THE TREATMENT OF STAMMERING (AND "LALLING").

By HAMILTON GRAHAM LANGWILL, M.D., F.R.C.P.E.,
Physician to Leith Hospital.

[THE following article has been written at the suggestion of Professor Wyllie, who did not see his way at the present time to comply with the request of the Editor for a contribution upon the treatment of stammering. Written, therefore, by one of his former pupils, the greater portion of this article is based substantially upon Professor Wyllie's teaching on this subject; but the writer would not wish him in any way to be held as homologating all that is stated therein.]

The condition of stammering or stuttering is so frequently met with amongst patients that it is somewhat extraordinary how little attention is given to the consideration of it in the ordinary textbooks. The amount and degree of mental suffering endured by the unfortunate stammerer can scarcely be estimated except by those who have experienced it; and yet, for various reasons, it comes about that parents, who may be ready enough to call in the services of their medical adviser for merely trifling and passing ailments in any member of their family, seldom bring their children to a doctor on account of this comparatively common and extremely important defect of speech. It thus unfortunately happens not infrequently that the habit of stammering, which is usually acquired during the years of childhood, has become so deeply rooted by the time the patient reaches an age at which he has to enter upon his future career, that he finds himself heavily handicapped; for it is a striking fact (though the question of the etiology of the condition is not under consideration at present) how much greater is the frequency of stammering amongst males than amongst females. What the writer aims at doing in the present article, therefore, is to draw attention to a method of treating this very important and frequent, but yet obstinate, defect of speech, which not only has proved eminently satisfactory in his own experience, but has the great merit of being applicable by any practitioner who has once carefully mastered the simple principles upon which it is based. Too often it happens, if the advice of the family practitioner is sought at all in reference to the condition, that he is unable, for want of any clear and precise methods of instruction on the subject in the ordinary textbooks, either to undertake the treatment of the patient himself, or even suggest to the parents how to proceed in seeking advice. Of so-called "stammer-curers" there is no lack, but the secrecy of the methods adopted by the great majority of these is scarcely in their favour, even if the methods generally practised by them were more physiological than is usually the case. It is, therefore, with a view to endeavouring to meet such a want that the following summary is here given of the method which the writer himself was taught, and which he has since frequently practised with markedly satisfactory results. Those desiring a much fuller and more elaborate consideration of the principles upon which it is based will find it in Professor Wyllie's book on *Disorders of Speech*.

GENERAL CONSIDERATIONS.

In commencing treatment it is most important at the outset to explain clearly to the patient the mechanism normally employed in speaking, especially emphasising the double nature of the process—vocalisation and articulation, showing him the part played by the larynx in producing the sound, and that played by the tongue, lips, etc., in modifying the same. The stammerer should then be made to understand that his defect consists essentially in a want of the proper harmony between the working of those two mechanisms. In a very large majority of cases the main error lies in the fact that so much attention is directed by the patient to his articulation of words that their vocalisation is neglected, and it is therefore to this (by far the commonest) type of stammering that attention will here be directed. Professor Wyllie's example of the violin player utilising in his performance two co-ordinated but separate mechanisms—namely, the "bow hand" producing the sounds and the "string hand" modifying these—is one which can be under-

stood by any patient, who can readily be made to see how effectually the player will "stammer" (or stick) if he concentrates so much attention upon the "string hand" (the "articulation," the common error of stammerers) that he neglects to produce the sound by the "bow hand" (the "vocal" mechanism). Moreover, the significance of the well-known fact that scarcely any one ever stammers in singing (where the "bow hand" is so much more in evidence than the (articulating) "string hand") is at once grasped by practically every pupil.

Should the stammerer have a "musical ear" the future treatment of his condition will be considerably facilitated, but the most unmusical patient will usually recognise that even his attempts at melodious (?) utterance are distinctly less difficult than speaking in his ordinary conversational tone. If the patient is unfortunately destitute of any "ear for music" the teacher should endeavour to get him to adopt the method of intoning (for example, as in church services), not, of course, for permanent use in talking, but in order that he may thus have firmly stamped on his mind, by practical illustration, the all-important part played by the cultivation of the *vocal* element in the cure of stammering. In this connection it may be of interest to point out another method which the writer frequently found of the greatest practical value, especially in the earlier stages of treatment. This consists in adopting when speaking the style, but still more the *tones*, of someone with whose voice the learner is familiar, when even the most difficult stumbling blocks were found to be easily surmountable. This faculty of imitating the tone and style of others (for example, a teacher or friend), is, of course, not possessed by all or in equal perfection, but where it can be utilised such a method of "getting out" a difficult word or phrase will be found, with a little practice, to be not only extremely easy and unobtrusive, but may even be made to appear quite natural in the circumstances. A similar advantage, of course, can be gained when the unfortunate patient is called upon to read aloud, if he adopts a "voice" different from his natural one. With his attention thus, as it were, constantly fixed upon the *sound* of the sentences, the *articulation* of them becomes much less of a difficulty than when he reads in his ordinary tones.

