On epilepsy and epileptiform seizures : their causes, pathology, and treatment / by Edward Henry Sieveking.

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Epilepsy

Sieveking

Radcliffe

1858

ON

EPILEPSY

AND

EPILEPTIFORM SEIZURES.

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EPILEPTIFORM SEIZURES.

Their Causes, Pathology, and Treatment.

BY

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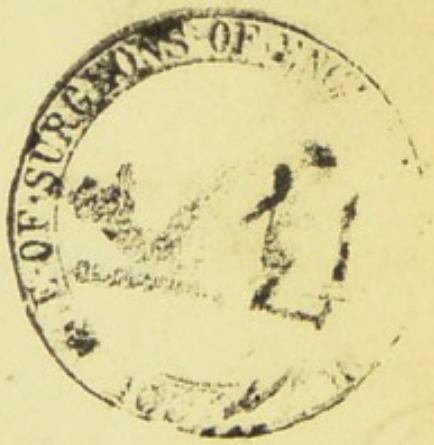

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TO HIS COLLEAGUES

THE

PHYSICIANS AND SURGEONS OF ST. MARY'S HOSPITAL,

IN ACKNOWLEDGMENT OF MUCH KINDNESS,

AS A PROOF OF GOOD FELLOWSHIP,

AND

IN EVIDENCE OF HIS DESIRE TO EMULATE THE INTELLECTUAL

AND SOCIAL QUALITIES WHICH DISTINGUISH THEM,

THIS ESSAY

Is Dedicated,

BY THE AUTHOR.

PREFACE.

THE strides that have been made during the last fifty years in the science of physiology can scarcely be said to have been equalled by the advances of pathology and therapeutics. This remark applies even more to the relation existing between the physiology and pathology of the nervous system than of any other class of organs or functions.

The labours of Bell, Marshall Hall, Flourens, Magendie, Müller, Brown-Séquard, have illumined a field which before the beginning of the present century was enveloped in darkness; and though the light thus shed upon medicine has removed much that was obscure, though Alison, Romberg, Todd, and Holland, Bright, Longet, Watson, Lebert, and many others have helped to reconstruct the foundations of medicine upon the newly-acquired physiological basis, it cannot be denied that much of what is still taught in schools, regarding the treatment of

disease, and of nervous maladies in particular, rests only upon empiricism.

But although the physician is compelled to admit that his therapeutic resources have not yet acquired the same firm scientific basis that he finds in some departments of medicine, he knows that all the laws regarding the preservation of health, the prevention of disease, the prolongation of life by these means, have been reduced almost to absolute certainty. Whether we take into consideration the diseases of one organ or system of organs, or another—whether we regard the diseases of childhood, manhood, or old age; in all cases the paramount importance of carrying into practice the rules of prevention embodied in sanitary science, holds good. Here lies our strength, here our logical consistency. No caviller or scorner can oust us from the strong position which here we occupy, for statistics, reason, and empiricism only serve to fortify it, while they mutually support one another.

While we concede a very high rank to sanitary science—a rank which may be said to bear the same relation to ordinary therapeutics that a multitude bears to the individuals composing it,—we may profit by the lessons it teaches us, by labouring for the prevention of disease wherever we meet with it in the daily execution of professional duties.

The sick man necessarily desires, above all things, to be freed from his present malady; but while the physician uses every appliance at his command to realize his patient's wishes, he must take a wider scope, and seek to prevent the return of the disease or to anticipate where the seeds have been or may be sown, but have not yet, to the eye of the superficial observer, sprung into life.

In this direction, the study of diseases of the nervous system promises more fruit than we can expect to gather through the intervention of the Materia Medica alone—this, at least, is my hope and my conviction, seeing how little has been achieved in the treatment of some forms of nervous diseases, although they have been the subject of earnest study from the beginning of medical science.

In epilepsy especially the results have been, if not barren, yet unsatisfactory; and still the very fearful nature of the disorder, the strange and violent symptoms that characterize and almost seem to remove it from the domain of ordinary diseases, constantly attract new inquirers, each anxious that he may succeed in lifting the veil that shrouds the mystery. No individual, however, can expect to do this; but each may, in his sphere, seek to aid in its ultimate removal; and in this hope I have not shrunk from

devoting much labour and time to a subject promising so little immediate reward.

The labour has been a labour of love; nor has it been undertaken without a full sense both of the difficulties in the way of the inquirer, and of the dangers of dogmatism and empiricism besetting his path.

With our present knowledge of hygiene, public and private, and with our acquaintance with the physiology of the nervous system, we are justified in expecting more decided benefit from a full development of our hygienic resources in combating epilepsy than by reiterated experiments with drugs alone. Although I have a high opinion of the value of medicines in the strict sense of the word, I place even a greater reliance upon the influence of hygienic and regiminal agents in combating chronic disease; and believe that no medical man avails himself sufficiently of the powers at his command who does not constantly combine both modes of warfare. Upon these principles my own practice is based, which, in theory at least, it is my constant endeavour to render as rational as possible.

Although I have repeatedly published papers in the journals on Epilepsy and allied subjects, the present work stands by itself. It is in no way a

republication of what has already appeared; although, as a matter of course, I have used the same cases as the basis of the results to which I shall direct the reader's attention. These observations have been tabulated, and are given in an abridged form at the conclusion of the book. With the exception of cases of too recent a date, I have put together all of which I have preserved notes and which have been under my own care.

Of the results of my inquiries I will here say nothing, except to express my vivid sense of the fact that my achievements fall far short of the goal to be attained. I may, however, add a hope that, although my readers may differ from some of the views which I entertain, they may feel willing to admit that, in my pursuit after light, I am not found to be running after a will-o'-the-wisp.

EDWARD H. SIEVEKING.

17, MANCHESTER SQUARE, LONDON,
September 9, 1857.

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ON EPILEPSY

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CHAPTER I.

Introductory remarks — The epileptic fit only a part of the whole disease — Description of the fit — The definitions given by classic writers — Objections to definitions.

THE features that characterize epilepsy are symptoms of a powerfully convulsive character; which, while they undoubtedly affect the general health of the sufferer, and induce him to attribute his entire morbid condition to them, also attract the attention of his friends and of the medical man generally so largely as to cause less prominent symptoms to be overlooked, which, however, belong as much to the entire portrait of the disease as the paroxysm. It is not to be wondered at that the suddenness of the seizure, the violence of the accompanying phenomena, the inability of art to contribute much, if anything, to their alleviation or arrest, should so often paralyse the hopes of the patient and of his friends. If we turn for an instant to other forms of disease, we shall find analogous instances, in which morbid conditions

often prevail, which do not attract much attention or cause serious apprehension until a climax is reached which taxes the entire vigour of the system or proves beyond the control of nature or of art. Thus, during the prevalence of cholera, the noxious influence of the poison is manifested very generally throughout the population by the almost universal occurrence of diarrhœa, which is amenable to simple hygienic and medicinal treatment, and is undoubtedly due to the same poison which induces the more fatal form to which the name of cholera is applied.* It has been shown that, while the curability of algide cholera by art is altogether a matter of doubt, there is no doubt that we may prevent or anticipate it by arresting the mild form which it puts on in the premonitory diarrhœa. We shall see that something similar occurs in epilepsy; and that our knowledge of the disease will be warped and very imperfect, so long as we have regard only to the fit that embraces all the characteristics to be found in scientific definitions, and overlook those minor symptoms which occur during the free intervals but do not amount to the sad dignity of a paroxysm. It will, however, be convenient to commence the observations I have to make upon the disease by a delineation of the epileptic fit or

* See Report of the Committee for Scientific Inquiries in relation to the Cholera Epidemic of 1854, p. 10. Untersuchungen und Beobachtungen über die Verbreitungs-art der Cholera, &c. Von Dr. Max Pettenkofer. München, 1855.

seizure itself. Having done this, I shall enter upon the bearing and value of the individual elements or symptoms of the paroxysm, and then examine the state of the patient during what is termed the free interval.

A brief and peculiar sensation announces in many cases to the person on the point of being attacked, that something peculiar is about to happen. He utters a scream of a shrill, unearthly character; falls as if hit by a gunshot, striking against anything that may intercept him, and injuring himself more or less, according to the nature of the opposing obstacle. There is entire unconsciousness; hence the patient does not protect himself, and falls into the fire, or into the water, upon sharp angles, or upon the rug, without having any regard to personal consequences. Our open grates are peculiarly reprehensible on this account, especially among the poor, who frequently are compelled to leave their children alone in a room with a fire in it, and among whom it is a very ordinary occurrence to find an epileptic individual fatally or very seriously injured by falling against the grate. One of my patients, a boy of eight years, was nearly drowned by falling into a canal. At first pale, the countenance soon becomes flushed; the limbs and features are convulsed and distorted, and it seems as though the restraining power of the muscular system had been destroyed or taken captive, and thus were running riot under some hidden but uncontrollable influence.

There is something necessarily suggestive of the influence of demoniac agency in these spasmodic throes; and without entering into a theological discussion on the terminology employed by the ancients or in sacred writ, it may be admitted that the epileptic paroxysm is peculiarly of a character to convey the impression that it is altogether beyond the ordinary range of physiological disturbances.

The convulsions that ensue are more or less violent, and generally show a predominance on one side of the body. The extremities are thrown about in sudden jerks, much like the movements of an animal recently dead, whom we submit to the shocks of a galvanic battery. It has appeared to me that the left side is the one most frequently affected. The spasmodic action is shown most in the flexors, in some of which it amounts to a permanent tonic contraction; the thumbs are drawn across the palm of the hand, and the fingers are at times clenched so firmly, that when relaxation takes place the nails are found to have left deep marks. Similarly the toes are forcibly flexed. The closed fingers are popularly regarded as so essential an element in the disease, that it is commonly considered necessary to force the thumbs and fingers open; a proceeding which is utterly useless, and can lead to no beneficial result.

The spasm is shown very uniformly in the muscles that close the jaw. The spasm of the muscles of the jaw is, like the spasm of other parts, clonic or tonic.

In the former case the result is that the patient grinds his teeth; and this is often done with such force as to break them. In the latter, the mouth is so firmly closed, that it may be impossible to open it or to introduce anything. This spasm is sometimes sufficiently violent to cause dislocation of the jaw. Dr. Cooke* quotes a case from Van Swieten in which this occurred. In consequence of the spasm, the inside of the cheeks and the tongue are very frequently lacerated and bitten by the patient. Hence bleeding at the mouth is a frequent symptom of the epileptic paroxysm, and one that may be relied upon as a pathognomonic sign, since persons who feign the disease will not be aware of its importance as a symptom, nor have the courage to produce a lesion sufficient for the purpose. If, as is frequently the case, the tongue is thrust out of the mouth during an interval of relaxation of the masseter and pterygoid muscles, and the jaw, then spasmodically closed upon it, the protruded part becomes livid from congestion, and the appearance of the patient is rendered more than ordinarily frightful. The tongue, or rather a portion of the organ, has actually been bitten off during the paroxysm; but this is a very rare occurrence, since the spasm is generally relaxed before the teeth are able to sever the protruded part. Owing to the saliva accumulating in the mouth, and the breath

* Treatise on Nervous Diseases, vol. ii.

being entangled in it, the patient in expiration forces out froth from between his lips, and the froth is frequently bloody if any abrasion or lesion has occurred within the mouth.

> Ut fulminis ictu
> Concidit et spumas agit, ingemit et tremit artus,
> Desipit, extentat nervos, torquetur, anhelat
> Inconstanter et in jactando membra fatigat.*

The spasmodic action is also shown in the eyes, which are frequently turned up so as to leave little more than the sclerotic visible, the pupil and iris being concealed under the upper lid. This is not, however, a uniform or persistent symptom, as the eye may be closed, or the upturning only be brief. The pupil is commonly contracted, but by no means, as would appear from the statements of authors, invariably so. I have seen them very much dilated. I have observed them vary at different periods of the same paroxysm. Thus I have found them dilated at the early part of the attack, and subsequently become contracted; but at both times from internal causes, the influence or withdrawal of light not altering the condition. They are, however, always insusceptible during the profound paroxysm to the stimulus of light, and this fact may be used as a means of diagnosis in cases of feigned epilepsy. The congestion, that takes place to the head, is parti-

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* T. Lucretii Cari, De Rerum Natura, libri sex. Lib. iii. v. 486.

cularly shown in the eye becoming suffused and bloodshot, at times leaving considerable ecchymoses in the conjunctiva.

The breathing is short and hurried, as in a person violently agitated; the disturbance of the respiration appears to be proportionate to the violence of the paroxysm. The same applies to the action of the heart; but no definite derangement of either function is observed to be connected with the epileptic paroxysm. Nor does it appear that the abdominal viscera suffer in any characteristic way. In violent seizures, the contents of the stomach are at times expelled by vomiting; involuntary defecation and micturition occur occasionally during or towards the close of the fit, and erections and seminal discharges have also been observed to take place. None of these symptoms are sufficiently uniform to lay claim to the dignity of a pathognomonic sign. They are, however, of importance when they occur, as indicating the extent to which the system is under the control of the disease.

During the continuance of the symptoms of which I have hitherto spoken, the insensibility of the patient continues complete; we are unable to rouse him by any of the means that would suffice to awake even a profound sleeper; the mental functions are in complete abeyance, and even the reflex actions are arrested. After the lapse of from ten to twenty minutes the convulsive movements subside, profuse

perspiration commonly ensues, consciousness returns, and the patient is restored to comparative health. A temporary swelling of the face is sometimes observed after the fits; after repeated attacks, a bloated condition often remains, which gives the confirmed epileptic a peculiar recognisable expression.

> Ubi jam morbi reflexit causa, reditque
> In latebras acer corrupti corporis humor,
> Tum quasi vaccillans primum consurgit, et omnis
> Paulatim redit in sensus animamque receptat.*

The fit is very commonly followed by considerable drowsiness; the patient sinks into a deep sleep, which has nothing morbid in its character, and appears to be granted by nature for the purpose of restoring the enfeebled and exhausted powers. Headache, for a longer or shorter period, very commonly remains after the epileptic seizure.

Such is the ordinary course of an epileptic paroxysm; but though it is common to meet with the symptoms just detailed, they all, more or less, differ in frequency and uniformity.

The definition which Sauvages† gave of epilepsy was this: "Est morbus clonicus universalis chronicus et periodicus, cum sensuum feriatione in pa-

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* Lucretius, ibid.

† Nosologia Methodica sistens Morborum Classes, &c. Auct. Franc. Boiss. de Sauvages, Regis consiliario, &c., tom. i. p. 578. Ed. ultima. Amstelod. 1768.

roxysmo et ante-actorum oblivione." The description which we find in Galen runs thus: "Comitialis morbus convulsio est omnium corporis partium minime quidem perpetua (ut in emprosthotono, opisthotono et tetano) sed quæ ex temporum accidit intervallis, nec solum hâc re sed mentis quoque et memoriæ et sensuum oblæsione, a jam dictis convulsionum generibus differt; unde constat," he continues, "in cerebro hunc affectum consistere." Except that the second definition is rather more lengthy, the sense is essentially the same as that conveyed by the first. And if we compare the description of more recent authors of epilepsy with the above two, we shall find but little altered. The prominent features of the paroxysms are, in fact, so marked, that there could be little difference in the accounts given of them. This opinion has been so fully realized by some, that for instance Dr. Lysons,* a physician who wrote upon epilepsy in the last century, prefaces his observations and cases with the remark that "the epilepsy is too well known to need description." I quote one definition from a recent author, in order to show that the lapse of ages has not materially affected the views that prevail on the subject. Dr. Copland† defines epilepsy as "Sudden loss of sensa-

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* Practical Essays upon Intermitting Fevers, &c. By Daniel Lysons, M.D. Bath, 1772.

† A Dictionary of Practical Medicine, vol. i. p. 785.

tion and consciousness, with spasmodic contraction of the voluntary muscles, quickly passing into violent convulsive distortions, attended and followed by sopor, recurring in paroxysms more or less regular." A better definition of the epileptic paroxysm, and one that more completely embraces its essential features, can probably not be devised; yet I incline to think that our knowledge of the disease will not gain by such definitions, however accurate, as they tend to limit the attention to the paroxysm, and often mislead the observer by inducing him to overlook conditions to which the definition does not apply, but which will appear, after a fuller examination of the whole subject, to belong to the same category of diseased conditions as epilepsy.

We should regard the fit as the flower of a noxious weed. We may be able to recognise the flower by its colour or its smell, when we have once seen it; but we shall fail to prevent the development of other flowers and seeds on the same plant, and on other plants, unless we recognise the plant itself by all its characters, and are thus enabled to pluck out the whole weed by the roots wherever it may be discovered. I am far from indulging in the presumptuous opinion that I have succeeded in discovering the means of doing this; but it does appear important to establish the correct principle upon which to proceed. And I cannot but think that the difficulties which environ the whole question of the

nature and treatment of epilepsy are enhanced by the paramount attention which has been paid to the fit itself. These views are borne out by the observation of Dr. Watson, who objects to attempting a definition of epilepsy, because its forms are so various, and its modifications so numerous, that no general description of it can be given.*

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* Lectures on the Principles and Practice of Physic, vol. i. p. 609, seqq.

CHAPTER II.

Consideration of individual symptoms characterizing the epileptic paroxysm — Frequency of premonitory symptoms — The aura — Character of premonitory sensations — Insensibility — Nature of the convulsions.

It has been stated above that the different features which we have attributed to the epileptic seizure may vary in frequency and uniformity. It is important in point of diagnosis, as well as in reference to the views we may form of the intimate nature of the malady, to determine as nearly as may be their relative value. It will therefore be my endeavour to analyse them with as much care as possible, and bring to bear upon their consideration as much of positive data as the history of medicine or my own experience supply.

The first question that it may be proper to answer, bears upon the frequency of the occurrence of premonitory symptoms. The affection that indicates the approach of a paroxysm has, from the time of Galen* downwards, been denominated an aura; and

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* De Locis Affect., lib. iii. c. 2. In relating a consultation about an epileptic boy, Galen says that one of the physicians (*ἄριστοι ἰατροί*), in describing the premonitory symptom, called it an aura: *αὔραν τινὰ ψυχρὰν ἔφασκεν εἶναι.*

it appears to be the prevailing doctrine among many physicians even to the present day, that the premonitory symptoms really occur in the form of an aura, or a breath of air. Esquirol,* in speaking of the aura, maintains the literal interpretation of the term, and says that the sensations spoken of by the patients: "Se propagent comme une *vapeur* le long des membres, du tronc, du cou vers la tête, et lorsque cette vapeur est arrivée au cerveau l'acces éclate." Whether Esquirol merely meant to convey that the symptom might be likened to a breeze, from the manner in which it was often found to pass from the extremities to the head, or whether his description is intended to imply that the patients felt a breeze or aura previous to the attack, I cannot decide. Certain it is that many of those physicians who have paid special attention to the phenomena accompanying epilepsy have failed to recognise the presence of an aura in the statements of their patients. Prichard† distinctly avers that he has never met with a patient who described the premonitory symptoms as an aura. By the list of the signs indicating the approach of a paroxysm in my own patients, it will appear that none of them described his feelings as a puff or draught. Georget (quoted by Dr. Watson) states that he found

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* Des Maladies Mentales, tom. i. p. 274, seqq. Paris, 1838.

† A Treatise on Diseases of the Nervous System, part i. pp. 85–113. London, 1822.

premonitory symptoms not oftener than four or five times in one hundred cases.

My own experience tallies with that of Romberg, who says that he has met with premonitory symptoms in about one half of his cases of epilepsy.* Of fifty-eight cases of epilepsy which have been under my own care, and of which I have preserved careful notes, thirty showed some indication of the approaching paroxysm. It must not, however, be concluded that because a patient at one time is made aware of the event about to take place, that therefore it will always be so. This Protean disease varies in this as in many other features; still it is most commonly the case that a patient habitually experiences a premonitory symptom, or that he is uniformly seized without any indication whatever.

The sensations which the patients describe as preceding the fit are extremely various. But even after hearing the details of a small number, it cannot fail to suggest itself that they may, without an effort, be ranged in two classes; those that are referred to the trunk and extremities, and those that appear at once to affect the head; in the former case the sensation is always described as mounting towards the head, and in the majority of cases the paroxysm appears to

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* A Manual of the Nervous Diseases of Man. By M. H. Romberg, M.D. Edited by E. H. Sieveking, M.D. Vol. ii. p. 197, seqq. Syd. Soc. Ed.

strike down the patient on its reaching that part: in the latter the sensation commonly takes the form of some strange illusion, which, however, the patient is able to recognise as such.

Tissot, whose works may yet be consulted as models of close observation and clear reasoning, quotes from Peiroux* the case of a young man who, when his fits came on, thought he saw a carriage drive up at a gallop and with great noise, containing a little man in a red bonnet; fearing to be *écrasé* by the carriage, he fell down stiff and without consciousness. Dr. Watson relates that "the late Dr. Gregory, of Edinburgh, was assured by a patient of undoubted veracity, that always when he had a fit of epilepsy approaching, he fancied that he saw a little old woman in a red cloak, who came up to him, and struck him a blow on the head, and then he immediately lost all recollection and fell down."† In Tissot's work we find that even in sleep, during which epilepsy frequently supervenes, peculiar dreams may indicate the approaching paroxysm. He gives the case of a man who dreamt that he was pursued by a bull, and soon after waking was seized with a fit.

These are, however, rather the curiosities of epi-

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* Observat. Medicin., p. 90; in Œuvres de Monsieur Tissot. Nouvelle édition, augmentée et imprimée sous ses yeux, tome septième. Lausanne, 1790.

† Lectures, vol. i. p. 616. 1843.

lepsy; the sensations of the patient not generally acting upon the sensorium in such a way as to produce illusions of the fantastic kind just described. With this exception, we may say that there is scarcely an impression referrible to the nerves of common or muscular sense, or of the special senses, which does not occasionally indicate the approach of an epileptic fit.* The premonitory symptom is generally accompanied by a sense of fear and terror. One of my patients described the sensation, which in him passed from the stomach to the head, of a pleasing character. Children particularly show the alarm they experience by running to and clinging to their nurses or mothers. The aura may be an undefined sense of indisposition or discomfort; it may be a definite pain, giddiness, or suffocating feeling; or it assumes the more classical form described as an aura, which is characterized by the passage of a peculiar sensation from some part of the body to the throat or head. In the case of the last we would specially observe that authors commonly state that when the aura, or sensation reaches the head, the insensibility ensues; it has rather appeared to us that the patients refer the termination to the throat. With some patients the premonitory symptoms assume a more tangible form, and one that makes itself perceptible to bystanders.

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* A very complete list may be found in Dr. Copland's article on Epilepsy.

Dr. Cooke* relates a case in which the approach of a paroxysm was indicated by a peculiar blue colour of the lips. "I. Frank," as related by Dr. Copland, "saw the paroxysm preceded by an eruption over the whole body except the face, of the vitiligo alba." The same author states "that in twenty-one epileptics treated in the clinical wards of the hospital at Wilna, vomiting announced the paroxysm in seven." Symptoms that may be termed objective have presented themselves to me in the form of tremors, cough, sickness, rigors, and a shaking of one hand.

Schenck relates a case of epilepsy which came under his own observation, in which the patient, before the seizure, was repeatedly turned round in a circle, and then fell to the ground in an ordinary paroxysm, "magna astantium commiseratione." Peiroux (quoted by Tissot) mentions a man who, before becoming unconscious, was compelled to run backwards ten steps; the unconsciousness was very brief, and he at once rose up again as if nothing had occurred. In Schenck we also find the account of a man, aged thirty, of whom it is said, in rather quaint Latin, "Solebat, quum duos vel tres passus progressus esset, sese inflectere quasi in circulum, idque continenter facere compulsus erat." This patient

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* A Treatise of Nervous Diseases, &c., vol. ii. part 2. London, 1823.

subsequently became epileptic, and the peculiar movements then ceased.* Such cases as those related by Schenck and Peiroux have received the name of "epilepsia cursiva," under which term Dr. Andree† details two well-marked instances, which were both cured by venesection, antiphlogistic remedies, and antispasmodics. They are instructive and well told, so as to justify our inserting one of them briefly here: "Rebecca Cole, ætatis sixteen. Before her seizures she first perceives a weight in her head, which makes her hang it down; then a tremor all over ensues and a sense of faintness; she then runs till she meets with some resistance, then falls down, struggles at first, after which she lies still and gradually recovers. The fit being over she trembles, is faint, sick at stomach, and dizzy; and now, by frequent returns of them, is almost become stupid."

As I have not met with a statement in writers on the subject, indicating the relative frequency of the various forms of premonitory symptoms, the following list of the warnings experienced by my own patients, and generally given in their own words, may

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* Παρατηρησεων sive Observationum medicarum, rararum, novarum, admirabilium, monstrosarum, Volumen. Studio atque opera Johannis Schenckii à Grafenberg. Francofurti, 1609, p. 110, where both the above cases may be found.

