

WILBUR (H. B.)

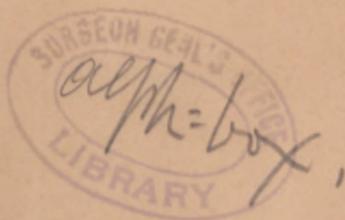
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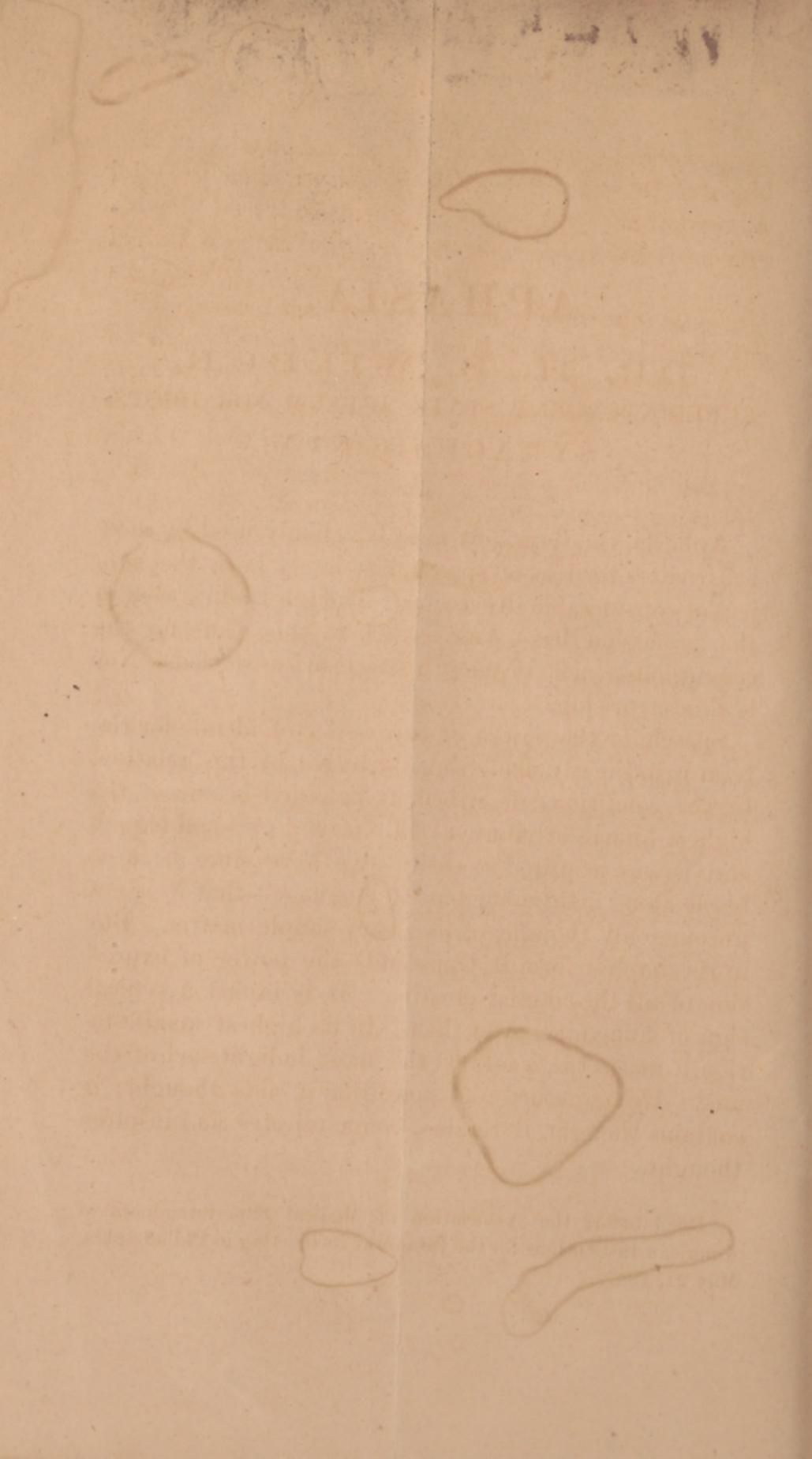
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Aphasia, the term now most commonly used by medical writers for loss of speech, has lately been the subject of considerable discussion. Though leading men in the profession have contributed to this, thus far the conclusions reached cannot be regarded as settled. Nor is this surprising.

Speech, or the power of expression of ideas—for the term is indirectly made thus inclusive in this relation, by the conditions described as aphasic—is one of the highest human attributes. In our own personal experience it was acquired so easily—we have since been so borne along amid a current of language—that it is not uncommonly thought of as a very simple matter. But in its simplest form it transcends the power of expression of all the animal creation. It is in fact a typical sign of humanity, even then. In its highest manifestation it meets the wants of the most enlightened of the race. By its nature and condition it aids thought; it contains thought, it retains, communicates and inspires thought.

*Read before the Association of Medical Superintendents of American Institutions for the Insane, at its meeting in Philadelphia, May 21, 1867.

It may be added that it has so many relations, physiological and psychological, that the loss of it could scarcely be satisfactorily accounted for by a few pathological observations, or a narrow induction from any stand-point.