The general principle having thus been made clear to the patient of utilising to the full every opportunity of calling into action the vocal as contrasted with the articulatory mechanism in speaking, he should then be taught how, in the light of such principles, each individual letter of the alphabet is to be dealt with. This question is very fully discussed by Wyllie in the work above referred to. Here it is only necessary to reproduce in tabular form—with his kind sanction—what he terms the "Physiological Alphabet," with its illustrative sentences. These sentences, which enable the teacher to retain easily in his memory the Physiological Alphabet, and illustrate the relative positions of the various component consonants, must be clearly distinguished from the sets of sentences (to be subsequently given) which are for use in *treating cases of stammering*. In explaining this "alphabet" to the stammerer, it will be sufficient for the teacher to go over, *seriatim*, the individual letters as therein arranged, and practically demonstrate to him not only the existence of the "stop positions," but the articulatory mechanism called into action in producing the various consonantal sounds.

VOWELS.

The importance of calling the full voice into play in all vowel sounds should be strongly urged on the patient, and for teaching purposes the Latin sounds should be given to them. Wyllie points out that, *physiologically*, the order in which the vowels are produced in the oral mechanism is pronounced thus:

i e a o u
æ ē ā ah ō ū

namely, "in an order which will represent a gradual transition from the narrowest and tightest shape of the resonating chamber on to the hollowest and largest shapes" (p. 7). This is well shown by his illustrative sentence: "Even ancient elves are awed over oozing." Moreover, there are few more *practically* important points for the stammerer to recognise than the significance of the fact that the initial *Y* in phonetically practically equivalent to *æ*, there being

*A Physiological Alphabet. (Wyllie.)**Illustrative Sentences.*

I.—Vowels.
Y — I E A O U — W.
These should be pronounced in the Latin manner, as *ēē*, *eh*, *ah*, *oh*, *oo*; *y* and *w* are Consonants, not Vowels, but are placed here for reasons given in the text.

I.—Vowels.
"Even ancient elves are awed over oozing."

*II.—Consonants.**II.—Consonants.*

	Voiceless Oral.	Voiced Oral.	Voiced Nasal Resonants.	
Labials (First stop position)	P (W)	B W	M	Peter Brown made white wax.
Labio-Dentals	F	V		Fine villages.
Linguo-Dentals	Th ¹ S	Th ² Z		Thinkest thou so, zealot?
Anterior Linguo-Palatals (Second stop position)	Sh T (L)	Zh D L R	N	She leisurely took down nine large roses.
Posterior Linguo-Palatals (Third stop position)	K H or Ch	G Y (R)	Ng	Can Gilbert bring Loch Hourne youths?

The voiceless W and the voiceless L have been given in brackets, the former being now almost confined to Scotland, the latter being peculiar to Wales. The uvular (burring) R is also in brackets.

merely a slightly fricative element added. For as initial Y pronounced as "yeh" is very frequently a source of great difficulty to stammerers, who are quite surprised at the ease with which they can utter the same word if only it is pronounced as if it began with "ee" thus: "ee-onder" instead of "yonder." The initial Y is therefore bracketed in the physiological alphabet along with the vowels. Similarly, the initial W (except when followed by "h" is to be regarded by the pupil as a vowel, and pronounced, as Wyllie says, like "a tight oo" with a slight element of friction, for example, "oo-ill" instead of "will," "oo-ater" representing "water." Y and W are thus, to borrow Wyllie's phrase, "stepping stones between vowels and consonants," and such a frequently recurring phrase as "Will you?" (which has always contained a double difficulty for the stammerer) becomes quite easy to him if pronounced as though it were spelled "ooill ee-oo?"

CONSONANTS.

