastward at a slope of about 25°, until shut out from view by an intervening peak; but to the west the slope is much steeper. Of the snow, the greater mass lay on that slope directly nearest us, covering the slope wherever its inclination was not too great. (The largest bed of snow would cover a space measuring about 600 by 300 feet, and of such depth that in only two spots did the black rock crop out above its surface. Smaller patches of snow extended well down into the ravine.) The height from the lowest snow to the summit of the peak would be about 1,200 feet or 1,000 feet. To the east-north-east our horizon was bounded by the spur, which, starting directly behind our main camp, and mounting abruptly, takes a curve in a horizontal plane, and centres on to the snow-peak. Again, that spur which lay south of us also radiated from the two highest peaks. This would seem to be the general form of the mountain; namely, that the large spurs radiate from the snow-peaks as a centre, and spread out to the plains below. This formation on the west side of the mountain would cause the streams to start from a centre, and flow on, gradually separating from each other, until they reach the plains below. There they turn to the west-north-west, or trace their courses along the bottom spurs of the range, and run into the Semliki River, and on to the Albert Nyanza. Of the second snow-peak which we had seen on former occasions, I could see nothing, owing to the Twin Cones intervening. This peak is merely the termination, I should think, of the snowy range, we saw when at Kavalli's, and has a greater elevation, if so, than the peak we endeavored to ascend. Many things go to show that the existence of these peaks is due to volcanic causes. The greatest proof that this is so lies in the numbers of conical peaks clustering round the central mass and on the western side. These minor cones have been formed by the central volcano getting blocked in its crater, owing to the pressure of its gases not being sufficient to throw out the rock and lava from its interior; and consequently the gases, seeking for weak spots, had burst through the earth's crust, and thus been the means of forming these minor cones that now exist. Of animal life on the mountain, we saw almost nothing. That game of some sort exists, is plain from the number of pitfalls we saw on the road-sides, and from the fact of our finding small nooses in the natives' huts, such as those used for taking ground game. We heard the cries of an ape in a ravine, and saw several dull grayish-brown birds like stonechats; but beyond these, nothing.

We have found blueberries and blackberries at an altitude of 10,000 feet and over, and I have been able to hand over to the Pacha some specimens for his collections, the generic names of which he has kindly given me, and which are attached below. That I could not manage to reach the snow, and bring back some as evidence of our work, I regret very much; but to have proceeded onwards to the mountain under the conditions in which we were situated, I felt would be worse than useless, and, though all of us were keen and ready to go on, I gave the order to return. I then read off the large aneroid, and found the hand stood at 19″.900. I set the index-pin directly opposite to the hand, and we started down hill. At 3 P.M. on the 7th I reached you, it having taken four hours and a half of marching from the Twin Cones. The following are the generic names of the plants collected by me. Emin Pacha has kindly furnished them. 1. *Clematis;* 2. *Viola;* 3. *Hibiscus;* 4. *Impatiens;* 5. *Tephrosia;* 6. *Elycina;* 7. *Rubus;* 8. *Begonia;* 9. *Peucedanum;* 10. *Gnaphalium;* 11. *Helichrysum;* 12. *Senecio;* 13. *Sonchus;* 14. *Vaccinium;* 15. *Erica arborea;* 16. *Landolphia;* 17. *Heliotropium;* 18. *Lantana;* 19. *Moschosma;* 20. *Lissochilus;* 21. *Dracœna;* 22. *Luzula;* 23. *Carex;* 24. *Anthesteria;* 25. *Adiantum;* 26. *Pellœa;* 27. *Pteris aquilina;* 28. *Asplenium;* 29. *Aspidium;* 30. *Polypodium;* 31. *Lycopodium;* 32. *Selaginella;* 33. *Marchantia;* 34. *Parmelia;* 35. *Usnea;* 36. Tree fern; 37. One fern; 38. One *Polypodium.* The generic names of the last three are unknown.

PHONETICS.[1]

I CONGRATULATE the Modern Language Association on the establishment of a section which is as indispensable to language as the character of the Prince of Denmark is to the play of Hamlet. Language lives in sound; and the study of modern languages is the study of the spoken tongues.