The general facts presented and the theories advanced by writers upon this topic, are doubtless familiar to the members of this Association. If, therefore, I take occasion to summarize them, it will be for my own use, and not for their instruction.

It will be remembered, then, that a peculiar interest in the subject has grown out of a coincidence remarked in some of the earlier recorded cases; namely, that it occurred quite uniformly in connection with right hemiplegia. The inference was, by these observers, "that the loss of memory of the principal signs of thought was dependent upon lesions of the left anterior lobe of the brain." M. Broca, upon supposed pathological grounds, locates the so-called faculty of articulate language in the posterior part of the third left frontal convolution, which he styles the "convolution of articulate language."

Dr. Hughlings Jackson, of the London Hospital, remarks: "There can be no question that at present the evidence points most strongly to the conclusion, that the faculty of expression resides in the left, and not in the right, hemisphere." This opinion (though stated in more general terms) is based upon the same and similar facts as those furnished by the Continental authorities, and must necessarily be interpreted with the same exclusiveness as to localization.

In the cases of aphasia mentioned by medical writers, a variety of phenomena are witnessed. Speech proper is not only affected, but in most instances other modes of expression, as that of writing, and even the more sim-

ple form, natural signs. Again, the loss of comprehension of language is not commensurate with the loss of power of expressing ideas. In some cases of aphasia the subject is conscious of the failure of expression, in others seemingly not. In some instances there remains the power of imitating articulate sounds to a greater or less degree. In others there is manifested a spontaneous or automatic utterance of words or sentences expressive of strong emotion. This occurs even when there is an inability to repeat them as an act of will.

(The access of aphasia is sometimes gradual and sometimes sudden. In its duration sometimes transient and sometimes lasting.)

Trousseau, in his admirable lecture upon the subject, insists that in aphasia, therefore, "there is not merely loss of speech, but also impairment of the understanding. The patient has lost, simultaneously, in a greater or less degree, *the memory of words, the memory of the acts by means of which words are articulated, and intelligence.*"

We have, then, up to this date, a localization of the faculty of speech in a given portion of one side of the brain, by one set of observers. This involves some difficulties. In the first place, a rigorous compliance with the demands of inductive science makes it necessary for the advocates of this theory to show that aphasia is invariably connected with lesion of the left anterior lobe of the brain; that the converse of this must also be true; namely, that when there is a positive lesion of the lobe of the brain, aphasia, to a greater or less degree, must be one of the symptoms.

Again, the brain, as a whole, has hitherto been considered a symmetrical organ, even by those who regarded it as an assemblage of lesser organs, arranged in pairs with corresponding functions. This whole philosoph-

ical scheme must now be revised to meet the new localization. For if parallel organs of the two sides of the brain have different functions in one case, why not in all? And then the propensities, faculties and feelings, hitherto ascribed to the human mind, must clearly be multiplied by two.

We have, however, another set of observers who stoutly deny the theory of localization with all its consequences. It must be confessed that this view presents some difficulties. Its advocates must explain the seemingly more frequent coincidence between aphasia and lesion of the left side of the brain than otherwise. This Dr. Robertson attempts to do.*

I may add to this brief summary of the points brought out in the discussion of the subject, that Dr. Brown Sequard denies the amnesic theory of Trousseau; holding, as he expresses it, "the deprivation of speech to be a reflex phenomenon"—"that a great variety of symptoms may be produced by a lesion of almost every part of the brain"—"that the loss of speech is usually unaccompanied by any loss of movement in the tongue." "The paralysis, in fact, is a paralysis of the organ of expression of ideas."

While these various questions at issue among the parties to this discussion are still pending, let us turn our attention for a little to a point upon which they all seem to be agreed. And this, it seems to me, is rather underlying and primary. We must first have a clear faculty, before we can locate it on a healthy normal brain. We must have a distinct and definite function, to be disturbed or destroyed by the lesion more or less serious of the organ performing it. These writers all speak of the "faculty of expression of ideas," and of its relation to a corresponding organ.

*See *Journal of Mental Science* for Jan. 1867.

Gall had located the faculty of verbal memory in the anterior lobe of the brain. His followers have made his organ of language take a still wider range. It embraces in their scheme the facility of acquiring language (other languages as well as one's own), the power of retaining it, and fluency of speech. The two sides of the brain, however, share in the somewhat extensive and various duties allotted this portion of cerebral tissue. As has been before remarked, the writers upon aphasia have made this faculty still more inclusive. Can then this power of expression of ideas, in its full extent, with all its inclusiveness and conditions, be embraced within the proper office of a single faculty? Can all the reins of mental phenomena necessary; of perception, memory and volition, and all the instrumentalities put in action, both natural and acquired, mediate and intermediate;—can all these be grasped in the one hand of a subordinate human faculty, and this located in a contracted and one-sided fraction of cerebral structure which it shares with another function of a radically different nature? Surely the modern doctrine of differentiation of function could hardly lead to this.

As bearing upon this question, I propose to notice first, some of the steps in the development of language, and then some of the manifestations of undeveloped or interrupted expression that have fallen under my observation, or within the range of my reading. And here a difficulty meets us. For in considering the subject, from whatever point we start, the relations of this wonderful gift are so numerous and so divergent, that we shall seem, at times, as we progress, to cross and recross the path already trod.