† Cases of Epilepsy, Hysteric Fits, and St. Vitus's Dance. By John Andree, M.D. London, 1746.

not be devoid of interest. The numerals correspond to the number of the case, of which a summary may be found at the end of the volume :—

Case 2. "Sense of choking and dimness." 3. "A sensation extending from the thumb up the arm, with spasm of the latter." 4. "Headache." 6. "A sensation ascending from the stomach." 7. "A sensation passing from the hand to the head." 8. "Dimness, and pain in the right arm." 9. "Pain across the shoulders." 10. "Loss of sight." 11. "Vertigo and general stiffness." 12. "Feeling of illness for half an hour before the fits." 13. "Head goes round." 17. "Sense of suffocation and tremors." 18. "A momentary warning." 21. "Dimness." 22. "Short cough." 24. "Sickness." 26. "Lightness of head, followed by oppression." 28. "Sense of strangeness." 31. "Pain at stomach and sickness." 33. "Drowsiness." 34. "Loss of power in left hand for twenty minutes before the fits." 36. Rigors. 40. Pain in hypogastrium. 41. "Shaking and curious sensation in hand." 43. "Lightness in head." 46. "Sense of heavy weight." 53. "Sometimes the fits preceded by a cry." 55. Has no premonitory symptoms immediately before accession of fit, but feels "spiteful and low-spirited" for a day before fit. 57. "Comes over in a heat" for two to three minutes before fit. 58. Always has a "sensation at the heart" before the fit. This list is sufficient to show that there is an entire absence of uniformity in the cha-

racter of the symptoms; still we gather from it that the sensations referred to the trunk or extremities are much more numerous than those which are described as having their seat in the head. In eight instances (4, 10, 11, 13, 21, 26, 33, 43) the sensation is referred to the brain, or its immediate dependents the eyes; in the remaining nineteen its site is stated to be in other parts of the body.

We shall have occasion to see that the occurrence of the premonitory symptoms in the head or about the trunk and limbs respectively, is regarded by some as an indication of the character of the malady; the effective cause of the disease, the causa proxima, being supposed to reside in the head or elsewhere, according to the form of the "aura." As this question involves the whole theory of the disease, I merely allude to its bearing upon the centric or eccentric origin of epilepsy, and pass on to the consideration of other matters.

Insensibility is ordinarily and very justly regarded as an essential symptom in genuine epilepsy. In the complete paroxysm the unconsciousness is so profound that we are entirely unable to rouse the patient, and even the reflex functions appear to be in abeyance, so that it has been suggested to introduce irritants, like snuff, into the nose, as a test of the reality of the seizure. Romberg doubts that this insensibility to reflex action is a uniform accompaniment of epilepsy; for he states that he has repeatedly observed the same start to

follow the sprinkling of cold water over the face in the epileptic subject as in the healthy individual. "We have yet to inquire," he continues, "into the manifestations of reflex action resulting from irritation of the mucous membrane, as to whether, for instance, sneezing is produced by the introduction of acrid vapours into the nose, or cough by irritant fumes."

Although the occurrence of entire unconsciousness is regarded almost universally as essential to constitute the epileptic fit, and enters into all the definitions, there can be no doubt of the existence of paroxysms which present all other symptoms of epilepsy, but in which a certain amount of consciousness is retained throughout. We shall have occasion to see that several of the diseases that are commonly regarded as residing mainly in the nervous system merge into one another, and that the boundaries by which they would appear to be circumscribed by nosologists are by no means so uniformly to be traced. In the same way the symptoms belonging to epilepsy vary much. I have repeatedly been at a loss for a considerable time after a patient has come under my hands, whether the affection he or she was labouring under was epileptic or not, until the occurrence of certain well-marked symptoms removed all doubt. I have at this moment a patient under treatment, who presents all the symptoms of epilepsy, and has also bitten the inside of her mouth so as to cause

hæmorrhage; she asserts that frequently in her fit she is aware of circumstances going on around, and that she retains sufficient memory of what has been spoken in her presence to repeat it after the paroxysm has subsided; at other times the unconsciousness is absolute. Some authors of acknowledged reputation adopt the same view that epilepsy may occur in which more or less consciousness is persistent throughout. It appears, in fact, difficult to understand how it can be reasonably denied by any one, who admits that in the intervals of the true paroxysm, vertiginous and spasmodic attacks very commonly affect the epileptic patient, which evidently stand in a close relation to the main seizure, but are not characterized by loss of consciousness. A high authority in all matters connected with the pathology of the nervous system, Dr. Prichard,* who in everything that he has written evinces a mind capable of the largest views, remarks on the point in question, that in some cases there is a certain amount of consciousness throughout the fit, which he regards as being generally a prelude to the total abolition of the disease.

Poupart relates† the case of a lady in whom the fits were of such brief duration, that unless, as sometimes

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* A Treatise on Diseases of the Nervous System, part i. London, 1822.

† Esquirol, Maladies Mentales, and Mémoires de l'Académie Royale des Sciences. 1705.

happened, they were accompanied by a scream, persons in whose company she happened to be were not necessarily aware of anything being wrong. Her father had been epileptic, and she herself was seized at different times without being thrown down; the eyes were convulsed, the look became fixed for a few seconds, after which the patient, herself unconscious of the interruption, would resume the thread of her conversation where it had been dropped.

I would also refer, in connexion with this question, to three important cases detailed by Dr. Bright,* in a paper on epilepsy from local disease, where the distinguished author dwells upon the fact of the patient retaining a certain degree of consciousness during the fits, which was regarded as an indication that they depended upon a local cause rather than upon a constitutional affection.

The convulsions which are associated with epilepsy present great variations in character and extent.† Generally they are clonic; and the violence with which the muscles act often renders it matter of physical difficulty to restrain the patients; whenever it entails no special risk to the patient, it is better that nothing be done to interfere by physical force. Moreover, the convulsions are extremely irregular;

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* Guy's Hospital Reports, vol. i. p. 457.

† Nulla quippe gesticulatio, inflexio posituraque noscitur quam non aliquando exhibuerit epilepsia.—Boerhaave, Aphor. de cognosc. et curand. Morbis, p. 237. Lovanii, 1752.

the want of co-ordination being a feature deserving of special attention in our endeavour to localize the cause of the disease. The most ordinary movements that we meet with are an irregular jerking of the head to one side of the body, and spasmodic action of the extremities of one side of the body. These movements may be incessant during the attack, or they may only occur at longer or shorter intervals; or, again, they are so slight as to be imperceptible during the greater part of the seizure. The duration and violence of the muscular spasm is at times so great as to induce a wonder that human nature can sustain the effort so long. The diagnosis of the affection may be rendered difficult by the absence of the convulsions, and the case may be regarded by the medical man, who has no means of ascertaining the previous history, as a case of apoplexy or of syncope. The absence of stertor has been pointed out by Dr. Prichard as a guide to the affection being epileptic, and not apoplectic; this alone would scarcely, however, be a safe indication, since we meet with cases of apoplexy in which there is no stertor. As it might entail a serious error in the treatment, it would be wise, where doubt existed, to wait for a brief space before applying active measures, as in a case of epilepsy the symptoms would probably, after a short time, assume a different character, which would be sufficiently indicative of the nature of the disease.

The convulsive movements are at times so limited as to cause a difficulty in the diagnosis. Dr. Prichard has devoted a separate chapter to what he denominates partial epilepsy, and details some interesting cases, in which the spasm was confined to a much smaller number of muscles than is generally the case. One instance is that of a man aged forty-six, who had strong convulsive jerking of the left arm; his arm was violently tossed about for a minute or two, and afterwards felt numbed, and for a short time the patient was incapable of moving it. These symptoms occurred in fits, during which the man never lost his senses, though each attack was followed by vertigo and severe headache. A similar case is detailed by the same author, in which jerking of the right arm gave place to paralysis. I shall, in another place, discuss the nature of convulsive seizures not belonging to the class of epileptic disorders; but I may take this opportunity of expressing a doubt of the propriety of classing any convulsive affection with epilepsy, in which there is not at the same time decided evidence of a coexistent affection of the mental powers.

Strange symptoms are related by some authors as accompanying the epileptic paroxysm. Boerhaave (quoted by Cooke) met with a Jewish woman who in the fit alternately contracted and elongated her lips; they were thrust out into a sharp beak, and then drawn back with such celerity as to make the be-

holders giddy. An erection of the penis, a phenomenon which may be considered under the head of spasmodic action, is stated by Hoffmann to accompany the epileptic seizures of children. It is not improbable that it also occurs in adults, since involuntary micturition, defecation, and seminal emissions are known to take place. A spasmodic action of the muscles of the neck is so uniform an occurrence in epilepsy that Dr. Marshall Hall* has based upon it a theory of the disease involving a novel mode of treatment, which will be discussed in the proper place. At one stage of the epileptic paroxysm the face becomes flushed, and the muscles of the neck are visibly in a state of excitement and contraction. The internal jugular is most liable to suffer through the spasmodic action of the omohyoid muscle; and it is fair to assume that it would be more exposed to compression than the adjoining carotid, owing to the latter possessing greater resiliency. When the sternohyoid and platysma are together in a state of spasm, the external jugular will also be compressed, and so give rise to the superficial vascular engorgement, which becomes palpably visible in the face. An interesting case, in proof of this last fact, carefully observed by Dr. Russell Reynolds

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* Lecture on the Neck as a Medical Region, and on Trachelismus. By Marshall Hall, M.D., F.R.S. London, 1849. And On the Threatenings of Apoplexy and Paralysis, Inorganic Epilepsy, &c. By the same. London, 1851.

during the paroxysm, is related by Dr. Marshall Hall. This eminent physiologist is of opinion that, "whatever the violence of the arterial circulation, there is no danger, no tendency to morbid action, as long as there is no impediment to the return of blood along the veins; the idea of a tendency or determination of blood *to* the head is a fiction and a chimera, and the real state of things in the condition which has been so designated is, in fact, its impeded return *from* the head." This impeded return he attributes to the spasmodic action of the muscles of the neck on the veins, "an action evident in a vast many instances, though latent perhaps, and to be inferred from the similarity of its effects in others."

While it would be impossible to deny that spasm of the muscles in the neck, the platysma, sternocleido mastoid, scaleni, and trapezius more particularly, materially affects the circulation of the blood in the vessels of the part, the literal interpretation and careful observation of all the symptoms of epilepsy will not allow of our regarding this as more than a small part of the phenomena. The experiments of Sir Astley Cooper, to which there will be occasion to revert more in detail, show that compression of the arteries leading to the head may induce epileptic seizures in animals; and while there is ample pathological evidence to show that morbid conditions inducing compression of the vessels of the neck generally, are frequently associated with epilepsy, cases of an opposite

character are not wanting in the history of medicine. The following case, which fell under my personal observation, offers proof of the possibility of cessation of the epileptic fits under circumstances which are ordinarily regarded as liable to produce them. It strongly attracted my attention, as it occurred just about the time that Dr. Marshall Hall put forward his views on trachelismus, and seemed to afford evidence, apart from other considerations, that they did not suffice to establish a *rationale* of epilepsy.

Frances T., æt. sixteen, of ordinary stature, well made, without curvature of the spine or thoracic deformity, was in good health previous to her eighth year, except that her eyes were thought defective, from her clumsiness. She was not affected with swelling of any kind; there was no evidence of her having been scrofulous, though her appearance at the time of being first seen by me was heavy, and of a scrofulous character. At eight years of age she was seized with a struggling fit in bed, and became black in the face; she did not scream, and the attack passed off in ten minutes. She continued in her usual health for six months, when she had a second fit at 5 A.M., in bed: it was more visible than the previous one, and lasted six hours; she did not scream, but was perfectly unconscious; every part of the body was agitated, the nose was turned up, and the neck swollen. After the fit she appeared somewhat deficient in intellect, and did not speak as plainly as

before. She then had six fits at intervals of six hours each. The first lasted about six hours: the symptoms were always the same; the attacks always occurred in bed: she had vomiting; the eyes were turned up; there was discoloration of the face. The fits were followed by much flatulence and discomfort. Soon after the fits ceased the neck was observed to swell; there were no further epileptic symptoms; the memory was good, the speech clear, but a connected conversation appeared out of the question. When seen by me she could say her prayers, but had a difficulty in receiving instruction, as she was unable to express what she meant: hearing good, eyesight defective. Since the cessation of the fits there has been constant headache, much augmented during the last three months previous to coming under my care; the patient compares it to earache. Two years ago there was some otorrhœa, the side not known; bowels confined; catamenia regular for a year past. After the second fit the entire left side was paralysed for some time; but at present there is no difference in the strength of the two sides, except a slight strabismus of the left eye. The pupils are sluggish, but contract under the action of light. She never falls, but occasionally stumbles. Measurement of neck above the thyroid $13\frac{1}{2}$ inches, 15 inches over the thyroid gland at time of consultation; tongue clean; pulse 132, soft. The treatment consisted merely in the application of a seton to the nape of the neck; and the

exhibition of iodide of potassium, with gentian, and the administration of tepid sponging. The seton rapidly had a very beneficial effect; after wearing it eleven days, the earache had entirely left, and only some frontal headache remained. The last report, about seven weeks after commencement of the treatment, is that there has been no return of the earache; in other respects, no material alteration. As there was much irritation from the seton, this was now removed, and I heard nothing more of the patient.

In contrast with the case just related, we may advert to one given by Dr. Parry,* in which the thyroid gland always enlarged to a very great degree before the fits, but returned to its natural state after the fits.

I have hitherto spoken of the spasmodic action of the muscles in epilepsy as being essentially clonic; but though De Sauvages' definition is true in the main, and is generally adopted, we meet with a variety of epilepsy in which the muscular action shows itself as a tonic or tetanic spasm. It is not, however, to be overlooked that even in the ordinary form of epilepsy the clonic spasm is ordinarily accompanied by tonic spasm, in the shape of firm closure of the fists, or in what is technically designated as carpopedal contractions. In one of my patients the

* Collections from the unpublished Medical Writings of the late Caleb Hillier Parry, M.D., F.R.S. vol. i. p. 396. London 1825.

left arm is stated to be sometimes, as it were, glued to the head during the fit. The general character of the spasm accompanying epilepsy, however, is certainly clonic, and tetanic convulsions must be regarded as the exception. Their occurrence in conjunction with epilepsy has been long noticed. Thus, on referring to Frederick Hoffmann's consultations,* we find, in case 30, that a young woman of twenty-three years presented all the complex symptoms of epilepsy which are minutely described, but that her body became rigid. Prichard has more particularly directed attention to this peculiarity in certain epileptic patients. He has constituted tetanoid epilepsy as a distinct variety of the disease. In it the paroxysm is essentially such as we meet with in ordinary cases of epilepsy; but, instead of the irregular spasm of the various muscles, the limbs are stretched, and the whole body extended and fixed by a rigid spasm; the eyes are widely open, not reverted, as they are usually, but staring frightfully, and the pupils contracted, and insensible to the stimulus of light. If, on the one hand, the convulsions show great variations in character and mode of localization, on the other they manifest extreme differences of degree. We see the spasmodic attack passing through all the changes from a mere twitch of an individual muscle

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* Frederici Hoffmanni Consultationum et Responsorum Medicinalium Centuria prima. Tomus primus. Amstelod. 1734.

to the most violent excitement of every voluntary muscle of the body. In many cases nothing but a slight spasm is perceptible about the muscles of the neck; in others nothing but a contraction of the fingers or toes—the carpopedal contractions of authors—indicates the nature of the seizure, or the eyes only are peculiarly affected; or, again, a close observer is able to detect nothing of a spasmodic character, and the inference of the case before him being epileptic might be unsafe, unless in the same individual more decided epileptic seizures had been previously manifested, or unless he found that the symptoms were identical with those observed in other instances where the epileptic nature was undoubted. It is common to distinguish from epilepsy a form of disease termed eclampsia, in which the main symptom is a temporary loss of consciousness, not of a syncopal character, and not attended with any spasmodic action of the voluntary muscles. I confess that the gradations by which the features of well-marked epilepsy pass into those of eclampsia, appear to me so imperceptible, that I doubt the propriety of distinguishing the two diseases nosologically; I should be disposed to regard eclampsia as a variety of the same type of disease, but characterized by the absence of spasm of the voluntary muscles.

CHAPTER III.

Consideration of individual symptoms characterizing the epileptic paroxysm, continued — The pulse — Biting the tongue — Frequency of the fits — Influence of the moon — Influence of diurnal changes — Influence of seasons — Headache, its relation to epilepsy — Somnolency.

BITING the tongue and the inside of the mouth or lips is a symptom of some importance in the diagnosis of epilepsy, because it indicates that the unconsciousness must have been complete and the spasm violent. The absence of the symptom by no means proves a seizure not to have been epileptic, for it may be regarded as a mere accident, like any other injury in the epileptic, induced by the coincident convulsion and unconsciousness, as a fall into the fire or against a sharp corner. In fifty-six cases of epilepsy of my own I find that it is stated to have occurred twenty-one times, or at the rate of 37·4 per cent.; hence it may be regarded as a common symptom. In some patients the tongue is bitten at every fit; in others it is perhaps injured occasionally; in others it may be bitten once, and not again. We may not always expect to find a trace of the injury, for the extent of the lesion varies much; and even

when a considerable solution of continuity takes place, it is remarkable how soon and completely the repair is effected. As in the same patient the convulsions are often noted to prevail on one side of the body, so also do we find that the injury done to the tongue is commonly limited to the right or the left side.

A few words will comprise all that may be said about the pulse during the paroxysm. There is no feature in the pulse which is in any way pathognomonic. The general circulation suffers secondarily from the attacks, and shows greater or less excitement, proportionate to their violence. The pulse is accelerated, and its force varies with the general vigour of the patient. During the intervals of the fits its force and frequency present the usual variations which are found to be associated with greater or less physical strength. The prevailing character of the pulse in the majority of cases that have fallen under my observation, is that which is met with in subjects who want blood and tone. It is generally much accelerated, feeble, and soft. In cases exhibiting more of the sanguineous and florid type, the pulse may present no variation from the normal character. The same will probably be the case when the attacks have only commenced recently, or occur at long intervals. The more frequent they are, the more perceptible will be the derangement of the circulation; but in no case does it appear that even

prolonged cases of epilepsy exercise any definite influence upon the central organ of the circulation. Nor can any causal relation be traced, such as exists between chorea and morbid conditions of the heart. In short, the manifestations of any influences of epilepsy upon the circulation appear to be confined to such effects as may be found in any circumstances which at once enfeeble the individual while they excite the circulation. An exception from the general rule that an acceleration of the pulse is produced by epilepsy, if any change is perceptible, is detailed by Dr. Burnett,* who quotes two similar instances from Morgagni, as the only ones on record. In Dr. Burnett's case, an officer, aged forty-six, became epileptic, and the pulse was reduced from the normal standard to 20, and at times sunk as low as 14 in the minute during the fits. This slowness became persistent, and is attributed by the author to derangement of the chylopoietic viscera, which appears also to have been the cause in the cases related by Morgagni.†

The frequency of the fits and the question of their periodicity will next command our attention.

The complete paroxysm, of which alone I have hitherto been speaking, occurs at very varying intervals; sometimes a single fit may occur never to

* Case of Epilepsy attended with remarkable Slowness of Pulse. By William Burnett, M.D. (Med.-Chir. Trans., vol. xiii. p. 20.)

† Book i. letter ix. art. 7; and letter lxiv. art. 5.

return ; sometimes the second fit may not show itself, as in one of my own cases (No. 44), for seventeen years after, and then a rapid succession of attacks may take place. The more ordinary case is, that at first the fits present themselves at intervals of a few months, and gradually increase in frequency, until we find them occurring day by day, and even repeatedly in the course of twenty-four hours. In some cases, a constant and rapid succession of epileptic seizures will affect the patient, with scarce a moment's perfectly free interval : this occurred in my twenty-second case. But neither in my own observations, nor in the histories of the disease preserved by other authors, has there appeared to be any uniformity in the mode in which the paroxysms took place. An approach to regular periodicity is sometimes observed in the female, as the disease there, at times, bears a palpable relation to the catamenia ; but this is by no means uniform and sufficiently marked to lay down a general law ; moreover, in this the periodicity can scarcely be said to be a feature of the epilepsy, but the semblance of a periodical return is due to the spasmodic paroxysm depending upon another condition, which in its nature is of a periodical character.

In ante-Hippocratic times a periodicity was supposed to prevail in epilepsy, and was attributed to the moon ; hence epileptics were termed moony, or moonstruck (*σεληνιαζόμενοι*) : the demoniac posses-

sion appears a much more intelligible doctrine to any one who has once witnessed the terrific contortions of some patients; but for the influence of the moon we can find neither a parallel in human pathology, nor a proof of its reality satisfactory to our own minds. A very interesting case is related by Mead, in which a periodicity was observed which countenances the belief in the influence of *Selene*; but its very rarity justifies our seeking for some other explanation, while I am able to bring forward authorities which, apart from my own experience, appear to be sufficiently conclusive on the point. Dr. Mead* was a firm believer in the moon's power in causing epilepsy; with Galen, he was of opinion that the moon governs the periods of epileptic cases, and he states that he has often predicted the times of the "fits with *tolerable* certainty."

The following is the account of the case referred to:—"But no greater consent in such cases was, perhaps, ever observed, than what I saw, many years since, in a child about five years old, in which the convulsions were so strong and frequent that life was almost despaired of, and by evacuations and other medicines was with difficulty saved. The girl, who was of a lusty, full habit of body, continued well for a few days, but was, at full moon, again

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* The Medical Works of Richard Mead, M.D. London, 1762.

seized with a most violent fit; after which the disease kept its periods constant and regular with the tides. She lay always speechless during the whole time of flood, and recovered upon the ebb. The father, who lived by the Thames' side, and did business upon the river, observed these returns to be so punctual, that not only coming home he knew how the child was before he saw it, but in the night has risen to his employ, being warned by her cries when coming out of the fit, of the turning of the water. This continued fourteen days, that is, to the next change of the moon; and then a dry scab on the crown of the head (the effect of an epispastic plaster, with which I had covered the whole occiput in the beginning of the illness) broke, and from the sore, though there had been no sensible discharge this way for above a fortnight, ran a considerable quantity of limpid serum; upon which, the fits returning no more, I took great care to promote this new evacuation by proper applications, with desired success for some time; and when it ceased, besides three to four purges with mercurius dulcis, &c., directed to be taken about the new and full moon, I ordered an issue in the neck, which, being thought troublesome, was made in the arm. The patient, however, grew up to woman's estate without ever after feeling any attacks of those frightful symptoms."

We shall not weary the reader by a quotation of the authors who have written on both sides of the

question. The doctrine of the moon's influence is, however, by no means extinct.* The question is one of a very vague character; and the answer is manifestly not as easily attainable as, for instance, to an inquiry relative to the causation of the tides, otherwise we should not still find it necessary to enter upon the inquiry. Some medical men continue to hold to the lunar influence, and among the lay public we often meet with evidence that the belief still prevails. Thus the mother of Mary Ann A. (case 50) stated of her daughter, that for three years she had been subject to fits "at the fall and change of the moon." Nothing but a most minute and extensive analysis of a larger number of epileptic seizures could satisfactorily determine, whether this disease bears a relation to the phases of the moon different from what is observed in other morbid conditions.

Dr. Moreau† has, in his prize essay on Epilepsy, set the question at rest. The author, whose position at the Bicêtre gave him the best opportunities for instituting a rigorous inquiry and ensuring correct reports, analyses 42,637 attacks occurring successively

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* Romberg (l. c. vol. ii. p. 205) does not state his own experience on the subject, but says that, "although here and there doubts have been raised against this view, the accurate observations of others have established its correctness."

† De l'Etiologie de l'Epilepsie. Par le Docteur J. Moreau (de Tours), Médecin de l'Hospice de Bicêtre. Mémoire couronné. Mémoires de l'Académie de Médecine, tom. xviii. Paris, 1854.

in one hundred and eight male patients in the course of five years. For the details of the analysis, I refer the reader to the Memoirs of the Academy of Medicine; it will suffice for the present purpose to give the general results. The 42,637 were thus distributed: Between the phases of the moon the number of epileptic seizures was 26,313; the number occurring during the changes themselves was 16,324. The difference in favour of the former was therefore 9984; or the relative frequency of the occurrence of the fits at the changes and in the intervals was as 26 to 16. Dr. Moreau concludes, I think, justly, that the changes of the moon exert no influence upon the epileptic seizure, as they are more frequent during the intermediate periods.