I was honored by appointment to the presidency of this section, not in virtue of any linguistic attainments, but simply in recognition of my long and minute study of practical phonetics. At this the first meeting of our Phonetic Section, a few words on that subject will not, I trust, be unwelcome.

We constantly hear of the difficulty in pronouncing a foreign language, and especially of the difficulty of our own language to foreigners; but the reason of the difficulty has not been sufficiently recognized, namely, that learners have no initiatory phonetic training. They try to imitate speech in the mass; and they fail, because, after our earliest years, the faculty of imitation is no longer an instinct, as it is in childhood. The child unfailingly adjusts its organs of speech to the production of whatever sound it is accustomed to hear, and no difficulty is experienced in the process. The youth and the man cannot do so, however, because their organs are already set for the pronunciation of one class of sounds, and they cannot readily alter the adjustment to suit the production of other varieties; that is, they cannot form new sounds in the verbal combinations of speech, but (and this is the point I wish to bring out) they can, or they can be readily taught to, produce any sound by itself. This power is a prerequisite for the certain result of facility in combining the new sound with others as fluently as by a speaker "to the manner born;" for what is called combination is in reality merely rapid sequence.

I have known persons who had long been familiar with Welsh speakers, utterly unable to pronounce the sound of *ll* in a word, but they have been taught in a few seconds to give the element its true native effect, by itself, and, after brief exercise, to give it and an associated vowel the rapidity of sequence which is called combination. We all know speakers who cannot pronounce the English *w* in *we;* but we do not any of us know a single such speaker who cannot at once be made to pronounce the element by itself, and within a few minutes to give it and the succeeding vowel the necessary rapidity of sequence to convert *w-e* into *we*. On the same principle, the German *w*, which English imitators pronounce *v*, can be readily acquired as an elementary sound by any person, and then syllabically connected with vowels exactly as by native speakers.

The sound of *th* is another shibboleth to those who do not possess it in their vernacular. Habit and association have fixed the false method acquired in early undirected attempts, and the wretched mispronunciation is continued year after year. Yet this supposed difficult sound can be pronounced as an element almost at the first effort by any of these speakers, and its combination in syllables be afterwards mastered with certainty.

The only difficult part of English pronunciation is in the application of what is called "accent," which gives a definiteness and stress to some one out of any group of syllables, and a feebleness and indefiniteness to all the other syllables in the group. Accent (or syllabic light and shade) is the most marked characteristic of English utterance, and generally the last to be acquired by a foreigner; yet there is no real difficulty in mastering even this accen-

[1] Address by Dr. A. Melville Bell before the Modern Language Association, at the first session of the Phonetic Section.

tual habit, by simply practising syllables in unison with taps of the fingers. The broken English of foreigners who have been long resident in our midst is due entirely to phonetic neglect, and not to any inherent difficulty in the sounds of the language.

I can foresee that this statement will be called in question, because many teachers of languages have to be included among the speakers of broken English. Nevertheless, the fact remains, that such speakers labor under a disability which might have been prevented, and which may still be removed, by application of the principle that the separate formation of any element, in any given way, is feasible by any person, and that elementary combination is merely elementary sequence.

One result of this principle is to show the pre-eminent importance of the study of phonetic elements. Another result is to show the necessity of some means of indicating these elements independently of ordinary letters, because the latter have already, in all our minds, fixed associations with certain sounds. We require some symbols for pure phonetic qualities, — analogous to the Arabic ciphers for numbers, the algebraic signs, and the notation for music. We want characters which have an absolute value in the mouth — in all mouths — to enable us to teach and discuss the sounds of our respective languages, and to express our exact meaning in regard to them. We do not want to apply such signs instead of letters and in substitution for alphabetic writing, but we want to use them in interpretation of letters. The attempt to interpret letters by other letters is never free from ambiguity.

The symbols which make up what I call "Visible Speech" are precisely such as here described. They constitute a universal alphabet, because by means of them the sounds of any language are expressed with such directiveness that they can be reproduced from the writing by any expert in the system. But the main function of the symbols is fulfilled when they have taught the learner the phonetic value of ordinary letters. Our familiar *A B C*, the German alphabet, the Greek, the Arabic, and every other system of letters, may be preserved unchanged, while the symbols of "Visible Speech" are available as a key to them all.

