

On nervous or sick-headache : its varieties and treatment : two lectures delivered at Addenbrooke's Hospital, Cambridge / by P.W. Latham.

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ON NERVOUS OR SICK-HEADACHE.





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Plate I

Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7

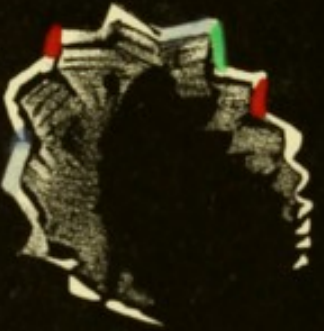


Fig. 8



PLATE I.

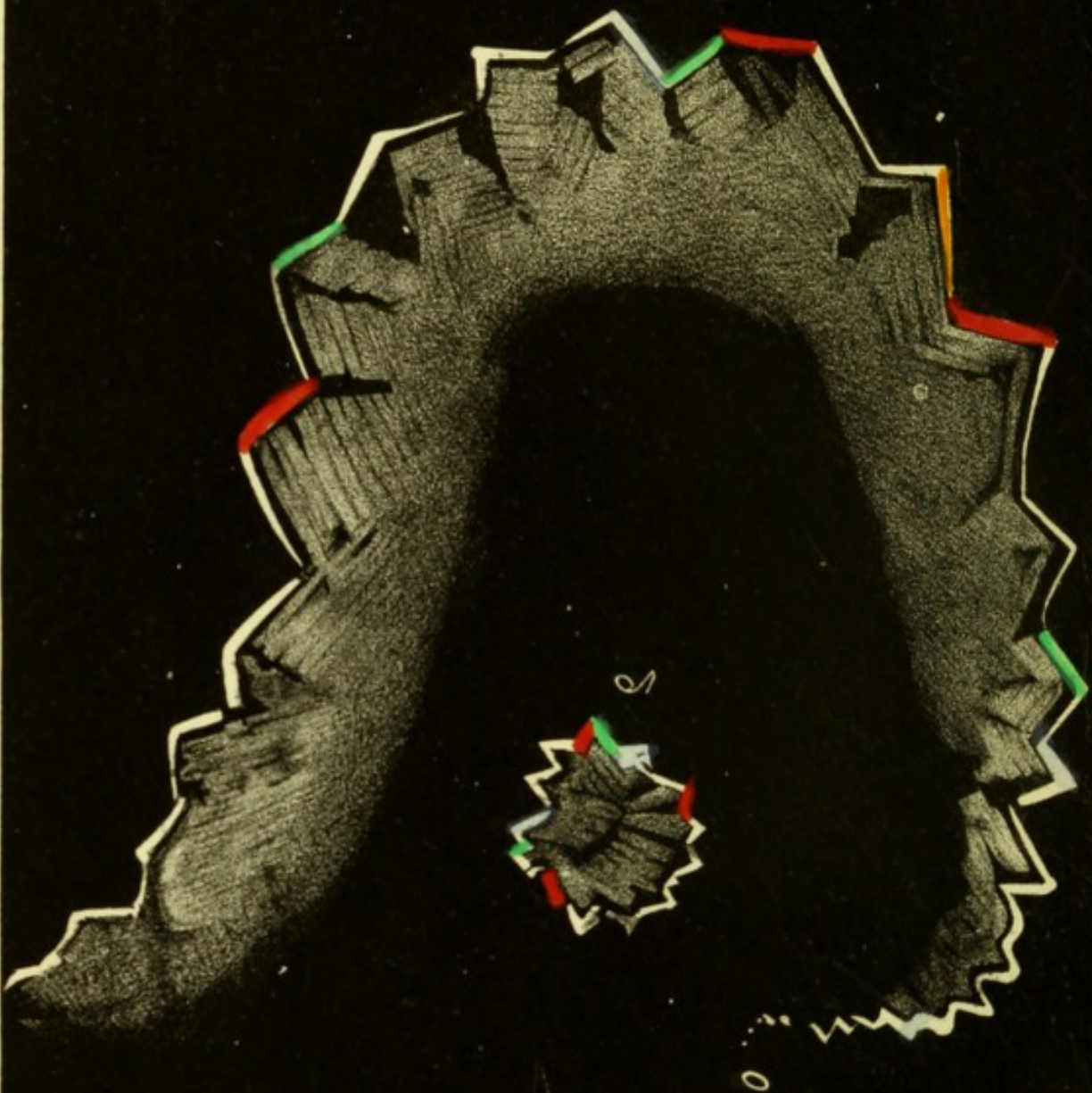
Figs. 1-4.—Early stages of the affection of vision which sometimes precedes sick-headache; the glimmering beginning close to the sight-point. (See page 7.) The letter O marks the sight-point, or centre of the field of vision, in each figure.

Figs. 5-8.—A similar series; the glimmering beginning a few degrees below and to the left of the sight-point. (See page 8.)

PLATE II.

The same phenomenon fully developed. δ . Beginning of a secondary attack, which never attains full development unless it arise on the opposite side. (See page 8.)





H. Airy, Del.

J. Jobbins, Lith.

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ON

NERVOUS OR SICK-HEADACHE

ITS VARIETIES AND TREATMENT.

*TWO LECTURES DELIVERED AT ADDENBROOKE'S
HOSPITAL, CAMBRIDGE,*

BY

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PREFACE.

IN the two following lectures I have endeavoured to show that the phenomena of what is popularly called sick-headache or bilious headache, may be produced by uncontrolled or disturbed action of the sympathetic nervous system. The first lecture was delivered in March, 1872, and soon after its publication in the *British Medical Journal*, my attention was directed to the papers of Du Bois Reymond, Möllendorff, and Wilks, whose respective views I have referred to, in my second lecture, which was delivered in February, 1873. My chief object however in writing the latter was to point out how, in my opinion, the disturbed action of the sympathetic is brought about.

The plan of treatment based upon this theory, and advocated in the following pages has, in my hands, proved successful; and I am therefore in-

clined to regard this fact as supporting, in some measure, the truth of the theory.

I am indebted to Dr. Airy for allowing me to reproduce the drawings (Plates I. and II.) which accompanied his paper in the *Philosophical Transactions*, "on a distinct form of Transient Hemiopsia."

CAMBRIDGE,
May 1873.

ON NERVOUS OR SICK-HEADACHES.

LECTURE I.

GENTLEMEN,—We have lately discharged from the hospital a young man, aged 17, whose condition during the short time he remained here did not fall very far short of the standard of health. He was somewhat anæmic, and of rather stunted growth, but he was sharper and more intelligent than the generality of his class: with these exceptions, there was nothing about his general condition which calls for remark. He had been troubled, however, with four slight attacks of what is variously called nervous headache, sick-headache, or bilious headache: the attacks commencing with mistiness before the eyes, and succeeded by unilateral frontal pain, nausea and vomiting. This affection does not often come under our observation in the hospital, though I suspect that, if carefully inquired after, the percentage of patients liable to the disorder would not be found so small as is generally supposed to be the

case. In private practice, however, the affection is by no means uncommon. It affects both males and females; and perhaps in an University town, owing to the large proportion of individuals of studious and sedentary habits, it may be more prevalent among males than in other places. At all events, it is a complaint which often comes under my notice; and in the forms to which I am going to refer, I believe much may be done to moderate the intensity and frequency of the attacks.

The symptoms accompanying some forms of this disorder have been detailed *ad vivum* by Sir John Herschel, the Astronomer Royal, Sir C. Wheatstone, Professor Dufour of Lausanne, and others; and in the *Philosophical Transactions* of 1870, p. 247, you will find an extremely interesting paper by Dr. Hubert Airy (On a Distinct Form of Transient Hemiopsia), wherein he faithfully and most graphically records his own experience of the affection, and quotes the descriptions which have been given by the above distinguished persons. With many of the comments contained in the paper I entirely agree; but there are some points upon which I can supplement the information there given: and my chief object in bringing the subject under your notice is with a view of trying to explain how the symptoms may be produced.

The headache is preceded for a variable period by certain disorders of sensation, the most striking of which is a transient disturbance of vision, which sometimes takes place. In some persons, the malady stops short here, and is not followed by headache; in others, the headache appears to be developed without any premonitory symptoms, until careful inquiry reveals the contrary. The complaint then has two stages. 1. The stage of disordered sensation. 2. The stage of headache, nausea, etc.

I will first consider the forms attended with disturbance of vision. Even this commences in different ways in different individuals, or even in the same individual. Here is Sir John Herschel's account. "I was sitting one morning very quietly at my breakfast-table, doing nothing, and thinking of nothing, when I was startled by a singular shadowy appearance at the outside corner of the field of vision of the left eye. It gradually advanced into the field of view, and then appeared to be a pattern in straight-lined angular forms, very much in general aspect like the drawing of a fortification, with salient and re-entering angles, bastions, and ravelins, with some suspicion of faint lines of colour between the dark lines. The impression was very strong, equally so with the eyes open or closed; and it appeared to advance slowly from out of the corner till it spread all over the

visual area, and passed across to the right side, where it disappeared. I cannot say how long it lasted, but it must have been a minute or two. I was a little alarmed, looking on it as the precursor of some disorder of the eyes; but no ill consequence followed. Several years afterwards, the same thing occurred again; and I recognised, not, indeed, the same precise form, but the same general character—the fortification-outline, the dark and bright lines, and the steady progressive advance from left to right. I have mentioned this to several persons, but have only met with one to whom it has occurred. This was a lady of my acquaintance, who assured me that she had often experienced a similar affection, and that it was always followed by a violent headache, which was not the case with me.”¹

At a subsequent period (November 17th, 1869), he writes to Dr. Airy as follows. “Since I wrote to you, I have been very frequently visited with the phenomenon in a greater or less degree. . . . It always now begins with a small glimmer *near* the middle of the field of view, and spreads out.”