The tendency of the human mind to adopt foregone conclusions is often shown in the manner in which persons, favouring the notion of a lunar influence in epilepsy, interpret the very frequent exceptions from the coincidence between the fits and the lunar changes, in those patients in whom they watch the influence of the latter with solicitude. Thus such persons will view a fit occurring two or three days before or after the full or the new moon as coming within the range of such influence; but it must be manifest that, if we seek for a definite relation between the epileptic seizure and the moon, according to the analogy of the tides, we should repudiate all conclusions that are not based upon

similar clear and irrefragable evidence. I have myself no bias beyond that induced by the facts that are available. I certainly do not seek for what is commonly regarded as the marvellous; but this, not because I am unwilling to receive what I cannot fully comprehend, but because, being in daily life surrounded by wonders, it is unphilosophical to multiply them where the ordinary processes of reasoning based on statistics show them not to exist.

A more definite periodical type is observed in a large number of patients in the cycle of the twenty-four hours, the fits very commonly showing a preference for the night. The circumstance has nothing in common with the type of intermittent diseases, but depends upon the physiological effect which sleep produces upon the brain. It would almost appear that there is a peculiar proclivity in some persons to nocturnal attacks; at least there is a marked difference in the frequency with which some persons are attacked at night. They are seized by the convulsions while asleep, or they wake up first and are then attacked. In some the fits occur more often early in the morning, shortly after rising, than at other times. As the nature of the changes that take place in the cerebral circulation during sleep are themselves hypothetical, their influence in the production of epilepsy must necessarily be so also. It does not, however, appear illogical to assume that during sleep there is an increased afflux of blood to

the head, both from the prone position, which is well known to favour its production, as from the analogy with the effects produced by narcotic poisons. Such at least appears to be the opinion of those authors who have touched upon the subject. In a practical point of view it becomes important to bear this influence of sleep in the production of epilepsy in mind, since it serves as an indication in the treatment. In proof of the increased local afflux of blood, I would cite the benefit which is often obtained by the application to the head of cold lotions on retiring to rest, and the prosecution of similar measures calculated to maintain a due balance in the circulation. By this remark I do not wish to shelve the question of the causation of epilepsy; I would rather anticipate a misconception by at once stating that during sleep, as well as at other times, gastric derangement often acts as an exciting cause of the paroxysm.

In general hospital or private practice it is very difficult to obtain statistics that are sufficiently precise to determine the question of nocturnal and diurnal influence. In drawing upon the valuable Reports of the Somerset County Pauper Lunatic Asylum, prepared by Dr. Boyd, for information upon this point, I would take an opportunity of expressing a regret that an important and positive gain which might be secured to medical science is wasted by scientific matter being inserted in reports addressed to lay-governors of hospitals and charitable institutions, who,

with rare exceptions, are unable to appreciate it. It would be no mean undertaking if individuals, or societies like the Sydenham Society, would seek to rescue from unmerited oblivion some of the valuable facts thus attainable.

But to return to Dr. Boyd.* Forty epileptic subjects, who were under his observation in 1852, and whose seizures he has analysed, had 3202 fits, 1962 of which occurred by day and 1240 by night. In 1853 there were 49 cases of the disease, in twenty-four males and twenty-five females, who had 3998 fits, 2407 occurring by day and 1591 by night.

In the annexed table (No. 1, p. 44) is exhibited the relative frequency of fits by day and night for every month in the year 1852.

The average of attacks by day and night throughout the year 1853 is given in the second table.

It has been stated by some authors, and it is a popular belief, that certain seasons exercise an influence in the production of epilepsy, and that it is more frequent in spring than at other times. On this question no one can afford more definite information than M. Moreau. His analysis of the entire number of fits occurring in 108 epileptics in the course of five years yields (see p. 45) the following per-centage for the four seasons :—

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* See the Reports of the Somerset Lunatic Asylum for 1852 and 1853.

No. 1.

	Jan.		Feb.		March.		April.		May.		June.		July.		August.		Sept.		Oct.		Nov.		Dec.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
1852.																									
Day	43	106	106	161	52	171	42	128	68	86	51	94	57	66	65	72	48	124	35	53	73	72	35	154	1962
Night	24	106	35	179	49	112	23	35	42	31	41	31	24	32	27	35	57	72	50	30	54	38	28	85	1240
1853.																									
Day	54	73	47	69	88	70	53	115	61	91	58	108	57	171	118	157	104	135	116	107	134	231	97	93	2407
Night	23	39	34	25	87	57	120	70	111	41	84	65	67	62	79	107	50	53	43	65	75	142	41	51	1591

No. 2.

	Day.	Night.
Males	52	43
Females	76·7	42

Summer	25·2
Spring	26·8
Autumn	23·4
Winter	24·3

These numbers give some colour to the popular notion derived from Hippocrates that spring is the favoured season; the difference is, however, not as much as $1\frac{1}{2}$ per cent., and cannot, therefore, deserve very serious attention in reference to the etiology of epilepsy.

The actual number of fits occurring in each month are stated by Dr. Moreau to have been :—

January	3944
February	3709
March	3749
April	3732
May	3972
June	4025
July	3657
August	3081
September	3131
October	3472
November	3426
December	2739
Total	42,637

Headache is one of the symptoms that bears so close a relation to the epileptic paroxysm, that it deserves a separate consideration; the more so as the frequency of its occurrence may become an important argument in the consideration of the proximate cause of the disease. It has not hitherto met with quite the consideration which it deserves.

In my own cases I have met with headache in 66·0 per cent. In fifty-six cases it is stated to have occurred thirty-seven times. The headache was found to be constant or frequent in twenty-one cases; it occurred before the fits only, in four cases; after the fits only, in twelve cases. The pathological significance of the headache occurring immediately after the fit only, is necessarily distinct from that of the cephalalgia preceding the attack, or habitually affecting the individual. The violence of the convulsions, the spasmodic affection of the muscles of the neck, the general excitement of the circulation, conspire to exhaust the nervous system, and to induce the conditions in which, under other circumstances, we very commonly meet with headache. Hence it would be strange if the direct result of an epileptic fit were not often to bring on this symptom. It cannot by itself be taken as an indication of the nature of the disease. The headache that habitually affects the epileptic, or that precedes the seizure, occupies a different position, and forms a material item in our arguments regarding its proximate cause. In the same way as epilepsy is very commonly associated with cephalalgia, so also do we frequently meet with individuals, who are not epileptic, subject to headache; but in whom the concomitant symptoms of giddiness, and temporary and partial loss of power, remind the physician of their possible relation to epilepsy, or of the approach of the latter disease.

Where we are unable to detect any visceral derangement to account for such symptoms in young persons, we must be on our guard. This, of course, will be the more necessary if at any time there have been an epileptic seizure. In classifying different forms of headache I have thought the introduction of the term cephalalgia epileptiformis necessary to express a pathological fact. On this point I have, on a former occasion,* made some observations which it may be permitted to repeat here: "Among the causes of cephalalgia residing, as it were, in the cranial contents, or affecting them without the intervention of other organs, the foremost are mental and intellectual excitement carried beyond the normal limits of healthy stimulation; they may act by a shock, as in a child that is frightened or suddenly carried into a brilliant light, or made the gazing-stock of pseudo-admiring friends at an hour when it ought to be in the land of dreams; it may act by the continued strain upon the reproductive energies of the earnest student diving into the secrets of nature, that are revealed to none but such as are prepared to sacrifice themselves on her altars; it may, after days and nights of unremitting toil, prostrate the

* On Chronic and Periodical Headache. By E. H. Sieveking, M.D. Medical Times and Gazette, August 12th, 19th, and 26th, 1854; and Tables of Analysis of One Hundred Cases of Headache, Association Medical Journal, Nov. 9th and Nov. 16th, 1855.

poor milliner who, with a weary heart and aching eyes, uses her very life-strings to earn bread for her invalid parents. A direct stimulus is anything that, through the organs of smell, of hearing, or of sight, gains admission to the perceptive faculties. The excitement may produce but a temporary result commensurate with the powers of the individual; or it may find a favourable nidus; and the deranged action, once set up, may be propagated until broken by some greater countervailing power. Many forms of epilepsy are nothing but the spasmodic expression of this derangement; and for private use I constantly employ the term *cephalalgia epileptica*, as indicative at once of what I regard as a cause and a tendency, occurring possibly in a subject in whom the epileptic paroxysm has been manifested merely by slight vertiginous attacks, by a single attack in former times, or by some spasmodic action that alone would not be regarded as of an epileptiform character. The pain in this form of headache may affect any part of the head, but it is frequently limited to a spot at the vertex; and where that is the case, I have found marked benefit arise from making the attack directly upon the apparent seat of injury." In an analysis of one hundred cases of headache, taken successively as they presented themselves in my memoranda, and published in the "Association Medical Journal," two cases of epileptiform headache are given; and although the number is scarcely sufficient to serve as

a basis for calculations, I think that two per cent. does, judging by my reminiscences, approximatively indicate the frequency of this form of the complaint.

The following, which is not one of the two cases adverted to, is an instance of what may be called cephalalgia epileptiformis:—

E. G., a widow, aged thirty-seven, of robust appearance and florid complexion, has always enjoyed good health, except that she has been subject to headache, supposed to be connected with the fact that her mother's head was "split open" when she quickened with patient. A year before consultation, E. G. felt a sudden numbness in her right leg, ascending to the trunk, right arm, and face, with a film over her eyes, and leaving a violent headache, lasting the whole day. The numbness passed off after two hours. These attacks returned about once a month; they took away her senses, but not to such an extent as to prevent her being conscious of what was passing around; articulation became impaired, and the patient complained of being very nervous.

I may be permitted to draw upon my note-book for another instance of a similar kind, as illustrating the occurrence of the affection in the child. It is not one of those included in the table.

M. I., aged four, the daughter of a painter, had inflammation of the brain a year ago. Was unconscious for a week. The illness lasted a fortnight; but she was neither blistered, bled, nor leeched. Two

years ago, without known cause, she had fits, but they have not since returned. For a year the child has been subject to a pain in her temples and occasional vertigo; she turns pale, and sits down, and says she is sick, but does not vomit. The pain is paroxysmal. She loses the use of her limbs at times, at night, when taken up for certain wants. There were no carpopedal contractions. There was evident derangement of the primæ viæ, which was regulated by medicines and diet. The prolonged exhibition of steel wine effected a complete cure of the headache.

It seems a just inference that the causes which induce the headache that follows the epileptic fit are also indictable for the somnolency that, with but few exceptions, ensues after the paroxysm has passed off. In some cases the patient at once returns to his ordinary state of existence, but in the majority of instances he falls into a profound sleep, which lasts a shorter or longer period. Sometimes the drowsiness is considerable, but the patient is able to rouse himself if necessary; again, there may be no perceptible interval between the fit and the subsequent sleep, the patient passing insensibly from the abnormal condition into that of normal sleep. There is commonly a feeling of exhaustion after a fit which is not necessarily proportionate to the violence of the paroxysms; the mere fatigue resulting from the spasmodic action might otherwise be sufficient to account for the sleep; but this relation is not suffi-

ciently definite, though undoubtedly the amount of muscular action has some influence upon the subsequent sleep. On the one hand, we at times meet with violent epileptic convulsions which are not followed by sleep; thus in a girl aged ten, who for three years had been subject to violent epileptic fits, and whose mind was gradually giving way under their influence, no sleep ensued after them, and her sleep was generally better at the times when she was free from the seizures; on the other hand, we meet with cases in which the paroxysm is very slight, and the stupor and drowsiness strongly marked.

Instead of the sleepiness, we sometimes observe a state approaching to or constituting actual delirium; or the same patient at one time sleeps a long time after the fits, and then a period comes when he or she is delirious for several hours after the paroxysm has gone off.

CHAPTER IV.

The phenomena observed during the intervals of the complete epileptic seizure — Necessity of considering the health of the individual in all its bearings — The abdominal organs — The pupil — Vertigo — Choking — Sequelæ of epilepsy — Loss of memory — Paralysis — Impaired articulation — Expression of countenance — Influence upon duration of life — Statistics.

In my opening remarks I have observed that the violence and peculiar character of the epileptic paroxysm very commonly causes symptoms to be overlooked which, occurring in the intervals, and not palpably bearing any immediate relation to the fit, are therefore regarded as offering no aid in the interpretation of the disease. The tendency, and I think the fault, of medical science at the present day is to divide and refine too much; one is apt to forget now-a-days that the human body, though a complex of various organs, is essentially one and indivisible, and that no part can be well understood except in its relation to the whole. The most egregious errors are but too frequently committed when the practitioner seeks to treat the disease of a part without remembering its interdependence with other parts; and the individual

patient, no less than the science of medicine itself, suffers from the prevailing specialism. In the same way as the disease of a limb or organ necessarily reacts upon and is reciprocally influenced by the condition of the entire body, so, too, may we not separate the different phases of man's existence from one another, setting them up like signposts in a wilderness, without an indication of where they point the traveller's footsteps to. Rather must we ever seek to read the entire man, not forgetting how interdependent all his vital phenomena are; and especially how closely interwoven with all his physical acts are the thoughts and feelings, sufferings and rejoicings that emanate from or manifest his spiritual existence. These remarks will receive frequent illustration when we arrive at the consideration of the influences to which epilepsy must often be attributed; at present they are submitted to the reader, in order to enforce, in the appreciation of the epileptic paroxysm, the necessity of not separating it from the intervening periods, or so-called free intervals. In order to understand the nature of epilepsy, a more careful study of the general condition of each patient, and especially of the symptoms that may show themselves in the free intervals, is necessary. Epilepsy is a disease of the whole man, and not of any one organ or system of organs alone.

At times, as we have before remarked, a single paroxysm may occur, never to return. This, however,

is rather the exception than the rule. The fact, however, must still be regarded, to whatever immediate cause the individual attack was attributable, as indicative of a peculiar predisposition in the person. The more common circumstance is that, one paroxysm having taken place, after the lapse of one, two, or three months, it is repeated; that then a period of the same length transpires until the occurrence of the third attack, or that the period is abridged, and that again a comparatively long free interval ensues, followed by a fourth attack, and so on: several intervals may present the same duration, and then a shorter free period may intervene; but the general tendency is to a diminution of the interval, and a corresponding increase in the frequency of the attacks. The more frequent the seizures, the more serious the aspect of the disease. Like ague, the shorter the intermissions, the firmer is the hold which the morbid condition has upon the system; hence we cannot but regard it as beneficial and promising if, as a result of therapeutic proceedings, we find the space that separates one fit from another gradually widening. The more frequent the fits, the more marked will be the symptoms of disease which may be traced in the interval; and yet a careful observer will rarely fail to discover a certain peculiar deviation from health in epileptic patients, even if the intervals are protracted. There will be the characteristics of a nervous diathesis; an excitable, frequently irritable,

manner; a restless eye, a quick but feeble pulse; there is more or less difficulty in collecting the thoughts and connecting the different links of mental association, while at the same time one or other of the organic functions presents a palpable deviation from health: the organs that are more particularly under the domain of the sympathetic ordinarily show that they are deficient in vigour, that they want that stimulus which the vascular and nervous systems supply when the individual enjoys robust health. Hence a common symptom is a torpid state of the intestinal tract, as shown in flatulent dyspepsia, eructations, intestinal flatulency, and constipation. An associated symptom is an enlarged state of the pupil, such as is commonly met with in persons suffering from the presence of intestinal worms, from a morbid condition of the generative organs, or from a torpid condition and enlargement of the mesenteric glands. Occasional vertigo; irregular, frequent, or constant headache, with or without vertigo, and not traceable to any definite exciting cause; anomalous sensations in different parts of the body; slight partial spasmodic seizures; more particularly a distressing sense of suffocation or choking, belong to the symptoms commonly met with in the free intervals. The suffocating sensation, last alluded to, is often identical with the description given by patients of the globus hystericus, and no doubt depends upon the same nervous condition; I have, however, observed in

decidedly epileptic cases that the sensation is more distinctly described as that of constriction round the neck, than as the "ball rising up the throat" of hysterical females. The choking sensation is observed in males as well as in females. Dr. Parry,* who forcibly dwells on the close relation of various nervous affections, particularly adverts to this point, and expresses the opinion that globus hystericus, epilepsy, and mania are but different gradations of the same fundamental affection. I have already quoted instances proving that the paroxysm itself varies in the completeness of its symptoms; numerous instances are given by most authors who have written on the subject, showing the infinite gradations that are met with, from the complete and violent epileptic fit, to the merest twitching of a single muscle. Esquirol† relates that some epileptics only shake the head, the arm, the legs; others only close the hand, run or turn round. Dr. Esparron recognised an attack of epilepsy by a simple convulsive movement of the lips; Pechlin drew the same conclusion from convulsions of the eyes and thorax. I have at times been at a loss to give a distinct name to certain symptoms manifested in my patients, until the outbreak of an epileptic paroxysm declared their nature and showed

* Collections from the unpublished Medical Writings of the late Caleb Hillier Parry, M.D., vol. i. p. 392, seqq. London, 1825.

† Des Maladies Mentales, &c., tome i. Paris, 1838.

their relationship. The following may be quoted from my case-book as an instance:—

E. H., a married woman, æt. fifty-four, who had previously been in perfect health, was seized once a week, or at longer intervals, with occasional loss of speech and tremors, lasting for half an hour or more; these attacks were accompanied by pain in the head and shoulders; she very rarely lost her consciousness. These seizures were followed by great weakness and prostration. After the lapse of a year they became severer, and they now assumed the complete character of epilepsy. There was always entire unconsciousness, foaming at the mouth, gnashing of the teeth, and convulsive movements.

Many patients, after the outbreak of the typical paroxysm has removed all doubts as to the nature of the disease they are labouring under, suffer in the way that the subject of the last-quoted case did before the appearance of the epileptic fit. The French distinguish between a *grand mal* and a *petit mal;* the former term being applied to the complete epileptic seizure, the latter to the passing symptoms of vertigo, headache, brief spasmodic affection of individual muscles, and the like, which frequently occur in the intervals, but are not accompanied by the entire loss of consciousness or the general convulsions that characterize epilepsy in the accepted sense of the term. Epileptic vertigo, like epileptic headache, often exists for a long time before the outbreak of the epileptic

paroxysm. Thus one of my patients was for three years subject to giddiness, accompanied by sickness, but without having any confirmed fits. Five years after the vertigo returned with headache, and was now accompanied by entire loss of consciousness. Another for three or four years occasionally felt giddy, and for a short time lost the control over her speech, but without ever becoming unconscious, when she suddenly was seized with an undoubted epileptic paroxysm, in which she struck her face and breast, and bit her tongue severely.

In some patients the brief attacks of vertigo and semi-unconsciousness, like a cloud passing over the mental horizon, are very frequent; the more frequent they are, the more the issue is to be feared, for they appear to indicate a lower tonicity or tension of the nervous system, and a more complete subjection of the individual to the morbid influence. The memory fails in proportion as these attacks occur; a difficulty of articulation ensues, dysphagia is at times observed, there is a difficulty in retaining the saliva in the mouth, hence dribbling results, and causes the boy and the girl when approaching puberty, or the adult man and woman, again to put on the semblance of infancy. Doctors Foville and Copland are at issue with reference to the influence exerted by the epileptic vertigo on the intellect. The former asserting that it brings on intellectual decay more frequently than the severe fits; while the latter maintains that

"the more severe the fits, the more is this result to be dreaded." My experience leads me to coincide with Foville and with Esquirol upon this point; the latter, in speaking of the influence of epilepsy in causing mental derangement, states that this tendency to dementia bears "a more direct ratio to the frequency of the vertiginous attacks than to that of the epileptic seizures; the vertigo exerts a more active, a more energetic influence upon the brain than what is called the *grand mal*, or the complete fit. The vertiginous attacks destroy the intellect more rapidly and more certainly, although their duration may be almost inappreciable; because there are individuals who may be vertiginous in the presence of other parties, without their being able to perceive it, unless previously informed."

These observations lead to the consideration of a subject which, legitimately, ought perhaps to be postponed until we have examined into the causes and pathology of epilepsy; but the circumstances just alluded to have so direct a bearing upon the general effects produced by epilepsy, that I propose at once to discuss the whole question of the sequelæ resulting from the disease. A single fit, as I have had occasion to remark, may occur, never to return, and without leaving any trace of disease. More commonly, however, unless the disease be arrested and the habit broken, the fits recur with gradually increasing frequency, and it is then that we soon discover that the

intellectual faculties begin to fail. The patients themselves complain that they can no longer retain their recollection of past events; circumstances at times that happened the same day, and the day before, are more difficult to be remembered than others of a much earlier date; thus, C. W. (No. 43) stated that he could scarcely recollect anything of the previous day, but remembered things that happened "years back" much better. The same individual (in whom the disease was diagnosed as being brought on by an exostosis or similar condition of the interior of the skull, resulting from a fall) complained of often feeling a numbness in his fingers. A temporary paralysis of a part, or even of the whole body, but then with a predominance on one side or the other, not unfrequently remains after the fit. This may happen once and not return. Thus, in one of my cases (No. 26), the whole of one side was paralysed after fits that occurred three years previous to my seeing the patient; but, although the fits recurred, the paralysis did not again show itself in this form. In this case, however, the paralysing influence of the disease is shown in the fact that ever since the patient was first seized he has often stammered; he is also found often to walk and talk in his sleep.* In others, the paralytic condition becomes more or less

* The relation between somnambulism and allied states and epilepsy was long since pointed out.

permanent, and is temporarily aggravated when the fit comes on. Or we find a paralytic condition of certain muscles of an extremity, and a permanently excited state of certain other muscles, inducing considerable deformity of the part. In this way distortions of feet and hands are produced, which the patients carry to their graves. Pes equinus, and other forms of club-foot, may result from the epileptic paroxysm, though fortunately the complication is not very frequently met with. In a girl of fourteen years, who had been subject to fits since her sixth year, and continued liable to them in an aggravated form at the time I was consulted, the right-hand presented a peculiar contraction, which came on after a venesection had been employed for the relief of a paroxysm. The hand was partly flexed at the wrist ; the fingers and thumb being extended, and the fingers somewhat drawn back towards the dorsum of the hand, so as to form a hollow at the metacarpus ; the joints had not, as is sometimes the case, become anchylosed, but the parts could be restored to their normal position ; yet, on being set free, at once returned to their abnormal state.* Moreau† has analysed 440 cases of epilepsy in females, which occurred between 1821

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* The reader will find an instructive chapter on the relation of paralysis and epilepsy in Dr. Todd's Clinical Lectures on Paralysis and Diseases of the Brain, p. 281.

† De l'Etiologie de l'Epilepsie. Mémoires de l'Académie de Médecine, tome xviii.

and 1851 in the Salpetrière, to determine the relative frequency of paralysis. Of these, 80 were paralytic, 9 had been so from birth, 24 were temporarily, 47 permanently affected.

The paralysis

Preceded the epilepsy in .	17	cases.
It followed in	34	„
It occurred coincidently in	20	„
The period of its duration was unknown in . . .	9	„
Total	80	

The extent to which articulation suffers depends upon two causes—the partial paralysis affecting the muscles of the pharynx, larynx, tongue, and face (in fact, the muscles under the domination of the respiratory tract), and upon the extent to which the intellect is impaired. Even in comparative health we often find a hesitating speech brought on temporarily by depressing mental and physical influences; this is much more the case in morbid conditions of the nervous system. Hence in some epileptic subjects we find a permanent impairment of the speech, induced by a paralysis of certain muscles, as in the case of the distortions of the extremities just spoken of; in others, an occasional impairment or a temporary aggravation of the difficulty of articulation, results from the general depression of the nervous system, induced by repeated paroxysms.

Associated with the difficult articulation is a prevailing expression of hebetude; in an extreme degree, amounting to idiocy, but in minor degrees characterized by a peculiar heaviness about the eyes, a pasty, leaden, or livid hue, a thickness and coarseness about the lips, which the experienced eye will not fail to recognise, while constant dribbling adds to the painful expression. The cutaneous circulation seems to be no longer carried on in channels possessing vitality, but to flow sluggishly through uncontractile tubes. A similar sluggishness becomes the type of the animal and organic functions of the confirmed epileptic; the circulation of the surface being particularly feeble, epileptics are chilly and liable to coldness of the extremities; thus one patient writes from the country that, since being affected with the disease, she is subject to very cold feet. As we find that epilepsy occurring early in life is the most curable, so, on the other hand, when persistent, it more frequently and speedily induces mental derangement, characterized by imbecility. There is some difficulty in obtaining satisfactory statistics on this point as on some others relating to epilepsy, because confirmed epileptics are so frequently removed from the observation of the physician who saw the commencement of the disease, to be placed in asylums; hence the statistics of these establishments only refer to a certain portion, but by no means to all epileptics, as they exclude nearly all

cases that have been cured, or in whom the disease has not reached a maximum of intensity. To the comprehension of the disease these cases are as important as, and perhaps even more so, than the instances in which art is, at present at least, utterly unable to achieve any satisfactory result. With this warning, I quote the numbers given by Esquirol.*

Of 385 epileptic females in the female department of Charenton, 46 were hysterical; of the remaining 339,—

12 were monomaniacs,
30 „ maniacs,
34 „ furious,
145 „ demented,
8 „ idiots,
50 „ habitually reasonable, but afflicted with frequent loss of memory, and
60 exhibited no aberration of intelligence.