The infant escapes from foetal life, passes that brief stage of almost vegetative existence that attends the dawn of extra-uterine life, and emerges into a conscious

existence. Impressions, starting from the surface and traveling either by the roundabout way of the nerves of general sensation or the more direct route of special sensation, work their way through the sensorial ganglia to that inner sanctuary where the soul lies sleeping. The slumberer awakens for the first time, awakens as a personality. This is no more marvellous than that daily morning miracle within the consciousness of every one of us. Communication is thus established between the world of relation and the new ego.

A primal attribute of this being is teachableness. Of instinct it is almost destitute. Experience is its schoolmaster. The first voluntary step taken is in the direction of muscular movements. These are at the outset somewhat vague, and upon muscle in the aggregate; then sectional or trunk movements. Experience is accompanied with a growing definiteness of purpose, and gives an increasing discriminativeness and individualizing in the exercise of the muscular system. Think of the range between the vague muscular movements of early infancy, and the wondrous dexterity of an accomplished pianist.

An analogous process and progress takes place in the exercise of the functions of sight and hearing, as well as in general sensation, till it ripens into perception.

Then appears the imitative faculty prompting the repetition of the movements seen, and the sounds made by others. Then the appreciation of the use and fitness of these as a means of expression.

After these comes memory—the memory of signs and sounds—the memory of the necessary nisus and co-ordinations to reproduce those signs and sounds. Later still is the comprehension of the idea of speech proper, and the memory of words and their meanings, and the

memory of the necessary volitions to produce appropriate and meaning utterance.

When the education is carried still further, the power is acquired of representing ideas in a visible form by the written character, involving a still further exercise of memory, volition, co-ordinating influence and muscular movement.

The power of human expression then is multiform, leaving out of question that kind of instinctive and responsive expression that the young infant shares with the higher orders of animals. We may notice those forms of expression that are specifically human.

The signs and sounds that express the feelings, or serve as a medium of communication in the case of animals, are vague and scanty.* Not so the first language of childhood. How great is the child's power of expressing its wants and wishes before speech comes. Its physique becomes transparent to a careful observer, enabling him to follow the very processes of thought. Doubt and questioning will cloud a little face, while an idea comprehended or a thought begotten will light it up. Then there is a whole armory of expression by signs innumerable, before articulation is attained or even reached after. It furnishes weapons of inquiry as to what and how, and when and where; of distinction of time and place, of personality and circumstance.

And a point to which attention should be called is this; each one of these is worked out experimentally, its use learned, and then repeated till it becomes spontaneous and automatic.

The time comes, with advancing months, when experiments prompted by the imitative faculty and based upon a dawning appreciation of distinctions of vocal sounds

* Felton's Greece, Vol. 1st, Chapter 1st, Origin of Language.

(other than those of tone) are begun. The inarticulate sounds emanating from the larynx are interrupted in their progress outward by motions of the lips and tongue. In these preliminary efforts the resulting sounds are either simple prolonged sounds or repetitions of syllables. The necessary movements of these upper vocal organs are at last individualized and brought under the complete control of the will, and then the sounds made are elementary and syllabic. During this gradual process of acquisition of what may be termed a second language, the grasp of the first is not surrendered. The two are used conjointly in varying proportions till the second is fully mastered.

Nor is the first language ever entirely relinquished. There are differences in the relative use of these two modes of expression, both in the individual and in races. These depend upon the strength of the emotional nature, upon the degree of civilization, and upon habit.*

Viewing this perfected speech physiologically, we have a complicated vocal apparatus, supplied by voluntary nerves acting independently at first, but at last so trained and skillfully co-ordinated by experiment and use that the individual in using it is conscious only of the primitive volition.

Let me reiterate; this co-ordination is not instinctive, but the result of training. No articulate language, however promptly responsive to sensation or emotion, is in any sense instinctive or sensori-motor or anything but strictly volitional, in view of an intelligent appreciation of the circumstance that called it out.

Let me now review hastily the order of development of the power of expressing ideas.

* For some very interesting remarks upon gesture-language, see Taylor's "Early History of Mankind."

Purely instinctive cries, and vague and purposeless motions, marking only sensitiveness and inborn activity. These pass into expressive cries and voluntary motions, as sensation becomes defined and physical acts are brought within the range of consciousness. In time, through the agency of special sensation, new relations are perceived and established. Curiosity and imitation are awakened. Voluntary expression, in its first form, by habitual use passes into its automatic stage.

Then comes speech proper; in itself more difficult, for the apparatus is more complicated, but still practicable because of the experience acquired in mastering the former. This new acquirement assumes an automatic form.

We may follow expression, for analogy's sake and because of the range of aphasia, into that mode where conventional signs visible to the eye are made the substitute of vocal utterance.

Think of this mode of recording and communicating ideas! It is acquired by slow degrees as a correlative of reading. The eye takes the place of the ear, and the hand of the vocal organs. It involves a constant and double process of translation; idea into word, and this into character. The muscular movements necessary are trained and co-ordinated with similar pains-taking. At last, such facility is reached in all its processes that one's thoughts seem to flow from the pen. The letters apparently form themselves. Words spell themselves as if their elements possessed uncontrollable affinities. In some cases—if one may so express it—this occurs persistently where a new orthography has declared a divorce of the old alliances.