In other cases, the attack begins by inability to see the spot on which the eyes are fixed, while all around is clear and distinct as usual. The area obliterated soon increases, and is one-sided; so that

¹ *Familiar Lectures on Scientific Subjects.* London, 1866, p. 406.

to the patient, if he be walking along the streets, his friends appear with only one eye each, or he sees one-half only of their faces. The names on sign-boards become half obliterated; and the patient is like Abernethy, who, when trying, after an accident, to read his own name, "could see as far as the *ne*, but could not see a bit of the *thy*." The edge of the part obliterated soon assumes the fortification-outline, this outline being faintly luminous; objects at the centre of vision become less completely obliterated, but a glimmering vibratory movement, somewhat resembling the undulations of heated air as seen above a hot stove, appears within the zigzag outline; and this movement gradually extends over the whole field of vision. This zigzag outline, which however is not always observed, has been variously described to me. One patient stated that it appeared as though the zigzags on a Norman arch were slowly moving along the arch, whilst another set were slowly moving over them in an opposite direction; and the glimmering vibratory movement which filled up the field of vision very closely resembled, he said, the appearance seen on looking through two pieces of gauze slowly vibrating in opposite directions.

I will now read you a few extracts from the account which Dr. Airy gives of his own sensations.

The first attack came on when at school, the last morning before the holidays. "I noticed it first by being unable to see the 'A' in 'tan A,' when I looked at the top. At first, it looked just like the spot which you see after having looked at the sun, or some bright object. I thought it might be an eyelash in the way, or something of that sort; but I was soon undeceived, when it began to increase. I then bethought me that it must be the same thing that——suffered from, so I let it alone, knowing that it would go off in time, which it did, leaving a most terrible headache behind it, which is the worst part of it, the blindness itself giving no pain whatever. When it was at its height, it seemed like a fortified town, with bastions all round it, these bastions being coloured most gorgeously. If I put my pen into the space where there was this dimness, I could not see it at all; I could not even distinguish the colour of the ink at the end. All the interior of the fortification, so to speak, was boiling or rolling about in a most wonderful manner, as if it were some thick liquid all alive. It did not belong to one eye, but to both, the right eye having the most.... Since then, I have very frequently been revisited by this affection.... Usually after two or three hours' close reading, especially if I have had insufficient exercise, I become aware that part of the letter I am looking at,

or a word at some little distance from the sight-point (in most cases, below, to the left), is eclipsed by a dim cloud-spot that would not be noticed except for this obliteration. Even at this very earliest stage, the tremor, that is so characteristic of the developed disease, can be detected, and as the cloud enlarges, it begins to assume its proper zigzag outline, enriched with tinges of colour.

“At this early stage the spot is but faintly luminous in a dark room, or with the eyes shut and shaded, and scarcely shows at all against a bright sky. Its shape and colours are best seen by looking at a shady part of the ceiling or a neutral-tinted wall.

“When this blind spot makes its appearance close to the centre of vision, as soon as it begins to spread and shows a serrated margin, it at once presents the irregular horse-shoe shape, with one arm adherent to the sight-point and the other receding from it outward. The teeth of the adherent arm are small and fine; those of the receding arm grow larger and larger.¹ But when the blind spot takes origin at some distance from the centre of vision, as it spreads it preserves its contour unbroken, stellate, nearly circular, until its margin nears the centre of vision; then the serration at the point nearest the

¹ Plate I. figs. 1—4.

centre shows irregularity, and a breach appears in the outline: one branch of the incomplete circle takes a smaller pattern of zigzag and recedes.¹ . . . The climax is generally reached in twenty or twenty-five minutes from the first beginning; then the large arm, having over-spread the margin of the field, begins to fade and leaves the lower part to recover slowly from the storm. The small arm is the last to perish; it remains in strength while the large arm is dying away; but soon the outward spread carries it in turn to the upper margin of the field, and it there exhibits the same fervour that characterised the career of the larger end. The whole duration of the phenomena is just half an hour, often with curious exactness. When the disease is about halfway advanced, I generally observe the rudiments of a fresh attack, beginning nearly where the first began, and sometimes advancing so far as to exhibit its bastioned margin, with rolling and tremor, as though the performance were to be rehearsed from beginning to end.² But there it stops and fades away, unless it arise on the opposite side, when I have known a second attack develop itself immediately after the first. The sight feels somewhat dazed for ten or fifteen minutes after the final disappearance of the phenomenon. Throughout the earlier part of this visual

¹ Plate I. figs. 5—8.

² Plate II.

derangement I feel no discomfort at all; my faculties are free to observe the phenomena closely and carefully. It is not till near the end, when the boiling is at its height, that the eyes feel oppressed, and the head has a presage that it is going to ache. The headache comes on gradually; it is not localised in any particular part; it lasts for five or six hours or more, accompanied with slight nausea."

Sir C. Wheatstone says: "This evening I had a curious affection of vision. Whilst I was writing, characters near the centre of vision became invisible. Thus, on fixing my eyes on figure 6 in the group 4^e, 4 and 7 were completely obliterated. After a short time, the spot became larger, spreading towards the left in both eyes until it occupied a large oval space. ... The only difference between the phenomena, as they appear to me and as they are described by Dr. Airy, is that in my case they are always unaccompanied with colour."

You will notice from these descriptions that there are different ways in which this stage commences; viz., either by a glimmering near the outside corner of the field of vision, or by a glimmering near the middle of the field of view, or by objects at or near this point becoming obliterated. Again, in some persons the phenomena are accompanied with colour; in others this is not the case, the fortification outline

only being somewhat luminous. In others, again, in slight attacks there is no colour, but in the more marked ones colours are seen not only at the outline, but generally vibrating over the field of vision; and in still more decided attacks numerous stars are seen floating in all directions. Another very important point about these attacks is, that in perhaps from one-fourth to one-third of the cases during this glimmering stage, there is tingling in some portion of the body—the part is *asleep*. In a young female that I saw, the tingling affected one arm and the side of the tongue; and, curiously enough, both her sister and her father were affected in precisely the same way. The tingling was on the *same side* as that on which the glimmering in the eye began. In another case, the patient complained of a feeling of pricking and scratching on that side of the face corresponding with the glimmering. In others, speech or hearing may be affected. The Astronomer Royal (*Philos. Mag.*, vol. XXX, p. 21) says: “In one attack on myself, which occurred while I was conversing with an acquaintance in a railway carriage, I soon became painfully sensible that I had not the usual command of speech—that my memory failed so much that I did not know what I had said or had attempted to say, and that I might be talking incoherently.” In reference to another case, Dr. Airy

says: "Sometimes the speech is affected and the memory at the same time; on one occasion the mouth was seen to be drawn to one side."

The last question I have to allude to about this vibrating stage is, Are both eyes equally affected? Dr. Airy thinks they are. Sir John Herschel says: "I have sometimes had an impression that *one eye only* was affected—the right eye being affected with the right-handed and the left with the left-handed spectrum; but I never could devise any means of coming to a conclusion as to this point, and on the whole I lean to the opinion that both eyes are concerned in either case." But a few months later he writes: "On the 16th ultimo, on waking, I found the 'fortification pattern' *certainly* in my left eye *only*, and much more vivid with the eye open and looking at paper than when closed." I think, for reasons which will be given when I come to explain the phenomena, that at all events at first and in slight attacks one eye only is affected, but that the "tremor and boiling are so oppressive as nearly to extinguish the corresponding vision in the other." Now this disturbance of vision is often associated with a feeling of chilliness, cold hands and feet, etc; it may last from five to thirty minutes or longer, and then be succeeded by the stage of headache, which shows itself as follows. When the vibratory move-

ment is at its height, a little aching is felt in the head, on the side *opposite* to that on which the glimmering first appeared; it is slight at first, but gradually increases in intensity. Some persons have said that the sensation was as though a point in the temple were being bored with a gimlet, and the gimlet slowly increasing in size. The pain gradually spreads from this point, which may be covered with the finger, and pressure upon which affords relief, first over one side of the head, and then, but not always, extends to the other. As the headache increases, the ocular disturbance declines, nausea is felt; this increases with the headache; there are retching and vomiting, the latter sometimes, though rarely, giving relief; the head throbs; the slightest movement increases the pain; and any attempt to move from the recumbent posture increases the gastric uneasiness; the mouth feels clammy; the eyeballs ache, and are tender on pressure, one more so than the other; the pupils are sometimes rather contracted, and not infrequently unequally so, the pupil on the affected side being the smaller of the two; the patient lies apparently more dead than alive; his face pale, and the head hot. After a varying number of hours he is somewhat relieved by troubled sleep; he wakes up next morning free perhaps from headache; but he is listless; his brain

is weary, and he feels as if he had undergone a hard mental struggle. There may be now an interval of a few days, weeks, or years, before the disorder again shows itself.

The headache varies much in character, degree, and duration. In some persons the pain is not localised in any particular spot, but seems generally diffused over the head; others have not noticed that there is more pain on one side of the head than the other, or that the aching radiates from one painful spot until their attention has been directed to the fact, and then they distinctly recognise it; others, again, have neither vomiting nor nausea; and lastly, the duration of the headache may be very short or not extend over more than two or three hours, or it may be entirely absent. The disorder may even stop short at the vibratory stage, the vision be restored, and no further inconvenience felt.

On the other hand, the headache may be, and in many individuals always is, developed without the ocular disturbance, but other sensations are substituted for it. The patient has a feeling of chilliness; the feet are cold, and there is mental depression; a dread of impending evil; he is restless and uneasy; "cannot quite tell," as he says, "what he would be at;" he has what is expressively called the "fidgets." This condition may continue half an hour or more,

and then the slight boring piercing pain is felt in the head with which the aching begins, and the disorder runs its course as in the forms previously mentioned. In other cases, this feeling of depression or uneasiness lasts for several hours, the patient goes to bed, and in the early morning wakes with the headache fully developed.

I will now state the conditions under which this disorder shows itself. The great majority of persons who have come under my notice suffering from the headache were at the time more or less anæmic; there was a general want of tone—a relaxed condition of the muscular and the arterial systems, especially of the latter; the pulse being rather small and soft, often decidedly slow, but much accelerated on slight exertion or excitement. Even in those who were not anæmic and appeared robust, there was still this want of tone about the pulse. The sufferers possess what is called the nervous temperament; their brains are excitable, their senses acute, and their imaginations free. The attacks are induced by prolonged mental work, protracted mental excitement, or any intense strain on the feelings, such as grief, anxiety, passion, etc. Bodily fatigue, late hours, loss of sleep, the depression which follows over-excitement, a debauch, etc., are all predisposing causes; and it is curious that the attack is not

generally developed during the paroxysms of mental excitement, but afterwards, when the excitement has passed off, and the mental strain is somewhat lessened. In some persons already predisposed to an attack, any strong impression produced on the retina or on the olfactory or auditory nerves is sufficient to excite the headache. Again, in females, the attacks are more frequent at or after the catamenial period. Now, it is to be observed that all these causes, and causes like to them, are of a depressing nature; exhausting the powers and, therefore, lowering the tone of the system; putting it out of tune, disturbing the harmony in the functions, and, at the same time, exalting the susceptibility of the nervous system. What results from this condition? We possess, besides the cerebro-spinal system of nerves, a sympathetic nervous system, the ganglia of which can conduct, transfer, and radiate the effects of impressions; their power being controlled and regulated by the superior force in the cerebro-spinal centres. Let the general tone of the body be lowered, and with it the regulating power of the brain be impaired, then the conduction and radiation of impressions through the sympathetic ganglia are no longer interfered with, and, instead of tranquil, even, harmonious action in the various organs, as in perfect health, we have convulsive, excited, and painful movements.