Hence four-fifths were more or less deranged in their mind; one-fifth preserved their reason; "but," as Esquirol adds, "what reason!"

As mind and body suffer at all points from a repetition of epileptic seizures, it is not surprising that the duration of life is curtailed in these cases. The fit occasionally proves fatal by the suspension of the mental faculties, or by the interruption of the respiratory process; but more frequently death results

* Maladies Mentales, tome i. p. 274, seqq. Paris, 1838.

from the supervention of other diseases, or from the complications with which epilepsy is associated. The frequency of death from epilepsy bears no proportion, it appears to me, to the frequency and the importance of the disease itself; a source of some comfort, however slight, to the patient and the patient's friends, as all people have a fear of a death under such circumstances. From the Registrar-General's returns I have calculated that for 1850, 1851, 1852, and 1853, the mortality in England from epilepsy was, respectively, 0·44 per cent., 0·44 per cent., 0·47 per cent., and 0·50 per cent. of the total mortality; the number of deaths being in—

	1850.	1851.	1852.	1853.
From all causes	368,602	395,396	407,135	421,097
From epilepsy	1,630	1,760	1,935	2,120

Not being acquainted with the numerical frequency of the disease, the information obtained by the returns of the Registrar-General can only be regarded as an approximative indication. There can scarcely be any difference of opinion as to epilepsy being very much more frequent than these numbers would imply, if we judged of the frequency of the disease by its apparent fatality.

The following comparative table of deaths from epilepsy and from all causes, for London only, extracted from the Registrar-General's "Sixteenth Annual Report," yields similar results as the former numbers:—

No. 3.

		All ages.	Under 1 year.	1.	2.	3.	4.	Under 5 years.	5.	10.	15.	25.	35.	45.	55.	65.	75.	85.	95 and upwards.	Not specified.
Deaths from all causes in London in 1853 ...	M. ...	30,852	7,302	2981	1535	881	546	13,245	1172	522	1683	2233	2603	2689	2544	2466	1359	280	19	37
	F. ...	29,217	5,679	2886	1503	891	509	11,468	1140	479	1566	2051	2279	2257	2460	2796	2094	568	40	19
	Total	60,069	12,981	5867	3038	1772	1055	24,713	2312	1001	3249	4284	4882	4946	5004	5262	3453	848	59	56
Deaths from epilepsy in London in 1853	M. ...	202	5	5	1	4	—	15	7	7	18	31	44	36	16	15	13	—		
	F. ...	183	1	2	1	2	2	8	3	6	24	25	28	32	23	22	11	1		
	Total	385	6	7	2	6	2	23	10	13	42	56	72	68	39	37	24	1		

The per-centage of deaths from epilepsy at all ages, according to this table, is 0·64, or somewhat higher than the mortality for all England, calculated previously.

In the tables which can be constructed from the Registrar-General's reports, it is necessary to remember that there must be certain sources of error, owing to the uncertainty of the returns, and certain objectionable features in the nomenclature. The deaths from convulsion, which cause so large a mortality in infancy, are given in the reports under a different head from epilepsy, although I shall hope to show that there is not that general and essential distinction which is thereby implied between the two diseases. The addition of convulsions to epilepsy would materially alter the ratio of epileptic mortality in early life.

Thus we find the deaths throughout England in 1853 to have been—

	Males.	*Females.*
All causes	214,720	206,377
Epilepsy	1,158	962
Convulsions	13,977	10,819

If we compare these numbers with the table on the opposite page, we at once perceive either that epilepsy and convulsions must be regarded as essentially different, or that the nomenclature is ill-chosen; for the mortality at the different ages pursues a totally different ratio in the two cases. In the case of epilepsy the deaths occur chiefly after puberty; in that of convulsions, they almost exclusively affect the first years of life.

Thus, on calculating the per-centage of mortality

No. 4.

Deaths in London, at different Periods of Life, in 1853.

		Total.	Under 1 year.	1.	2.	3.	4.	Under 5 years.	5.	10.	15.	25.	35.	45.	55.	65.	75.	85.	95 and upwards.	Not specified.
All causes	Males	30,852	7302	2981	1535	881	546	13,245	1172	522	1683	2233	2603	2689	2544	2466	1359	280	19	37
	Fem.	29,217	5679	2886	1503	891	509	11,468	1140	479	1566	2051	2279	2257	2460	2796	2094	568	40	19
Epilepsy	Males	202	5	5	1	4	—	15	7	7	18	31	44	36	16	15	13	—	—	—
	Fem.	183	1	2	1	2	2	8	3	6	24	25	28	32	23	22	11	1	—	—
Convulsions	Males	1,242	985	154	48	28	13	1,228	9	1	2	1	—	1	—	—	—	—	—	—
	Fem.	920	712	118	48	16	9	903	12	2	1	—	—	1	—	1	—	—	—	—

from all deaths under one year for 1853, we find it to amount to 25·5, or above one quarter. The average number of deaths occurring at the same period of life from epilepsy annually, is 0·4; whereas we find that, of the 2162 deaths set down to convulsions for London in 1853, 78·4 per cent. occurred during the first year of life alone, and 98·5 per cent. during the first five years (see Table No. 4). This I deem conclusive that there is a necessity for the revision of the nomenclature, if it is not intended to mislead.

Correctly to estimate the influence of epilepsy upon the duration of life, we ought to know the average duration of the disease after it has once shown itself; for this, too, there are no data even of an approximative character, so multiform is the disease; moreover, on comparing the two mortalities for England and for London, we observe that the greatest mortality from epilepsy in the former case falls in the decennial period from 15 to 25, in the latter from 35 to 45. The greatest general mortality in England and Wales, and in London, respectively, after the first ten years of life, occurs between 65 and 75; the greatest general mortality for London, in males, however, it is to be observed, takes place in the decennial period 45—55, which must not be overlooked in our statistics of epilepsy; since we shall find, in examining into the proclivity of the two sexes to the disease, that it preponderates, in England at least, in an undoubted manner, in males.

Of the immediate cause of death in epilepsy we have no data. The lesions associated with the affection will be spoken of under the head of morbid anatomy; but of the fatal symptoms which are at times seen, we must advert to those of an apoplectic character. Apoplexy, as we have already observed, is not always easily distinguished from epilepsy; in fact, the two diseases frequently pass into one another. Prichard* specially dwells upon the relation of the two diseases.†

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* A Treatise on Diseases of the Nervous System, part. i. pp. 85, seqq.

† See also Copland's Dictionary, vol. i. p. 795.

CHAPTER V.

The causes and complications of epilepsy — The demoniac controversy — The predisposing and exciting causes — Prevalence of epilepsy in England and France — Influence of race — Epilepsy, endemic and epidemic — Influence of sex; of age — Hereditary influence — State of individual organs — The kidneys — Albuminuria — Saccharine urine — Eruptive fevers — Thoracic and abdominal organs — The sexual functions — Excesses — Continence — Marriage.

We now approach the debateable ground of the causes of epilepsy. They have been classed under different heads by all authors who have ever written upon the subject, from the time of Galen downwards.

This would be an appropriate place to discuss the question of demoniac influences in the production of epilepsy, did the subject not tend to lead us into the dangerous field of theological discussion. There have ever been two distinct modes of viewing the relation of the immaterial and the material world. The antagonism between those who believe in a constant and direct manifestation of the spiritual world to our senses, and those who, while believing in spiritual influences, dispute the force of the evidence that is

brought to prove their palpable character, has ever existed, and will ever continue to exist. It was manifested in regard to epilepsy at the time of Hippocrates, who eloquently and energetically combated the demoniac origin of the "sacred" disease. "The disease called sacred," he says, "arises from causes like the others—namely, those things which enter and quit the body, such as cold, the sun, and the winds, which are ever changing, and are never at rest; and these things are divine, so that there is no necessity for making a distinction and holding this disease to be more divine than the others; but all are divine, and all human. And each has its own peculiar nature and power, and none is of an ambiguous nature, or irremediable."* Dr. Adams, in a note to another passage of Hippocrates, adverts to the demoniac possession so frequently spoken of in the New Testament, and expresses himself strongly in favour of the opinion that the term δαιμονιζόμενοι ("the possessed with devils") of Sacred Writ, was only employed in compliance with the prevailing form of expression. "That the persons thus described," he adds, "as being possessed with impure spirits were the same as the demoniacs of the Greeks, and that they were epileptics and maniacs, cannot admit of the very slightest doubt." A similar view

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* The Sacred Disease. Dr. Adams' translation of the Genuine Works of Hippocrates, vol. ii. p. 857.

is maintained by Dr. Cooke,* who enters fully into the inquiry. Whatever may be the interpretation of the phraseology of the New Testament, no one contends that there is any form of disease in the present day which is seriously to be attributed to the influence of evil spirits, unless it be the spirit of gin

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* A Treatise on Nervous Diseases, by John Cooke, M.D., F.R.S., vol. ii. part ii. London, 1823. Other writers on this side of the question are—Rev. Hugh Farmer: Essay on the Dæmoniacs of the New Testament. London, 1775. And Answer to Dr. Worthington on the same. Richard Wright: Essay on the Existence of the Devil. 1810. Lardner's "Remarks on Dr. Ward's Dissertation," in his Works, vol. x. p. 265; and in his work On the Credibility of the Gospels.

The other side—*i. e.*, the literal view of demoniac possession—is defended by Warburton: Divine Legation, lib. ix. and sermon xxvii. Jortin: Ecclesiastical History, i. 268. Blomfield, in the Index to his New Testament, on the word δαιμονίζομαι. Worthington: Impartial Inquiry into the Case of the Gospel Dæmoniacs, &c. London, 1777. Fell on Dæmoniacs. London, 1779. And numerous others. As the literal version probably has the largest number of advocates, I would draw attention to the circumstance, that frequently the sacred writers use terms implying "possession" in conjunction with other diseases, confessedly of a pathological character, and apply the same terms for the treatment to both; just as we might speak of curing epileptics, phthisical subjects, and lunatics. Thus, for instance, in St. Matthew, iv. 24, it is stated that the people brought to Jesus καὶ δαιμονιζομένους καὶ σεληνιαζομένους καὶ παραλυτικοὺς, καὶ ἐθεράπευσεν αὐτούς: and again, St. Matthew xv. 22 and 28, ἡ θυγάτηρ μου κακῶς δαιμονίζεται —καὶ ἰάθη ἡ θυγάτηρ αὐτῆς. In the first instance the possessed are classed together with other sick persons; and in both the terms applied to the cure of the patients are such as are used for ordinary diseases.

and brandy. We have, therefore, to deal with agents that are more tangible, and which it is more possible to appreciate in their true bearing upon disease.

In many cases we are able to show the operation of two distinct influences which have co-operated towards the production of the epileptic fit. We have seen that frequently the actual outbreak is preceded by a protracted state of indisposition, accompanied by symptoms which may legitimately be regarded as belonging to the complete picture of the disease, and which indicate a peculiar habit of body. We know of a variety of circumstances which are found to prevail more or less extensively in epileptics before the disease has manifested itself, and which, like the barrel of gunpowder, require the spark to induce an explosion. The inflammability of different materials, if we may continue the simile, varies much, and in the same way the facility with which epilepsy may be excited in different subjects differs according to their susceptibility. The class of influences which determine and modify this susceptibility are termed predisposing, while those which appear to be immediately connected with, or to stand in the relation of cause and effect to, the outbreak itself, are called exciting influences. It is probable that no first outbreak of epilepsy ever occurs without the concurrence of the predisposing and the exciting influence. We find that all the various circumstances that may be mentioned as inducing a predisposition to epilepsy

may affect an individual without causing an attack; and we constantly find that individuals are exposed to the influence of the same circumstances which have been known to excite the paroxysm in others, without themselves becoming epileptic. The complex of symptoms which constitute the fit once having occurred, they may recur under a much more trivial exciting cause than in the first instance; and in many cases it appears as though the first fit was an impulse which had set in motion a series of automatic movements, which returned as often as a certain accumulation of force has taken place, without any other exciting cause than that residing in the natural functions of the body.

The great bulk of the evidence is in favour of the view that the predisposing influences enfeeble the body, and more especially the nervous system. The disease is regarded by the great majority of authors past and present as one of debility, and the influences that induce it are such as would weaken the individual, and expose him to the reception of noxious influences of all kinds. Hence we must assume something more than the predisposing influences, commonly so called—namely, a peculiar habit of body, which we are certainly unable to define, but which, for want of a better term, may be called a nervous diathesis.

That a material difference in this respect exists in different nations, and in different districts of the same

country, appears undoubted. We should expect a different ratio in different classes of society; but we should scarcely be prepared to assume the very marked difference of the liability to the disease between the whole population of two parts of the same country, were we not provided with irrefragable evidence to that effect.

Whether epilepsy be a disease of solitary occurrence or of wide-spread frequency is a point that probably would but little affect the individual sufferer. But to all who take a comprehensive view of disease, and would wish to estimate its bearing upon the general sanitary condition of a race or a nation, it must be a matter of serious import to determine its statistics. Epilepsy appears to belong to all climes and all countries; it occurred in the early history of mankind, and it prevails at the present day,—among the untutored savage as among the most cultivated of civilized society; it startles the mother from the security with which she hangs over her beloved infant; it affrights the lover trusting in the future happiness promised to him by his betrothed; it warns the son and the daughter of the mutability of things when they see a parent, whom they thought healthy, struck down by the convulsive paroxysm. Epilepsy spares no condition, age, or sex, and still there are not many diseases upon which fewer positive statistical records are to be found; a circumstance which may be explained by the fact that it is not itself gene-

rally a fatal disease, that the individuals suffering from it are not generally admitted into our hospitals, and that different notions prevail as to what ought and what ought not to receive the name of epilepsy.

If we refer to the Registrar-General's reports,* we find a statement of the number of deaths which are caused by epilepsy, which, when compared with the total deaths of the same respective periods, indicate a very small per-centage of mortality due to this cause. I believe that this must not be taken as an indication of the frequency of the disease, as medical men are so constantly in the habit of meeting with it. Still the statistics that I have been able to compass and which are to be relied upon, offer a remarkable uniformity in their results. I give first a tabular statement of the mortality from epilepsy for London, registered in the December quarters for the five years 1849 to 1853 inclusive:—

	Deaths from epilepsy.	Total deaths in same period.	Per-centage of mortality from epilepsy.
1849	73	12,877	0·56
1850	79	18,544	0·40
1851	75	13,964	0·53
1852	118	13,448	0·87
1853	117	17,390	0·67
Average	92	15,244	0·61

* See Sixteenth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England. 1856.

That the per-centage of mortality for London during the period specified is not far removed from the mortality from epilepsy returned for the whole of England is proved by the following table, the materials for which are also drawn from the same work :—

	Deaths from epilepsy.	Total deaths from all causes.	Per-centage of mortality from epilepsy.
1850	1630	368,602	0·44
1851	1760	395,396	0·44
1852	1935	407,135	0·47
1853	2120	421,097	0·50
Average	1861	398,057	0·46

The average mortality from epilepsy being in the former case 0·61, in the latter 0·46.

Again, according to another return with which I have been favoured through the courtesy of Dr. Farr, it appears that the total deaths throughout England and Wales from epilepsy during the seven years 1848 to 1854 inclusive, were 12,876, or, on an average, 1839 annually, which is rather lower than the average of the four years 1850 to 1853 given above.

If we take the population of England for any given year, say for 1850, we may easily calculate the average frequency with which epilepsy is a cause of death; and by comparing these statistics with the statistics obtainable from other sources, we may approximatively determine the frequency with which epilepsy attacks the population at large.

The population of England in 1850 was 17,754,000; the deaths from epilepsy in the same year were 1630, or at the rate of 0·009 per cent. of the total population. These numbers, however, receive further confirmation from the statistics of epilepsy occurring in the army which my friend Dr. Balfour has kindly enabled me to present to the reader. It is not to my purpose at present to go into details; it will suffice to say that among troops serving at home and abroad, and whose strength is given for varying periods between 1817 and 1846, amounting in all to 1,061,233, there were 3264 cases of epilepsy with 96 deaths. This gives a mortality of 2·94 per cent. of the deaths from epilepsy, or 0·009 per cent. of the whole strength, the per-centage of the seizures to the whole strength being 0·307. This, it will be perceived, is identically the same result as the per-centage of the mortality from epilepsy relative to the total population of England, which was 0·009. In round numbers, we may state that 4 out of every 3000 soldiers are epileptic; and if we apply the same data to the total population, we should conclude that the number of male adult epileptics in England in 1850 was 17,754,000 × 0·003, or about 18,000. We are justified in assuming this number to be not far from the mark, because it is proved by our own statistics and the statistics of numerous writers, that the period most favourable for the development of epilepsy is between the tenth and twentieth years, and that the proclivity to the disease diminishes after the latter period.

The statistics for the colonial corps for similar periods as those given above for British troops, yield a higher average of mortality from epilepsy, but a lower frequency of the disease. The total strength of the colonial corps was 129,914; the total cases of epilepsy admitted into hospital 165, and the total deaths from that cause 19, or 11·5 per cent. of the cases of epilepsy were fatal. It is to be observed that 16 of the 19 deaths occurred among negroes, although they constitute little more than half the entire force.

On calculating the ratio of deaths from epilepsy to the total strength, we find it to be 0·014; while 0·12 per cent. of the total strength was affected with epilepsy.

The results obtained by the analysis of the statistics of the colonial corps differ considerably from those yielded by the British troops; the number of deaths from epilepsy in the former being proportionately very much larger, while the seizures are more numerous among the British troops.

Comparative Statistics of Epilepsy.

	Total strength.	Number of cases of epilepsy.	Number of deaths.	Percentage of deaths to cases of epilepsy.	Percentage of seizures to total strength.	Percentage of deaths to total strength.
British troops ...	1,061,233	3264	96	2·94	0·307	0·009
Colonial corps ...	129,914	165	19	11·2	0·12	0·014
Population of England in 1850	17,754,000	unknown	1630	.....	.....	0·009
French recruits (in 23 years)	4,036,372	6627	.....	.....	0·16	

We shall feel less surprise at the marked difference presented by the two classes of troops in Her Majesty's service when we examine the returns which the French system of conscription places at our disposal. In the following table is given the number of young men of twenty-one years of age who were exempted from military service by reason of their liability to epilepsy, the fact being proved by the certificate of "three fathers of families residing in the same canton."* The variations in the frequency of epilepsy ranges from 41·5 to 339·0 per 100,000 recruits :—

No. of Department.		*No. of Department.*	
1. Puy de Dôme	41·5	16. Ain	105·9
2. Manche	60·2	17. Bas Rhin	106·8
3. Haut Vienne	76·2	18. Vosges	109·8
4. Loiret	78·4	19. Calvados	111·5
5. Seine et Marne	82·1	20. Lot	113·7
6. Yonne	82·6	21. Ardennes	117·9
7. Tarne et Garonne	85·9	22. Jura	118·5
8. Aude	86·8	23. Cantal	120·7
9. Indre	87·6	24. Tarn	123·7
10. Rhone	88·5	25. Saône et Loire	124·4
11. Meurthe	93·5	26. Moselle	125·3
12. Côte d'Or } 93·9		27. Hautes Alpes	127·7
13. Doubs }		28. Charente } 130·9	
14. Deux Sèvres	98·3	29. Orne }	
15. Finistère	100·5	30. Charente Inférieure	131·1

* It is not stated that a medical certificate is required, but we may assume, that where conscription is an essential part of the administration, no extensive system of fraud can well be carried out.

No. of Department.		*No. of Department.*	
31. Côtes du Nord	132·2	59. Drôme	186·9
32. Eure	133·4	60. Indre et Loire	187·3
33. Gard		61. Hautes Pyrénées	188·2
34. Ardèche	133·6	62. Loire et Cher	194·7
35. Loire	134·6	63. Hérault	196·4
36. Seine	137·6	64. Landes	197·8
37. Creuse	137·7	65. Isère	201·8
38. Haut Rhin	138·0	66. Gers	202·8
39. Cher	139·2	67. Morbihan	203·1
40. Dordogne	144·1	68. Sarthe	204·2
41. Corse	145·5	69. Haute Marne	204·4
42. Arsne	150·3	70. Haute Loire	209·1
43. Allier	150·4	71. Var	210·3
44. Pas de Calais	153·4	72. Somme	213·2
45. Nord	155·3	73. Haute Garonne	222·4
46. Basses Alpes	156·0	74. Mayenne	223·7
47. Arveyron	158·1	75. Vendée	232·9
48. Gironde	158·3	76. Marne	233·3
49. Vaucluse	160·2	77. Basses Pyrénées	255·1
50. Nièvre	163·7	78. Bouches du Rhone	257·1
51. Maine et Loire	166·6	79. Ariège	258·9
52. Haute Saône	169·7	80. Loire Inférieure	261·2
53. Vienne	174·2	81. Seine Inférieure	274·2
54. Ile et Vilaine	178·6	82. Lozère	277·2
55. Seine et Oise	183·5	83. Aube	280·5
56. Oise	184·3	84. Corrège	285·5
57. Lot et Garonne	184·4	85. Meuse	296·3
58. Eure et Loire	185·7	86. PyrénéesOrientales	339·9

In the important work of M. Boudin,* from which the foregoing table is extracted, we find other interesting facts bearing upon the frequency of epilepsy.

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* Traité de Géographie et Statistique Médicales et des Maladies Endémiques. Par J. C. M. Boudin, Médecin-en-Chef de l'Hôpital Militaire du Roule. Tome ii. pp. 449, seqq. Paris, 1857.

"From 1831 to 1853 inclusive, a period of twenty-three years, there were 6627 exemptions on the score of epilepsy among 4,036,372 young men examined by the *Conseils de Révision*, or at the rate of 164 per 100,000." This is equal to 0·16 per cent.; a lower amount than met with in our troops, which may be accounted for by the greater absence of exciting causes among recruits than among soldiers in active service, as well as by the fact that all epileptics are rigorously excluded from the service. "During the same periods," M. Boudin continues, "the proportion of exemptions to 100,000 men examined varied as follows:—

Year.	*Numbers exempt.*	*Year.*	*Numbers exempt.*
1831	269	1843	153
1832	220	1844	163
1833	198	1845	141
1834	178	1846	147
1835	159	1847	173
1836	151	1848	170
1837	154	1849	167
1838	169	1850	141
1839	168	1851	140
1840	160	1852	124
1841	143	1853	135
1842	155		

"We should not at once conclude from the preceding table that the number of epileptics has diminished in France since 1831. It would probably be more just to conclude that since 1834, and especially since 1833, the recruiting system has been carried

out with more justice. It is certainly worthy of remark that since this period the proportion of exemptions from epilepsy has offered a great uniformity. However that may be, if we consider that the average number of young men of twenty-one is from 300,000 to 310,000, we may conclude, from the annual average of exemptions by reason of epilepsy (164 in 100,000) that there are about (3 × 164) 492 young men of twenty-one years of age in France who are epileptic."

I have met with no satisfactory statements in authors regarding the influence of race upon the production and the course of epilepsy. But although, at first sight, on comparing the statistics of British troops with colonial corps, there would appear a ground for the inference that a marked difference exists, we are warned to be careful of jumping at any conclusion by the table of the French departments, which shows a difference varying from 41·5 to 339·9, under circumstances which are not, in my opinion, to be accounted for by any difference in race.

M. Boudin does not enable me to solve the difficulty; I shall therefore avoid adding to it by offering an hypothetical suggestion; but it will be well to extract the few remarks which the author referred to himself makes upon the question. "May we," he says, "conclude that epilepsy is in certain cases an endemic affection, properly so called? We do not think that our documents justify this deduction, and it is not impossible that the extreme relative fre-

quency of epilepsy in certain departments is due to hereditary influences, possibly even to race; still we are far from wishing to deny absolutely the possibility of an endemic influence. Some authors have thought that epilepsy was much more frequent in mountainous districts than in the plain. The preceding table proves just the reverse. For the minimum of epilepsy is found in the Puy de Dôme, while the department of the Bouches du Rhone, which is but very slightly mountainous, presents 257 annual exceptions among 100,000 recruits."

If we seek to compare the results deducible from M. Boudin's table with those yielded by the comparison of British and colonial troops, we have no standard of measurement, and the difficulties which M. Boudin experienced in determining the causes of variation in different parts of the population of his own country, become still more manifest when we have to deal with men so little amenable to scientific inquiry as the members of the colonial corps. Whatever the determining circumstances may be which influence the prevalence of epilepsy in certain races, remains to be discovered. Further statistics, too, of a reliable character, would be desirable; but until they are obtained, an inquiry into the hygienic conditions of some of the departments of France, for which we possess satisfactory statistics on this point, would promise valuable conclusions.