We are now prepared to understand the comprehensiveness and variety of the so-called faculty of the expression of ideas. We have the idea of language with

all its antecedents, the purpose to use it, and the necessary nisus or effort to accomplish this. We have memory, based upon sense-perceptions or upon logical or accidental association (retentiveness of ideas, of sensations, of words), and a memory of the movements necessary to reproduce words. We have imitation. We have the free flow of nervous influence—complete co-ordination—flexible vocal organs, and active senses to watch the complex process.

Besides this, we have underneath this peculiar form and above it those supplementary modes of expression, equally inclusive, the development of which I have already traced.

With these preliminary observations upon the growth of the power of expression, I now proceed to notice some of the cases of complete or partial absence of it that have fallen under my observation during an experience of some twenty years, in an institution designed for the education of idiots.

One of the most common features of idiocy is a defect in this respect. In fact, perhaps the best single test of the degree of idiocy in any case is in the comprehension and use of language. The failure to understand and appreciate language depends upon the want of perception and intelligence. The inability to use language, upon the want of power to set in motion and control the complicated instrumentalities necessary to expression, or an indisposition to make the effort.

In the case of persons who have once been in full possession of the power of expression, there may be aphasia without structural change. But in my field of observation, structural defect or structural change may ordinarily be predicated.

In a paper by Dr. Alex. Robertson upon aphasia, in the January number of the *Journal of Mental Science*,

he remarks: "Aphasia is certainly rare in insanity." He is attempting to show that the essential morbid change is motor not mental, and this statement is made in connection with another to this effect. "So far as I can find, in no case has disease been found in the gray substance alone." It may be said of this last, that no more weight should be attached to it than is accorded generally to mere negative testimony. Of the former statement it may be remarked, complete aphasia may be uncommon in insanity, though on *a priori* grounds one might question it, for the absence of speech might be predicated in three forms, to say the least: In cases of dementia, where the requisite intelligence is wanting to enable speech. When there is a resolute and continuous determination not to speak on the part of the patient; in time resulting in inability. When there exists a delusion on the part of the patient, sufficiently strong that he cannot speak. "As he thinks, so is he."

The impaired or modified exercise of the power of expression is certainly a not unfrequent occurrence in insanity.*

In tracing the cause of a want of comprehension of language to its physiological source, we find two conditions upon which it may depend:

* I had purposed presenting some cases illustrative of this general fact, but it might seem presumptuous in me in addressing a body of gentlemen more immediately conversant with this part of the subject than myself, and I, furthermore, called to mind a chapter on the morbid phenomena of speech in Forbes Winslow's book on the Brain and Mind, which is doubtless familiar to all of you. The chapter in question presents numerous examples, showing the wide range that affections of speech and expression take; and also, it seems to me, that the various forms of expression are interrupted and deranged by the influence of other than mere structural changes.

1st. Some affection, organic or functional, of the gray substance of the brain.

2d. A similar affection of some portion of the nervous tissue which should conduct the manifold impressions made upon it, and thus furnish the natural stimulus of the action of the former.

So in tracing the cause of an inability of expression, we may find the difficulty existing either in the gray cerebral substance, where the first link in the chain of material instrumentalities begins; or again, in the conducting fibres of the nervous system, that should co-ordinate and operate the vocal organs, or finally, in the imperfection of the vocal organs themselves.

I may here remark, that in the exercise of this power of expression in any form, or in its development, there is no evidence that any impulse from without calculated to produce this end ever stops short of the nervous seat of consciousness in originating expression. In other manifestations of human life one may witness reflex and instinctive acts—in expression never. I mention this because some writers on aphasia have seemed to suppose that certain expressions of an emotional kind were in their nature instinctive.

I have had under my immediate care and observation 443 idiots, of a greater or less degree of mental deficiency, embracing a very wide range of endowment. The average age on reception was about twelve.

Of these, 121 were entirely mute; could or did not utter a single word: 64 who could say only a word or two: 163 in whose case there was imperfect speech: 95 are described in our register as able to speak. In these last cases the ability to speak is commensurate, in some degree, with the intelligence. But in a large proportion of these even, there was great backwardness in learning to speak.

A large proportion of the cases submitted to my care were congenital cases; perhaps 75 per cent. The remainder had their faculties impaired by disease in infancy or early childhood. In these latter, when there has been loss of speech it has occurred in some instances gradually, but more commonly instantly. Intelligence and speech or expression have certainly not always gone with an equal step.

There have been among the number but a few cases of paralysis. Nor have I noticed any connection between paralysis of either side and defective speech, except when the vocal organs were actually paralyzed. In fact the most improvable subjects have been among these. There have been cases of congenital chorea. A few partially or totally deaf. When partial deafness and idiocy exist in the same case, there seems to be quite a disuse of the organ of hearing, and of course mutism is the result, as in the case of entire deafness. It may be said of this, as of the physical causes of mutism generally, that a much less affection will prevent the development of speech, than would interrupt it after it was once acquired. Habit alone would make a difference. In the one case it is co-operative, and in the other counteractive.

To my surprise there have been very few cases of stammering.