In one of the early experiments with the system, the professor of Oriental languages in the University of Edinburgh dictated some peculiar East Indian words which were entirely new to me when I wrote them; and, when they were reproduced by the boys who were then the sole interpreters of the system, Professor Reid declared that he could not get his students to pronounce the same words with similar accuracy, after six months' instruction.

In this case the young readers heard the words for the first time when they themselves pronounced them. The explanation is, that the symbolic writing exhibited to their initiated eye the organic mechanism of the sounds, and they had only to follow this, and the original effect was necessarily reproduced without thought of sound on their part, or of any thing but the organic positions.

Some very interesting and crucial tests were applied by Mr. Alexander John Ellis, — the one man in England competent to apply such tests, as he was the author of the most exact analysis of speech-sounds, and the most complete phonetic alphabet that had then been published. I quote Mr. Ellis's own description of the experiments: —

"The mode of procedure was as follows: Mr. Bell sent his sons, who were to read the writing, out of the room, — it is interesting to know that the one who read all the words in this case had only had five weeks' instruction in the use of the alphabet, — and I dictated slowly and distinctly the words which I wished to be written. These consisted of a few words in Latin, pronounced first as at Eton, then as in Italy, and then according to some theoretical notions of how the Latins might have uttered them. Then came some English provincialisms and affected pronunciations; the words 'how odd' being given in several distinct ways. Suddenly German provincialisms were introduced; then discriminations of sounds often confused, in Polish, German, Dutch, and Swiss words; French and English words, and German and French words; some Arabic, some Cockney English, with an introduced Arabic guttural, some mispronounced Spanish, and a variety of shades of vowels and diphthongs. The result was perfectly satisfactory; that is, Mr. Bell wrote down my queer and purposely exaggerated pronunciations and mispronunciations, and delicate distinctions, in such a manner that his son, not having heard them, so uttered them as to surprise me by the extremely correct echo of my own voice. Accent, tone, drawl, brevity, indistinctness, were all reproduced with surprising accuracy. Being on the watch, I could, as it were, trace the alphabet in the lips of the reader. I think, then, that Mr. Bell is justified in the somewhat bold title which he has assumed for his mode of writing, — 'Visible Speech.'"

Mr. Ellis subsequently had the whole phonetic theory of the system, and the plan of symbolization, explained to him, when he had the magnanimity to write, —

"Mr. Melville Bell's scheme will, I believe and hope, thoroughly supersede one on which I have labored for many years, and expended much money."

I venture to say that the whole history of authorship does not exhibit a course of action more altruistic and honorable than that of Alexander John Ellis in his reception of "Visible Speech."

Mr. Ellis, of course, embodied the classifications of "Visible Speech" in his subsequent works. His system of "Glossotype" or "Glossic" was designed for the purpose of enabling all the new phonetic distinctions to be represented by Roman letters. This it accomplished by inversions and other arrangements of the letters, making up an alphabet, complete but arbitrary, and consequently difficult to use without constant reference to tables. "Glossotype" is a translation of "Visible Speech" into letters that are to be found in every printing-office. It, of course, entirely lacks the grand characteristic of "Visible Speech;" namely, self-interpreting letters, which exhibit in their forms a symbolic record of what the mouth must do in order to pronounce their sounds. "Glossotype" may be correctly described as "'Visible Speech' without its visibility."

My speaking to you here in Harvard reminds me that when I paid my first visit to America, in 1868, the then president of this university, Dr. Thomas Hill, was, I found, much interested in "Visible Speech," and in phonetics generally. I had the honor of meeting in Dr. Hill's drawing-room a gathering of professors and others, whom he had invited to receive some demonstrations of the system. To my surprise, Dr. Hill showed himself almost as well acquainted with my system as I was myself. I wrote on the blackboard for his interpretation, and he wrote for mine. Yet he had had no oral instruction in the method, but had studied it entirely from the written description.