[Each of these is considered here "as it is pronounced during the enunciation of a syllable containing it."] The table shows the consonants arranged in vertical and horizontal columns, the vertical columns containing (1) the voiceless oral, (2) the voiced oral consonants, and (3) those voiced consonants which have in addition a nasal element imparted to them. The horizontal grouping, on the other hand, has reference to the part of the oral mechanism at which they are produced.

The significance of the "stop-positions" (that is, positions in the oral chamber where the air current from the larynx can be checked or modified) should of course be explained to the patient: but, what is far more essential, great stress must be laid upon the difference between the voiceless and the voiced consonants. The teacher should make perfectly certain that the pupil has firmly grasped the fact that some of the consonants have no voice in themselves, and from the outset he should see that the stammerer allows ample voice to all those consonants possessing it. It is in this that one of the greatest strides is made in gaining the mastery over his difficulty. For probably the commonest error present in stammerers consists in the fact that they omit the voice from consonants which physiologically contain it, and endeavour to impart it to others into which it should not enter. Accordingly when the pupil has learned not merely to recognise clearly that the initial B is (so to speak) equal to P with "voice" added, and similarly D is a voiced T, but has also learned to emphasise these facts practically (by thus giving due value to the vocal element in these consonants) he will discover that he has gained a large part of the victory. The stammerer should be taught to emphasise always (wherever possible) the voice element in

consonants, whilst these which are physiologically voiceless are to be touched off in articulation as lightly as possible, the effort of the pupil being, as it were, directed to the ensuing vowel or voiced consonant. Thus in saying, for example, "Bold Peter did fight," the pupil should lay stress upon the letters as italicised, the voiceless "P" and "f" being merely formed, so to speak, in the articulatory mechanism, but in no way emphasised.

It is, perhaps, worthy of noting that in listening to the pupil trying his exercises, the teacher in many cases should be able (without knowing actually the word he is trying to enunciate) to tell whether it begins with a voiced consonant or not. Thus, in saying "Tom Pinch," no sound is audible during the formation of the voiceless T and P, so that no one could tell what letter the pupil was trying to produce; it is merely an explosive character that is being silently prepared for the ensuing vowel. On the other hand, in pronouncing, for example, "dog biscuit" the pupil should give audible evidence that he is producing a voiced consonant, almost as if it were spelt (phonetically) "ud(-og) ub(-iscuit)."

It is unnecessary here to go over individually each letter as arranged in Wyllie's table here reproduced; but the teacher should make clear to the patient the reason for the classification therein adopted, and not rest content with merely explaining the terms applied to the various groups of letters. It is sometimes well to insist upon the pupil learning by practical experiment how, and in what part of the articulatory mechanism, each of the consonants is produced, so that he may be able to state whether any given letter is—for example, a "linguo-palatal (voiced)" or a "voiceless labio-dental"—not merely from having learnt the place it occupies in the alphabetical table, but from practical testing of its production in his own articulatory mechanism. A few notes upon some of the less evident points in the table may be of service, and for convenience these may be grouped under the following headings:

(1) *Voiceless Consonants.*

The pupil's attention must of course be called to the difference between the voiceless "th," in the word "think" as contrasted with the voiced "thou." He should also be made to understand clearly that the "hard" c in the English language is really K; the "voiced" equivalent of which we shall see is G as in "got."

The aspirate "h," which has been the subject of considerable dispute amongst writers on this question, would appear to be rightly described as a "voiceless fricative of the posterior stop position" by Wyllie, who also points out that the "soft" ch (as in the word "loch") is practically an exaggerated aspirate at the end of a syllable.

(2) *Voiced Consonants.*

As mentioned above, W should be regarded by the pupil as practically equivalent to "ōō," and therefore having all the "voice" of a vowel sound.

It may be well to insert here a few words with reference to the most satisfactory method of dealing with one of the common stumbling-blocks of stammerers, namely, words beginning with "wh." If, as is usually the case, it is found that the pupil attempts to pronounce the combined "wh" *voicelessly*, he will experience the greatest difficulty in uttering such words, but if he is taught to regard the initial letters as being really (phonetically) in the *reverse order* (namely, "hw"), and further that the "w" here represents the vowel sound ("a tight ōō"), he will find with a little practice that such words as "when," "what," "whether," can be easily uttered if they are pronounced as if they were spelt "hōō-en," "hōō-awt," "hōō-ether."

