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The next communication was presented by Prof. Charles H. Grandgent (Boston), on

8. "Vowel measurements,*" and Professor Bell being called on to give his views on the subject treated by Prof. Grandgent, made the following remarks:

Mr. President, I wish to make a few observations on this paper. I commence by saying that the idea of absolute measurements for the mouth cavities is altogether new. I am not aware that this has ever been carried out before. I do not know how far it may prove of utility, because there is a grand maxim that—"that which is best administered is best."—Now, it may prove in teaching pupils, that this plan of measurement may be capable of accurate application; in the meantime, I do not know, sir; I have been during all my experience guided entirely by the ear. From long association, when I hear a sound, I know by the quality of the sound, the organ that mainly is affected in its production. Whether another student would arrive at different, or more reliable results by accurate measurements, I am not prepared to say. At all events the matter is full of interest. So far as developments go, I see a perfect coincidence between the results from auricular observation and the results of this real measurement. I don't know that I need take up your time with further remarks. I am much interested in seeing this experiment and shall follow its developments with increasing interest, I have no doubt; but in practice I shall remain satisfied with the results obtained by the ear. I do not see that measurements of the mouth could be of service to pupils, unless, it may be, in self-investigation. I do not in the meantime, at least, see how a teacher can apply such measurements in the mouth of a pupil, so as to direct his pronunciation.

Mr. Spanhoofd:—Mr. President, I am glad to have been able to listen to Professor Grandgent's very instructive paper. I had seen a short extract of it and knew in a measure what to expect; but I would like to say that my expectations have been not only fulfilled but far surpassed. His careful exposition of the vowels of his own dialect, of course, I cannot discuss; he would have to call upon other gentlemen from Boston. I also think his method is beyond my discussion. I would like to apply it myself before discussing it. I think it is exceedingly ingenious and can only be helpful in every respect to the further investigation of the subject of vowel sounds in general. Prof. Grandgent is perfectly right in insisting upon the necessity of correct and scientific methods in investigating and examining the

*In the absence of Professor Th. W. Hunt (Princeton College), the heading of the paper presented by him, entitled "Independent Literary Judgment," and put down as No. 1, of the Fourth General Session, was omitted. For a syllabus of this paper, see Appendix II, at the end of these Proceedings.
positions of the organs of speech. In my phonetic reading I have been struck all along by the great difference of methods employed by physiologists on the one hand, and philologists or linguists on the other. Linguists approach the subject from the language side, of course, and their method is to get hold of the sounds, train the ear to catch the different shades of sounds and to reproduce them accurately; while the physiologists adopt such a method as has been presented to us so admirably in Professor Grandgent's paper. Similar experiments have been made by German physiologists. Czermak inserts a flexible wire through his nose to ascertain the position of the soft palate; and Grützner covers his tongue with red carmine ink, then pronounces the vowel sound and thus gets an exact imprint of the contact of the tongue against the soft as well as the hard palate. But linguists and philologists seem to shrink from this kind of self-sacrificing devotion to science. They like simply to adopt the methods of these physiological investigators, and arrange their vowel systems accordingly. As Professor Grandgent has pointed out, they do a great deal of theorizing and generalizing, by applying things that they observe on themselves to the whole human race, while all physiologists have insisted upon their observations being simply their own, and not applicable to anybody else. It seems to me that Professor Grandgent has done a great service to the science of phonetics by devising this very simple and ingenious method of determining the vowel positions, and I would not like to sit down without thanking him personally for the information that I have derived from his paper.

Professor Grandgent:—I am very glad to hear so pleasant words from Professor Spanhoofd. I would like to say in regard to the method of tongue measuring which I pursued under Dr. Techmer at Leipsic, that while it gives excellent results for consonants, the information that it conveys with regard to the vowels is very unimportant.

Prof. Cohn:—I would like to ask a question, which I am ready to ask only through a misfortune of my own which may make a curious subject in this question of vowel measurements. How far does Mr. Grandgent think that it is possible to find an average general measurement for the vowels? I would like to ask the question for this reason: About two years ago I met with an accident the result of which was to change entirely the inside shape of my mouth, the relative position of my jaws, and I was compelled after this, when my doctor allowed me to begin to speak again, to look for tongue positions that would enable me to enunciate as clearly as before, not only for consonants, especially for the consonant s, but also for the vowels.

Prof. Grandgent:—If I understand correctly Professor Cohn's question, it would be whether a change in movements of the tongue could compensate for a different configuration of the interior of the mouth. It could to a certain extent; but not entirely.
Prof. COHN:—Well, I think that very few people notice any difference in my speech since my accident. It is true that I have had to make great efforts in order to accommodate myself to the new conditions in which I was placed; but it seems to me that I have managed to be understood.