Let me say one word or two now with regard to the physiological action of the sympathetic nervous system. Its branches, constituting the so-called vaso-motor nerves, reach their ultimate destination supported on the large and small arteries, and control, in a remarkable manner, the action of the muscular coat of these vessels. If the sympathetic nerves distributed to any part, as for example, the neck of a rabbit, be divided, the small arteries of the corresponding side of the face and of the lining membrane of the external ear become dilated, blood accumulates in them, and there is an elevation of temperature. The retina becomes more sensible to light; the pupil, in consequence of the action of the oculo-motor nerve on the circular fibres, contracts, and a flow of tears takes place. If the distal portion of the cut nerve be now irritated by galvanism for a minute or so, the vessels contract so as to diminish their calibre, the radial fibres of the iris contract, and dilatation of the pupil takes place.

I shall now proceed to apply this to the disorder we have been considering, and to show first of all that we have *contraction* of the vessels of the brain, and so a diminished supply of blood produced by excited or uncontrolled action of the sympathetic; and that the exhaustion of the sympathetic following on this excitement causes the *dilatation* of the vessels and the headache.

It is well known that the vision is disturbed by a diminished supply of blood to the brain—as, for instance, in the faintness which is induced by hæmorrhage. The patients become giddy; everything appears dark before them; perhaps they have, moreover, flashes of light before their eyes, or noises in their ears, and then become insensible, and sink to the ground. How often do we hear from persons who are dying from asthenia such expressions as the following? “How dark the room is”; “I can’t see”; “open the shutters”; telling us too plainly that the heart is powerless to drive the blood onward to the brain. Now, in one instance which came under my notice, the person who had been occasionally troubled with the form of headache we are considering, stated that he once fainted. “I was very much fatigued, and had run quickly up some steps, when I tumbled on the floor; the faint was only momentary; I immediately recovered myself, and took the nearest seat. On sitting up, everything became dark before me, so I leant forward and put my head between my knees. I then noticed the appearance before my eyes; it had precisely the same character as the wavy glimmering which preceded the headaches, but was much darker, more marked and extensive; it only lasted half a minute or three-quarters, then entirely passed off, and no headache followed.” Here is

another account which strongly supports the view I take of the phenomena. "I had not been troubled for two or three years with these blinding headaches until one morning, as I was sitting at breakfast, the symptoms showed themselves. I had been overworked for some little time, and felt chilly and irritable as I sat at table. I was looking sideways at the window, watching the falling snow, when I noticed that one of the panes of glass appeared as though warped and waved, the lines of snow becoming indistinct at the part; as I moved my eyes, the other panes of glass presented the same appearance; then on looking at the wall, I recognised my almost forgotten enemy; there was a distinct glimmering at the right side quite at the edge of the field of vision. I immediately lay down on the couch with my head low; the appearance of glimmering gradually extended itself over more than half the field of vision, and continued for about twenty minutes. I noticed that it was less distinct when I lay on my left side than when I lay on my right; when it was declining, as I turned to my right side, the movement was more plainly perceptible. The headache on the left side had been gradually increasing; my feet were very cold, and when the glimmering had almost disappeared, I got up and drew an easy chair to the fire, but had not been

seated more than a minute, when the glimmering became more distinct and appeared to extend. I at once lay down again, when the disturbance of vision soon ceased, and the headache took its place." This disturbance of vision, then, is due to defective supply of blood to one side of the brain from the contraction of the cerebral arteries, probably of the middle cerebral. In the case which I have just read to you, there was loss of tone about the cerebro-spinal system from overwork; the brain is no longer able to inhibit the action of the sympathetic; a slight cause serves now to excite the action of the latter nerve; it affects more particularly the cerebral artery of the left side, causing glimmering on the right side of the field of vision. The glimmering is lessened by adopting a posture which allows the blood to flow readily towards the part affected. The patient rises before the optical disturbance and the excitement of the sympathetic are entirely over; in the erect posture the blood is driven with less force to the brain, and, with the lessened pressure on the arteries, these contract more strongly, owing to the still excited state of the sympathetic, and the glimmering increases. The patient lies down again, the blood is driven with increased force to the brain, the resistance of the arteries is overcome, the action of the sympathetic is exhausted, and the same condition

results as is observed after section of this nerve. The vessels become distended, the head throbs and aches, and the pupil contracts. If we take this view of the disorder, you will perceive that it has (as was first suggested to me by my friend Dr. Edward Liveing) a relationship, though happily a very distant one, to epilepsy. The contraction of the cerebral arteries, the tingling in some portion of the body and twitchings of the muscles, which, as you see, are sometimes associated with it, suggest the resemblance; whereas it differs widely from that terrible disorder in that it never threatens life, it is never associated with unconsciousness, and I have never known of its passing into epilepsy.¹ On the

¹ The recent communication of M. Brown-Séguard to the Société de Biologie has an important bearing on this point. Some years ago, M. Brown-Séguard discovered that epilepsy could be developed in the guinea-pig in three or four weeks after section of the sciatic nerve near its origin, or, still more certainly, by forcible ablation of the nerve, and that then, by gently irritating a certain zone in the temporal region, fits could at any time be produced. But he found that section of the spinal cord immediately above the origin of the sciatic nerve does not give rise to epilepsy; and this led him to suspect that the symptoms were due, not to section of the fibres of the sciatic nerve proper, but to section of the fibres of the sympathetic united to the sciatic after its emergence from the spinal chord. "Division of the great sympathetic in the abdomen produces only transient effects—incipient symptoms, as it were, of epileptic attacks, but nothing positive or definite. On the other hand, section of the roots of the last dorsal and first lumbar nerves produces epileptic attacks, and it is known that these roots furnish sympathetic filaments to the sciatic nerves. From all this M. Brown-Séguard concludes that it is

contrary, with advancing age the attacks, as a rule, become much less frequent. They cease generally after fifty or sixty, and in women not uncommonly at the change of life.

There is no *à priori* reason why the sympathetic nerve of one side only should be affected, and therefore the disturbance of vision only affect one eye, except that in nervous disorders generally, such as chorea, epilepsy, tic douloureux, etc., one side of the body is often much more affected than the other; but the statement of Sir John Herschel, the fact of posture increasing or diminishing the intensity of the glimmering when it exists at one side or other, the succeeding headache commencing unilaterally, all tend to support the view that the affection at least commences on one side of the brain. The other side may, and probably does, become involved, if the glimmering spread over the whole field of

to the section of the sympathetic that we must essentially attribute the artificial production of epilepsy." (*Lancet*, Oct. 5, 1872, p. 502).

Would not these experiments of M. Brown-Séquard rather show that a series of morbid phenomena originating in section of the sympathetic alone might develop such symptoms as are associated with migraine or sick headache? but, that for the production of epilepsy, there must be a series of morbid phenomena both in the sympathetic *and* in the cerebro-spinal system—structures must be operated upon containing the two kinds of fibres; and possibly this is the reason why, though the two disorders may be essentially different and distinct from each other, they have some symptoms in common.

vision. If the attacks, however, begin with the disappearance of objects at or near the centre of vision, I think, then, that both sides may be equally affected; and this may explain the fact why with some persons the headache is uniformly diffused and does not make itself felt at one spot more particularly than another.

Other questions arise: Why is there in some cases (1) disturbance of vision without headache following; in others (2) disturbance of vision followed by headache; in others again (3) headache preceded by disordered sensation, but not by disturbed vision? I think these may be explained by the more or less relaxed condition of the vascular system in the different cases. If the muscular fibres of the arterial system be only slightly relaxed, a very little irritation of the sympathetic nerve may be sufficient to diminish the supply of blood and cause the disturbance of vision, etc.; but the exhaustion of the nerve would also be slight, and consequently the blood-vessels would not be dilated sufficiently to produce headache. Let the muscular fibres, however, be in a feebler condition, then, after the effort of contracting, they will relax more completely, and headache will result; and lastly, if they be in a still weaker state, then the action of the sympathetic may not excite contraction sufficient to diminish

the supply of blood to such an extent as to cause disturbance of vision, etc., but sufficient to produce mental depression, coldness of the extremities, etc.; or, a very slight effort at contraction may be followed, from the state of the vessels, by considerable dilatation and headache. The condition (3) might also be explained, however, by the supposition that different branches of the blood-vessels in the brain are affected than is the case when the conditions (1) and (2) show themselves.

Lastly, though looking on this as a nervous disorder, it is easy to see that if the theory advanced be true, or near the truth, gastric derangement, or any other derangement which will irritate the sympathetic nervous system, may be an exciting cause; and it is well known that irritation in the stomach or intestines has a powerful effect on the sympathetic nervous system, so that the terms "sick-headache" or "bilious headache," implying that the disorder has arisen from derangement of the abdominal organs, may not in some cases be altogether inapplicable.

Adopting, then, this theory—and you must recollect, gentlemen, that it is advanced not as certain and proved, but only as possibly true—what are the indications for treatment with which it supplies us? Let us consider separately the remedial measures to be adopted (1) during the stage of disturbed sen-

sation, (2) during the stage of headache, and (3) during the intervals between the attacks.