Idiots, with reference to the power of expression, may be arranged under some general heads:

Those who from the absence of intelligence fail to comprehend language or any mode of communication, and who of course, therefore, are unable to give any expression to their simplest wants or feelings.

Those who appreciate to a certain degree the natural language of affection, its gentle tones and caresses, and who measurably respond to this.

Those who discriminate sufficiently through the eye and ear to get the first idea of communication by signs and sounds, following the direction of gesture, obeying simple commands by sign, and recognizing their own names.

Those who imitate some articulate sounds.

Those who can say a word or two, generally accompanied by appropriate gesture.

Those who can utter brief sentences. Two varieties are witnessed in this class. In the one the child will repeat the sentence after having heard it, but without having the power or disposition to originate it. In the other, he spontaneously utters it, when occasion calls, at play or otherwise, but is entirely unable to say it when told, or to repeat it after another. If the effort is made to have him repeat three consecutive words, for example, he repeats only the last, and perhaps fails in that.

Those who comprehend language to a considerable degree, but who refuse to try to speak. In some of these cases they seem not to know that they have any vocal organs. In others it seemingly arises solely from the want of the necessary will. In others the will avails to the extent of copying the motions of the lips and tongue, and faintly the sounds, but not as a word. This occurs even when the word pronounced by another is comprehended. In the presence of the word itself—if I may so express it—he in some measure copies it (I do not say repeats it), and yet fails to see in his own copy the idea it contains.

Those who attempt to speak, but who precede the utterance by some sign expressive of the word, as an aid to their memory of the necessary co-ordination to produce the sound. The steps of the process in this case are the idea, the sign, the memory of the word, and then

the attempt at the co-ordination of the articulating organs.

And finally, comprehension of language with defect in the vocal organs sufficient to impede utterance, but not to prevent it after proper training.

In these last classes there is a general tendency to cultivate other forms of expression to compensate for the failure of speech. This last demands such an effort of the will both in attention, and in co-ordination, that the pupil shrinks from it. He is discouraged too by the partial failure of his attempts, and reverts to the simpler form of expression that he has mastered. It will be observed that the relation between the idea and the natural sign is closer than between the idea and the spoken word, which is conventional. The written sign, when introduced to such an one, serves as an intermediate step between the natural and the articulate expression. With the normal child the written form, of course, follows speech in order.

Case 1. A girl of eight years old; tall, slender, and with regular features. There were few if any external impressions that would produce reflex motion in her. One could prick her with a pin, and there would be no withdrawal of the part suffering; she would simply scream, and throw out her limbs in vague and purposeless movements. She would allow the ball of her eye to be touched without winking or betraying any consciousness of the finger, or any effort of the will to avoid the infliction. There was no definite sensation of light.

She did not stand or sit alone, or manifest any fear of falling. She did not hold anything in her hand. She could not be fed except by placing the food within the reach of the organs of deglutition.

She did not use her ears sufficiently to distinguish tones of affection from tones of anger. She did not notice the direction of sounds.

Shortly before she was brought to the Asylum she surprised her family by humming a part of an air, frequently performed in her hearing on a piano. This was regarded as an evidence of great improvement. She never had noticed any articulate sounds, and never made any effort to produce them. She never noticed or attempted to use any other form of expression. The organs necessary to either were not in the least under the control of her will.

She died some fifteen months after she came to the Asylum, from typhoid fever. There was no opportunity for a *post-mortem* examination.

It will be seen from this description that there was no open communication with her brain from without. There could, therefore, be no imitation. There was no responsive or intuitive exercise of will to produce articulate sounds. There was no power to execute the volition, if it had existed. This was true not only of speech, but of all expression.

She learned to use her eyes and ears, to walk, to know her name when called, and to obey a few simple commands.

Case No. 2. A boy of eleven years old—could walk, having learned this before the access of the convulsions that caused his idiocy. There were but two or three objects that he ever held in his hand, or attempted to grasp. He would take food in his hand, and carry it to his mouth. Tormented with a perpetual thirst, he would carry a cup of water to his lips, dropping the cup as soon as it was emptied. Dropping scarcely expresses it—his grasp relaxed and the cup fell. His only play-thing was a bunch of strings that he shook before his eyes, intercepting the light. The organs of sight and hearing were perfect; but he used the former only in relation to food and the single play-thing referred to:

the latter never, that I could discover, though experiments were made upon him with guns, and all sorts of surprises in the way of sounds. There was no perception of articulate sounds—no imitation, and no attempt to utter them.

As in the former case, the nerves of relation and of special sensation were at fault. The nervous centres originated no action. The radiant nerves transmitted no co-ordinating influence. The dormant mind knew no language, remembered no language, and attempted none.

But, in distinction from the former, there was in this case a marked enjoyment in being fondled, in being held in the lap. He would in return, rub his cheeks against his mother's cheek, and put his arm around her, and he had been taught to put his lips to hers, though without any effort to kiss with them. In other words, he understood and could respond to, in some slight degree, the natural language of affection.