Stammerers frequently experience a similar difficulty in pronouncing words beginning with "sw," for example, "swim," "sweet," but this likewise they will easily surmount if they are taught to pronounce such words as if they were spelt (phonetically) thus—"sōō-im," "sōō-eet."

"Zh" of course is never spelt so in English, nor is it used at the beginning of a word, but, as pointed out by Wyllie, it is the equivalent of J in the French "Jean," etc. L and R, two initial letters that often give great trouble to stammerers, are both "voiced fricatives," and the pupil should be made to emphasise the vocal element in his practising, as his error commonly lies in attempting to pronounce them as "voiceless" consonants.

(3) *Voiced Nasal Resonants.*

The two consonants under this heading are very frequently a source of great difficulty to the stammerer. The teacher should therefore specially see that his pupil bears constantly in mind the *voiced* character possessed by them both, for there is possibly no commoner error amongst such stammerers than that of attempting to pronounce, for example, "never mind," as though the first voiced letter in each word was the *vowel*. Instead of emitting the voice feebly and interruptedly, he should be taught to pronounce the initial letter strongly and with a continuous hum. These nasal resonants are pre-eminently two instances where the teacher should be able (as previously mentioned) to foretell that it is a "voiced" consonant that the pupil is attempting to pronounce, from the fact that the *initial vocal element* is distinctly *audible*, as if it were pronounced thus (phonetically) (un)"never (um)mind."

It will be evident that some of the letters in the ordinary alphabet do not appear in the "physiological alphabet." The omissions, however, are readily accounted for: C if "hard" is equivalent to K, while if "soft" it becomes equal to S; again, J is phonetically really represented by "dzh" (for example, "Dzhoo" is the phonetic spelling of Jew), the same remark applying also to G when pronounced "soft" as in "George." These two letters, J and G (soft), occasion so much difficulty to stammerers from a failure to recognise the part played in their composition by the fully-voiced D that the teacher should frequently recur to them in order to impress the solution of the difficulty clearly upon the pupil's mind. Names such as John, James, George, etc., are so common that the stammerer should constantly bear in mind the initial D that they all contain. It is interesting to note that, as is well pointed out by Wyllie, the corresponding *voiceless* compound sound is seen in our use of the soft "ch," as in "chew," which phonetically is really "tshoo."

Q, of course, is really = kw—for example, "quail" becomes "kwait," while similarly X is equivalent to "ks" (for example, "ksiphoid"). It is thus evident that while apparently incomplete, the physiological alphabet contains all the existing consonantal and vowel sounds in ordinary use.

The requisite material having thus been supplied for the instruction of the stammerer, it is only necessary now to summarise here the method recommended by Wyllie in the management of such cases. Briefly it is as follows:

The important distinction between vocalisation and articulation should first be made perfectly plain to the patient, and the example of the violin player clearly impressed upon his mind, so that he may distinctly understand that it is his "bowhand" which is at fault, and that no exaggerated action

on the part of the *articulatory* mechanism can ever make up for deficiency of the *vocal* element.

He should be encouraged to speak with a full voice, and in specially difficult cases to practise speaking on a fixed key, or intoning, especially if he has a defective "musical ear."

He should then be taught the physiological alphabet very carefully, and more especially in connection with this the ("stammerers") set of sentences here given.

This second set of sentences, reproduced here by Professor Wyllie's kind sanction, is specially arranged for the *treatment* of stammering pupils, representing as they do the consonants as they are arranged in the *vertical* columns of the "Physiological Alphabet," thus bringing out clearly what is the all-important point in teaching the pupil—namely, the distinction between those that are "voiceless" and those that are "voiced." Thus:

A. *Initials that contain voice.*—(In pronouncing these the voice must be thrown boldly into the initial):

1. "Even ancient elves are awed over oozing."
2. "We visit the Zulus like ramblers yearly."
3. "My nephew."
4. "Best gold dust."

B. *Initials that do not contain voice.*—(These must be touched off lightly, and the voice be promptly brought out in the succeeding vowel or voiced consonant):

1. Far shores seem thinly hazy.
2. Two poor comrades.

With a view to greater practice upon some of the more difficult initials, the following sentences are also here reproduced:

A. *Those containing voice:*

Billy Button bought a buttered biscuit.
Davy Doldrum dreamt he drove a dragon.
Gaffer Gilpin got a goose and gander.
Mother make more mustard: no, no, not now.