The preceding observations prove that epilepsy

may be regarded as a sporadic disease, favoured and promoted by certain endemic causes, to which we at present, however, possess no further clue than the evidence of their existence.

At times, however, the disease has made its appearance in a distinctly epidemic form. Such was the case at the time of the dancing mania which afflicted the people of Aix-la-Chapelle, Cologne, Strasburg, and many of the Belgian towns, in the second half of the fourteenth century. Epileptic convulsions formed the commencement of the disease, when the affection was completely developed. "Those affected fell to the ground senseless, panting, and labouring for breath; they foamed at the mouth, and suddenly springing up, began their dances among strange contortions."*

A more defined epidemic of epilepsy has occurred during our own time, and has been described and watched by a British physician.† The epidemic affected the inhabitants of Teheran in 1842; it was confined to the months of January and February, and the fits as described appear to have been undoubted epilepsy. Dr. Bell, who was an eye-witness, gives the following delineation of the fit: "Powerful convulsions of one side; for a short time quite

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* The Epidemics of the Middle Ages. By J. F. C. Hecker, M.D. Translated by Dr. Babington. Syd. Soc. Ed., p. 88.

† Some Account of an Epidemic which prevailed at Teheran in the Months of January and February, 1842. By C. W. Bell, M.D. Med.-Chir. Trans., vol. xxvi. p. 223.

purple in the face and chest. Two or three severe opisthotonic spasms, and horrid grinding of the clenched teeth, as in tetanus. Total insensibility; pulse about 90; very powerfully excited, so much that, although convinced that this disease was purely nervous, and little likely to be benefited by blood-letting, and that when this violent excitement passed it would be succeeded by a condition of proportionate feebleness and prostration, yet I found it absolutely necessary to bleed again, in order to protect the brain." The whole population of Teheran appears at the time to have been affected more or less by the epidemic influence, inasmuch as for some nights they were troubled with a sleeping of the leg and arm of one side. Dr. Bell himself experienced it, and "found the sensation and unnatural excitement of the heart extremely unpleasant; but it ceased after taking a dose of iron."

I proceed to the consideration of the predisposing causes in the individual.

The questions of sex and age are those which first suggest themselves. English authors are all but unanimous as to the greater proclivity to epilepsy being on the one side of the male sex, while the majority of Continental writers take the opposite view. Of the fifty-seven cases of epilepsy appended to this book, and taken from my own notes, twenty-eight were females and twenty-nine males; numbers which in themselves would not suffice to determine

the question: but, even as far as they go, they prove no marked preponderance on one side or the other. I again have recourse to the statistics of the Registrar-General, and they would appear fully to confirm the statements of English authors; but it is to be remembered, as pointed out at p. 77, that on the one hand, the numbers of deaths by no means represent the numbers of epileptic cases; and on the other, that from the exclusion of almost all cases of "convulsions" in the first five years of life, an error is introduced which we are unable to rectify, as we should as little venture to class all convulsions with epilepsy as to regard them all as tetanus.

From the annexed table (No. 5) it would appear that the mortality of males at all ages from epilepsy is 52·26 per cent., of females 47·73 per cent., and that therefore 4·53 per cent. of male deaths occur from epilepsy in excess of female deaths from that cause; or, to put it in a different way, we find that the average male deaths in one year from epilepsy are 961·3, of female 878·1; so that annually in England and Wales 83·2 more males die epileptic than females. If only a portion of the deaths from convulsions have to be included in this number, it is probable that this relation would become still more marked, for Dr. Tripe* has shown in an elabo-

* British and Foreign Medico-Chirurgical Review, April, 1857, p. 460. We are glad to perceive that Dr. Tripe also objects energetically to the term "convulsions."

No. 5.

Deaths at each Age from Epilepsy in England and Wales during the Seven Years 1848 *to* 1854.*

	Total.	Under 1 year.	1.	2.	3.	4.	Under 5 years.	5	10.	15.	25.	35.	45.	55.	65.	75.	85.	95 and upwards.	Not specified.
Males	6,727	231	118	91	64	59	563	256	361	996	1063	1039	876	679	559	291	37	2	7
Females...	6,147	162	90	65	54	58	429	214	329	1174	1054	854	650	600	531	267	42	1	2
Persons ...	12,876	393	208	156	118	117	992	470	690	2170	2117	1893	1526	1279	1090	558	79	3	9

* This table was kindly supplied to the author by Dr. Farr in 1857.

rate paper that the deaths of males preponderate over those of females during the first five years of life from diseases of the nervous system, by as much as 20·5 per cent. Among recent British writers, Drs. Watson and Elliotson may be quoted in support of this view, though they supply no statistics. Romberg maintains the same doctrine.

All French writers regard the numbers indicated by the two great asylums, Bicêtre and Salpétrière, as conclusive evidence that epilepsy prevails most in females. Esquirol, writing in 1838, states that there were 162 male epileptics at Bicêtre, and 389 female epileptics at Salpétrière; Moreau, in 1854, gives the numbers respectively at 149 and 234. This would yield a total of 723 females to 311 males, or a ratio of nearly 70 to 30. I cannot but think that there must be some fallacy in regarding these numbers as representing the liability of the whole population to the disease; and that Esquirol, in attributing the greater proclivity of females to epilepsy to their greater "impressionability," adopts a conclusion too hastily arrived at.

Age materially influences the occurrence of epilepsy; but in all calculations hitherto made, the majority of convulsive diseases of early childhood have been excluded from the consideration; allowance must be made for the fallacy resulting from this source. I have not ventured to include in my tables some cases of convulsions which I should regard as

identical with epilepsy. The following table yields the results of an analysis of fifty-eight cases observed by myself :—

Age at which epilepsy first occurred.	Number of cases.			
0— 5 inclusive	12	17	40	From infancy to the age of twenty inclusive.
6—10 „	5			
11—15 „	13	23		
16—20 „	10			
21—25 „	3	5	10	From the age of twenty-one to forty inclusive.
26—30 „	2			
31—35 „	5	5		
36—40 „	0			
41—45 „	3	7	8	From the age of forty-one to fifty-five inclusive.
46—50 „	4			
51—55 „	1	1		

From this table it would appear that the greatest proclivity to epilepsy is to be found at the period of puberty; a fact upon which there is scarcely any difference of opinion among writers. Nor does the table of the Registrar-General, given at p. 89, militate against it; since epilepsy is very rarely fatal in the first instance, and the greater frequency of its first occurrence before twenty years is perfectly compatible with the greatest fatality of the disease later in life. By reference to the Registrar-General's table, however, we find that the greatest mortality occurs between fifteen and twenty-five years, but that it is scarcely diminished during the subsequent decennial

period, for the ratio in the former one is 16·8, in the latter 16·4 per cent. of epileptic mortality.

Distributed according to sex, I find my cases arranged as follows :—

Age.	Sex.			
0 — 5	7	Male	5	Female.
6 — 10	1	„	4	„
11 — 15	6	„	7	„
16 — 20	7	„	3	„
21 — 25	2	„	1	„
26 — 40	—	„	2	„
31 — 35	2	„	3	„
36 — 40	—	„	—	„
41 — 45	2	„	1	„
46 — 50	2	„	2	„
51 — 55	—	„	1	„

The nervous diathesis of the female would seem to prevail throughout her whole life with more uniformity than in the male. There appears to be only one period at which the female epileptics are in excess ; the same is the case in the table of epileptic mortality, where the decennial period (15—24) is characterized by the number of males being 996, while that of females is 1174.

The general results yielded by the above tables are confirmed by the data of Moreau,* who favours us

* De l'Etiologie de l'Epilepsie, Mémoires de l'Académie de Médecine, tome xviii.

with a table in which the ages of 995 epileptics, collected from various French sources, are analysed :—

Epileptic from birth	87
Epileptic in infancy	25
From 2 to 10 years	281
„ 10 „ 20 „	364
„ 20 „ 30 „	111
„ 30 „ 40 „	59
„ 40 „ 50 „	51
„ 50 „ 60 „	13
„ 60 „ 70 „	4

This table would seem to confirm my opinion that the occurrence of epilepsy is regulated by the same laws in France which govern it in this country; and that, therefore, the marked difference between the two in point of sex will be shown to depend upon an erroneous basis having been assumed for the calculations.

Hereditary influences are very palpable in epilepsy; they are shown not only by the prevalence of epilepsy in the same family, but also by the co-existence of epilepsy with other nervous affections, and more particularly with mental derangement. Considerable difficulties are always opposed to inquiries into the existence of such affections in families, as there is a great tendency on the part of individuals and their connexions to conceal facts of the kind. Moreover, it is almost impossible to ascertain the state of health of most of the collateral branches of a family, or those removed in the ascending line from the patients—

such as uncles or aunts, of grandfathers and grandmothers. And again, although we may succeed in obtaining tolerably complete data, showing the health of the relatives of a large number of epileptics, the value of the results is unsatisfactory, unless we have as a standard of comparison the ratio of the solitary occurrence of epilepsy; that is, unless we know how often epilepsy may occur without being reproduced in relatives. But the fact is, that nervous diseases of all kinds are so widely spread, that but few families entirely escape them; and the more we extend our intimate acquaintance with the domestic relations of our friends and patients, the more frequently do we meet with instances of insanity or epilepsy where we previously imagined that there was complete exemption. I shall not easily forget the startled, the almost guilty look with which a gentleman met my inquiry while I was standing over a son who, for the first time and apparently without cause, was violently convulsed with the epileptic paroxysm. The inquiry was merely whether he had been epileptic himself, and it was made in order to obtain a clue to the attack in question. The father, a hale and vigorous-looking man, shrunk from confessing that he himself had been epileptic.

I have met with hereditary epilepsy in 11·1 per cent. of my cases; but I have not extended my inquiry as far as Herpin and Moreau have done, who have included every variety of nervous affection

among the hereditary influences to which epilepsy might be traced. Such an extension is calculated to mislead, because necessarily dealing with vague data; and it would be perfectly reasonable if we go so far to go still farther, and to include other exhausting or debilitating diseases.* Still M. Herpin's† tables are interesting as far as they go, and I reproduce them in the following combination :—

State of Health in 380 *Relatives of* 68 *Epileptics.*

Epilepsy	in	10 cases.
Insanity	„	24 „
Suicide	„	1 „
Melancholia	„	2 „
Hypochondriasis	„	3 „
Hysteria	„	2‡ „
Chorea	„	2 „
Sleep-walking	„	2 „
Nervous excitability	„	3 „
Apoplexy	„	11 „
Cerebral softening	„	1 „
General paralysis	„	2 „
Meningitis and chronic hydrocephalus	„	13 „
Mortal convulsions	„	1 „
Tetanus	„	1 „
		78

* In the Review of Herpin's work on Epilepsy, by Dr. Parkes (Med.-Chir. Review, April, 1853), the reader will find some remarks on this question that are much to the point.

† Du Prognostic et du Traitement Curatif de l'Epilepsie, par Th. Herpin, p. 327. Paris, 1852.

‡ I cannot but demur to this number, as it is incredible that not more than 2 relatives of 68 epileptics should have been hysterical.

It follows that 68 patients had 78 relatives who laboured under some affection of the nervous system; but of these disorders the author himself holds that only epilepsy and insanity deserve consideration, because he finds that the proportion of their occurrence among the relatives of epileptic patients is so much larger than among the population at large. He calculates that epilepsy occurs between four to five times, and insanity twenty-four times more frequently among the relatives of epileptic patients than the population at large.

The large number of cases of apoplexy and meningitis among the relatives of his epileptic patients necessarily attracted M. Herpin's attention; he was naturally inclined to assume that they sufficed to establish a definite predisposing relation; but, on comparing them with the calculations of M. Marc d'Espine, made to determine the causes of mortality in the Canton of Geneva, he finds both apoplexy and meningitis occur even more frequently in the population at large than among the relatives of his epileptics.

"The relation of the number of deaths from apoplexy to that of the total deaths (exclusive of still-born children), calculated for eight years, is 40 per 1000. This number must be increased in order to allow for the apoplectics who die of another complaint; if we make an addition of one quarter for this, we obtain 50 per 1000. The relation of apoplexies in the families of our first series is 11 in 243

individuals, or about 45 per 1000. We find, therefore, that the relatives of our patients present fewer cases of this affection than the population at large. . . . . The same calculations applied to tubercular meningitis yield the same conclusion. M. d'Espine finds the ratio to be 38 per 1000. Our first series yields 7 in 243, or 29 per 1000 ; our second series, 6 in 137, or 44 per 1000; being an average of 36 per 1000."

In seeking for the causes of epilepsy it is necessarily the desire of the medical man to trace it to some local affection, to discover the habitat of the morbid condition. In a disease so manifestly connected with affections of the nervous system, a search into the state of this part of the organism would naturally be made; but hitherto all attempts to demonstrate a lesion by the microscope or test-tube, which should be so constantly associated with epilepsy as to justify our considering it in the light of an essential constituent of the disease, have failed. Palpable as the symptoms of the disease are, no uniform lesion has hitherto been discovered, either during life or after death, by which we could gauge the relation between functional and organic changes as we can in many other diseases. If we have to deal with inflammation of the lung, we know that the deposit of lymph in the air-vesicles, and the objective symptoms as cough and dyspnœa, bear a certain relation to one another, and we may, as a general rule, measure one by the other; the progress of peritonitis

similarly offers a certain ratio between the amount of local changes and the symptoms appreciable by the medical man. In epilepsy neither the nervous system, nor the vascular system, nor any of the individual viscera present uniform lesions. Of the symptoms referrible to the nervous system we have said enough when discussing the phenomena of the paroxysm. These, and their relation to insanity, show that the chief fault resides in the cerebro-spinal axis. But it is impossible to overlook the manifest relation that the state of nutrition and the blood exercises upon the nervous system in the production of those symptoms; for, of all the influences that we can trace in the production of epilepsy, we see none that operate so frequently as those which are connected with some derangement of nutrition. And yet there is no definite change in the excretions or secretions which can be shown to be a uniform accompaniment of epilepsy. It is here more particularly that we should have hoped for some aid by the modern improvements in analysis, and although something has been gained, much more yet remains to be done.

The only organs of secretion which have been proved to exercise a well-marked influence upon the occurrence of epilepsy are the kidneys. The bearing of albuminuria upon its production has been frequently observed, since Dr. Bright* first drew at-

* Reports of Med. Cases, vol. ii. p. 446.

tention to the importance of this symptom as an indication of a very serious organic lesion. Sir Henry Halford had previously (1820) pointed out the connexion between apoplectic conditions and suppression of urine, and it appears from the researches of Drs. Prout, Bostock, and Christison, which have since been confirmed by others, that in these cases of imperfect secretion of urine, urea can be detected in the serum of the blood. The epileptic seizures that frequently* occur in parturient women have been shown to be due to various causes which impair the powers of the patient; but in the large majority of them there is albuminous urine, as first shown by Dr. Simpson and Dr. Lever. However, here too, though a predisposing influence, it is evidently not essential, for convulsions occur without albuminuria; and albuminuria, as at other periods, and in the male sex, may occur without giving rise to epilepsy. We are informed by Dr. Churchill that "Dr. Blot found albumen in the urine of 41 pregnant women out of 205, and chiefly in primiparæ; and Dr. Litzmann examined the urine of 131 females, 79 during pregnancy, 80 during labour, and 80 after delivery: albumen was present in 37, and absent in 95; of the 37, 26 were primiparæ." On the other hand, the fact of Dr. Lever having found

* In Dr. Churchill's excellent Manual of Midwifery, third ed., p. 480, an analysis of 190,313 cases of labour, collected from various sources, shows convulsions to have occurred 273 times, or 1·4 per 1000.

the urine albuminous in every case of puerperal convulsions but one, which have come under his notice, argues strongly in favour of the view that, however frequent albuminuria may be in pregnancy, there must be even a more intimate relation between convulsions of parturition and this symptom.

No such uniformity is to be traced between the existence of epilepsy and albuminuria in other individuals. Albuminuria when present, by impoverishing the blood, or by the coincident relation of urea in the blood, may, and frequently does, appear to cause epileptic seizures; but in the great majority of cases of epilepsy no palpable derangement of the renal secretion can be detected. Albumen was found permanently present in one of the twenty-three of my cases in which the urine was tested for albumen, temporarily in one; the former proved fatal, and from the state of the kidneys it was manifest that degenerative disease had been going on in them antecedently to the occurrence of the spasmodic action.

Some time back Dr. Goolden* maintained that a

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* Lancet, 1854, vol. i. p. 656, vol. ii. p. 29. Since writing the above Dr. Goolden has favoured me with the following communication, which shows that he does not regard saccharine urine as an ordinary accompaniment of epilepsy, but as having been due to a peculiar epidemic influence prevailing at the time at which he met with it: "With regard to the saccharine condition of the urine, I have since found that sugar is a very rare attendant upon epilepsy. I can only account for the nearly constant presence of sugar at the time of my experiments published, by a fact that

saccharine condition of the urine ordinarily accompanied epilepsy.

Since his observations were published I have tested this secretion, either by Moore's, Trommer's, or Barreswil's test, and generally by more than one, for sugar in nearly all the cases of epilepsy that have fallen under my notice; but in none of the eighteen in which the test was applied have I succeeded in obtaining the proper reaction. Our present knowledge of the relation of the kidneys to the system at large, as the chief emunctories, and the bearings of their functional and organic disturbances upon the general health, and especially upon the healthy condition of the central organs of the nervous system, would incline the physician to watch them, especially in a disease like epilepsy; but hitherto no definite ratio has been detected. With the greater facility for quantitative and qualitative analyses of the urine introduced by the volumetric method of Liebig and Neubauer, the determination of other constituents of the urine, and especially of the urea, will aid in the appreciation of morbid phenomena. And though from the intermittent character of the disease we cannot expect ever to discover in the kidneys the causa proxima of the affection, the knowledge of any material and uniform deviation from the normal stan-

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Dr. Prout observed, which was, that the saccharine diathesis prevailed to a great extent prior to each cholera epidemic, and my experiments were all made under the same condition."

dard of so important a secretion, would necessarily aid in the comprehension of the changes induced by or associated with the paroxysm.

Scarlet fever is one of the diseases which is very apt to be followed by albuminuria, and it has also, with other eruptive fevers, the reputation of carrying epilepsy in its train. The inference would naturally be that the epilepsy was the result of the deranged state of the renal secretion. In the two cases of epilepsy which have fallen under my notice, and where the paroxysm followed so closely upon the scarlet fever as to justify our belief in a close relation between the two, no albumen was detected in the urine. As, fortunately, epilepsy rarely follows upon the scarlet fever, and, as the above two cases show, its occurrence under such circumstances is not necessarily connected with disturbance of the renal function, we are compelled to look beyond this malady to find the predisposing cause of the epileptic seizure.

I have met with convulsive disease preceding and following measles ; and I may mention that the severest case of opisthotonos that I have witnessed was attributable to suppressed scarlet fever, when after death an effusion of lymph was found upon the cervical portion of the spinal cord. In the analysis of cases I have, however, been careful only to include those that were indubitably epileptic.

The heart,* the lungs, the liver, the spleen manifest, as far as we know, no lesion which can in any way be brought into a causative relation with epilepsy. I have not detected any permanent derangement in the heart's action, even in prolonged cases of epilepsy; no relation appears to exist between disease of the heart and epilepsy, as we know to prevail between chorea and heart-disease.

An impaired state of the digestive powers is frequently associated with epilepsy, and the regulation of the diet of the epileptic is an important indication, which applies to all, but to none so forcibly as to children. But though a predisposing influence may occasionally be traced to continued insults being offered to the stomach; still this cause cannot rank higher than almost every other influence which carries with it a debilitating effect. Dyspeptics may be counted by thousands, while epilepsy can only number its victims by units.

More or less derangement of the bowels accompanies almost all varieties of epilepsy; costiveness, as I have already observed, habitually indicates the

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* Although my own researches have failed to show any definite relation between heart diseases and epilepsy, it is right to quote the following statement of Dr. Todd: "Many of the epileptic seizures which take place only or chiefly in the night during sleep, in elderly persons, I have reason to believe have some intimate connexion with a diseased condition of heart,—an altered condition of its muscles rather than of its valves."—*Clinical Lectures on Paralysis, &c.*, p. 307.

sluggishness of the intestinal movements, while the frequent presence of worms and the abnormal state of the fæces further demonstrate the unhealthy condition of the alvine tract. These derangements are so frequent, that I question the propriety of establishing, as Prichard has done, a distinct class of enteric epilepsy. Where the general health is much and extensively disordered, it is often a mere matter of individual interpretation whether we regard a given disease as more closely connected with the affection of one organ or another. I am, however, tempted to extract from Dr. Prichard's work a case which he gives under the head of enteric epilepsy, both because it illustrates the variety to which he applied the term, and because it is also an instance of a most remarkable, perhaps unparalleled, case of epilepsy in an idiot. The treatment is essentially the same in this case and that generally adopted by Prichard in enteric epilepsy—the use of oil of turpentine, which according to him, exercises a peculiar sedative and tranquillizing effect upon the nervous system. The complication of epilepsy with any form of insanity is regarded by all physicians who have turned their attention to the subject as the most hopeless variety. Yet it would appear that a case like the following ought to encourage both the medical man and his patient never to despair, but to induce the former perseveringly to search out the secrets of nature:—

"Henry Parker, æt. eighteen, St. Peter's Hospital,

Jan., 1818, an idiot, subject to epileptic attacks from infancy. He has sometimes three or four attacks in a day. At other times they occur once in a day; occasionally he escapes them in a week. He is insensible of their approach. He labours now under diarrhœa. His food passes off in an undigested state: his appetite is voracious; he goes about the house and yard picking up anything that can be eaten, and devouring it; he has been seen eating a cabbage-leaf from the ash-pit. He is emaciated, and his skin has a yellow tinge. He was sent to the medical ward. A warm bath twice a week and a nutritious diet was ordered for him. There is an eruption on his skin of the character of psoriasis. It occasionally subsides in the course of a night; the diarrhœa then becomes more troublesome, and when the eruption again appears the diarrhœa is relieved.

"Jan. 8. Ol. terebinth. ℥j. statim.

"Jan. 9. The dose purged him, and brought away undigested matter, but nothing like worms.

℞ Habeat ol. terebinth. ʒij. ter indies, et
Pulv. rhei hydr. c. cret. āā gr. v.
Pulv. arom. gr. ij.
Post sing. doses tereb. sumend.

He took twelve powders; they relieved the stomach of the unpleasant sensation of heat produced by the turpentine. The turpentine has been given regularly, and he has been allowed full diet. The fits return now about once in seven days; they are not

so violent as formerly, and last but a short time. The voracious state of his appetite continues. The yellowness of the skin is considerably diminished, and his general appearance much improved. The bowels are regular; the eruption disappeared gradually. The tongue is a little furred. He appears aware of the improved state of his health, and grateful to his attendants.

℞ Magnes. carb. ℥j.
Pulv. rhei ʒij.
Syr. papav. alb. ℥j.
Aquæ puræ ℥vj.
℥ij. ter die.

He took this mixture for some days, but it produced no improvement in the state of his appetite. The oil of turpentine was then resumed, and given twice in the day.

"June 13. Twenty-one days have now elapsed without any return of fits. He complains of headache. The pain is confined to the forehead. Leeches were ordered to be applied to the head about once in seven days, and the head to be kept shaved.

"September. The fits have gradually ceased. The paroxysms have been latterly much more slight; they lasted but a few minutes, and he was rendered aware of their approach by languor and headache. He is still in a state of idiotism.

"Jan. 1, 1819. He has experienced no return of the fits. He complains occasionally of headache, which is relieved by a purgative. He was discharged from

the medical ward, and put upon the common diet of the house; till this time he had been allowed meat every day.

"Nov. 3, 1819. He continues in a much improved state, though no medical care is taken of his health, and though he fares upon the common diet of the paupers in the house. He has had no returns of his complaint but once, when he had some very slight fits.

"Sept. 1, 1821. He has long been free from the symptoms of epilepsy."

The relation between the sexual organs and epilepsy is one that deserves our especial attention, since it appears undoubted that the physiological evolution of these organs, no less than certain morbid states, are found so frequently associated with epilepsy as to justify the inference that they may stand in a closer relation than one of mere coincidence.

When speaking of the distribution of epilepsy over the different periods of life, I had occasion to observe its predominance about the time of puberty; it is essentially a disease of that period. The physiological character of puberty is the development of the sexual powers; anything that unduly promotes or interferes with that development is certain to give rise to violent reaction in the system. Hence, both in the male sex and in the female sex, an inquiry into the state of these functions is an essential part in our investigations. Venereal indulgence is more frequently

accused of being accessory to the epileptic paroxysm in the male; continence with a consequent undue excitement of the nervous system, is more commonly viewed as a cause in females. "Coitus brevis epilepsia est" is an old adage; at all events, several writers record cases of the supervention of epilepsy in consequence of the act of cohabitation. This act would then rather have to be regarded as an exciting than a predisposing cause, since without the act the paroxysm would probably not have occurred.