1. *During the Stage of Disturbed Sensation.*—In the forms attended with disturbance of vision, you will find that in the same individual the longer this stage lasts, the greater will be the headache; and therefore we must endeavour to shorten it as much as possible. If the condition, then, depend upon deficient supply of blood to a part, such means must be adopted as shall assist and increase the flow of blood to the part; and this can be done in some measure by posture and stimulants. Directly the glimmering appears, the patient should lie down with the head as low as possible, and if the glimmering be on the right or left of the field of vision, he should lie on the *opposite* side. Let him take at once a full sized glass of sherry; if at hand, half a bottle of soda-water is a useful addition. Champagne would be preferable, being more diffusible; but its administration would often involve a little delay, and at the commencement of an attack it is a great point to save time. A large tablespoonful of brandy diluted may, if the patient prefer it, be substituted for the sherry. If alcoholic stimulants be objected to, or if it be not advisable to recommend them, then a teaspoonful of sal volatile in water may be prescribed instead. If the patient be chilly or

his feet cold, the couch should be drawn before the fire and a hot bottle applied to the feet. By these means the heart is enabled to drive the blood with greater force to the brain, and the duration of the vibratory movement is thereby materially lessened. After it has passed off, the patient should lie still for a time, so that the glimmering may not return. This injunction will only be necessary when the headache is slight; if it be severe, attended with much nausea or vomiting, the patient will be little disposed or able to leave the recumbent position. If, instead of the disturbance of vision preceding the headache, there be a feeling of depression or irritability, fidgets, etc., the administration of such cerebro-spinal stimulants as henbane, valerian, assafoetida, spirit of chloroform, or ether, will often cut short the attack; ten or fifteen drops of the tincture of henbane, with the same quantity of spirit of chloroform, will sooth the nervous irritability in the slighter forms, and may be repeated in three or four hours, if necessary. If there be great mental depression, then valerian or assafoetida should be tried. Stillé says: 'Nothing is more astonishing in the operation of remedies than the promptness and certainty with which a dose of valerian or assafoetida dispels the gloomy visions of the hypochondriac, calms the hurry and agitation of nervous excite-

ment, allays commencing spasms, and diffuses a soothing calm over the whole being of one who but an hour before was a prey to a thousand morbid sensations and thick-coming fancies of danger, wrong, or loss." I give the preference to valerian, and prescribe from half a drachm to a drachm of the ammoniated tincture. The assafoetida may be given in the form of the spiritus ammoniæ fœtidus of the *Pharmacopœia*, also in half-drachm or drachm doses. As a rule, alcoholic stimulants are not advisable here. A small quantity will cause flushing, heaviness, slight confusion of thought, etc., without relieving the depression; and though the severe headache may be averted, alcoholic stimulants do not answer so well as the remedies previously mentioned.

2. *During the Stage of Headache.*—If the headache be slight and the patient soon able to sit up, there is little to be done; a cup of coffee or tea, cheerful conversation, a walk, drive, or ride, may often help to remove the pain. If, however, the headache, nausea, etc., be severe, then the administration of further remedies is called for. The patient should keep perfectly still and quiet, with the room darkened; for every sound or sight causes pain, and the slightest movement is sufficient to produce gastric uneasiness. Sometimes free evacuation of the

contents of the stomach, especially if it contain undigested food, is followed by relief. Dr. Fothergill says, "an emetic and some warm water soon wash off the offending matter and remove these disorders,"¹ which may be very well where there is any offending matter to wash off, but it is not very often that this is the case; the nausea frequently continues long after the contents of the stomach have been discharged; an inverted action of the duodenum is set up; the bile appears in the fluids excreted; the patient believes that all his troubles are due to "its overflow;" "it's all liver," he says, and it is sometimes difficult to persuade him to the contrary. Generally, then, you should try to relieve and check the vomiting. Iced soda-water, with or without two or three drops of dilute hydrocyanic acid, or spirit of chloroform; cold tea; the effervescing citrate of potash, with hydrocyanic acid, may often afford marked relief. The headache may be lessened by applying cloths dipped in cold water, or evaporating lotions to the head; if the extremities be cold and the headache severe, a warm stimulating foot-bath can be tried as soon as the nausea will allow the patient to sit up. If the attacks occur in the early part of the day, as soon as the pain has subsided, it is generally better for the patient to sit

¹ *Medical Observations and Inquiries*. London, 1784, vol. vi. p. 121.

up, or move about, or take exercise in the open air. A young lady, on consulting me for this disorder, said: "Nothing relieves these headaches except a good gallop on my pony. I have sometimes to lie still for three or four hours before the pain is bearable; but directly I am able, I mount my pony and always return home better." During the attack the appetite is diminished, the idea even of food provoking disgust. Still, after the nausea has passed away and the headache has continued a few hours, a plate of soup or some easily digested food will often have a good effect in equalising the cerebral circulation. A remedy which may very often be given with advantage if the headache be severe, is bromide of potassium, in doses of 5, 10, or 15 grains, to which 30 or 40 minims of sal volatile may in some cases be added with advantage; and if the nausea still continue, these may be given in combination with the effervescing citrate of potash. A saline purgative at the commencement of an attack is sometimes an effectual remedy; but, as a rule, the use of purgatives is objectionable.

So far, the measures which I have suggested are only palliative. We come now to the consideration of such as are preventive, or to the treatment necessary during the intervals between the attacks. First of all, you must try to find out the exciting cause,

and endeavour to remove it. Hours of study or work must be abridged; excessive bodily fatigue, loss of rest, everything in fact, must be avoided which the sufferers know from individual experience will act as exciting causes. Where the attacks are associated with excessive mental work, they should be regarded as danger-signals, showing necessity for relaxation. In the next place, you must endeavour to improve the tone of the bodily and nervous systems by proper medicinal and hygienic means; and the chief remedies which I employ are steel, strychnine, and cod-liver oil. The success, however, following these remedies depends a great deal upon the way in which they are administered. For a day or two after the attack the stomach and bowels may possibly be disordered, and not in a fit state to tolerate such remedies. This must be first corrected. The simple vegetable bitters, such as gentian, with small doses of henbane and some aromatic, may be of service, and, if necessary, one or two grains of blue pill, with four or five of compound rhubarb pill, may be given at night. We may then try steel. If the attacks have been very frequent, or if there be any scrofulous tendency, I give the iodide of iron in the following form. \mathcal{R} Ferri et ammon. citrat. gr. v; potassii iodidi gr. ij; aquæ \mathfrak{z} j: and I add, according to circumstances, 15 to 20 minims of tincture

of henbane, or 20 or 30 minims of aromatic spirit of ammonia. If the stomach be at all irritable, I give this in the effervescing form, adding to each dose 20 grains of bicarbonate of potash, and directing it to be taken with a tablespoonful of lemon-juice or a corresponding amount of citric acid: the dose to be taken twice a day, about 11 and 4. I soon leave off the effervescing form, and then add to each dose five minims of liquor strychniæ, omitting the henbane and sal volatile, and continuing the iodide of potassium according as it seemed to be indicated or not. In other cases, I give the citrate of iron and ammonia with strychnine at the beginning, and sometimes combine them with infusion of calumba. The iron is indicated by the greater or less anæmia of the patient; but the strychnine is, in my opinion, a very important remedial agent in the disorder. In small doses it acts as a simple tonic, increasing the appetite and improving the digestion; it dilates the vessels, and thus increasing the supply of blood, it augments the activity of the spinal chord (Harley). It promotes the capillary circulation, and therefore its use is advisable for persons troubled with cold hands and feet (Anstie); and if it fulfil these conditions, it is clearly indicated in the disorder which we are considering. Cod-liver oil also often acts very beneficially. "It has been found by experience that

great exertion and prolonged labour can be endured without fatigue when starchy and fatty foods are alone eaten....and there is reason to think that cod-liver oil is more easily absorbed than other similar substances" (Ringer). "It improves the digestive process, increases the proportion of red corpuscles in the blood, and invigorates the whole nutritive function" (Wood); and I believe it particularly sustains the energy of the brain during prolonged mental exertion. A gentleman in the foremost rank at the bar told me that, whenever he was engaged in a jury-trial which was likely to tax his energies to a greater degree than usual, the thing which best sustained him was a good dose of cod-liver oil taken in the morning before going into court: and others engaged in mental work have confirmed this view. I therefore regard cod-liver oil as having, besides its other properties, a nutrient and tonic action on the cerebro-spinal nervous system. As a remedy for these nervous headaches, I only prescribe it once a day, beginning with a small teaspoonful immediately after breakfast, and gradually increasing the quantity to a tablespoonful, but not beyond, unless in exceptional cases.

You must take care to regulate the action of the bowels, but by no means have recourse to strong purgatives. Five grains of the Socotrine aloes pill,

given at night, are generally sufficient. If the bowels be habitually constipated, then no remedy seems to answer so well as the aloes and iron pill. Five grains given twice a day, half an hour before meals, will act freely; and in a few days you will have to diminish the dose, for the remedy possesses this advantage, that its effect is augmented instead of being lessened by continual administration, especially when strychnine is given at the same time. The natural waters of Friedrichshall or Marienbad may in many instances be of service, given as laxatives.

Besides the remedies to which I have called your attention, others have been recommended, such as arsenic and quinine, caffein, etc. Where anæmia is not a prominent symptom, they may sometimes be of service.

Lastly, you must lay down stringent rules for your patients with regard to diet, exercise and relaxation, and you must impress upon them the importance of these rules being strictly observed.

LECTURE II.

GENTLEMEN,—The subject of this morning's lecture is sick-headache; a disorder often classed among the minor ailments, but which, though rarely assuming a serious aspect, is sometimes very troublesome to those individuals who are liable to its attacks. During the past year theories more or less varied have been promulgated respecting the nature of the malady, and correspondingly diverse opinions have been entertained as to the mode in which it should be treated. Nor has this been without some good result, as judging from the last reports which have appeared on the subject much less desponding views are now expressed regarding the action of remedies, either in warding off the attacks or in relieving them, than was the case twelve months ago. On a former occasion I stated in this place that I regarded the disorder as an affection of the sympathetic, and the theory which I advanced was briefly this: if by fatigue, anxiety, or other depressing cause, the general tone of the body be lowered.

and with it the regulating or inhibitory power of the cerebro-spinal over the sympathetic nervous system impaired, then that uncontrolled action or excitement of one or more portions of the latter takes place, causing contraction of the blood vessels under the influence of the affected portions: that this excitement is followed by exhaustion or paralysis of the sympathetic, which is associated (just as would be the case after section of the nerve) with dilatation of the vessels and—if the cervical portion of the sympathetic be affected—with headache. I was not then aware that any author had previously given such a marked prominence to the sympathetic in the production of the series of symptoms. I have since seen three very important papers, wherein (though not agreeing as to the condition of the sympathetic system) the headache is attributed to an abnormal state of that system. I will give you a few extracts from these papers, one by Du Bois Reymond¹, another by Dr. Möllendorff², and the third by Dr. Wilks³; and I will then endeavour to explain more fully than in my former lecture how the stage of headache in my opinion is brought about.