B. *Those that do not contain voice:*

Peter Piper picked a peck of pepper.
Tiptoe Tommy turned a Turk for twopence.
Kimbo Kemball kicked his kinsman's kettle.

In practising these the pupil should be told specially to notice what letters cause him the greatest difficulty, and, after having had the physiological method of overcoming these explained carefully by his teacher, he should be encouraged not only to practise repeatedly sentences containing these difficult letters, but also to draw up further illustrative ones. At first it is well to give the pupil only sentences that contain initial consonants that are of *similar character* (that is "voiceless" or "voiced"); but after one or two lessons he should be given sentences that contain words with initial consonants of *dissimilar* character, so that he may learn readily to emphasise the "voiced" and touch off the "voiceless" initials as is required. After the pupil has thoroughly grasped the principles of the "Physiological Alphabet," he can readily draw up for himself illustrative sentences, especially such as contain the letters that prove the greatest difficulty to himself.

He should be instructed to read aloud for ten or fifteen minutes daily, his lesson commencing always with the "stammerers" set of sentences given above, and after going carefully through those and the exercises upon the specially difficult consonants, he should proceed to read poetry and then prose.

In these daily lessons he must be told to notice always what letters give rise to difficulty, in order that he may have these explained to him by his teacher if the pupil himself is unable to discover from the "Alphabet" how they ought to be pronounced. If necessary such daily lessons should be continued for months. He should always speak and read (as Wyllie says) "with voice, making music with the voice, and listening to it as he speaks."

He must learn to take inspirations at short intervals, so that he may have ample breath for giving the full vocal element to all vowels and those consonants requiring it.

With a pupil of average intelligence it is usually sufficient if two or three lessons (at intervals of a few days) are given upon the main principles, and especially the "Physiological Alphabet" and the second set of sentences, after which time all that is necessary is an occasional visit from the pupil in order to see that he is carrying out the rules accurately.

In not a few cases stammering is associated with indications of a neurotic constitution, and in some with too great an emotional excitability; and as its persistence is apt to increase this excitability, an early cure of the condition is highly important.

It will be noticed that the writer has not in this article made any distinction between stammering and stuttering. Stammering is best used as the general term which should include two varieties: (1) That in which the patient *stutters* in his speech; (2) that in which he *silently sticks*, making compressive efforts with his oral articulatory mechanism without emitting audible sounds. Since some authors, however, have included under the term stammering the condition known as "lalling," a few words must here be said regarding this condition, and more especially its treatment.

LALLING.

The nature and varieties of this phenomenon are very fully discussed by Wyllie, to whose work the writer would refer anyone seeking further information on the subject. Here it is sufficient to state that "lalling" is essentially "baby-speech," being presented in the speech of every child at its earliest stage of talking. It is a *morbid* phenomenon only when it persists for an unusually long time, as is the case in all children who are backward in mental development. Essentially it is a defect not in phonation, but in the *education of the oral articulatory mechanism*. The speech is (as Wyllie says) "scamped," the difficult articulatory movements being slurred over, so that the word may be made easy of pronunciation, as in the speech of babies, the easier consonants being substituted for the more difficult ones.

In treating such cases, if the patient be an intelligent adult, the instruction should of course be given to him or herself; when it is a child, the parents must be taught how to remedy the defect. The first essential is to find out upon what particular letters the patient "lalls." For this purpose the patient should be made to pronounce after his teacher (1) each of the *vowels* given simply; (2) each of the *consonants*; but these must be given by the teacher in three different ways, the pupil attempting to imitate him exactly, namely, (a) as *initial*, (b) as *terminal*, (c) as *mid letter*. The whole "Physiological Alphabet" must be gone through so that every defective letter may be detected by the teacher and noted down. Thus, for example, the letter P should be given to the pupil as Papa, apap, appa; similarly M as Mama, amam, amma, and so on.

The whole alphabet having been gone through in this fashion, the defectively pronounced letters being underlined, the teacher can afterwards concentrate his pupil's attention upon those on which he "lalls," and teach him, by demonstration in his own articulatory mechanism, how they ought to be pronounced. If the patient be intelligent and of sufficient age, careful instruction in this fashion will often effect a wonderfully rapid cure.

ON CEDEMATOUS AND ERYSIPELATOUS ANTHRAX.

By JOHN HENRY BELL, M.D.,

Consulting Medical Officer to the Bradford Royal Infirmary; and Consulting Surgeon to the Bradford Eye and Ear Hospital.