Prof. GRANDGENT:—I think the main change in Professor COHN's speech is in the consonants, and especially in his s, as he said. I notice that he makes a peculiar movement of the lips in pronouncing the sound of s.

President LOWELL:—As a person interested in dialect, to a certain extent, and especially the dialect of my native district, I would like to ask Professor GRANDGENT whether, when he speaks of the Boston dialect, he means the ordinary dialect of the people, or that of cultivated persons?

Professor GRANDGENT:—I referred especially to my own dialect, Mr. President. (Laughter).

President LOWELL:—You meant the way in which you speak yourself?

Prof. GRANDGENT:—Yes, sir.

President LOWELL:—In that case it seems to me that you have a personal peculiarity. I should like to inquire whether you yourself would not consider it so. It seemed to me that the short o which you get in “whole” is the rustic pronunciation, and that “whole” is the urban pronunciation, according to my speech. I think that this is the case, and I was particularly interested for that reason in what you said about the position of the organs in the pronunciation of “whole” and “hull,” because all my life I have been puzzled by the older representations and by the way in which a Yankee countryman pronounced “whole.” It used to be spelled “hull,” but I never heard it so pronounced; but you tell me the position of the organs in pronouncing “whole” and “hull” is exactly the same, except the lips and a very slight difference in the jaw.

Professor GRANDGENT:—This variety of “whole” certainly is more general in rural districts; but it is a part of my natural dialect (however it may have come there), and so it was my duty to note it. I should like once more to say that my speech is merely a Boston dialect, and is not presented by any means as the Boston dialect. There are very marked variations inside the city of Boston.

President LOWELL then expressed surprise that Prof. GRANDGENT’s Boston dialect admitted the “short” pronunciation of “whole,” which he had thought characteristic rather of country than of city speech.

Dr. BRIGHT:—Mr. President, for example, if a musician were making a study of different musical instruments he would first require those instruments to be put into normal condition. I fancy it to be equally fit, before examination be made in the speech of any individual, to observe whether that individual may have normal, health-
ful physical activities in the utterance of speech. A pupil would not, I suppose, be considered an efficient student of music, nor a performer on the piano, if he had not been taught to discriminate between an instrument of that variety when in tune and when out of tune, or if he could not distinguish between sweet, harmonious tones, and the metallic rattle of an instrument which needed the attention of the maker. This is my preamble, which I wish might be made effective as a note sounding a crusade against the American nasal twang. I almost fear that foreigners are right in saying that we have such a twang which must be designated by the national epithet; but we are always willing to take to ourselves all that may be rightly imputed to us, and to correct our habits when they are wrong. I have wondered whether, under the patronage of this Organization and with the authoritative influence of the distinguished headship of its Phonetic section, some hint might not be thrown out to the teachers in the elementary schools of the country which would make them aware of certain vicious habits so very prevalent throughout the country. Just as a child might and should be taught at the beginning of its career, to breathe correctly to secure the proper functions of its body with reference to circulation and nutrition, so it should be made to appear an equally important and serious moral duty on the part of the teacher to lead the child at the beginning, when it is susceptible and imitative and trustful in its teacher, to acquire right habits in the activity of the organs of speech. I hope that the President may utter the timely word that may find wings to every quarter of the country.

Professor Bell:—I felt when I sat down that I had some point to refer to which escaped me at the moment. I wish to say in relation to the measurements brought forward by Professor Grandgent, that we have two absolutely different and opposite scales in the cavities of the mouth in pronouncing what are called front vowels; and I wish to give you a very simple hint by which you can test for yourselves the reality of these scales. If you close the throat-passage, that is, hold the breath, and silently put your tongue in the position for e and a, you will find that while you have your throat closed, if you strike the neck with the finger, you are making an ascending scale from e to a. Then if you close the mouth-passage by putting the tongue on the back palate in the position for e or ng, and then silently adjust the front of the tongue for e, a, etc., you will find by tapping on the teeth, that you are making a descending scale from e to a. The anterior cavities yield a descending scale, while at the same time the posterior cavities yield for the same series of vowels an ascending scale. E is the narrowest vowel in front, and Professor Grandgent's measurements should show it to be the broadest at its posterior cavity. With reference to the subject that has just been called up by the last speaker, it would give me very great pleasure if I could say anything which would be effective in curing that wretched, disagreeable habit that is undoubtedly most prominent in America; but I should say the most direct way of curing it would be to
send you around from school to school,—for you have not a trace of it.