The sense in which sexual derangements are supposed to induce epilepsy is by enfeebling the system; by producing an excitability of the nervous system, an "impressionability," which, on the application of an exciting influence of sufficient strength, gives rise to the epileptic paroxysm. It is observed that in epileptics generally the sexual feelings are strong, so that in persons predisposed to the disease, the temptation to a vicious indulgence is probably peculiarly powerful. The inquiry into these circumstances is always fraught with considerable difficulty, as boys and young men are not easily induced to confess to masturbation, and unless carried to a great extent the vice cannot be positively predicated from their external appearance and demeanour. Young females who are guilty of the same fault can at all times only be suspected, as we possess no means of eliciting a confession. In either case the opinions of the parents go for very little, as they are too apt to be blind to

such faults, or are misled by the positive appearances of their children, who at all times will rather confess their vices to a medical man than to a relative.

In a person guilty of masturbation we generally notice a peculiar hang-dog expression; an unwillingness to meet the speaker eye to eye; a large sluggish pupil; a pale, livid hue and languid circulation of the surface, a general nervousness of demeanour: if we examine the urine we often discover the patient to be labouring under azoturia, showing that an excessive metamorphosis of the tissues is perpetuated; varicocele, and a gleety discharge are frequently induced in men, and leucorrhœa may be sometimes attributed to this cause in females. Leuret found that in 106 cases of male epilepsy in no less than 12 onanism was to be regarded as the cause of the disease, while Beau, in 242 cases of female epilepsy, traced onanism only three times.

But in females the relation of sexual function is shown in a more marked manner, by the frequent derangement in the menstrual orgasm on the one hand, and by the concurrence of the epileptic seizures with the period of menstruation on the other. Epilepsy in the female at and after puberty is very frequently accompanied by some derangement of the catamenia: either they are altogether arrested, or they are irregular and scanty, or they are (but less frequently) menorrhagic; or, again, there is constant and profuse leucorrhœal discharge. But even where

no marked abnormity is to be detected in the character of the menstrual flow, we still, in women, find a definite periodic character imparted to the epileptic seizures, which precede or follow the catamenia. It is not, however, to be concluded that the physician is therefore to direct his entire attention to the sexual function. In the female this at all times more or less governs the whole system, and epilepsy does not escape the general law; hence, while in female affections of every kind it is never to be lost sight of, its condition in epilepsy may not be regarded in any other light than as indicative of a general derangement of the system, coincident with the epileptic paroxysm, and though not causing, yet favouring, its occurrence. In most other affections of the female, the restoration of the menstrual period to its normal condition, or its first appearance at puberty, tends to diminish or cure other coexistent morbid conditions; in epilepsy this relation does not appear to prevail to the same extent. Herpin states that he has not met with a single instance in which the appearance of the catamenia has induced even an improvement, not to say a cure, of the complaint. This very unfavourable experience does not coincide with that of some other observers; and the *laissez-aller* practice which would result from the adoption of such views would be opposed to all sound pathology. They would tend to induce medical men to neglect the first indication in all affections of the female, viz., of restoring the cata-

menia to their normal condition. Dr. Prichard* gives a long chapter on what he terms uterine epilepsy; a form which he describes as mainly affecting young females of a sanguine temperament, ruddy complexion, and light hair, and resulting from a suppression or some other derangement of the catamenia. He details fifteen cases, and refers to four others which have occurred in his practice. One of the cases proved fatal, and after death the left lateral sinus was found blocked up through its whole extent by an old deposition of lymph which had become organized. Almost all the others were cured by repeated venesection, warm-baths, and the internal administration of oleum terebinthinæ. The results obtained by Dr. Prichard are clearly at variance with the categorical affirmation of Herpin. Still the immediate bearing of the state of the uterine function upon epilepsy in a large number of cases is imperceptible.

On examining my records with reference to this point, I find that the cases of females subject to epilepsy may be divided into three classes. Of a total of twenty-seven, seven were of an age at which the catamenia could not have made their appearance, one was beyond the age, and nineteen were of the age at which the state of the sexual organs exercises a powerful influence over the general health. Nine of these pre-

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* A Treatise on Diseases of the Nervous System, part i. p. 148. London, 1822.

sented no deviation in this respect from health, that I could detect, and a definite relation of the fits to the catamenial period is only noted in one. To these may be added a case of a young woman who is now under treatment, in which an increased severity of the epileptic seizures has been noted since the catamenia have, from some unknown cause, been arrested. The following list gives the respective ages of the patients and the amount of sexual derangement observed :—

1. æt. 15, leucorrhœa—no irregularity.
2. æt. 34, ditto ditto.
3. æt. 42, some irregularity of catamenia.
4. æt. 24, catamenia scanty, but no relation to the fits.
5. æt. 17, catamenia irregular.
6. æt. 17, never menstruated.
7. æt. 44, catamenia very scanty, with bearing down.
8. æt. 15, catamenia once for a day, six months before consultation ; has had fits for four years.
9. æt. 32, catamenia scanty, but regular ; her fits occur shortly before or after the catamenia.
10. æt. 20, the catamenia were irregular before the scarlet fever, which was followed by fits ; they have been *regular since.*

The derangements observed present no characteristic feature, while the amount and frequency of the morbid affection of the uterine system probably does not differ materially from what may be observed

in any chronic disease affecting a similar number of adult females.

In connexion with the present subject, it will be suitable to say a few words on the influence which marriage exerts upon epilepsy. That it prevents masturbation in men, and tends to relieve many disorders of the sexual functions in females, is an undoubted fact; but, as we have seen that the marital act itself may become an exciting cause of epilepsy, and as we know that the hereditary influence of the disease is great, we ought not to counsel epileptics to marry; as well on account of their partners, as on account of their offspring, unless the long time that has elapsed since the occurrence of a paroxysm, justifies a hope that the morbid taint is quiescent if not extinct.* Herpin, who has taken much pains to determine the inquiry by facts, has raked up† three doubtful cases from unknown authors,‡ which have

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* Prichard takes a different view on this point; see his Remarks on Uterine Epilepsy, l. c., p. 217, where he says: "Pregnancy generally removes disorders connected with disorders of catamenia; but even if pregnancy should not take place, I am very much disposed to believe that diseases of this kind would generally be removed by marriage."

† Du Pronostic et du Traitement de l'Epilepsie, p. 520. 1852.

‡ Hoffmann gives a case of the kind, Opera, tome iii. p. 21. I may point to one of my own cases, in which the patient, a widow of thirty-eight, stated that she had had fits from time immemorial, but had been freer from them since marriage and childbirth than formerly.

been cited to prove the beneficial influence of marriage in this disease. It is manifest that the difficulty of meeting with instances which establish the point, sufficiently demonstrates the truth of the general law that marriage is not curative in epilepsy. The fact that the greater number of epileptics are *célibataires*, is due to the circumstance that the affection makes its first appearance most frequently at puberty.

Hébréard in 1813 found that, of 162 epileptics at Bicêtre,—

119 were bachelors,
36 „ married,
7 „ widowers, or divorced.

Moreau found, in 1821-22, that, of 240 female epileptics,—

142 were spinsters,
32 „ married women,
17 „ widows,
49 whose condition was unknown.

But, as Moreau himself observes, these numbers prove nothing as to the question at issue, "because the great majority of these patients do not marry."

Although I do not doubt that continence *may* by itself give rise to epilepsy, it is excessively difficult to obtain reliable information on the point, and the cases I should imagine to be rare. The older authors dwell more upon this cause than recent writers. Those curious upon the point will find an assemblage of cases showing the effects of continence, among

which epilepsy is included, in the first volume of Tissot's works;* partly quoted from Hoffmann, Zacutus, and others, partly supplied from his own experience.

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* Œuvres de Mons. Tissot. Tome premier, contenant l'Onanisme, p. 224, seqq. Lausanne, 1790.

CHAPTER VI.

The exciting causes of epilepsy — Physical — Mental — Statistics of French writers — The author's observations — Sleep and sleep-walking — Difficulties of rigid classification — Remarks on the relation of predisposing and exciting causes — cases.

THE influences which we have hitherto considered as bearing some definite relation to epilepsy, are commonly enumerated among the predisposing causes of the affection. Another class of so-called causes are entitled exciting, because they are supposed to exercise a more direct influence upon the production of the complaint. From their more immediately preceding the paroxysm there is better ground for connecting them with the latter than often applies to the predisposing causes, which are more vague, while their interpretation is often more fanciful. In a large number of instances neither the patients nor the physician can detect any peculiar circumstance to which the outbreak of the paroxysm can be immediately attributed. It seems as though the electric battery became overcharged, and the discharge was effected in the form of the epileptic

seizure simply to relieve the excessive tension. If the comparison is just, it is intelligible that no palpable occurrence is required to elicit the current, but that the mere approach of an opposite pole may suffice for the purpose.

An analysis of my own cases shows that a definite exciting cause was maintained to have occurred in nineteen out of the fifty-seven. We give them in the order in which they stand :—No. 5. Otorrhœa ; 10. Fright ; 11. Mental exertion ; 22. Scarlet fever ; 24*a*. Cutting teeth ; 25. Swallowing the core of an apple ; 27. Operation of strabismus ; 29. Otorrhœa ; 31. Derangement of stomach ; 32. Blow on head ; 34. Fright during pregnancy ; 35. Anxiety ; 37. Approach of catamenia ; 41. Fright ; 43. Fall on head ; 44. Fever ; 55. Death of mother ; 57. An illness in which the head was blistered and shaved ; 58. Scarlet fever. Mental causes came into operation six times, fright three times, mental fatigue once, and mental distress twice. Physical causes were accused in fourteen instances ; they may be classified as follows :—

Otorrhœa	2	cases.
Scarlet fever twice Fever once Cerebral affection once	4	„
Approach of catamenia once	1	„
Injury to head	2	„
Errors in diet	2	„
Dentition	1	„
Operation	1	„

All authors dwell upon the powerful influence of psychical affections in the production of epilepsy, and among them none is so operative as fear. I extract from Moreau's Memoir the following two tables, which place this circumstance in a clear light.

The first table, by Leuret, comprises 106 male epileptics, in whom the exciting causes traced were—

Fear	35 times.
Anger	2 „
Drunkenness	6 „
Falls	3 „
Onanism	12 „
Poverty	2 „
Psoriasis	1 „
Insolation	1 „
Chill	1 „
Unknown	39 „

The second table, drawn up by M. Calmeil, includes 240 female epileptics :—

Psychical Causes.

Fright	51 times.
Fear	31 „
Painful impression	15 „
Disappointment	11 „
Sight of an epileptic	2 „
Rape	9 „
Unkindness	5 „
Anger	4 „
Joy	2 „
Grief	12 „
	142

Physical Causes.

Mercury	1	time.
Childbirth	2	„
Suppressed epistaxis	2	„
Suppressed catamenia	1	„
Causes that were not appreciated	21	„
Critical age	2	„
Poisoning by camphor	1	„
Severe operation	1	„
Onanism	3	„
Without cause	64	„
	98	
Psychical	142	
	240	

Whatever value we may attach to analyses of this kind, one indubitable fact results—viz., that psychical causes operate much more frequently in the production of epilepsy among females than among males; the proportion in the first table being 34·9 per cent., in the second 59·1 per cent.; a conclusion which entirely coincides with the physiologically greater "impressionability" of females. Nor can it escape attention that the psychical affections are, with trivial exceptions, those that would depress the nervous and vascular energy—a point which must be borne in mind in directing the treatment of epileptics, as it is quite as much the duty of the physician to operate on the body through the mind, as upon the mind through the body. It would be more easy to raise objections to most of the other exciting causes mentioned, since

their importance is rather a question of individual opinion. Nor must it be overlooked that, in my own cases as well as in those quoted, there are a large number in which no cause could be discovered, although both patient and medical man are naturally anxious to trace some tangible circumstance, which may be supposed to have been instrumental in the production of so grievous a malady. Numerous as are the causes adverted to by the French authors, it is surprising that two are not mentioned which often exercise a powerful influence in the production of epilepsy—syphilis and dentition. It may at times be difficult to determine whether to class them with predisposing or exciting causes; and another reason why dentition is often overlooked in the causation of epilepsy is the fact that many medical men regard the convulsive fits occurring during the period of dentition as essentially distinct from epilepsy. I am of opinion that both the relation of infantile fits to the epilepsy of later life, and the characters of the fits themselves, are a proof of the pathological identity of the two affections. I have not, however, in deference to prevailing opinion, in my tables mixed the two together, and therefore reserve some remarks on the subject for a later period.

With regard to syphilis, it is also difficult to say whether it acts as a predisposing or an exciting cause; under different circumstances it probably acts differently; thus it may merely enfeeble the body by

depraving the blood, and thus lay it open to the influence of some other exciting cause, or it may induce epilepsy by giving rise to the formation of syphilitic disease of the cranial bones, and direct injury to the brain. But here, as elsewhere, it is probable that some peculiar state of the nervous system must predispose the individual. Thus C. B., a man aged thirty-two, who had been syphilitic six years before he came under treatment, since which time he had not enjoyed the good health he had previously, suffered from a series of abscesses, and a year before presenting himself for advice became epileptic, the fits recurring about once a month. The fact of his wife having had many miscarriages confirmed the opinion that the syphilis had thoroughly undermined the constitution, although, at the time of consultation, no positive proof could be adduced of the poison still existing in the system. The patient stated that he always had perfect health before the syphilitic infection, so that it was fair to regard the syphilis as closely connected with the epileptic seizure. Still, on close questioning, it was ascertained that he had had one fit when he was fifteen years of age, which was sufficient to prove that there was some other taint or weakness in the system capable of inducing epilepsy. The frequency of Onanism as an exciting cause in the French tables may be due to the greater willingness of French patients to confess to the vice. In the cases of confessed masturbation that I have had to

deal with, I have not met with epilepsy; and in my cases of epilepsy, though I have never lost sight of the possible influence of this cause, I have failed to elicit it. In boys and men there is at least no difficulty in making an inquiry, but in females I confess to an inability to arrive at anything beyond a strong suspicion. In a young woman now under my care, in spite of a rigid examination of the patient as well as by direct questioning of the mother, I can obtain no indication of a cause; and yet the appearance of the girl, as well as the argument *par voie d'exclusion*, produce in me the moral conviction that masturbation is at the bottom of the whole evil.

It would not be right to conclude the consideration of the exciting causes of epilepsy without once more adverting to the influence of sleep in its production. Physiologists are unable to tell us the actual changes that take place in the cerebral circulation during sleep; but that the whole process of nutrition and metamorphosis is different during the sleeping and waking state is demonstrated. Some persons, otherwise in perfect health, suffer from spasmodic movements at the moment of going to sleep; in all we are able to induce automatic movements during sleep; and there is good reason for believing that persons in whom automatic movements are spontaneously induced during sleep—that is, who show more or less tendency to somnambulism, in which, while sensation is in abeyance, the automatic movements are con-

tinued—have a tendency to epilepsy. Sleep-walking, however,—or, as Sir Henry Holland defines somnambulism, "a dream put into action,"—is a common occurrence in young children, and is by no means a necessary indication of approaching epilepsy. It is merely to be regarded as a proof of an excitable nervous system, and may be taken as a warning to parents and guardians to protect such children more carefully than others from all undue physical and mental excitement.

Whether or not there is actually an increase in the amount of blood in the brain during sleep, and whether, as has been suggested, the choroid plexuses become turgid or not, we are unable to affirm otherwise than hypothetically; the evidence is more in favour of cerebral congestion than of the opposite condition inducing ordinary sleep—evidence supplied by physiology and pathology. I cannot sum up my opinion as to the influence of sleep in the production of disease depending upon the brain, better than in the words of Sir Henry Holland,* who, in his admirable chapter on sleep, observes: "There is reason to suppose that such effects depend on the proportion of venous blood present in the cerebral circulation, either from congestion in the great veins or from imperfect arterialization in the lungs."

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* Medical Notes and Reflections. Second edition, p. 452. 1840.

It is a question whether the circulation in the spinal cord does not also deserve consideration, especially in regard to the production of spasmodic affections. It can scarcely be doubted that the seminal discharges which occur during night depend in part upon a physical influence exerted upon the spinal cord, as position and the texture of the bed are known to determine their occurrence. The relation between sexual excitement and epilepsy has already been adverted to. The nocturnal enuresis of young children belongs to a similar category as the seminal discharges of the adult; and in them also the tendency to convulsive affections predominates in sleep. If the view is correct that the greater venosity of the blood is closely connected with the production of nocturnal spasm, how urgent a reason, in addition to all the other arguments that may be adduced, for attending to the maintenance of adequate ventilation in our sleeping apartments.

In reconsidering the causation of epilepsy, and briefly recapitulating the preceding arguments, we would insist upon the danger of too minute classification. There is always a risk, in a science like medicine, in attaching too much value to a term: this applies in the present instance to the relative value of predisposing and exciting causes, which we may rigidly distinguish upon paper, but which cannot always be as clearly kept asunder in the observation of a diseased individual. We have seen that, in

many instances, it is impossible to trace a definite influence of either kind. But as far as the evidence goes that we have been able to collect, there appears to be no room for doubt that most of the causes that are productive of epilepsy, operate by enfeebling the system at large; and, by impoverishing the blood, lay open the nervous system more particularly to injurious impressions, which in health would leave no effect. The relative importance of the predisposing and exciting causes, and the reality of the distinction, is shown most emphatically in those forms of epilepsy which have been termed eccentric, because on the removal of the exciting cause the disease has ceased. Not one of the circumstances which in some individuals are productive of epilepsy are necessarily or generally so, but are met with very commonly in other individuals without ever giving rise to any form of spasmodic disease. Thus no disorder of the primæ viæ is more common in children than that which gives rise to parasitic animals; but the frequency of epileptic convulsions due to this cause is by no means proportionate to its frequency: and yet it would be careless in any case of epilepsy not to inquire into the point, because the removal of the worms, whether ascarides, lumbrici, or tænia, is demanded under all circumstances for the restoration of health, and numerous cases are met with in which epilepsy is arrested in consequence. If we fail to discover an exciting cause, it is taught that we have to do with a diseased

condition immediately affecting the brain, and the disease is then called centric epilepsy. But we shall see that here equally there is scarcely a morbid condition which has not been found in connexion with epilepsy, while every one of those pathological states occurs much more frequently independently of epilepsy. It would therefore appear more in consonance with observed facts to regard epilepsy as an affection invariably dependent upon some hitherto unexplained derangement in the nervous system, often dormant for years, and even for life, unless the exciting cause comes into operation. If this view be correct, a distinction between essential and non-essential epilepsy cannot be said to exist; but wherever a paroxysm has occurred, we should assume the same peculiarity of the nervous system to prevail in a stronger or feebler degree, and the difference would be mainly in the agent which roused its susceptibility into action. To revert to a former simile, the diathesis may be compared to combustible material of greater or less inflammability, which differs in the facility with which it will take fire, but will infallibly do so if a flame of sufficient intensity is brought into contact with it. Protect it from the flame, and combustion will not take place. The same we constantly find to be the case in epilepsy: remove the exciting cause, and the fits will remain in abeyance; allow the flame to be approximated, and the combustible mixture in your patient's system will certainly take fire, the proximity

necessary for the purpose constituting the main difference between two different subjects. I have seen this so frequently, that it is one ground why I would specially warn the young practitioner who acts upon these views from placing undue reliance upon the medicinal agents which he prescribes while giving other directions in consonance with the views just detailed. Thus I have again and again found that a continuance of the same active and restless mode of life pursued by a patient at the time of consultation prevented the pharmaceutical appliances from producing a satisfactory result. The patient has then been placed in other circumstances, or has withdrawn from the previous avocations, allowing body and mind the proper rest, and the exciting cause being withdrawn, the nervous system had time to recover its tone, and if not a permanent, still a temporary cure was the result—a cure to all intents and purposes, because it was shown that the epilepsy was under the control of external influences.

A very interesting case which was published many years ago, and has found a place in some works on nervous diseases, may be quoted here as one of the most palpable instances on record of the influence of a physical lesion not affecting the central portions of the nervous system in producing epilepsy.*

* An Epilepsy from an uncommon Cause. By Dr. Thomas Short, Physician at Sheffield, F.R.S. In Medical Essays and Observations, published by a Society in Edinburgh, fifth edition, vol. iv. 1771.

A woman, aged thirty-eight, had been subject to epilepsy for twelve years, when she came under Dr. Short's care. The attack always occurs with a sensation or aura, commencing at the lower part of the gastrocnemii. Dr. Short was so fortunate as to surmise the presence of an irritating agent at the site from which the aura proceeded, plunged a scalpel in, and removed a small hard cartilaginous body, of the size of a large pea, attached to the nerve. From the date of the removal of the neuroma the epilepsy ceased.

A similar case is given in Darwin's "Zoonomia" (p. 329). He states: "I once saw a child, about ten years old, who frequently fell down in convulsions as she was running about in play. On examination, a wart was found on one ankle which was ragged and inflamed, which was cut off, and the fits never recurred."

Similar cases are those in which the introduction of a foreign body into any cavity of the body—as beads into the ear—induces epilepsy, and where *amotâ causâ tollitur effectus;* but in all these instances the observation before made applies, that the exciting cause was only capable of inducing the paroxysm because there was some peculiar predisposition in the nervous system, which must be regarded as the "effect defective."

I may append to these remarks a curious instance given by La Motte,* how the definite action

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* Chirurg. Complet., obs. 176, tome ii. p. 422. Also quoted by Esquirol in Maladies Mentales.

of an exciting cause may be proved. The importance of avoiding it, where possible, is manifest, but in the present instance, this would not have been feasible. La Motte mentions the case of a woman who was eight times pregnant; five of her children were girls, three were boys. Every time she was pregnant with boys she had epileptic seizures, which did not affect her when the child was of the female sex.

CHAPTER VII.

The pathological anatomy of epilepsy — The value of morbid anatomy in reference to the disease — Appearances seen in the brain — Dr. Boyd's observations on the weight of the brain — J. Wenzel's observations on the pituitary body and pineal gland — Results obtained by other observers — Appearances in the spinal cord — Esquirol's observations — Lesions not connected with the nervous centres.

In a disease characterized as epilepsy is by symptoms mainly referrible to the brain, or, at all events, invariably associated with evidence of disturbance of the cerebral functions, it is natural that anatomists should have specially searched within the cranium for the organic lesions to which the disease might be attributed. They have been so far successful that in a large number of patients who have died of long-standing epileptic affections cerebral lesions have been discovered; but while this is by no means uniformly the case, it is remarkable how little there appears to be a definite relation between a lesion of a single portion of this complex organ and the convulsions of epilepsy, and how commonly every one of the lesions that have been found associated with epilepsy occur in other patients who have shown no epi-

leptic symptoms. On the other hand, epilepsy is by itself so rarely a fatal disease, that the opportunities of performing post-mortems upon persons who have died of uncomplicated epilepsy, and during or immediately after the fit, are very limited. Hence, in cases of long-standing, in which cerebral lesions are met with, it becomes doubly doubtful how we are to interpret these changes; they may not bear any relation to the epilepsy, or if they do, that relation may be one of sequence and not of causation.

If there is this difficulty in regard to cases of epilepsy of an inveterate character, we cannot expect a more satisfactory solution of the phenomena by the post-mortem appearances developed in subjects who have died soon after its first appearance, or in one of the first seizures. We have seen that during the fit itself the effect upon the circulation varies; hence it is reasonable to conclude that some of the post-mortem changes occasionally met with may be the result of the spasm set up, and not the cause of that spasm.

If a railway-train runs off its rails, and is precipitated into a river, we do not look upon the broken parapet, or the puddles caused at the side of the banks from the overflow of the river, as the cause of the accident, but we regard them as the unavoidable consequences of the catastrophe; the causes we look for in the state of the rails, of the wheels of the carriages, or in the manner in which the signals have been attended to. In the same way the spasmodic

constriction of the vessels of the neck, the disordered respiration, the violent jactitation accompanying epilepsy, may, and undoubted do, induce effects which in the post-mortem must be regarded in the same light as the broken parapet in the instance of the railway accident. But in the case of epilepsy it becomes a matter of yet greater difficulty than it generally appears to be in the inquiries instituted by the coroner to determine the real and efficient cause.

While I should be the last to discountenance pathological inquiries, I would express a doubt as to the mystery of epilepsy ever being unravelled by exclusively relying upon the results of cadaveric inspections. It is rather in its vital relations that the disease deserves to be studied than in the dead-house. The interval between the fatal issue and the early stages of the disease is so much longer here than in most of the diseases that ordinarily prove fatal, that an excessive margin is allowed to vague and indefinite surmises; I fear that until we are better acquainted with the actual nature and mode of transmission of the nervous force, our appreciation of the physical changes accompanying epilepsy will continue removed from the exactness which may be demanded of a scientific doctrine.