¹ *Archiv für Anatom. Physiol. u. wissenschaft. Medicin*, 1860, s. 461.

² *Virchow's Archiv*, B xli. s. 385. 1867.

³ *Medical Times and Gazette*. Jan. 2, 1869.

Du Bois Reymond thus describes the attacks as they presented themselves in his own person : " Ever since I was about 20 years old I have suffered, though in other respects quite healthy, from Migraine. Every three or four weeks I have been troubled with an attack which generally arose after some slight irregularity, such as long fasting, a wearisome evening party, etc. As a rule, it was preceded by constipation. The next morning I awake with a feeling of discomfort and with a slight pain in the right temporal region which gradually spreads therefrom without crossing the median line, reaches its climax at mid-day and towards evening declines. So long as I rest quietly, the pain is bearable, but on moving it has a stunning (stupifying) severity. It increases under all conditions which increase the blood-pressure in the head, by bending down, coughing, etc. It increases synchronously with the beat of the temporal artery. This, on the affected side feels like a hard cord, whereas that on the other side is in its normal condition. The countenance is pale and depressed, the right eye is small and reddened. If the attack is severe and has reached its greatest intensity, nausea supervenes, but, so far as I can recollect, I have vomited in one attack only. Towards the end of the attack the right ear gets red, and feels distinctly hot, the rise in temperature

being also perceptible to the touch. Sleep often lessens the headache considerably. After the attack slight gastric uneasiness remains, and sometimes on the following morning one spot of the hairy scalp is tender. For a certain period after a seizure, causes which before would unfailingly have developed one, seem to be innocuous. In Summer the attacks are less frequent than in Winter, on pedestrian tours I am never troubled with them. They are now comparatively much less violent and frequent than formerly when, with less regard to my health, I had leisure to devote myself continuously to great mental efforts."

Du Bois Reymond then goes on to state that in migraine there is a "tetanic condition of the muscular fibres of the arteries of the affected side of the head, or a tetanus of the cervical portion of the sympathetic of that side";¹ that *during* the headache the arteries are in this tetanised condition, the pupil of the affected side dilated, and the temporal artery like a hard cord. Dr. Edward Liveing, who regards the sympathetic phenomena in migraine as of secondary importance, has referred to the view of Du Bois Reymond, in a paper which appeared in the *British Medical Journal*². Dr. Liveing, though not denying "that disorders of local circulation occur in

¹ *Loc. cit.* p. 464.

² April 6, 1872, p. 365.

the course of migraine and that the implication of the sympathetic may play an important part in their production, yet regards them among the least constant and regular of the phenomena and certainly not as essential and the cause of the rest." He maintains that the phenomena are those of "a nerve storm traversing more or less of the sensory tract from the optic thalami to the ganglia of the vagus, or else radiating in the same tract from a focus in the neighbourhood of the quadrigeminal bodies." Dr. Liveing's views will, I believe, soon be published *in extenso*, and will merit and command that attention which is always accorded to the writings of an accurate observer and an accomplished pathologist—and possibly lead to some discussion. I quite agree with him, however, in differing from Du Bois Reymond as to the condition of the vessels during the stage of headache. Dr. Liveing says, "I carefully compared the temporal arteries in a well-marked hemicranial paroxysm, but could discover no such increased rigidity of the one on the painful side as Du Bois Reymond describes." Du Bois Reymond himself saw a difficulty about his hypothesis, for he says, "One symptom among those presented above, and which is never wanting in the description of migraine, certainly does not accord with our theory; namely, the reddening of the conjunctiva, which

occurs during the attack. The reason of this, probably, may be that the muscular fibres of the vessels of the conjunctiva are either relaxed earlier, or began to contract sooner than those of the other affected vessels."¹ The tetanic state has, in fact, passed away with the commencement of the headache, the sympathetic is exhausted; the beat of the temporal artery, instead of being hard, is soft and full, its walls have lost their tonicity and are yielding, and this condition is also shewn by the reddening of the conjunctiva, and sometimes also by the contracted state of the pupil.

That the stage of headache is accompanied by a fulness of the vessels, is shown very strikingly by Möllendorff's investigations. Möllendorff maintains that the cerebral symptoms present a great resemblance to those which are produced by section or paralysis of the cervical ganglion of the sympathetic, and that the stage of headache is accompanied by a fulness of the vessels; and this he proves, I think, very conclusively. Möllendorff says,² "If during an attack of hemicrania sufficient pressure be exerted on the common carotid of the painful side near the thyroid cartilage, as almost to stop pulsation in the temporal artery, the headache ceases as if by a charm, the eyes are joy-

¹ *Loc. cit.* p. 465.

² *Loc. cit.* p. 387.

fully opened, and the depressed and painful expression passes off. But, on discontinuing the pressure, the pain unfortunately returns with the first wave of the pulse. The first pulsations are, in fact, more painful than before; since, owing to the defective tonicity of the vessel, the fresh rush of blood causes greater vibration of its walls; the throbbing, however, soon becomes more uniform.

“If, on the other hand, before the pain has reached its climax, the carotid artery of the opposite side or the subclavian artery of the same side be compressed, the pain is then increased. The bloodstream in one direction being thus cut off, a greater volume of blood is driven towards the relaxed carotid, and, owing to the paralysed muscular tonicity, admitted into it. If, however, the pain have reached its climax, then compression of the carotid artery of the unaffected side alleviates somewhat the headache, by allowing a more rapid lateral flow of blood to the unaffected side, and so relieving the painful side. This experiment has been invariably successful with every person that I have had an opportunity of seeing, during an attack of hemicrania.

“That there is an increased arterial flow of blood, resulting from the enlargement of the vessels, is also strikingly shown by the ophthalmoscope. It is, however, difficult to prevail upon the patients, during

the attack, to submit to this very painful investigation. I can, therefore, only furnish the following result of repeated observation on the same individual.

“The eyes were quite normal and darkly pigmented. During the intervals between the attacks, no difference was observable in the two eyes on examining them with the ophthalmoscope. The fundus appeared dark brownish-red; the optic papilla normal; the arteria and vena centralis retinae in each eye equal. During the attacks, the fundus of the affected eye was bright scarlet red; the optic papilla reddened and swollen; the arteria and vena centralis retinae broader—the latter nodulated and very tortuous, and of much darker colour than usual. The other eye had its dark brownish-red background, and its arteria and vena centralis as usual. The arterial fluxion is consequently manifest, both by the direct dilatation of the central vessels, as well as more particularly by the change in the colour of the choroid; the dilated bright red arteries concealing the pigment, and the fundus, instead of having a dark red-brown colour, appears of a scarlet colour. The thick, nodulated, tortuous vena centralis retinae, at the same time, indicates that there is an impediment to the return of blood to the brain. Considerable injection of the conjunctival vessels is often observed extending to the circumference of the

cornea. This, however, disappears as the attack passes off. The most distinct ophthalmoscopic appearances are seen in the most severe attacks."

"As the headache begins, and while it lasts, the action of the heart is considerably lowered, a pulse whose normal frequency is 72 to 76 beats in the minute, sinking to 56 or 48 beats; the radial arteries are small and contracted, whereas in the carotid and temporal there is a soft broad stroke..... The respirations are correspondingly diminished with the frequency of the pulse, shallow breathing alternating with deep sighs. Simultaneously with this there is an unequal distribution of warmth on the surface of the body; sufficient blood is not driven to the extremities through their small and contracted arteries, consequently, during the paroxysm there is a persistent icy-coldness of the hands and feet, chilly sensations about the whole body, but at the same time there is subjectively elevated temperature of the affected side of the head and a sensation of warmth in the internal part."

Dr. Wilks has lately referred me to a lecture which he published in the *Medical Times and Gazette*¹ wherein without being aware of Möllendorff's views he has attributed the headache to the same conditions and almost in the same terms as the

¹ Jan. 2, 1869.

latter had done in 1867. Here is Dr. Wilks' description 'gathered from personal experience.' The pain "is most usually fixed to one spot or is more concentrated on one side than the other. It may commence as a dull pain over the forehead, then, as it increases pass down to one eye and so to the temple where it remains fixed. Exceptionally the pain is at the top or back of the head. The pain is sometimes so violent as to deserve the name of neuralgia, but generally it is somewhat duller and of a most sickening character. Its great peculiarity is the throbbing that occurs with each beat of the heart, aggravated by every movement of the body, and more especially of the head itself. The movements required for washing and dressing on rising can scarcely be endured. The sufferer walks slowly, since everything which tends to make his arteries beat a degree more violently adds to his misery; in his head he perpetually hears or feels 'throb,' 'throb,' 'throb,' and his only relief is to support the head against a pillow or rest it on the hand and avoid all possible excitement. His whole attention is distracted by the painful throbbing, and he becomes utterly incapacitated for business; every movement, every word spoken aggravates the pain. His only desire is to be let alone and be unspoken to. During this time he looks exceedingly ill, very pale, with a dark margin

round the eyes, and the pupils contracted; there is a general feeling of chilliness over the whole body, excepting the head; the pulse at the wrist is feeble, whilst that in the head is strong. The anorexia is complete; the loathing of food so great that it is often impossible to swallow a single mouthful of food, and sometimes there is actual vomiting. In a bad attack the stomach generally refuses food for twenty-four hours. There may have been no error of diet to account for the attack, nor any constipation of the bowels, as is often thought; although a disturbance in these parts is often one of the symptoms of the complaint. The duration of a bad attack is generally several hours. If the person awake with it, the headache persists during the day, and it is only after another night's rest that he rises free. If it should come on during the day, it gradually increases in force, and then the night brings little comfort, for the throbbing aching head entirely precludes sleep."

"Now as to the cause of this misery. . . . The vaso-motor nerve on one side is for the time paralysed, the vessels of the head dilate, more blood is sent to it: and thus the increased heat, throbbing and pain which the patient has to suffer until the tone of the nerve is restored. The most important question to solve is the immediate cause of the

function of the nerve being thus temporarily in abeyance."

I will now endeavour to show, more clearly than I have done on former occasions, that the suspension of the function of this nerve is dependent upon an antecedent excitement, which excitement takes place from defective tone and controlling power in the cerebro-spinal system. I base my proof upon the following propositions.