I mention these facts simply to encourage those of you who may not have already entered on the study, to make practical investigation for yourselves. In this way you will, at all events, acquire a knowledge of the varieties of linguistic sound, and also see the organic formation of familiar elements, which you may possibly have been forming all your lives without knowing how you formed them; and the power of analyzing familiar sounds will ultimately become a guide to the formation of new and unfamiliar sounds.

We live in a busy world, and cannot afford to spend much time, even in the most interesting studies, unless they involve also our material interests. I may therefore point out, that a knowledge of the whole round of speech-actions can be acquired, under proper oral instruction, in a period so brief that the busiest student need not be deterred from undertaking the work. The study is in itself most interesting, and it is, besides, of important material benefit to those who master it. In primary schools, in schools for the deaf, and in all the fields of teaching, there is an increasing demand for skilled phoneticians; and to you, members of the Modern Language Association, this demand naturally looks for supply.

I am most desirous, before I leave the world, to see the subject of phonetics added to the curriculum in universities and normal schools. I may add, that, in furtherance of this object, I have presented, through the Bureau of Education, and with the kind cooperation of the commissioner of education, a copy of my recent work on "Vocal Physiology and Visible Speech," to every university and normal school in the United States. The same presentation has also been extended to the universities and normal schools in Great Britain and the British Colonies. The opening of this Phonetic Section of the Modern Language Association may be taken as an indication of the growing interest in the subject, and an omen of its future prominence among educational studies.

You will, of course, have many aspects of phonetics presented to

you in the contributions you will receive from year to year, — such as historical phonetics, or the order of past changes in pronunciation; national phonetics, or the tendencies of individual languages; formal phonetics, or the operation of definite laws; assimilative phonetics, or the influence of sound upon sound; and doubtless other varieties, — but all these should pre-imply a fundamental power in practical phonetics. Theorizing on sounds which you cannot illustrate is profitless.

Sounds have been described as long, short, acute, grave, flat, sharp; heavy, light, dull, obscure, hard, soft; harsh, smooth, open, shut, thick, thin; narrow, broad, fat, liquid, etc.; and organically as labial, lingual, palatal, guttural, nasal, dental, head sounds, throat sounds, chest sounds, even ventral sounds. The whole nomenclature has been indefinite and unscientific. Such names must be discarded for a terminology that shall express something which is uniformly intelligible to all who use it.

For example: certain mouth-actions are produced with, and certain others without, accompanying voice: these are clearly distinguished as "vocal" and "non-vocal." Certain actions are performed by the back of the tongue, others by the top of the tongue, others by the front of the tongue, others by the point of the tongue, others by the lips; and the resulting elements are unambiguously named "back," "top," "front," "point," "lip." Some sounds are formed with the tongue in close approximation to the roof of the mouth, others with the tongue removed from it as far as possible, and others in an intermediate position: these varieties are clearly distinguished as "high," "low," "mid." Some sounds are formed with constriction of the organic aperture, and others with comparative looseness and expansion; and these are distinguished by the term "wide" applied to the latter class. Some sounds issue through a channel over the centre of the organ concerned, others through apertures formed at the sides, and some with the mouth-passage entirely closed: the last are descriptively named "shut;" and the side-aperture sounds, "divided." Some sounds are formed with the co-operation of two parts of the mouth, and these are called "mixed;" and some are emitted wholly or partly through the nose. The former are called "nasal;" the latter, "nasalized." Such definite nomenclatures as these are easily learned, readily remembered, and unambiguously understood.

One practical application of phonetics will probably come occasionally under the consideration of this section; namely, the removal of anomalies and irregularities in spelling. This association may well become the national authority and umpire in questions of what is called "spelling-reform." The established writing of our words is only partially phonetic; and the first point to be determined is, Can it be made wholly so? The answer is both yes and no, — no, if the condition be made to admit no new letters, and to maintain the present aspect of words; yes, if new letters be allowed, and the aspect of words be free to change, without regard to present usage. Written words become pictorial to the eye, and any change of the literal picture destroys for a time the identity of the word. Thus words are both combinations of sounds and combinations of letters. The sound is the original, the real word: the letters form a conventional pictorial word. Are we to retain both in mutual independence, with all the inconvenience which the present arrangement entails, or are we to alter the conventional so as to represent the real? If we agree to disturb the old word-picture, let us make the new one perfectly accord with the word-sound; but that would be to give up historical spelling altogether. If we decide to retain historical spelling, we should then agree on some initiatory scheme, by which the difficulty of learning to read may be importantly lessened, for the benefit of children and of the nations which are acquiring the English tongue.