I have premised these remarks, in order that the exposition of the post-mortem appearances met with in cases of epilepsy may not be received with too exaggerated an estimate of their value.

We will consider first some of the pathological changes met with in the brain.

But few cases, as we have already said, are fatal early in the disease, or during the epileptic paroxysm. In these an increase in the amount of blood in the vessels of the brain and the meninges, or in the amount of interventricular or sub-arachnoid fluid, has generally been the sum of the post-mortem changes noted by the respective observers. Numerous instances of this kind are quoted by Tissot,* from Drelincourt, Wepfer, Morgagni, Johnstone, and Meckel. But, as Dr. Cooke† justly observes, the fact of the brain being overloaded in the paroxysm, or as its immediate consequence, by no means in itself justifies the inference that the vessels were in that condition previous to the seizure. At times the vessels are found to have given way, and the consequence of this is an effusion of blood within or upon the brain. One of the earliest instances of this kind on record is quoted by Morgagni,‡ from Valsalva, in which extravasated blood was found between the dura and pia mater, "besides a quantity of serum everywhere effused; the ventricles were also filled with serum, and in them the plexus choroides had their turgid glandules."

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* Œuvres de M. Tissot, tome vii. 1790.

† A Treatise on Nervous Diseases, vol. ii. part 2. 1823.

‡ The Seats and Causes of Diseases, translated from the Latin of Morgagni, by Benj. Alexander, M.D., vol. i. p. 187. London, 1769.

The great variety of lesions met with in epileptics long subject to the disease, and whose death has not been the immediate result of the paroxysm, can scarcely be better demonstrated than by relating successively the post-mortem results in a series of cases found by Dr. Boyd,* who has paid much and careful attention to the subject. In the "Edinburgh Journal" this observer details the post-mortems of six epileptics. Two males presented cerebral wasting; in one female the skull was unusually thick; in one female there was fluid in the brain; in another male the brain was indurated, and presented sharp bony projections from the exterior of the skull; in one male there was congestion of the brain; in two of the females the brain was above the average size, the one firmer the other softer than natural. In the "Asylum Journal" Dr. Boyd adds the post-mortems of nine other epileptics, seven of whom were males, and two females. The following are the abridged memoranda of the cases, which show the extreme variation in the local phenomena, even in cases of long duration. We premise, in order that the bearing of the weights may be better understood, that the normal weight of the brain in the male is 46 ounces, in the female 42 ounces.

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* See the Asylum Journal for Medical Science, April, 1857, p. 377; Edinburgh Medical Journal, No. 15, p. 121; Seventh Report of the Somerset County Lunatic Asylum, 1854.

1. Male, æt. eighteen. Epileptic for thirteen years, with hemiplegia of the right side. There was extensive loss of substance laterally of the anterior lobe of the left cerebral hemisphere; the space filled by fluid was contained in a reticular membrane; the cerebral substance beneath the membrane was smooth, unusually firm, and brownish. Weight of right hemisphere, $21\frac{1}{2}$ ounces; of left, $14\frac{3}{4}$ ounces.

2. Male, æt. nineteen. Died of typhus. The ridges of the skull were unusually prominent in the temporal fossæ. Weight of the brain, $46\frac{3}{4}$ ounces.

3. Male, æt. twenty. Died of typhus; epileptic for four years from a fright; an encysted bag, the size of a filbert, over the left cerebral hemisphere, with thinning of the corresponding portion of the skull. Brain otherwise natural; weight, $47\frac{1}{2}$ oz.

4. Male, æt. twenty-five. Mania; epileptic for seven years; brought on by a fall attended with fracture of the skull. Brain large, but otherwise natural; weight, 49 oz.; skull natural.

5. Male, æt. thirty-three. Recent epilepsy, with mania. Arachnitis; roughness of the lining membrane of fourth ventricle. Brain large; weight, $51\frac{1}{2}$ ounces.

6. Male, æt. forty-one. Epileptic from birth; idiotic. Brain small, otherwise natural; weight, $38\frac{1}{2}$ ounces. Died of phthisis.

7. Male, æt. forty-eight. Epilepsy for several years, with mania, caused by close application to business. Congestion to brain; weight, $53\frac{1}{2}$ ounces.

8. Female, æt. thirty-four. Brain large; convolutions flattened; weight, 48 ounces.

9. Female, æt. thirty-eight. Fits from two years; partial paralysis of extremities, which were most convulsed in the fits. Sudden death. Right cerebral hemisphere 2 ounces lighter than left.

I shall again advert to the subject of the weight of the brain, but I draw attention to the fact, that in the above cases the weight was six times above the average, and twice below, and only once normal.

In the Report of the Somerset County Lunatic Asylum for 1854, Dr. Boyd favours us with the results of his observations upon 53 fatal cases of epilepsy which occurred under his care during six years; 30 were males, 23 females, and 12 were also idiots.

The shape and form of the skull presented an abnormity only in one case, a female, in which it was thick behind, and the diploe wanting. In nearly one-third there was a difference in the weight between the cerebral hemispheres of from $\frac{1}{2}$ to 6 ounces. Of the males 21 were epileptics only, and in them the average weight of the brain was 50·3 ounces; in 9 males, who were epileptics and idiots, the average weight of the brain was 46·6 ounces; in 2 only of the latter it was below, but in 6 above the average. The average weight of the *left* cerebral hemisphere in the males was $\frac{3}{4}$ ounce greater than the right hemisphere. Of the 23 females, 20 were epileptics, and 3 epileptics and idiots; in the 20 epileptics the average weight

of the brain was 43·2 ounces, and *right* cerebral hemisphere was slightly heavier than the left: in the two idiots the brain was $\frac{1}{4}$ ounce less than the average natural weight; and in the third idiot, who died from cerebral apoplexy, which would add to the weight, the brain was $2\frac{3}{4}$ ounces heavier. One may truly say that the loss of balance so often metaphorically applied to disturbed states of the nervous system, is shown, by the above observations of Dr. Boyd, to bear a literal interpretation. The general increase of weight in the brain of epileptics is a fact which, if confirmed by more extended observation, cannot fail to influence our views with regard to treatment; in speaking of which I shall recur to the point.

Among the authors who have specially attended to the weight of the brain in epilepsy, Ferrus and Parchappe may be mentioned. Parchappe's* observations are not numerous. He gives four cases in which epilepsy and insanity were associated; in three, in which both affections had lasted several years, there was thickening and opacity of the arachnoid, with softening of the middle portions of the cortical layer. In the fourth case the disease had lasted one year only, and the intellectual disturbance had been temporary; there was sudden death from nephritis,

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* Recherches sur l'Encéphale, sa Structure, ses Fonctions, et ses Maladies. Par M. Parchappe. Deuxième Mémoire, liv. iii. chap. v.

but the ventricular arachnoid was rough and thickened, the ventricles contained much serum, and the septum lucidum was very soft. The average weight of the four brains was 1·498 kilogrammes, or 52 ounces 6 drachms.

M. Ferrus, whose researches I am only acquainted with through the medium of M. Parchappe's works, examined the nervous centres in a large number of epileptics; he has almost invariably found hypertrophy of the brain, with increased density, and a brilliant white colouring of the white substance, together with hypertrophy of the cranium; alterations which M. Ferrus is much disposed to rank as causes of epilepsy. In exceptional cases he has met with other morbid changes, such as softening, tubercle, and hydrocephalus. Together with these observations we may also advert to those of Messrs. Bouchet and Cazauvieilh,* who found a true chronic inflammation of the cerebral tissue to constitute the uniform lesion in epilepsy; a conclusion based upon the post-mortems made in eighteen cases of the disease.

As a special opportunity of returning to Dr. Boyd's investigations may not offer, it is convenient at once to add the results which he has obtained by the measurements of the crania of epileptics:—

"The average cranial measurements in 30 male

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* De l'Epilepsie considerée dans ses Rapports avec l'Aliénation Mentale. Extrait des Archives Générales de Médecine.

epileptics was: circumference 22, transverse measurement from the centre of the external auditory foramen over the head to the other 13·9, and from the root of the nose to the occipital protuberance 13·2 inches; in 29 female epileptics, circumference 21·5, transverse measurement 13·2, antero-posterior 12·9 inches. The average cranial measurement in 14 male epileptics and idiots was: circumference 21·7, transverse 13·7, antero-posterior measurement 13 inches. In 13 male idiots, not epileptics, the average circumference was 21·4; transverse measurement 13·5; antero-posterior measurement 12·8 inches."

Among the observations upon the pathological changes produced in epilepsy, few have been made with more searching accuracy than those of Joseph Wenzel. They led him to the conclusion that the pituitary body was the only part of the encephalon presenting any uniform lesion. As his inquiries have been much misrepresented and misunderstood, I think it right to give them somewhat in detail. J. Wenzel founded a society in Mayence for the special study of the post-mortem appearances in epilepsy; and unfortunately his death interrupted the progress of the inquiry, but his own results were published posthumously by his brother.

Wenzel's* investigations were made at the begin-

* The original edition not being at my disposal when I first entered upon the study of his researches, though I have since examined it for comparison, the extracts are taken from a

ning of the present century, and their care and minuteness render them deserving of the especial attention of all interested in the study of the disease under consideration or engaged in the prosecution of any pathological inquiry.

The total number of post-mortems upon epileptics made by Wenzel amounts to twenty; they were not inmates of a lunatic asylum, but patients residing with their friends, or admitted into the general hospital of the town on account of other diseases.

The following are some of the main inferences from twenty post-mortems of epileptics, which were conducted with extreme care:—

French translation, entitled, Observations sur le Cervelet et sur les diverses Parties du Cerveau dans les Epileptiques, par Joseph Wenzel, Docteur-en-Médecine, etc.; publiées après sa mort par son frère et collaborateur Charles Wenzel, Médecin, etc. Traduit de l'Allemand par M. Breton, pp. 217. Paris, 1811.

The title of the original is: T. Wenzel, Beobachtungen über den Hirnanhang Fallsüchtiger Personen; nach seinem Tode herausgegeben von C. Wenzel. Mainz, 1810. Most English writers who refer to Wenzel have probably made use of the French edition, in which, curiously enough, *Hirnanhang* is given throughout as *cervelet*, which is the common term for cerebellum. Anybody, however, who will be at the pains to look at the French description of the part, will at once understand what is meant; thus, at p. 53, it is stated, "Le cervelet est situé dans la fosse de la selle du Turc;" and a large part of the book is devoted to a description of the sella Turcica and adjoining parts. The error has already been pointed out by Dr. Sims, but as I was not at first aware of the correction, and was myself for a time misled by the statements of English authors who had misunderstood Wenzel, it may be right to repeat the warning.

There are certain deviations or changes of structure of the brain which are found in epileptics, and which are merely coincident with, or consequent upon, the disease; such as variations in the form and size of the convolutions, softening or hardening of the cerebral tissue, accumulation of serum in the lateral ventricles, alterations in the size and consistency of the corpora striata, thalami optici, and corpora quadrigemina. The pituitary body is invariably found diseased in epileptics, and the morbid condition almost invariably consists in an effusion of lymph, which has become more or less indurated at the point of junction of the two lobes. The pineal gland is also found to be commonly affected; and these two parts are seen to be diseased when no morbid affection can be traced in any other part of the brain. Wenzel is of opinion that the slightest modifications of the pituitary body have the most serious consequences for the animal economy. He regards it as all but certain that the diseased state of the pituitary body in epilepsy is the result of an inflammatory affection; and although he does not go into the details of treatment, he makes his observations the ground of objection to the empirical mode of treatment commonly pursued in epilepsy. Incipient epilepsy, above other remedies, demands, he is inclined to maintain, antiphlogistic treatment, and especially local and general bleeding; or, he asks, is that form of epilepsy alone curable which takes its origin in a distant part of the body,

and does not depend upon lesion of the pituitary body? In speaking of the morbid anatomy of epilepsy, Wenzel dwells much upon the necessity of a careful examination of the base of the cranium, as the sella Turcica, the posterior and anterior clinoid processes, are very apt to present some form of malformation in epilepsy. A considerable part of the volume is devoted to this branch of the subject.

An abstract of the cases detailed by Wenzel will, I apprehend, be acceptable to my readers. The results obtained by Wenzel are rendered still more important by the fact that not only his anatomical researches into the brain generally are very extensive and minute, but that in many of the epileptic post-mortems, he examined bodies of the same age, and of persons who had not been epileptic, in order to have a proper standard of comparison. On the other hand, we may not overlook the statement of Rokitansky,* that he has "frequently failed to discover the disease" spoken of by Wenzel "in those who had notoriously suffered from epilepsy and convulsions," and that he had "met with it in other individuals who had been thoroughly healthy."

The question of the bearing of disease of the pituitary body upon epilepsy, like that of Addison's dis-

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* A Manual of Pathological Anatomy, vol. iii. p. 434. Translated by C. H. Moore, Syd. Soc. Ed.

ease to the bronzing of the skin, may therefore still be regarded as a moot point, which deserves further investigation. For this reason we may oppose to the general affirmation of Rokitansky the following summary of observations :—

Case 1. Male, æt. thirty-eight. Epileptic for four years. Death from phthisis. There was no trace of disease within the cranium, except in the pituitary and pineal bodies; the latter was small, pale grey, and singularly soft; the pituitary body was extremely small; its two lobes were separated from each other by transparent, viscous, yellow matter. There was a corresponding loss of substance in both lobes; the anterior one was throughout of a pale rose colour, and in its middle scarce a trace of the white substance commonly found there remained; the posterior lobe was almost converted into a mere sac.

Case 2. Man, æt. thirty, who had had repeated attacks of epilepsy, and died of typhus. Exhibited no cerebral disorganization, except that the pineal and pituitary bodies were very soft, and the two lobes of the latter separated by a yellowish-brown, viscous, transparent substance.

Case 3. Male, æt. twenty-three. Epileptic from infancy. Post-mortem like the last.

Case 4. Male adult. Affected with epilepsy from infancy. Sudden death. Cerebrum healthy, except pineal and pituitary bodies; the former very soft and small; the latter of "monstrous" size, and swollen

on "its upper surface, of a deep red," all the vessels gorged with blood. The whole anterior lobe red inside and outside, "without a trace of white substance within;" the posterior lobe, which is always grey in adults, was of a deep blue, and at the point of junction between the two lobes there was a viscous, yellow, transparent matter.

Case 5. Female, æt. sixty-six. Sudden death. Epileptic for some time. Brain healthy, except pineal gland, which was soft, and pituitary body of a yellowish colour, and nearly equally soft. The posterior lobe filled with pale grey substance, like thick soup; the line of separation between the two lobes was filled with yellow, viscous, transparent matter, and both lobes were covered with the same liquid.

Case 6. Male, æt. twenty-three. Died in an attack of epilepsy, having had several previous seizures. Convolutions of brain flattened. The pineal gland small and soft; pituitary body enlarged. A deposit of yellow, transparent matter between the lobes; a vesicle formed on its left side by the investing membrane.

Case 7. Female, æt. fifty. Epileptic for twelve years. The pituitary body contained small round, solid, transparent bodies, of the size of "graines de Séseli," which he could not find in the pituitary body of a man of fifty-five, examined at the same time, who had died of apoplexy.

Case 8. Male, æt. thirty. Epileptic for several

years. Died of typhus. Fewer convolutions anteriorly than posteriorly. Corpora striata and optic thalami larger on left than right side. Pineal gland dried up; anterior lobe of pituitary body externally red; instead of the white spot internally, the part was deep red, verging upon black. Between the lobes there was an empty cavity.

Case 9. Female, æt. twenty-four. Epileptic for several years. Pineal gland much discoloured, very small, and excessively soft. Anterior lobe of pituitary body extraordinarily thick and red. Posterior lobe, which at this age ought to be grey, was white. No yellow matter between the lobes. Brain otherwise healthy.

Case 10. Female, æt. seventeen. Epileptic all her life. Pineal gland very small and soft. Pituitary body enlarged. A white, thick matter, resembling indurated lymph, separated the two lobes. The brain otherwise healthy.

Case 11. A child, æt. two years and nine months. Subject to convulsions from the age of two months. There was much turbid yellow serum under the arachnoid at surface and base of brain; much serum in ventricles. Corpora striata and thalami optici converted into a pulp. Pineal gland very large and pale grey. All the vessels of the pia mater investing the pituitary body were gorged with blood. There was an accumulation of turbid and slightly indurated lymph between the two lobes. The anterior lobe

was deep red within ; and at the point of junction of the two lobes there was in the cellular tissue much semi-fluid lymph.

Case 12. Man, æt. twenty-one. Epileptic for fourteen years. Anterior convolutions of brain very large ; the brain healthy, except pineal gland, which was atrophied ; the infundibulum, which was as red as if it had been plunged in blood and vermilion ; and the pituitary body, the anterior lobe of which, at its upper part, presented on each side a white indurated spot. A light fluid ran out on separating the lobes.

Case 13. Man, æt. twenty-six. Epileptic for several years. Convolutions as in last case. Pineal gland small ; upper surface of large lobe of pituitary body hollowed out as in old people. The angles of the anterior lobe of a pale yellow, the remainder of the lobe red-brown. The right angle covered with inequalities. The posterior lobe broadened, and of a pale grey colour, like paste.

Case 14. Female, æt. twenty-four. Epileptic for fifteen years. Pineal gland atrophied ; pituitary body presented an extraordinary excavation ; the infundibulum much reddened and thickened.

Case 15. Female, æt. fifty-three. Epileptic for some years. No lesion except pineal gland, which was atrophied, and contained two very large calculi. The pituitary body contained in its anterior lobe, which was slightly enlarged, a yellowish-white sub-

stance, such as is never found in the healthy state. Posterior lobe pale grey and very soft.

Case 16. Man, æt. nineteen. Epileptic for several years. An effusion on the brain of semi-fluid lymph; no lesion otherwise except pineal gland and pituitary body. The former atrophic. The posterior lobe of latter was hard and very dense, and contained two spots of a brilliant white and cartilaginous appearance, yielding a milky fluid; on removing them a cavity remained, lined with dense cellular tissue. The interior of the anterior lobe presented two spots of white substance.

Case 17. Man, æt. fifty. Had been epileptic formerly, when he was cured for fifteen years by swallowing a roasted mouse which had been reduced to powder. Return of fits a year previous to death. Vessels on surface of brain gorged with blood. Convolutions of brain widely separated, broad and long. The corpora striata and thalamus opticus of right side almost absent; grey matter very pale; white matter dirty-white. Pineal gland pale grey, containing much sand. Pituitary body presented a small band a line broad, at the point of junction of the two lobes; between them was a transparent, clear-yellowish viscous matter, nearly the thickness of a line, a portion of which was indurated. The anterior lobe red at its margins and within.

Case 18. A soldier. Epileptic for several years. Died in a fit. Remarkable narrowing of sella Turcica.

Grey substance very pale. Pineal gland enlarged, with a cyst the size of a hemp-seed on its upper surface, containing a clear yellow fluid. Anterior lobe of pituitary body singularly narrowed; softer than normal; yellow and brownish. The posterior lobe contained a brownish-yellow round spot.

Case 19. Man, æt. twenty-seven. Epileptic for fifteen years. Great contraction of the sella Turcica. Effusion of turbid, whitish serum at the posterior upper surface of the cerebrum; much limpid serum in the ventricles; the cerebral tissue firm. Pineal gland harder than usual. Pituitary body surrounded by white and indurated pia mater; surrounding the insertion of the infundibulum the greater part of the surface presented an excavation. Anteriorly was a transparent point the size of a large needle's eye, containing some yellow viscous matter.

Case 20. A child, æt. eleven. Dead of violent convulsions, following soon after smallpox and cynanche. All parts of the cerebrum healthy excepting the pituitary body. At the point of junction of the two lobes was a quantity of deep-yellow, transparent, thick bilious matter, causing a separation of the two lobes to the extent of two lines.

These cases seem to justify the conclusion of the author of the liability of the pituitary body and the pineal gland to take on diseased action in epilepsy of long standing. It is true that Romberg* has detailed

* Manual of Nervous Diseases of Man, translated by E. H. Sieveking, M.D., vol. i. p. 43.

a case of facial neuralgia in which there was no epilepsy, though half the pituitary body was converted into a purplish-brown pultaceous liquid; and he quotes Engel as having met with disease of the pituitary body without epilepsy. Wenzel, however, by no means asserts disease of the pituitary body invariably to be accompanied by epilepsy, but that he has found epilepsy to be invariably accompanied by a morbid condition of the pituitary body. No one appears to have followed up the subject in such a manner as to confirm or refute Wenzel's observations; though, in the case of the two organs specially concerned, it is probable that pathology may contribute more to the elucidation of their functions than physiology. Nor do the observations of Dr. Boyd relative to the altered nutrition of the brain in any way contravene those of the German author, since the two sets of lesions might well coexist; and it does not appear that either physician has taken the point of view adopted by the other. The general impairment of the mental faculties that accompanies persistent epilepsy may with all reason be assumed as associated with a different cephalic lesion from that which is immediately connected with the epileptic paroxysm.

Osseous growths from various parts of the dura mater, but especially from the falx cerebri, similar productions within the brain, malformations of the cranium, contraction of the foramen magnum from deposit of new bone, exostosis from the parietal and other bones of the cranium, accumulation of fluid in

the ventricles, hydatids in the choroid plexus, tumours of all kinds, the various products of inflammation, circumscribed abscesses, in short, every morbid condition to which the brain and its envelopes are liable, have been met with in epileptic subjects, and have been regarded by authors as the *causa proxima* of the disease. That they may each of them be powerful exciting causes we willingly admit, except perhaps such formations as Pacchionian bodies or cysts in the choroid plexus, which are scarcely pathological; but we cannot join with those who found upon these changes a distinction between idiopathic and sympathetic epilepsy simply because none of them have as yet been proved to be essential to the disease.

To detail the lesions found by different pathologists in the post-mortems of epilepsy would lead too far, and scarcely avail much to the elucidation of the pathology of the disease. There is scarcely a disease or an injury of the cranium, the dura mater, the cerebrum, the cerebellum, or medulla oblongata, which is not recorded by some author as having been met with in post-mortems of epileptic subjects. Esquirol at one time thought that the cartilaginous and osseous deposits which he found on the arachnoid of the spinal cord might account for the disease; but, apart from other considerations regarding the symptomatology of the disease, the remark holds good here which applies to the individual lesions of the brain above alluded to, that they may occur without

inducing epilepsy, and are not, therefore, the essential lesion. I am unable to decide in how far the observations of Dr. Boyd and Professor Wenzel may be regarded as conclusive on the particular points to which they advert. Considering how rarely epilepsy is fatal by itself, and especially that it possesses so very chronic a character, we should not, from analogy with other morbid conditions, be justified in expecting to find a palpable disorganization except in cases of long standing. The periodical character of the paroxysm, though only, in my opinion, one of the manifestations of the disease, tends to confirm this view. We meet periodicity in many diseases of a type altogether removed from the ordinary character of nervous diseases; but in these there are more marked and continuous manifestations of morbid processes throughout the intervals. The evening exacerbations of febrile affections, of inflammatory disorders, of rheumatism, may be cited in evidence. I am at this moment attending an old lady labouring under a well-marked attack of gout, affecting the abdominal viscera, in whom the return of pain is as regularly periodical as the attacks of intermittent fever; but, in this as in the other instances cited, the history and the persistent symptoms adequately prove that the whole course of the disease is distinct from what is commonly regarded as an affection of the nervous system. In making this remark I must, however, guard myself against being supposed to ad-

vocate the idea that the nervous and vascular systems may, in our estimate of disease, be entirely isolated. I merely contend that the periodic character of the epileptic paroxysm is a ground for not assuming that the disease is dependent upon an organic lesion in the first instance, but that the organic lesions, appreciable to the senses, or rather to our means of investigation, are the secondary effects of the disease.

I have, in my opening remarks, already dwelt upon the necessity of not regarding the paroxysm or fit in any other light than as a part of the entire morbid condition; but the symptoms traceable during the interval are so faint, and require so much careful and minute inquiry to be elicited, that they are apt to be overlooked by those who expect as palpable deviations from health here as in those disorders which are universally regarded as depending upon blood disease. Still it is by their analysis that we may more confidently hope to attain to a just estimate of the organic lesions accompanying epilepsy, than by the most careful examination of the explosive phenomena of the seizure taken alone.