Professor Calvin Thomas (Univ. of Michigan)—I should like to ask Professor Bell if, in his observation of America generally, he thinks that a nasal twang is characteristic of American speech. Professor Storm of the University of Christiania designates it as an American characteristic. Of course, he does so upon the strength of his reading and his hearing of Americans here and there, now and then. I do not pretend to have a very good ear in matters of phonetics. I am a learner in the subject; but I will say that while I have frequently heard a nasal twang from Americans, I cannot say that it seemed to me to be anything like a national characteristic. I should like to know what an Englishman would have to say upon that point.

Professor Bell—I am afraid that I must back up the statement that nasality is a national characteristic. It is, however, almost always associated only with legitimately nasal sounds; these are only three in English, m, n, and ng. The vowel in connection with these, either before or after, should not be affected by nasality and is not, as a rule, in the utterance of English; whereas, here the vowel before or after m, n, or ng is nasalized. There is where to look for the pure oral vowel. You have a very strong nasality yourself, Mr. Thomas. I think that with a little attention to that characteristic, you will be conscious of it. There is no doubt that as far as these northern states are concerned, nasality is very prominent; it is the most prominent characteristic. At the same time, there is almost as much nasality in the Cockney dialect of London as there is here. It is associated with a different intonation, but as far as the nasal passage is concerned, the habit is almost as prevalent as nasality is here.

Dr. Bright—My intention was serious, however imperfect my manner in suggesting this subject for discussion, and I am glad to see that the matter has been so earnestly taken up. The fact that thousands in America have this defect and do not know of it, is a startling statement of the seriousness of the subject; and the fact that with a very little wisely directed training any child may be made to master and correct that habit for life, is sufficient justification for an appeal to elementary teachers. For this initial guidance technical training in phonetics is not required, any more than it requires technical knowledge to teach a child to use his nostrils in breathing or to favor an erect posture of the body.

Prof. Thomas—I am delighted to receive precisely the item of information that the President of the Phonetic Section has given me. I may remark, however, that my home is in the West. I suppose my pronunciation may be taken as fairly representative of people born in that portion of the United States which was once the Territory of the Northwest—people who sprang from New England or New York stock and whose pronunciation has been continually schooled from boyhood by reference to the books. I may say in this connection, in regard to the pronunciation of “whole” of which our President spoke a moment ago, that my natural pronunciation of that word is
certainly not 'hölë,' although I hear it so pronounced very frequently; and on the other hand, it is not 'hull.' I think if I had occasion to say "The rabbit occupied the whole hole," I should distinguish sharply between the two words. In other words, my o in that word is a German short o, as near as I am able to utter it.

President Lowell:—I think that I should escape the whole difficulty by saying that the rabbit occupied the whole burrough. (Laughter).

Prof. Thomas:—Very possibly I should, in print. I desire to ask one more question, whether this American nasality of utterance which appears to be, then, a universal American characteristic, is comparable to the French nasal vowels as they were when the nasalizing process began? If so, and it is universal, how dare one speak of it as incorrect? It is bound to prevail ultimately, and we shall have nasal twang vowels in English, at least in America, just as there are nasal vowels in French. I fear that I am not a competent observer in regard to this subject, evidently I am not; but if this practice is really universal, then it is simply a fact of our speech and has the historical justification which a fact of speech always has. In that case I fear that the schoolmasters and the schoolmistresses will find themselves encountering hopeless difficulties in the attempt to change the tendency which has set in.

Prof. Bell:—Advice has always been considered universal; and we, therefore, do not consider that some attempt toward eradication may not be made.

Prof. Joynes:—I speak, sir, with some reluctance and diffidence, and I would say, I hear with surprise that this nasality is presumed to be a universal American characteristic. With my experience and to my judgment, it is very largely local and provincial, pertaining to certain localities of our country. If it prevails to any extent among the cultivated classes in the South, I am sure we are at least in the condition described by Dr. Bright, that we do not know it.

Prof. Bell:—I would like to say that this is precisely the source of the difficulty in correcting the habit; it is a habit that is not known; the speaker himself is not conscious of it. That it is not merely a local characteristic of certain states, but really is national, is found by the fact that our friend Professor Thomas comes from the far West, and he has this tendency just as much developed as we can well have it here in New England.

Prof. Thomas:—Has Prof. Joynes the same?