Case No. 3. A boy of nearly five years old—healthy in infancy, during which he learned to walk and talk in the usual manner. At three years old, began to have convulsions at intervals, depending apparently upon a dropsical effusion in the brain. The head expanded rapidly, and the temporal veins were much enlarged. Under the influence of these attacks, his mental faculties were gradually impaired. His speech continued in some degree, as also the power of expression by signs. Some six months before he came under my care he had a severe convulsion, which ended the series. His intelligence was not more affected by this than the preceding ones, but the connection between the brain and the vocal organs was entirely severed. He did not comprehend language, though his hearing was unimpaired, and he was quite appreciative of musical sounds. He spoke no longer: there was no automatic action in that direc-

tion; there was no accidental utterance of articulate sounds. He soon grew lively and playful, and when thus engaged looked quite intelligent. He responded to the advances of his brothers and sisters when they frolicked with him. But he did not seem to know that he had vocal organs. He grew imitative, even learning to hum several airs, but never attempted articulate sounds. This state continued for a year or more, though he was learning rapidly in other directions. At last he attempted to whistle. He was encouraged in it, and slowly, and with patient efforts in exercises in articulation, in connection with musical sounds, he was brought to speak. The severed connection was restored. He learned not only to speak, but to read and write. The loss of speech and intelligence, and the progressive steps in the recovery of both, were not synchronous.

Case No. 4. A girl of five years old. At about two years old had hydrophobia with convulsions. Animation was suspended, and to all appearance she was dead. At the end of half an hour she revived, but with returning spasms. These continued some twenty-four hours, when it was found that she had forgotten every thing previously acquired. She was as ignorant and helpless as a new-born infant, though previously she had been rather precocious, walking well and talking quite distinctly. In a few weeks, she gained strength and the ability to walk, and then walked incessantly during the day for five months, disregarding everything. She continued to have occasional spasms from fear, at the sight of a dog or cat. She remained in this condition for fifteen months, not recognizing her own parents, ignorant of her own name, and utterly incapable of imitating anything. At this time, a change of medical treatment had the effect to make her more quiet by day, and laid the foundation for improvement in other respects.

When placed in my hands she was the picture of robust health, with a wonderful activity and fearlessness. She had a great imitative faculty—would make the motions required with her lips and tongue; would make sounds, but had no power to combine the action of the larynx and articulating organs. I had had but little experience then, and I find that I called it paralysis of the vocal organs. It was a want of co-ordinating power. She began to learn to speak only after a long preliminary training, all pointing to this faculty. In fact, reading came before or in advance of speech. In our course of instruction words precede letters. She learned to distinguish many of these. The teacher would show her a word. She promptly pointed to the object, or made an adequate sign, or imitated the action. The teacher looked inquiringly still. She recalled mentally the spoken word—she attempted its utterance and, after several efforts, perhaps succeeded. It was a forced utterance, not spontaneous, natural or vernacular. This girl did not have continuous treatment, and at the age of puberty became an epileptic, and manifested some evidences of insanity. She however learned to speak many words and short sentences, but always failed in co-ordinating power.

In connection with the cases already described, a word or two may be said of the means taken to obviate these incapacities in the way of expression. These should obviously be directed to the very point of interruption, when this can be determined. The avenues to the brain and mind must be opened. Perceptions of sight and sound must be forced through the obstructed channels. The will must be brought into exercise. The pupil must be made to comprehend language, commands accompanied with gestures, the names of various objects. Then may follow exercises in imitation of muscular move-

ments, very palpable at first; then exercises in individualizing and co-ordinating muscular movements. At last attention is directed to the vocal organs, and similar exercises are continued to individualize and co-ordinate these. Then the imitation of simple sounds—simple articulations—words of easy utterance. In time the machinery of expression is so perfected that it only awaits the spontaneousness of the pupil to set it in motion. And speech comes, though perhaps in a halting way.

A case or two will illustrate the form of this hesitation. During this whole course of training, the teacher in his attempts to communicate with the pupil is compelled to use that form of expression which is best comprehended by the pupil. Now it is gesture alone, now a combination of speech with gesture, and finally the voice alone suffices as a means of communication.

Case No. 5. A stout boy of thirteen years old, large head, but with rather a singular face, from a projecting forehead. He attempted to speak only a word or two, and these only his father could understand. In making these his face was contorted. He had been kept, to prevent his being in mischief, in his father's work-shop, and there had learned to understand any simple language addressed to him. His mental operations were very slow. He could not count nor distinguish colors by name, though he had quite a practical eye for forms. He used his eyes more than his ears. I should have observed that he did not make an effort to speak till nine years old, though he used a quite expressive pantomime. We applied the usual means of training, modified to meet his case by special exercises to make him think quickly. He was attentive, and made great efforts to follow the exercises in articulation. His reading was in advance of his speech. He picked up the deaf and dumb alphabet from some

of the other boys, and when reading he often was compelled to spell it on his hands before he could give it utterance. So when a question was asked him, he would often reply with a sign; then followed the memory of the word, which he would proceed to spell on his fingers; and by that time he was ready to give it a lame utterance. This boy learned to read and write, and speak quite distinctly. His utterance was always deliberate, and in case of difficult words one who knew him could always trace the steps in the process from idea to utterance.