1. In the cerebro-spinal system are included fibres possessing an inhibitory power over the sympathetic system; or, in other words, in those organs in which it is possible to operate separately on the fibres proceeding from the sympathetic and from the cerebro-spinal system, the section or paralysis of one kind of fibres produces the same results as galvanism or excitement of the other kind of fibres. This is illustrated by the following extract. "All glands are provided with sympathetic nerves, and many, if not, all, possess others derived from the cerebro-spinal nervous system. The experiments just referred to show that the quantity of a secretion is differently affected by the section or irritation of these two sets of nerves. Thus, irritation of the pneumogastric nerves increases the quantity of the gastric juice, whilst irritation of the sympathetic nerves diminishes or arrests it. Again, division of the sympathetic

nerves of the submaxillary gland increases the flow of saliva, but irritation of the distal cut portion of the nerve diminishes it; on the other hand, section of the cerebral nerve diminishes, whilst a similar irritation of the undivided cerebral nerve causes an increase of, the secretion. Since, in the former case, the small arteries of the gland contract and the supply of blood is diminished, whilst in the latter those vessels dilate and more blood is distributed to the gland, the diminution or augmentation of the secretion accords in either case with differences in the quantity of blood conveyed to the gland, and the influence of the nervous system in regulating the quantity of the secretion is indirectly manifested by the dilatation or contraction of the coats of the small arteries.”¹

2. Violent mental emotions produce, in particular organs of some individuals, the same effect as would result from stimulation of the sympathetic, or section of the cerebro-spinal nerve. “Violent emotion may suspend the salivary secretion, as is shewn by the well known test often resorted to in India for the discovery of a thief among the servants of a family—that of compelling all the parties to hold a certain quantity of rice in the mouth during a few minutes—the offender being generally distinguished by the

¹ Marshall's *Physiology*, vol. 2, 1867, p. 349.

comparative dryness of his mouthful at the end of the experiment. That the secretion of gastric fluid is entirely suspended by powerful mental emotion seems almost certain, from the well known influence which this has in dissipating the appetite for food, and in suspending the digestive process when in active operation."¹

3. Remedies which produce contraction of the minute arteries, and which are considered as exciters of the sympathetic ganglia, will, when vision is affected by them, develop similar phenomena to those described by Dr. Hubert Airy and others as sometimes preceeding sick headache.

To illustrate this proposition, I shall take the action of digitalis. Whatever may be the primary action of this drug in small doses, most observers agree that in full doses it acts as a stimulant to the cardiac and other ganglia of the sympathetic system. Traube's most recent view is that it acts on the vaso-motor centre. According with this, various observers have noticed the contraction of the minute arteries under its administration. Dr. Dickinson found digitalis useful in menorrhagia from its contractile effect on these vessels. The small vessels of the frog's foot have been observed to contract by Drs. Fothergill and Malan on the

¹ Carpenter's *Physiology*, edited by Power, 1869, p. 811.

application of an infusion of digitalis. Stadion, Sanders, and others refer to one fact which has an important bearing on my present theory—the production, namely, under the action of digitalis of a glimmering before the eyes. Now, it occurred to me that, if the glimmering which sometimes precedes sick-headache be due to contraction of the cerebral vessels resulting from excited action of the sympathetic, and if digitalis excite the sympathetic and so sometimes produce disturbance of vision, the appearances described under the two conditions ought to correspond with each other. I have been at considerable pains to find descriptions of the glimmering resulting from the administration of digitalis; and in those which I have found I have been struck by their remarkable correspondence with the descriptions of the visual phenomena preceding sick-headache which I have given in my former lecture.¹

Dr. T. L. Brunton² says:—“The derangement of sight which I noticed was of two kinds—1st, a general mistiness of objects, such as is seen before fainting; and, 2nd, a large bright spot advancing before me, which sometimes resembled a ring showing prismatic colours faintly.”

¹ Compare page 4 et seq.

² *On Digitalis*, 1868, p. 46.

Purkinje¹ describes the appearances much more fully. He says, "I took daily three grains of the watery extract of digitalis for four successive days. This small dose produced no effect upon the system generally, but even on the second day I noticed before the left eye, a very faint glimmering without its presenting any distinct configuration in the arrangement of light and shade. It was just as if the crystalline lens was put into vibration with each movement of the eye, and with the altered refraction a transitory appearance of light and dark spots in objects was produced..... On the third day the glimmering was more marked..... On the following day the phenomenon was distinctly observed in the right eye also. Repeated observation rendered it more visible and I could distinguish a certain configuration which is delineated in Fig. 1, Plate III. It presented itself in the middle of the field of vision, as a roundish spot, faintly luminous, appearing and disappearing, and around it and concentric with it several similar light and dark waves possessing like movements were observable..... This glimmering before the eyes, precisely similar to the special form which appeared after the use of digitalis, has been observed by me on former oc-

¹ *Neue Beiträge zur Kenntniss des Sehens in subjectiver Hinsicht.* Berlin, 1825, s. 120—128.

Fig 1.

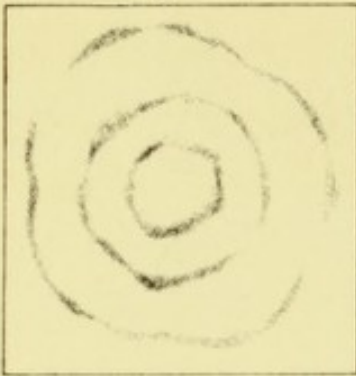


Fig 2.

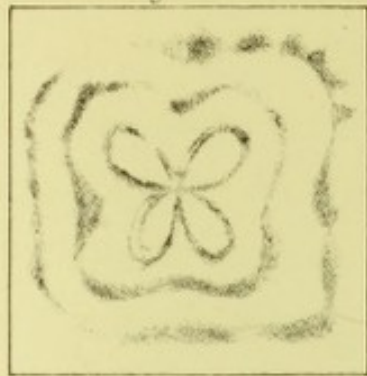


Fig 3.

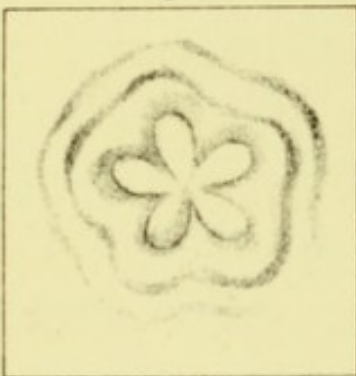
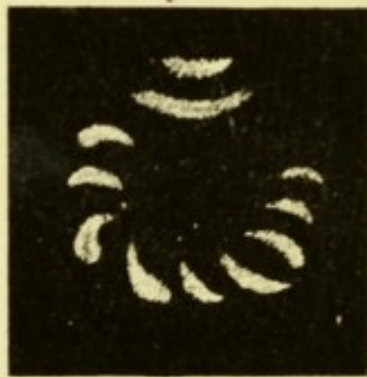


Fig 4.



Fig 5.



casions. The same phenomenon was very often developed after severely taxing the respiratory organs as for instance after running a race, and I doubt not that others in similar circumstances have noticed the same thing."

After a large dose of digitalis, the glimmering again appeared in the left eye some hours before the right was affected. On the second day the waves appeared to spread from a faintly luminous quatrefoil (Fig. 2), and on the third day from a cinquefoil in the centre of vision (Fig. 3), an appearance evidently not very unlike to Dr. Hubert Airy's serrated outline. As the glimmering declined, it was observed only on one side of the field of vision in curvilinear outline. (Fig. 4).

"The appearance and disappearance of internal movement in these figures is best compared to the undulations seen in a broad vessel of water, the surface of which has been put into rapid motion at one or more points."

"Besides this, on closing the eyes and gently rubbing them I could produce a tremulous phosphorence." (Fig. 5).

"This can be best represented by making similar figures on a flat surface in the dark with a solution of phosphorus in oil, and then as soon as the phosphorescence begins to disappear, reproducing it by

a gentle movement in the air; in this way tremulousness and increase and diminution of the light, with its disappearance and reappearance, are produced, similar to what are observed in the subjective phenomena."

The deductions which I draw from these propositions are the following. 1. If violent mental emotion stimulate the sympathetic, it does so by withdrawing the inhibitory influence of the cerebro-spinal system, and what violent emotion produces rapidly, long continued mental effort or fatigue will accomplish more slowly, but as surely. 2. The prodromata of sick-headache are due to excitement of the sympathetic; and this is proved to be the case, by the same phenomena appearing when vision is affected, as are produced by the action of digitalis. 3. It is a physiological axiom that excitement is followed by depression; and consequently excitement of the sympathetic is the cause of the "function of the nerve being temporarily in abeyance," and the headache associated with this condition.

It may be urged in opposition to this theory that the phenomena which I maintain are due to excitement of the sympathetic, vary very much in the attacks of sick-headache in different individuals. But this only supports my argument. The phenomena produced by digitalis in different individuals vary quite as much.

Another point in favour of the vaso-motor theory is the unequal distribution of the warmth of the body during the paroxysms. "There is a general chilliness over the whole body, excepting the head; the pulse at the wrist is feeble, whilst that in the head is strong." The fact was first discovered by Ludwig and Lovèn, that when the action of the vaso-motor centre is suspended in the part supplied by the nerve, and in those which immediately adjoin it, so that their vessels become dilated, contraction of the vessels in other parts of the body is at the same time produced. The blood-pressure is thus increased generally, and produces in the locally dilated vessels a very rapid stream of blood.¹

Before discussing the treatment I will make a few observations upon two of the theories which are advanced as to the nature of this disorder: the one, that it is a neuralgia; the other that it depends upon gastric or hepatic derangement.