Prof. Bell:—No. So I don't know how far it would be characteristic of the South and the North distinctively. Then, with reference to the French semi-nasals; these are recognized as nasal vowels, and there is a sharp line of distinction between them and the oral vowels. The difficulty here is simply that in America we have the habit of nasalizing a vowel without a recognition of the nasal element. We really do produce the same organic quality which, in a French sentence, would be represented by en, in, on, etc., but there the differ-
ence between oral and nasal is kept up because only vowels of a certain orthography have this nasal quality; here we have it in all cases where a vowel is allied to some nasal consonant. It is almost impossible to get one separated from the other, yet there is no natural connection; I think, therefore, that the French nasals retain their quality and the other vowels their purity, just because the one is sharply distinguished from the other, when in habit, here, there is no such distinction. I should like to add one word with reference to the correction of this habit of nasality. It seems to me that the first thing to do is to understand clearly what it is. This nasality is due to the lack of energy in the soft palate. We use the term "nasal" in a very loose way to characterize a sound which is either transmitted or obstructed by the nose. When the nasal passage is stopped we say that a man talks nasally, whereas, in reality, he is not then talking through his nose. If the term nasal were confined to its proper sense, I think we should find it easier to correct the prevalent habit.

Dr. A. B. Lyman (Baltimore):—I observed that the President of the Phonetic section spoke of his being able to distinguish all sounds. But there exist in every community certain persons who do not hear at all. I refer to deaf mutes. We have all heard about "the words which we have heard with our outward ears," but there are some persons who do not hear anything with their outward ears, or even with their middle ears, those whom it is impossible to make hear anything, even through the mouth, or by any means whatever; and I think the method brought forward in the able paper by Mr. Grandgent, might be of great service to those who are engaged in teaching deaf-mutes to speak. A short time ago I was present at an institution for teaching the deaf to speak without finger signs, but in audible tones, and I was struck with the remarkable success of the efforts of the teacher; several of those boys spoke better than some persons I have heard speak who could hear perfectly well. They had been trained, and it had been done entirely by practice, and from the results of long experience. I should conceive, however, that this method might be made of immense use in developing and carrying on that system of teaching. But there is another thing that I wish to ask the gentleman who read that paper, as to whether the photograph, the instantaneous photograph, with the assistance of the electric-light, might not be used to carry this idea to a still greater degree of perfection? I suppose many here present know of the experiments made some years ago by Professor Muybridge, of the University of Pennsylvania, in ascertaining the positions of horses' feet in trotting. That was done in California, when Dexter trotted. It had been maintained that a horse, in trotting, always had one foot on the ground. It was found, I think he said so, that the horse in trotting, went seventeen feet without touching the ground, and thus the old theory was entirely disproved. There are also positions of the horses' feet on the friezes of the Parthenon, and persons were under the impression that the positions of those horses' feet were something utter-
ly impossible; but how the Greeks found it out, we do not know; but the result of the instantaneous photograph shows that the horse in trotting got his feet exactly into the position as represented on the friezes of the Parthenon. Now, on that same principle, by means of the electric-light, and the flashing photograph, we might possibly bring these matters to a very much more accurate result than by attempts made in the way that the gentleman who preceded me explained to us. It rather seemed that his method is just the first step in that direction, and that in a very short time we shall have some other means of finding out exactly what these positions of the vocal organs are, and, while I have no doubt that the ear, provided the ear be correct, is one of the best guides, still, for those persons whose ears are not correct, or for the absolutely deaf, this plan might be made of no inconsiderable service; and I should like to ask the gentleman whether he has in contemplation any experiments of the kind here noted, or whether he has made any, or whether he knows of any being made by others.

Prof. Grandgent:—I know of no successful experiments of this kind. I have tried in vain to devise some way of making such pictures. Of course, the lips can easily be photographed, but the interior of the mouth cannot: the mouth aperture is not large enough to admit of it. The back part of the mouth could never be directly photographed at all; because there are obstacles in the way; and even the visible front part, which, for most vowels, is very small, could not, I think, be taken, through the normal mouth aperture.

Dr. Lyman:—The question, I think, would be whether a powerful electric light could not be thrown into the mouth through the most minute aperture and in some way a photograph be obtained of it. I am rather inclined to think that this could be done.

Prof. Grandgent:—But that would show only a small spot in the mouth.

Professor Adolph Gerber of Earlham College, presented the next communication on

9. "Russian Animal Folk-Lore compared with the Medial Animal Epics of the West,"

after which, on motion of Professor Calvin Thomas (University of Michigan), the Association adjourned for luncheon in Memorial Hall, as on the previous day. After luncheon many of the delegates availed themselves of the opportunity to visit Longfellow's Study, according to the courteous invitation of Miss Longfellow, as announced at the first Session. (cf. p. iv).

The Fifth Session of the Convention was called to order at 3 o'clock p.m., by President Lowell, who remarked: The first