In an extended English alphabet recently published under the title of "World-English," a method is shown by which the writing of the language is rendered perfectly phonetic, while the aspect of words is changed in the least possible degree consistent with that result. The alphabet is designed only for initiatory use, and to facilitate the learning to read from common letters and common spelling. Some critics have failed to see this limitation of the scheme, and have looked on the proposition as a new attempt at spelling-reform; but, on the contrary, the reason for producing "World English" was to demonstrate, that, so far as learners of the language are concerned, present orthography may remain altogether untouched; and that the literature of England and America need not be rendered foreign to the eye by any change in spelling.

Why cannot our legislatures rise to the importance of regulating school and official practice in the representation of our speech? Private efforts have cleared the way, and shown, in a variety of modes, what may be done. Official action now would be comparatively easy.

In the mean time, might not this association with advantage formulate some conclusions on the subject? Suppose the following questions to be discussed, and the answers promulgated for general information: —

1. Should our spelling be altered for the sake of facilitating the work of learning to read?

2. Can that object be attained without such alteration?

3. Can our spelling be partially phoneticized, by dropping silent letters and otherwise, without destroying the identity of words to the eye?

4. Can a purely phonetic method, in place of ordinary spelling, be made acceptable to the educated public?

5. Should we not recognize two independent forms of our written words, — one in common spelling, for use in literature; the other in phonetic spelling, for use in primary schools, and wherever else may be desired?

Definite answers to these or such questions would tend to concentrate effort in the approved direction, and to suspend futile effort in other directions.

The varieties of sound heard in dialectic and district pronunciation prove that the necessities of intercourse do not depend on nice phonetic distinctions. In fact, one who is familiar with the words of a language can understand speech when only one unchanging vowel-sound is used; or writing, when a mere hyphen is substituted for all vowel-letters. One system of shorthand is based on this principle. The consonants are written small when no vowel-sound follows them; and in this way the relative size of these characters informs the eye where vowels do and do not occur; with the result, that, except in monosyllables, the writing is sufficiently free from ambiguity for practical stenography.

Extended intercourse is assimilating the pronunciation of districts which differed widely in their utterance before the days of steamboats and railways. The dialect of my native place is no longer what it was in my remembrance. The provinces of a nation, and the nations of the world, are rising gradually to one phonetic standard. But variety comes with refinement; shades of sound become associated with shades of meaning; and the ear itself becomes more appreciative of slight differences.

Early English pronunciation was very unlike what we hear now, chiefly because it lacked many shades of sound which we distinguish. The letter *r* had always its consonant sound, which is now heard only before a vowel. *A* was alway *ah; ai, ah-i; aw, ah-w.* *W* was always pronounced after a vowel, as *ew, eh-w; ow, oh-w.* *U*, as in *but* and *us*, was always pronounced *oo;* and our silent letters *gh* and *l*, as in *might* and *would*, were always sounded. I can fortunately illustrate the effect of the English of Shakspeare's time by repeating a short speech, the pronunciation of every word in which has been ingeniously recovered by Mr. Ellis. This is Portia's speech on mercy, from the "Merchant of Venice," as prouounced on the Shakspearian stage ["The quality of mercy," etc.]. My object in this brief address has been simply to incite you to give increased attention to practical phonetics. Mastery of the mouth will give an advantage in all the other departments, and also in the teaching of modern languages. Without entering further into detail, which would make this a lesson instead of an address, I shall conclude by hoping that the deliberations of this Phonetic Section may advance the study of the art and science of speech, enhance both professional and popular interest in the subject, and be a continuous credit to the Modern Language Association.

THE Russian Government has in contemplation a project for connecting, by a system of canals, the White Sea with Lake Onega and with the principal navigable rivers of Russia. The canals are to be of sufficient depth to admit vessels drawing ten feet of water.