Case No. 6. A boy of eight years old—good looking and well formed—idiocy supervening in infancy. He looked intelligent, was very gentle and obedient. He understood any simple language addressed to him or spoken in his hearing. His mother, when asked, said that he talked. On examination, however, it was found that he simply repeated the sentences he heard, or the question spoken, originating nothing in the form of speech, under any circumstances. This he did evidently understanding the meaning of the language repeated. If a question were asked him the meaning of which he knew, and the answer to which he should know, he only repeated the question as it was given him. The teacher would reply, "say yes," or "say no," or whatever the answer should be. He at once repeated the whole, "say yes," or "say no." The control over his vocal organs was complete. He spoke quite distinctly, and with appropriate emphasis. He was quite intelligent in comprehending what was said to him, and in increasing the range of his comprehension of language. He soon began to learn rapidly the exercises given him, but the power or disposition to originate speech, even within the range of his wants or his affections, was wanting. He was an only child and tenderly cared for at home, and

the change to the institution was keenly felt. If one said in his hearing, "Do you want to go home?" he would repeat the question in a tone that betrayed his feeling, but he did not say of his own impulse even the word home. The failure in the power of speech seemed to be in the absence of the proper volition.

In this case, the defect was overcome at last through reading exercises, and he now speaks spontaneously. Not long since, a favorite companion who had a habit of removing his boots in school-hours, was called to account for this by the teacher in his hearing. She said to the boy, "I told you that if you took off your boot again, I should have to punish you." He interposed at once, addressing the teacher, "You said if he pulled off his boots; he has pulled off his shoes this time."

Case No. 7. A boy of thirteen years old, idiocy resulting from convulsions in infancy. He was good-looking, and quite gentlemanly in his appearance and deportment, but very nervous and restless. He understood any ordinary commands, and used an expressive pantomime, supplemented by a few single words uttered rapidly. This came only at 11 or 12 years old. When animated he looked quite intelligent. There was great quickness of perception in this case, and great imitation. In the play-ground, or in the school-room, when excited, he would utter brief sentences, quite distinctly. If asked to repeat two or three words he would say only the last,—thus, "my ball," "*ball*," "this book," "*book*." His memory would not go back of the last word in his attempt at repetition; and this in case of short sentences that he was in the habit of uttering spontaneously. The will had control over his speech only when under the stimulus of emotion.

Patient and varied efforts were brought to bear upon him to bring the power of utterance under the control

of his intelligence. The road at last was found, and he improved greatly, though never acquiring continuous speech. The teacher would repeat the consecutive words to be imitated in the most earnest manner, suiting tone and manner and gesture to the word, till the boy, borne along by a sympathy with the feeling that seemingly prompted the utterance, unconsciously uttered the desired sentence. He frequently amused himself by writing on a slate. At such times he would sometimes say, "Me write a letter?" and permission being given, he would cover his slate with written characters, and then bring it for inspection. A little distance off it had all the appearance of ordinary writing. There was a proper mingling of long and short words. There was a frequent recurrence of what seemed to be *and, the, is, say, &c.* There was an imitation of the elementary forms of the letters. And yet in the whole of it not a single word or letter as such.

Case No. 8. A boy of eight years old, active, good-natured and playful. He knew his name, understood some simple language addressed to him, but made no effort to speak. His countenance was quite expressive of his general wants and feelings, and of his comprehension of what was said to him, but he did not use any variety of pantomimic signs. In his new home he learned to distinguish forms and colors, to take part in simple gymnastic exercises, to notice pictures, to imitate elementary sounds, to speak some names of objects easily pronounced, and to recognize these when printed on cards. If he is asked to point to boy, hand, eye, dumb-bell, &c., he does this correctly and readily. If shown a printed word he knows at once what it represents, and points to the object, but his memory seems at fault as to the name, till it is pronounced in his hearing. Then he repeats it without difficulty. It is the memory of the

words, and not the memory of the acts by which the words are articulated, which fails him.

Case No. 9. A girl of ten years old, with slight deafness, and some choreic motions. She did not notice sounds unless very loud, or unless her attention was first attracted in some other way. With this peculiarity she of course had a very limited comprehension of language, unless accompanied by gestures or signs. She tried to say but a few words, and these were pronounced quite indistinctly, and with the same want of modulation and timidity of utterance commonly noticed in those who become deaf in early life. She did not use her ears, and so failed to appreciate the function of speech as a means of communication. There was therefore no disposition to make the effort to speak.

It was only necessary in this case to teach her to listen. This was done, and she now speaks and reads distinctly; hears and comprehends what is said to her. She reads quite well in the elementary reading-books of the school-room, and she comprehends the meaning of the printed page, not *directly* through the medium of the eye, as in the case of deaf-mutes, but *indirectly* as the printed words are the signs of spoken words, of which she knows the meaning. She can and does talk connectedly and sensibly upon matters within the range of her intelligence and knowledge.

Case No. 10. A boy of eight years old—tall of his age and good-looking, but with a few scars on his neck from scrofulous disease. He was partially deaf. The apparent deafness was increased by a disuse of the sense which has been noticed in the previous case, a deafness in the perceptive ear. Thus the ordinary sounds of common life, full of meaning to the natural ear, made a faint impression upon his organ of hearing, and through some defect in the brain itself, or in the nerves communicating

between the ear and the brain, he had not learned to interpret those sounds into a living language.