1. The neuralgic theory has been advanced as probable by many authorities. Tissot combining the two theories says, "After all these observations it cannot be doubted any longer that the attacks of migraine are for the greater part developed by some irritating cause in the stomach which acts upon the

¹ See Dr. T. L. Brunton's Lectures, *British Medical Journal*, 1871, vol. 1, p. 583.

branches of the nerves distributed to the anterior and lateral portions of the head, and which appear to act principally on the ramifications of the supra orbital branch of the fifth pair."¹

Romberg in his excellent treatise calls it neuralgia cerebri: and says, "we are not likely to confound this affection now-a-days with facial neuralgia as older authors Wepfer and Tissot have done."² In referring to this Hasse remarks "It might with equal propriety be regarded as having its seat in the ramifications of the trigeminus"³ and adds that a satisfactory explanation is still wanting. Lebert, again, defines migraine as "a painful neuralgia probably in the ramus ophthalmicus,"⁴ yet, when discussing the diagnosis of neuralgia of the trigeminus says, "Migraine has a great resemblance to neuralgia of the ramus ophthalmicus, and may really be so; but the former causes much greater disturbance of the sensorium, it spreads much more generally over the head, and is not unfrequently accompanied with nausea and vomiting; after the attack there

¹ *Œuvres de Mons. Tissot.* Lausanne, 1790, tome XIII. p. 120.

² Romberg on *Diseases of the Nervous System.* Translated by Dr. Sieveking for the Sydenham Society. London 1853, vol. 1, p. 177.

³ Virchow's *Handbuch der speciellen Pathol. u. Therap.* 1855, B. 4, ab 1, s. 70.

⁴ *Handbuch der Praktischen Medicin.* 4te. Auf. Tübingen. B. 2, s. 672.

may be an intermission for weeks or months, and the attack itself runs a more uniform or continuous course."¹

Dr. Anstie is the most recent authority who has supported the neuralgic theory. He defines migrainous pain as "atrophic molecular irritation in the trigeminus root."² and states that it "is almost the only neuralgia of the period of bodily development, and depends on inherited defects in the nutrition of the medulla oblongata."³ "The essential seat of every true neuralgia is the posterior root of the spinal nerve in which the pain is felt: and the essential condition of the tissue of that nerve root is atrophy, which is usually non-inflammatory in its origin."⁴

Now it seems to me that the strongest arguments against sick-headache being what is ordinarily called a neuralgia are to be obtained from a consideration of the prodromata. A precursory symptom which is often experienced is the glimmering commencing on one side or other of the field of vision, and, as I pointed out in my former lecture, there is during this glimmering stage in many cases, a tingling in some portion of the body, as the face, or the side of

¹ *Loc. cit.* p. 699.

² *The Practitioner*, Jan. 1873, p. 31.

³ *Brit. Med. Journal*, Jan. 18, 1873, p. 61.

⁴ *On Neuralgia*. London, 1871, p. 110.

the tongue, or the arm, etc., and the tingling is on the *same side* of the body as that on which the glimmering is first seen. When the head begins to ache, the pain is felt on the side or temple *opposite* to that on which the glimmering first appeared.

Tissot describes a very interesting case of this nature. "I was consulted by an officer in the Austrian service, aged 32, whose migraine was marked by characteristic nervous symptoms. 'From the age of nine years' (such are his own words) 'I suffered about every second month, sometimes more frequently, from migraine, though I have also been quite free from an attack for a year. It began in the eyes, and without previous warning. Everything suddenly appeared cloudy, more so, however, on one side than the other, like some one who has been steadily gazing at the sun. This lasted, perhaps, ten minutes, then an arm and a leg on the same side went to sleep. Sometimes one side would be affected, sometimes the other. There was a feeling of tingling or formication, which was also experienced in the mouth and tongue, and for the time being I had difficulty in speaking. These sensations continued from ten minutes to a quarter of an hour; then the pain in the head began, but in the temple only, where it continued very severe for seven or eight hours. After vomiting, I felt relief.'"¹

¹ *Œuvres de M. Tissot, 1790, tome XIII, p. 112.*

Tissot omits to mention whether or not the dimness of vision commenced on the opposite side to that in which the pain in the head was developed. In all the cases, however, which I have seen, this is the fact. The pain in the head is always developed on the side opposite to that portion of the field of vision which is most obscured.

Very recently a case came under my notice in the out-patient room here, which showed this in a very satisfactory manner. The patient had charge of a stationary steam-engine; and on the previous day, "while I was occupied," he said, "in cleaning my engine, a dimness came over my right eye, and everything to the right seemed indistinct. It was just the same as if I had been looking at the sun, except that the mistiness seemed all rolling about. If I closed my left eye I could see very little indeed; and though the mistiness and movement were visible when the left eye was open, I was then able to see things much better than when it was shut. After this had continued from ten minutes to a quarter of an hour, I felt a pain in the left temple and over the left eye, which soon became very sharp." He described further the character of the pain, nausea, etc., which usually accompany sick-headache.

If, then, we have disturbance in the field of vision, together with tingling along nerves dis-

tributed to the side of the body *opposite* to where the pain in the head is subsequently developed, how is it to be accounted for?

According to the view which I have advanced, we have at this stage excitement of the sympathetic, and contraction of the blood-vessels of the side opposite to where the tingling is felt; an anæmic condition of the vessels about the roots of the nerves seems so far to be a satisfactory explanation. But in the next stage, with paralysis of the sympathetic, the headache is developed, and the tingling of the nerves on one side of the body ceases, and is replaced by aching and painful impressions in the opposite side of the head. Now, it is this stage—the headache or migrainous pain—which is neuralgic. If so, and migraine be what is ordinarily called a neuralgia, we shall then be forced to believe that in this form the irritation first lingers about one set of nerves, and then transfers its affections to entirely different nerves. This is not the case in ordinary neuralgic affections. On the other hand, it is not difficult to understand that, if the vessels of the brain on the aching side are dilated and so produce increased pressure on the nerves, painful sensations will be experienced along the course of the nerves; at all events, the pain as Möllendorff shows, is lessened by compressing the carotid.

Again, take some of the other prodromata which are so well marked in some of the cases recorded by Tissot.

“I was consulted by a very able surgeon who suffered from depression and irritability several days before an attack. At noon his appetite failed and the attack generally declared itself at sunset by excessive chilliness. He was obliged to go to bed, to cover himself with clothes and to keep in a sitting posture, whilst the pain was so excessive that his head could not bear the slightest touch; all light or sound, even the ticking of his watch, was insupportable. The attack lasted 5 or 6 hours and declined gradually, the sufferer fell asleep and the next day was wonderfully well.”¹

“I have seen a learned Englishman whose attacks were always preceded by acid eructations of a distressing nature. . . . And I knew another man who cured himself by taking food, and always carried some bread in his pocket ready to take at the first feeling of rumbling in the stomach. The attacks are often preceded by other symptoms. One of my patients has a sort of deafness 24 hours beforehand, and after the attack there is slight numbness of the affected side, and this was always more marked on the right than on the left side: another patient

¹ *Loc. cit.* p. 99.

feels an aversion to tobacco some hours before an attack."¹

“Willis saw a young woman, whose migraine was hereditary and recurred frequently, who on the evening before an attack always had a voracious appetite and supped heartily, but was sure to awake the following morning with a violent headache which was always followed by vomiting of a very sour fluid or something very bitter.”²

Such symptoms as these preceding an attack seem to me to separate sick-headache very distinctly from what is ordinarily called neuralgia.

2. *The dyspeptic, or hepatic hypothesis.*—This theory has found some advocates and as I pointed out in my former lecture it may not in occasional instances be altogether inapplicable.

Fothergill's opinion of the disease was “that for the most part it proceeds from inattention to diet, either in respect to kind or quantity, or both;”³ and the same idea has been repeated by modern authorities. The somewhat enlarged liver and faint tinge of jaundice, &c. which occasionally show themselves after an attack in adults are, at first sight, in favour of such a theory. But, on a little further consideration, these abdominal complications strongly

¹ *Loc. cit.* p. 103.

² *Loc. cit.* p. 114.

³ *Medical Observations and Inquiries*, 1784, vol. 6, p. 107.

support the view I have advanced as to the character of the disorder, for they are precisely the conditions which would result from section or paralysis of the splanchnic nerves. Errors in diet do not always cause attacks; "Late suppers, with wine, which are constantly greatly blamed, are often partaken of by persons most liable to these seizures, without producing the slightest inconvenience."¹

Lastly, Gentlemen, a few words with regard to the treatment of this disorder.

Subsequent experience has confirmed my belief in the efficacy of the plan advocated in my last lecture, and my present remarks will only be supplementary to what I said then. Many opinions have been expressed within the last few months as to the treatment of the paroxysms by various remedies; and although it is of great importance that we should know how to alleviate or cut short the attacks (and this our remedies will in the majority of cases enable us to do) it is yet of much greater importance that we should if possible prevent them altogether; and it is therefore to the treatment during the intervals between the attacks that the greatest consideration is to be given. You must if possible remove the cause, and in a very large majority of cases you will on careful enquiry find

¹ Möllendorff. *Loc. cit.* p. 386.

that a cause does exist. Overwork, prolonged anxiety, overfatigue, disappointed hopes and affections, impoverished nutrition of the body, etc. are among the chief; and while these are in operation you cannot hope for much success in endeavouring to avert the attacks. The great point is to brace up the bodily and nervous systems and the chief medicinal remedies are strychnine, steel and cod-liver oil. But as a rule these remedies will not be tolerated for two or three days after an attack owing to the condition of the digestive organs; and if the splanchnic nerves have been involved in the paroxysm you can easily understand why this should be the case. Correct this condition and then try your remedies in the manner I formerly recommended. A form in which iron may be given and which I have found very useful and easily borne is as a mixture of similar composition to the *Mist. Ferri Comp.* of the *Pharmacopœia*, but without the myrrh; or this may be given with the addition of citric acid and an excess of carbonate of potash in the following form:—*Ferri Sulph.* gr. iiss. *Acid. Citric.* gr. xv. *Syrupi* ℥xxx. *Aq. Ros.* ad ℥j. *Pot. Carb.* gr. xx. *Sprit. Myristicæ* ℥xx. *Aq. Ros.* ad ℥ss. To be mixed together and taken whilst effervescing twice or three times a day. To this *Liq. strychniæ* or *Tinct. nucis vomicæ*, or vegetable bitters may be

added according to circumstances. The vegetable bitters alone seem to be sometimes of great service, the general tone of the system being increased through the greater activity of the digestive powers. Quassia is the best, then come Gentian and Calumba. Tissot, p. 150, speaks very highly of le trefle de marais, *Trifolium fibrinum*, *Menyanthes trifoliata*, buckbean or marsh trefoil; a remedy contained in the German Pharmacopœias but not in our own. Nothnagel says of the drug that "it possesses no special virtues superior to Quassia, and is used for the same purposes; but it has this advantage that the taste is less unpleasant."¹

2. *During the Stage of Headache.*—Let me first caution you against, as a rule, giving a dose of calomel followed by a black draught or other strong purgatives in this stage. In Fothergill's time bleeding seems to have been practised for its relief. "These are circumstances.....which are very often attempted to be cured by very different remedies and improper ones. A sudden giddiness, let it rise from what cause it may.....is a sufficient motive to call the surgeon, who must have a large share of disinterestedness and skill, not to be compelled to bleed the patient, sometimes under circumstances that do not admit of it with impunity."² The same remarks apply to

¹ Nothnagel, *Handbuch der Arzneimittellehre*, 1870. s. 446.