Our knowledge of the various forms of anthrax as they affect man in this country has been very slowly acquired. The external form known as "malignant pustule," or rather cutaneous anthrax, was not observed in England till the year 1854 (published in 1863). The pulmonary form, although it was known in the Bradford worsted district as "wool-sorters' disease" from the year 1846, was not recognised as anthrax till thirty-three years afterwards—1879. During these years cutaneous anthrax must have been seen frequently, but it was not diagnosed as anthrax till 1880; neither were such cases previously attributed to infection from wool. Other varieties of external anthrax, as the *edème malin* of Bourgeois, or malignant anthrax cedema, which I prefer to call cedematous anthrax and erysipelatoous anthrax, in accordance with the symptoms, although not uncommon in some countries of Europe, do not appear to have been observed in England previous to the cases now recorded.

Erysipelatoous anthrax has been so called solely on account of its resemblance to erysipelas, and not that it is a compound of erysipelas and anthrax.

It is, perhaps, appropriate that these varieties of external

anthrax and the pulmonary form of internal anthrax should have been first detected in the Bradford worsted district, where the disease as it affects both man and animals is more prevalent than in any other part of Great Britain. Primary intestinal anthrax has not yet been met with in England; but knowing that such cases are not infrequent in various parts of Europe, it is possible that they do occur here occasionally and hitherto have escaped detection.

The first cases of *edème malin* were noticed by Bourgeois in Provence, France, in 1834, and his observations were published in 1843. He wrote afterwards a very complete description of the disease in his book on *La Pustule Maligne et l'Edème Malin* (1861). All subsequent writers on anthrax have been almost entirely indebted to this author for their statements respecting malignant anthrax cedema, none have written from their own observations. This form of anthrax is rare. Dr. Nicholai states that out of 300 cases of external inoculation he had only seen two cases of this kind.

CAUSE.

How the virus becomes introduced locally when no point of inoculation can be seen is questionable; it may pass through natural openings of the skin or mucous membrane, and this may determine the production of a diffuse inflammation rather than the ordinary external lesion such as occurs when introduced through an abrasion or wound.

SYMPTOMS.

Bourgeois says, "It begins as a pale swelling, soft and without pain. It is only after several days and marked development that vesicles and eschar form, notably on the eyelids, but at the onset the skin is smooth and has no trace of pimple."

General symptoms are of a negative character. The freedom from pain and distress is remarkable. The pulse may not be much over natural and the temperature not more than normal.

Local symptoms are the extensive cedema which may extend from the scalp to the pubes, with much swelling. In the first case seen by Bourgeois in 1834 the lips of the patient protruded like the snout of a pig. In slight cases there is no redness, vesication, or eschar; in severer cases much redness, late vesication and eschar, or gangrenous appearance of the skin. In none has there been any pain, only tightness from stretching of the skin.

DIAGNOSIS.

The course of erysipelatoous anthrax is on lines so nearly parallel with ordinary erysipelas that the differences might easily be overlooked. The late Dr. Fagge, in his work on *Medicine*, states that "Zülzer speaks of the cedematous form of charbon as being sometimes mistaken for erysipelas." When a person has been exposed to contagion and is found to have considerable acute swelling of any part, especially of an exposed part of the body, unlike ordinary diseases, and without much pain, distress, or fever, this form of anthrax may be suspected. It may be distinguished from acute emphysematous gangrene and its congeners by the absence of injury, pain, emphysema, much fever, and constitutional disturbance. The only proof, however, is the finding of the bacillus by cultures or physiological tests with blood or serum taken from the body. In a slight case with cedema only it is probable that a few minims of blood taken from this part and injected under the skin of a white mouse would cause death from anthrax. Cultures are not so certain a test for anthrax as physiological experiments, but in doubtful cases they are more to be depended on for determining the kind of bacillus.

PROGNOSIS.

Every systematic writer on anthrax copies from Bourgeois's work. He states that *edème malin* is infinitely more dangerous than the pustule. Up to 1859 all the cases observed had terminated fatally. In 1861 he excepted some cases which had affected the eyelids. Of the 6 cases here recorded—if all may be taken as of this nature—it will be noticed that 3 were fatal.

Case 1.—(Edematous Anthrax.)

Dr. Rabagliati has kindly allowed me to copy from his diary the following notes of the illness of a gentleman, a wool-comber, who had been exposed to the infection of anthrax in the ordinary round of his business.