He spoke but a few words, and these he had learned by imitating the motions of the lips of others. He was thus practically a deaf-mute.

The efforts of instruction were directed not to communicating with him through the eye, substituting that channel of ideas for the obstructed one through the ear, but to removing the obstructions in the latter. He was exposed to the influence of a variety of sounds which were loud and distinct. His attention was called to the organ of hearing in every possible way. His eye was made to help the ear in the process of tuition, by, as it were, following the sounds from the lips (the explosive labials) till they reached the ear, and by connecting with language appropriate gestures.

Simultaneously with these exercises, the effort was made to improve his speech by a vocal drill in imitating motions of the lips, imitating elementary sounds, cultivating the power to make the co-ordinations necessary to speech. The word-method of teaching reading in use in the Asylum could be followed at the same time, in the case, by selecting words at the outset that were easily pronounced, and which made a decided impression upon the ear when uttered.

He learned to hear and talk, and is now learning a trade, where he communicates with his companions by the ordinary methods.

In enumerating the general forms under which the defects of expression might range themselves, as seen in my experience, I mentioned but a portion of them. The fact is, every idiot is, so to speak, an exception to general laws, and when attempting to classify him in relation to any particular he is found to transcend class limits at

some point or other. A careful study of almost every one of these anomalous cases presents some point of interest. Thus I have seen a case of retentiveness of memory of minute particulars occurring in daily life, that seemed to exceed the scope of that faculty. I may properly here describe a case that seems anomalous as related to language.

A multitude of relations are appreciated before the power of comprehending or using the proper expression of those relations is acquired. The case I am now about to describe will furnish an illustration of this last point.

It is a common saying, that language is a means as well as the instrument of thought. This is unquestionably true of continuous trains of thought. But in childhood, before language is acquired, some degree of thought is common, even to the extent of what Dr. Robertson calls syllogistic reasoning. Some of the first lessons of experience are acquired before any comprehension of language even. The truth expressed in the proverb, "The burnt child dreads the fire," is thus mastered long before the lesson could be inculcated by any other method than experience.

A boy of ten years old, in whom idiocy supervened after some disease of infancy. He comprehended language in some degree—would obey a few simple commands, and in time learned the names of a few familiar objects, which he would hand one when asked to do so.

Relations of numbers, it may be observed, are supposed more than any others to require some exponent palpable to the eye or ear. Marcel, in his work on language, upon this point remarks, "that ideas of number beyond six or seven, are impossible without names or exponents." The boy of whom I now speak was being taught the first idea of number; our custom is to begin this before the names of the numbers are imparted. He

was taught to string black and white beads alternately, then in pairs, and so on up to fours and fives, where the exercise is dropped, to be resumed again when the names of numbers have been learned. He, however, had fallen into the hands of a new teacher, who not understanding the matter had continued the exercise. I found him one day, to my surprise, stringing thirty-five black and white beads alternately. I found, on still further examination, that up to this point it was only necessary to indicate any number, by first placing them on the string, and then he would continue to alternate the required number without mistake.

My first thought was, in the absence of the power of counting he was enabled to do this by measuring on his string the alternate distances accurately. I found, however, that, owing to a marked difference in the size of the beads, these did not correspond at all. I have no explanation to offer for this mental operation, but it seems to me that number was comprehended to the extent mentioned, without language.

In ordinary persons, language is used invariably in mental processes, I doubt not, even stopping short only of the actual utterance, and including the necessary co-ordination to produce it. However, is it certain that when this power fails, or memory of language, as in certain cases of aphasia, thought must on the instant cease?

I have thus noted a few cases in the different stages of development in the power of expression. Substantially the same features may be seen by watching the growth of any normal child. In the case of idiots the development is so much more gradual, is attended with so many more difficulties, that the steps of the process can be more distinctly marked, and more thoroughly comprehended. I have attempted to bring out, incidentally, the fact that this power of expression is the result

of long-continued and varied training and exercise. In the case of idiots it is through the direct and positive labors of the teacher to that end, because in these cases there is a failure (as one of the conditions of idiocy) in the natural out-reach towards this acquirement. In ordinary childhood there is the capacity, the intuition, the craving and the aptitude for every form of expression, in its true order and relations, and an inborn curiosity; and imitation and surrounding circumstances lead these to their end.

This power of expression, then, it seems to me, is not a simple function exercised invariably in connection with a healthy organ. Nor is it a complex function, dependent upon the normal play of a series of organs. It lacks the prime conditions that attach to function.

It is a divine gift; typical in the race, because possible only when associated with those various other human endowments, in connection with which it grows, and with which in life it is so inseparably interwoven and related; and without which it is not. It is prophetic in its capacities, awaiting the development of the individual or the race that needs its ministrations; ever ready for any emergency of want or wish, thought, emotion or aspiration.

But to return, in closing, to the causes that interrupt or interfere with its exercise. Here is an indwelling spirit, as much an entity as the organization through which it is developed, and by which it manifests itself. Can this spirit, possessed of the power of expressing itself in various ways, through instinct, through intuition, and through education,—a power involving in its exercise so many instrumentalities and agencies, and modified by a thousand immaterial influences; can this spirit be deprived of all, or a part of these, invariably, by a physical change in a single link in the chain of mere instrumentalities?