² *Loc. cit.* p. 121.

the purgative treatment. Just as the bleeding may relieve the pain, so may the calomel and black draught, but only at the imminent risk of a speedy return of the paroxysm. The patient already enfeebled is reduced still more by the action of the remedy, the digestive system is still further enfeebled, the nervous equilibrium is rendered still more unstable and in a very short time even a day or two, a very slight worry or excitement causes a renewal of the paroxysm. More fault is found with the liver, more calomel and black draught administered and the miserable sufferer soon finds that he is, to use an expression of one of my patients "being rapidly purged into purgatory." Perfect rest, effervescing citrate of potash, soda water, bromide of potassium, etc., cold applications to the head, or a stimulating foot bath, employed as I suggested in my previous lecture will often be of signal service.

Another remedy for the disorder which has been discussed a good deal lately in the Medical Journals is Guarana. It is well known and has been long used in Germany and France; and you will find it described in any of the German or French works on *Materia Medica*, such as Posner's *Handbuch der klinischen Arzneimittellehre*, or Trousseau and Pidoux, *Traité de Thérapeutique*. From the last named work I extract the following which is the fullest account of the drug which I can find.

“ PAULLINA OR GUARANA is an American product obtained from a shrub of the same name which is a native of the north of Brazil near the river Amazon. The botanical name is *Paullinia sorbilis* of the family of the sapindaceæ. The fruit which it produces resembles that of the cacao in colour. The fruit ripens in October and November and is gathered by the natives for the preparation of the remedy which we are about to describe.

“ It is prepared in the following manner. The seeds are separated from the capsules; they are then exposed to the sun until the tegument separates itself from the seed on being pressed between the fingers. When it has been thus cleansed it is placed in a sort of stone mortar, previously heated, and ground down to a fine powder. This powder is reduced to a paste by the addition of a certain quantity of water, or by being exposed to dew during the night. It is kneaded and pounded for a long time, and some seeds either entire or coarsely ground are mixed with it. Small rolls are then made of the same fruit in the shape of cylinders or cones weighing about half a kilogramme, and these are dried and hardened in the chimneys. Afterwards they are packed up in the leaves of the cacao tree and thus they become a part of Brazilian trade.

“ PHYSICAL CHARACTERS.—*Paullinia* as it is pre-

pared by the natives of Brazil is exteriorly of a dark colour resembling chocolate. The outside is covered with a fine crust produced by its exposure in the chimney; when broken across, small cavities are seen where the inside has shrunk from the outer covering, and here and there whole seeds remain visible covered with their thin shining tegument. Its odour is *sui generis*, its taste is bitter and somewhat astringent, reminding one of Rhatany. It is not easy to reduce it to a fine powder but it softens considerably in water.

“CHEMICAL ANALYSIS. — M. Deschastelus, who analysed Paullinia, found the following substances in the plant:—

1. Gum.
2. Starch.
3. A resinous substance of a reddish brown colour.
4. A fatty oil coloured green by Chlorophylle.
5. Tannin, which colours solution of iron green.
6. A crystallizable substance possessing the chemical properties of caffeine.

“We cannot do more than indicate here the results of a long work which M. Dechastelus communicated to M. Gavarelle.

“The Genus Paullinia, dedicated to Simon Paul, contains thirty varieties. The principal ones are as follow :

Paullinia Africana (R. Brown), is used as a decoction in Senegambia to stop flux of blood.

Paullinia Asiatica (L.), used in Bourbon as a remedy against fever; its rind is bitter, pungent, acrid, and aromatic.

Paullinia pinnata (L.) The seeds of this plant are stupifying, and it is employed in Brazil and the Antilles in intoxicating fish.

Paullinia sorbilis (Martins). It is this which is used in Brazil to make Guarana. It is grated down with the lingual bone of a fresh-water fish, the *Vastres condaminea*, which takes the place of a file.

“*Paullinia* is prescribed in the form of powder, extract, or syrup, prepared in the same manner as Rhatany.

“In Brazil and the neighbouring countries *Paulinia*, according to M. Gavarelle, is often used by the natives in the form of a powder mixed with cacao and reduced to a tisane. It is used with remarkable success in cases of diarrhoea and dysentery, which are so frequent and severe in that country; and in convalescence to strengthen the stomach, promote the appetite and fortify the digestive powers. The bitter taste of the *Paullinia* tisane is rather agreeable to most palates, but for others it may be easily modified by the addition of sugar or any kind of syrup.

“ M. Gavarelle, who brought some Paullinia from Brazil, stated that the properties contained in this substance placed it in the same category with rhatany, but that its bitterness gave it some superiority over the latter in cases of dyspepsia and weakness of the digestive organs. He has also administered it with advantage in many cases of flux, where astringent medicines are indicated, such as diarrhœa, hæmorrhage, etc. Latterly we have often had occasion to prescribe Paullinia in powder in diarrhœa and in cases of acute or subacute dysentery, and are able to verify the fact of its efficacy. We give from one to two grammes daily in divided doses.

“ Paullinia has during the last few years obtained a certain popularity, in Paris, in the treatment of migraine. For a long time incredulous as to its efficacy in this disorder, we have been obliged to yield before the facts which we have observed in many of our patients who have taken Paullinia without our authorization. We are ignorant whether the chemist, who sells the greatest quantity of Paullinia in Paris, gives precisely the powder or the extract of Paullinia, or whether it is not combined with sulphate of quinine; but we owe it to truth to declare that of all the means we have seen employed against migraine, the powder which is said to be

composed exclusively of Paullinia seems to us to be the most ineffectual.

“The manner in which it is to be taken by patients suffering from attacks of headache is thus described in the instructions which are sold with the remedy. If the attacks are frequent (several in a month), a pill containing ten centigrammes of extract of Paullinia should be taken every morning half-an-hour before the first meal, to ward off the attack and consequently diminish the number in the hopes of a complete cure. In addition to this, at the first symptom of the headache, if one is warned in time, or during the attack if it comes suddenly, fifty centigrammes of the powder of Paullinia should be taken dissolved in sugar and water. After waiting a quarter of an hour this dose should be repeated if the pain is not lessened. The most violent migraine will often disappear in eight or ten minutes, and sometimes not return for a very long time. When the attacks are rare (once a month for instance), the powder alone will suffice, taken as we have described above unless the attacks are complicated by some other affection, for which it may be absolutely necessary to employ the pills.

“While we confess that we have seen Paullinia succeed in the treatment of headaches, we ought to add that its efficacy, which is at first evident enough,

gradually diminishes, and that most invalids end by being disgusted with it, because the attacks of headache although less painful generally become longer and more inconvenient. The various preparations of Paullinia are the same as those of Monesia and Rhatany, and are given in the same manner and in the same quantities.”¹

Trousseau’s opinion therefore of guarana as a remedy in this disorder is not a very high one, and some English observers have even asserted that it is perfectly useless. You must bear in mind however that there are, as I have stated, different forms of sick-headache, and therefore it would be too much to expect that any particular remedy should have the same effect in all cases. The sick-headaches which guarana seems to relieve are those in which distinct premonitory symptoms usher in the attack, and particularly those preceded by disturbance of vision. In such cases 15 grains of guarana given as soon as the headache begins, and if necessary repeated in half-an-hour, an hour, or an hour and-a-half, will often cut short the paroxysms. Such was the effect in the following case.

M. M., æt. 18, admitted as an out-patient Sept. 4, 1872; states that she has had headache at intervals

¹ Trousseau et Pidoux, *Traité de Thérapeutique et de Matière Médicale*. Paris, 1868, tome I., pp. 163—5.

for the last two years. The attacks commence with glimmering on the right side of the field of vision, which lasts from a quarter to three-quarters of an hour, and is followed by aching in the left temple, pain in left eyeball, nausea and vomiting. She always has an attack before the catamenial period and two or three others during the month besides. Two powders, each composed of 15 grains of guarana and 15 grains of sugar relieved the attacks, and by the use of citrate of iron and nux vomica they became far less frequent. She had none from the 6th of November to the 2nd of January, and at the end of February, when I last saw her, there had been no subsequent attack.

In such cases as these, moreover, the guarana may be given during the stage of ocular disturbance if this be of short duration; and sometimes with the happy effect of preventing the headache altogether. This I discovered accidentally. I prescribed the powders for a patient, telling her to take them as soon as the *headache* began. A few weeks afterwards she told me that twice over the glimmering which always preceded the headache had appeared before her eyes; each time she had taken a powder as soon as the *attack* began, that the glimmering subsided, and, to her great joy, without any headache following. If the glimmering stage were of

long duration, such as half-an-hour or so, I think it advisable to wait until this is passing off before giving the guarana, for caffein and guarana are said to stimulate the vaso-motor nerves, and therefore if the dose were absorbed into the system before the glimmering stage had declined I should expect it to be rather harmful than beneficial. In such cases the recumbent posture and stimulants administered as I formerly recommended¹ would probably be of more service. During the last few months I have been consulted by two individuals, in whom the premonitory stage was of long duration and followed by severe headache, but by adopting that plan of treatment they can cut short this glimmering stage and altogether prevent the headache.

On the other hand, in those individuals in whom the headache is developed suddenly, where the attacks come on without any premonitory symptoms, or very indefinite ones, guarana is far less efficacious. In some of these individuals it produces no effect whatever; in others, in one attack the remedy seems gradually to relieve the pain and throbbing, whilst in a succeeding attack, which appears to be of precisely the same character, the effect is *nil*. For some of these cases bromide of potassium seems more serviceable, in others chloride of ammonium in

¹ See page 24.

doses of 15 grains produces marked relief. The latter may be combined, or not, according to circumstances, with spirit of chloroform and compound tincture of lavender. Such are the remedies to be used in treating this disorder, and judiciously employed you will find them of great value.

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