In speaking of the value of the various circumstances influencing the causation of epilepsy, I observed that they occupied a different relation; some acting more immediately by predisposing the body to the occurrence of the paroxysm, when some peculiar stimulus is applied; others, occupying the place of that stimulus, and coming under the denomination

of exciting causes. There is some support to this arrangement to be found in pathological anatomy; and it is doubtless important in estimating the value of the relative post-mortem phenomena, that some such rule of measure should be applied; otherwise it would be difficult to understand why, for instance, a spiculum of bone pressing upon the brain, a sword's point, or a musket-ball imbedded in it, may in one person produce epilepsy, while similar lesions in another are not followed by any such phenomena. In judging of the post-mortem appearances of epileptic subjects, then, we must seek to find or distinguish three things: first, the state of the brain which may give rise to epilepsy or permit its occurrence on the approach of a given excitant; second, the state of the brain and its envelopes, which may be regarded as the excitant; and, thirdly, the condition of the brain or individual portions, which are affected in consequence of the derangement of the circulation and the nutrition of the parts immediately resulting from the epileptic seizure.

I agree with those who think that every vital act is accompanied by a change in the organism, and that therefore every morbid condition must necessarily be associated with some physical lesion. Our means of investigation are much too coarse as yet to measure the lesion in the majority of cases of functional derangement, and however much we may advance in our mode of inquiry, we shall never

bridge over the distance between death and life. There may be numerous organic lesions accompanying so-called functional derangement during life, which we may attain to measuring by secretions and excretions, by dynamometers, galvanometers, and æsthesiometers, but which the cessation of life places absolutely beyond the reach of those methods of estimation, even when perfected to the utmost, simply because the conditions are absolutely altered. While, therefore, we are to keep in mind the possibility of an appreciable change in the encephalon being necessary that the reaction to a certain stimulus may be shown by the epileptic paroxysm, we must also remember that it is perfectly possible that that change may be of a character to disappear entirely with the cessation of life. These remarks would apply to other diseases as well, but to none so forcibly as to those accompanied by what are termed nervous symptoms.

The poverty of our knowledge concerning the functions of the nervous system and the manner in which they are carried out, justifies us in setting aside altogether the consideration of the physical condition of the brain which predisposes to epilepsy. What else I may have to say on this subject, I reserve until I discuss the theory of the disease.

The question then suggests itself, to which of the two remaining categories the lesions belong which are most frequently met with in conjunction with

epilepsy; are they to be viewed in the light of exciting causes or as the results of the concomitant affections of the disease? The question is placed here, because it appears to be one deserving an answer, though a sufficiently exact and satisfactory response may yet be wanting.

I have put forward so prominently the observations of Dr. Boyd and Professor Wenzel, because they in no way contradict one another, and both tend to show a peculiar chronic malnutrition of the brain. The hypertrophy demonstrated by Dr. Boyd has not been inquired into microscopically or chemically, therefore we do not know whether it depends on a new deposit of a heterogeneous character, or whether it is the product of inflammation. Dr. Wenzel's observations of changes in the pituitary body point more definitely to inflammation, because we find both the early stages of this process as well as the suppurative form. It is perfectly conceivable that the hypertrophic condition might have coexisted in Wenzel's cases, had the balance been employed; it is equally possible that, had the pituitary body been examined by Dr. Boyd, he might have met with similar alterations as the former inquirer. I do not like dealing in suppositions, but they are offered in the present instance merely to show that there is no necessary contradiction between two excellent observers. In all their cases the disease had been of long-standing, and I incline to the opinion that a morbid

process once having been set up by the peculiarity of the spasm and the violent perturbation of the circulation, this has been maintained on the principle that the weakest organ invariably suffers most in any disease that may be set up. The epileptic paroxysm once having occurred and initiated a peculiar process in a part of, or in the entire brain, the process might be justly assumed to react upon the epileptic paroxysm, causing its re-excitement; the epilepsy and the organic lesion would then come to stand in the relation of the τύπος ἀντίτυπος of the Delphian oracle. We shall see that these points, whether our interpretation be false or true, exercise a material influence upon the treatment of the disease; and though morbid anatomy by no means affords us all the replies to our queries that we should desire, still the facts it supplies are sufficiently broad, and present a sufficient agreement to enable us to fix certain general principles of treatment, in consonance with them.

I have spoken of the observations of Esquirol relative to the presence of cartilaginous and osseous formations on the spinal arachnoid. That such formations may influence the occurrence of epilepsy I raise no question about; but our present knowledge of the functions of the nervous system and the phenomena of the disease in question, forbid our regarding any affection of the spinal cord, or of the nervous system extraneous to the cephalic centre, in any

other light than that of an exciting influence. In twelve epileptic women Esquirol found the spinal meninges injected once, and twice of a greyish colour; nine times they presented more or less concretions scattered over the external surface of the spinal arachnoid; the concretions were of a lenticular form, from one to two lines by one line, and they were cartilaginous or bony; while at the same time M. Metivié found similar concretions in the spinal column of two epileptic children. Esquirol found the spinal cord, especially the lumbar portion, softened four times.

Considering the relation of epilepsy to spasm in the range of the respiratory tract of nerves, it is remarkable that the changes found in post-mortem examinations should so rarely be traced to the medulla oblongata. Dr. Copland* especially dwells upon irritation of this portion of the nervous system as a cause of epilepsy, and that irritation is propagated to it can scarcely be doubted by any one who observes the phenomena of the seizure, whether or not he adopt Dr. Marshall Hall's views; but considering the facility of examining the medulla oblongata, and the rarity with which lesions are discovered in it, the view that it is essentially concerned in the propagation of the epileptic paroxysm, receives a strong negative.

Among the lesions not immediately connected with

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* Dictionary of Practical Medicine, art. Epilepsy.

the nervous centres, which at times possess a manifest relation to epilepsy, there are none that can be fairly regarded in any other light than as accidental exciting causes. Injuries to the nerves by wounds or by the spontaneous growth of tumours, belong to this class; degenerative disease of the kidneys, the chief depurators of the blood, equally deserves mention here; but, however important to attend to the removal of such morbid conditions to secure the patient's recovery from the epilepsy, they are not essential accompaniments of epilepsy. We have seen (p. 98 seqq.) how very rarely albuminuria, the prominent symptom of degenerative renal disease, accompanies ordinary epilepsy. On the other hand, puerperal convulsions have been shown to be commonly associated with it; and wherever we find albuminuria we must be on the watch for the possible supervention of epileptiform seizures; but a majority of cases of Bright's disease of the kidneys, whether in the form of the large mottled fatty kidney, or the granular and contracted variety, pass off without the occurrence of epilepsy. Again, I have seen an arrest of albuminuria followed not only by an arrest and apparent cure of severe dropsy, but by complete arrest of severe epilepsy which had supervened during the existence of the albuminuria, which had every appearance of a tendency to death.

CHAPTER VIII.

The theory of epilepsy — Consideration of the views of authors regarding centric and eccentric forms of the disease — authors' views on the subject — The brain the part primarily involved — Relation of the organs of circulation to the brain in epilepsy — Sir Astley Cooper's experiments — The influence of habit — The relation of infantile fits to epilepsy — The experiments of Brown-Séquard — The cerebral circulation in epilepsy.

If we apply a lighted taper to a muslin curtain, the boarding of a wooden hut, or solid masonry of a church, the effect will vary with the greater or less inflammability of the different substances. The curtain will speedily take fire and flare away; the planks may be scorched but will probably not inflame; while the stones will show no traces of the influence of a destructive agent which the first shower will not wash away. In the first two instances there is a possibility of ignition, in the third it is not possible. Mankind vary similarly in their tendency to nervous disorders generally, and to epilepsy especially; some are utterly insusceptible to influences that may produce them; others, like the wood, and the muslin, are more

or less impressionable. But wherever the disease occurs it is essentially the same disease; the same symptoms characterize it; it follows the same course, and, unless checked, leads ultimately to the same results. In regard to treatment, it is doubtless of importance that we should discriminate between the various causes that induce the malady, because in this case, as in the whole domain of pathology, the remedies to be applied will depend very much upon the circumstances connected with and immediately preceding the outbreak; but though the removal of those circumstances may arrest or mitigate the disease after it has shown itself, they do not constitute the disease; just as the lighted taper, in the instance above quoted, does not constitute the conflagration which may ensue if the muslin or the wood is ignited by its agency. Owing, as we think, to a misapprehension of the true nature of this relation, authors have been at great pains to establish a variety of classifications of epilepsy; which, however apparently differing from one another, agree in this, that they make the various exciting causes of the disease the basis of numerous divisions. No injury would accrue if the only consequence were an indication as to the mode of treatment; but the system of classification, which is based upon the exciting causes, induces a species of fatalism, amounting to this, that if the exciting cause cannot be traced, we are unable to control the disease. I conceive this proceeding to be

unjust to medical science, and equally discouraging to the medical man and the patient.

Esquirol divides epilepsy into essential, sympathetic, and symptomatic epilepsy; Dr. Cooke classifies it as idiopathic or symptomatic; Sauvages gives no less than fourteen divisions, which are all treated by him as occupying the same nosological rank: they are — 1. Epilepsia plethorica; 2. Cachectica; 3. Stomachica; 4. Uterina; 5. Simulata; 6. Pedi-symptomatica; 7. A pathemate; 8. Sympathetica; 9. Febricosa; 10. A dolore; 11. Exanthematica; 12. Syphilitica; 13. Traumatica; 14. Rachialgica.

Recent British writers generally adhere to the division into the idiopathic and centric, and symptomatic or eccentric form of epilepsy; the practical result of which is that only those cases are regarded as curable which are symptomatic and, by reasoning in a circle, all cases that are cured are set down as symptomatic or non-essential.*

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* No one has put this more strongly than Dr. Russell Reynolds, whose important work on Diseases of the Nervous System deserves to be studied by all interested in this department of medicine. I must beg leave to differ from him on this point, but as his views are those adopted by many writers, I quote the following passage: "If we can succeed in distributing all the cases hitherto known as epilepsy among the several classes of better-defined diseases, we ought to reject the term epilepsy from our nosology; but if we cannot accomplish this distribution, and are compelled to recognise the existence of many, or even of a few, cases distinct from any more general condition of systemic or local disease, then we must employ the term (epilepsy) in a re-

Not all writers, however, have adopted the views adverted to in the preceding remarks. If I understand Dr. Prichard rightly, he speaks of epilepsy only as one disease, which presents certain variations in its phenomena, but which are all closely allied to one another, and based upon the same essential morbid condition. The writer, however, who has most clearly asserted the essentiality of all cases of epilepsy is Georget,* who says: "Si, pénétré des principes de physiologie et d'anatomie pathologique l'on veut observer sans prévention l'épilepsie, l'on sera convaincu que cette maladie est une affection idiopathique du cerveau et l'on se rangera de l'avis de Pison, Willis et De Moor."

Our knowledge of the physical changes in the brain is not sufficiently advanced as yet to speak positively of the exact pathological disorders that accompany or induce epilepsy; but the analysis of the symptoms of the disease, based upon the knowledge we do possess of nervous physiology; the study of the consequences of epilepsy as shown in a large majority of epileptic post-mortems; the impossibility of rigidly carrying out the distinction between essential and non-essen-

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stricted sense, implying only those cases which, in the present state of medical science, are irreducible."—*The Diagnosis of Diseases of the Brain, Spinal Cord, Nerves, and their Appendages*, by J. Russell Reynolds, M.D., &c., p. 174. London, 1855.

* De la Physiologie du Système Nerveux et Spécialement du Cerveau, tome ii. p. 363. Par M. Georget, D.M. Paris, 1821.

tial, idiopathic or symptomatic epilepsy,—all justify us in discarding such an arrangement. Besides, however much we may value the results afforded by pathological anatomy, we must bear in mind that many of the observations made with regard to epilepsy have indicated lesions the exact bearing of which we are scarcely able to interpret, except in so far as they confirm the fact of the cephalic centre being deeply implicated. The observations of the Wenzels and of Dr. Boyd, interesting as they are, at present stand almost isolated, and require confirmation; though both series of inquiries prove how unscientific it is to draw positive conclusions solely from the appearances presented on a casual and superficial examination of the brain. I would ask, in how many post-mortems the pineal or pituitary bodies are ever specially examined, and whether they are not generally passed over simply because we do not know that they preside over a special function? How often is the specific gravity of one or the other part of the brain taken, or how often is one hemisphere weighed against the other? Moreover, though our knowledge of the nutritive processes in the brain have of late years been much extended, especially by the use of the microscope, it is impossible to deny that, with the more recondite changes that take place in the ganglionic and tubular matter of the brain and their relative relations, we are but very imperfectly acquainted.

With the exception of Esquirol, whose observations

of the affection in the spinal meninges in epilepsy have been recorded at p. 156, and Marshall Hall, all pathologists are unanimous as to the fact that the parts within the cranium are the organs immediately involved in the epileptic seizure. Here, as in all nervous affections, we may apply what Romberg, in poetic imagery, has said of the symptom of pain, which he terms "the prayer of the nerve for healthy blood." Spasm no less deserves this designation; but while we must not lose sight of the agency of the blood, we are bound to localize the disease as much as possible, in order that we may determine the means of attacking the immediate derangement which induces the spasm.

It is manifest that, in estimating post-mortem lesions of any kind, we must carefully distinguish between the results of long-standing disease and the appearances accompanying its earliest manifestations. The former, seen alone, may not, except by analogy, enable us to form any conception of the latter. Who that had only seen pneumonia in the state of dense hepatization would be able to appreciate the previous phases of the disease? Who that regarded only the stone in the bladder without reference to the dyspepsia or renal disturbance that had preceded, would be able to account for its formation, and take steps to anticipate its formation in other cases? In each of these instances we may receive indications and suggestions during our post-mortem inquiries; but

they will not and cannot, without physiological knowledge—without an acquaintance with functional disturbance manifested and ascertained during life, afford any very valuable information. In the same way, and yet more in regard to diseases of that part of the system which may be regarded as the special bearer of life, and of life in its highest sense, our researches into the value of tangible cadaveric changes must receive their stamp from our knowledge of the vital changes of the functions. The lesions in the disease in question, as far as we now know, are only the result of long-continued diseased action; and we are not even in a position positively to affirm which part of the complex organ in which they are found is the part primarily involved; and yet we are justified by all our previous knowledge of general physiology, as well as of the physiology of the nervous centres, in assuming that each portion has a definite function, and that a disease of so peculiar a character as epilepsy is accompanied by a derangement of function primarily of one part of the cephalic centre.

When we wish to form an estimate of a disease we naturally turn our special attention to the most prominent and most tangible symptoms. At the outset I observed—and I think it a subject of such importance that it will bear frequent repetition—that the epileptic fit is only a part of the total disease; still the study of this part is necessary, and

shows most markedly what part of the system is specially affected. The sudden and entire loss of consciousness alone would indicate an affection of the encephalon, and especially of the sensory ganglia; the only organ which must be excluded in reference to this point is the heart, as syncope might be mistaken for the insensibility of epilepsy; the state of the heart and the pulse, the spasmodic jactitations, however, at once negative this supposition. The control of the brain being withdrawn, the spinal system acquires a preponderating action, as shown in the spasmodic action of various muscular terminations of spinal nerves. Whether the irritation proceeds from without or acts directly upon the brain, appears to be of great moment with reference to the mode of treatment to be pursued, but does not affect the theory of the proximate cause. In the phenomena of cerebral reflex, certain molecular changes take place within the brain on the application of a stimulus conveyed through the sensations; and we know equally that morbid impressions conveyed to the brain from without may induce organic changes within the organ. There is an objection to bringing forward isolated cases in proof of a general law, but I may quote the well-known history of the soldier given by Lallemand,* in illustration of my present

* Recherches Anatomico-Pathologiques sur l'Encéphale, vol. i. p. 123; and Manual of Pathological Anatomy, by Drs. Jones and Sieveking, p. 255.

meaning: "A soldier was operated upon for aneurism of the right axillary artery. In applying the ligature the nerve was enclosed, cerebral symptoms followed on the seventh day, and death ensued on the eighth. The post-mortem showed an abscess in the left posterior cerebral lobe. The case is also of interest as affording proof of the uniformity of the law of crucial conduction." Here the external injury was the probable and immediate cause of the cerebral disease; and it is reasonable to assume that, in a similar manner, external exciting causes operate in the production of epilepsy by causing a specific irritation of a definite portion of the encephalon. Dr. Carpenter* regards "the sensory ganglia as the primary seat of that combination of loss of sensibility with convulsive movements which constitutes epilepsy;" and he subsequently observes—"The disease cannot be fairly attributed to those obvious lesions of structure which are sometimes coincident with it, and which, as Dr. Todd has justly remarked, are rather signs of altered nutrition, brought on by any cause which creates frequent disturbance of the actions of the brain, than the causes of that disturbance."

That a change in the balance of the circulation has a material influence in the production of epilepsy I think can scarcely be doubted. Sir Astley Cooper's

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* Principles of Human Physiology, fifth edition, p. 673. London, 1855.

experiments* afford strong evidence in favour of this view.

He states that, having tied the carotids in a rabbit, "Respiration was somewhat quickened and the heart's action increased, but no other effect produced. In five minutes the vertebral arteries were compressed with the thumb, the trachea being completely excluded. Respiration almost directly stopped; convulsive struggles succeeded; the animal lost its consciousness, and appeared dead. The pressure was removed, and it recovered with a convulsive inspiration. It laid upon its side, making violent convulsive efforts, breathed laboriously, and its heart beat rapidly. In two hours it had recovered, but its respiration was laborious. The vertebrals were compressed a second time. Respiration stopped, then succeeded convulsive struggles, loss of motion, and apparent death. When let loose its natural functions returned with a loud inspiration, and with breathing excessively laboured. In four hours it was moving about, and ate some greens. In five hours the vertebral arteries were compressed a third time, and with the same effect. In seven hours it was cleaning its face with its paws. In nine hours the vertebral arteries were compressed for the fourth time, and with the same

* Some Experiments and Observations on Tying the Carotid and Vertebral Arteries, by Sir Astley Cooper, Bart., Guy's Hospital Reports, vol. i. p. 457.

effect upon the respiration. After thirteen hours it was lively. In twenty-four hours the vertebrals were compressed for the fifth time, with the same result—viz., suspended respiration, convulsions, loss of motion and consciousness. After forty-eight hours, for the sixth time the same results were obtained by pressure. Thus it appears, if the carotids are tied, that simple compression of the vertebrals puts an entire stop to the functions of the brain." The experiment was reversed—the vertebrals tied and the carotids compressed, with similar result. Tying the vertebrals caused the breathing to become laborious; the animal's right ear fell, and the right fore-leg was partially paralysed. In five hours it ran about. The following day, when the carotids were compressed, it fell on its side, losing all sensation and volition, and recovered on withdrawal of pressure. The same results were obtained repeatedly. When both vertebral and carotid arteries were tied at the same time, "the animal breathed no more; but there were thirteen to fourteen convulsive contractions of the diaphragm and convulsions of the hinder extremities, and the animal ceased to exist."

But yesterday I was consulted in the case of a young lady, through the mediation of Mr. Spencer Wells, in whom I could not but regard the disturbance in the balance of the circulation as the main element in the production of the epilepsy to which she has been subject for three years and a half. She

is now (June, 1857) sixteen years of age, and has always enjoyed admirable health, with the exception of the fits, which possess the pathognomonic features of epilepsy. After a minute and searching inquiry, the only fact of any importance discoverable in connexion with the disease is that, although an older sister had menstruated at thirteen, she herself has not as yet manifested any symptoms of the catamenial function; and at the time at which she would have menstruated had she followed her sister's example, but at which in her the fits made their appearance, the occasional attacks of epistaxis ceased to which she had been previously liable. One could scarcely avoid, in this instance, arriving at the conclusion that an *error loci* afforded the therapeutic indication; and that the disturbance in the circulation, acting upon a susceptible nervous system, deranged the polarity of the latter. As yet no material derangement of the nervous and intellectual functions are manifested; and were, from other causes, death to occur suddenly at this time between the paroxysms, I doubt whether it would be possible to detect any kind of lesion indicating an altered nutrition of the cephalic centre.

I believe that, in the great majority of instances of epilepsy, the first attack is due to an irritation produced by derangement in the amount or quality of the blood circulating in the brain. In a person predisposed we frequently find over-fatigue, a long

walk, carrying heavy loads, prolonged mental exertion, the manifest cause not only of the first, but of many succeeding seizures. Hence there will be occasion, in discussing the treatment of the disease, to dwell much upon the necessity of bodily and mental rest, so as to allow the system to recover that balance, the disturbance of which gave rise to the seizure. This was particularly marked in the cases of Mary W. (No. 10), Robert P. (No. 18), R. P. D. (No. 11), H. S. (No. 39). But in no cases of epilepsy can our remedial agents be attended with any beneficial result unless we have a regard to this important indication.

These remarks lead to what I consider as of no less importance in the repetition and perpetuation of the disease, either from the point of view of its pathological theory or its therapeutic estimation—viz., the influence of habit. Medical men, no less than other observers of mental and physical functions, know how to appreciate this element in the influences to which mankind are subjected. For good or for bad, the repeated occurrence of the same acts facilitates their recurrence; and the proverbial expression implying that force of habit may acquire an uncontrollable influence, is no less applicable to disease than to morals. It is a fact familiar to every medical man, that an individual part which has once manifested a peculiar susceptibility is prone to take on diseased action again, and that a frequent occurrence of disease in a part renders

treatment more difficult at each succeeding attack. Hence the extreme importance of always thoroughly eradicating a morbid tendency when it first shows itself, and the no less important corollary which renders the period of convalescence from any disease, if possible, even more worthy of the special supervision of the physician than the stages of active disease. The reason of this is, that during convalescence the organs previously diseased are more liable to take on morbid action than other parts; and a return of disease in the former will not only leave the physician impaired forces to deal with, but, by the law of habit, will create an additional momentum in favour of the disease, which was before in abeyance. In no branch of pathology do we meet with more palpable instances illustrative of these observations than in the range of diseases of the nervous system. Habit is commonly interpreted as denoting a voluntary act which, by repetition, acquires the character of an instinctive act, though never entirely removed from the control of the individual if he chooses to exercise it; there is, however, a habit which, though never immediately under the control of the individual, may be subdued and held in check indirectly by the physical and physiological influences which we are capable of exercising. Such habit is the habit of an organ or organs to put on certain forms of diseased action.

In a disease like epilepsy, habit plays an undoubted

and very important part. Every successive attack strengthens the habit, and renders the individual more obnoxious to future seizures; every arrest or postponement of a seizure is so much gain in favour of the patient, not only by avoiding the pain and risk of the isolated paroxysms, but still more by diminishing his future liability to the disease.

Believing as I do, that wherever we meet with epilepsy there is the same fundamental weakness of the cephalic nervous centre, and that, by repetition of the attack, the same ultimate results may be brought about, whatever the exciting cause may have been, the necessity of seeking by every means in our power to weaken, if we cannot succeed in breaking, the strong links which constitute habit, becomes an imperative law for the physician.

The case of the clergyman's son (No. 22) made a special impression upon my mind in reference to this point. The lad became suddenly and violently epileptic during the convalescence from scarlet fever, owing, as it appeared, not to any residuary affection, but to a trifling indiscretion in diet. Various evacuant remedies had been tried previous to my seeing him, to get rid of what was supposed to be the exciting cause. The attacks had continued, with scarcely any intermissions, for many hours, and there appeared to be imminent danger. The seizures were arrested by what might have been regarded as a hazardous remedy, by morphia. After the ex-

hibition of the dose they subsided speedily, and they had not returned for eleven months after; and, had they occurred since, at a later period, I should certainly have been informed. Here was a case of hereditary epilepsy, for the father had also been subject to the affection; the convulsions were of the severest kind, and they supervened on a debilitating disease. This was assuredly a case in which an unfavourable prognosis was justified; and yet, by preventing the formation of a habit, the disease, terrible as it was, did not reappear. In speaking of treatment I shall again advert to the question of habit, as it is a point never to be lost sight of even in inveterate cases; yet I thought that my observations on the theory of the disease would have been even more imperfect than they are, had I not sought to dwell forcibly upon a feature which, under all circumstances, is one of vital importance.

In considering the theory of epilepsy, its relation to other diseases, and especially to those of a spasmodic character, must be borne in mind. There is much and powerful evidence to show that epilepsy belongs to a group of affections which are closely allied to one another, and hence exhibit many transition forms which have given rise to confusion in the minds of medical men.

The eclampsia of early childhood, laryngismus, or spasm of the glottis, may be especially mentioned as

belonging to the same category as epilepsy; the main reason why, in infants, the convulsive character is not so prominent as in children of a larger growth, would seem due to that very impressionability which gives rise to the nervous symptoms on a comparatively slight stimulus. Their muscles and the spinal nerves have not reached that period of robust development which maintains later, while the slightest interference with the organs of respiration, dependent, as in the cases adverted to; upon spasm in the superficial or deeper muscles of the neck, causes loss of consciousness. We constantly see the gradations from the merest crowing inspiration to the most confirmed convulsive seizure in the same infant; while the recurrence of the well-marked epileptic seizure in the adolescent or adult is preceded in a sufficient number of times by infantile fits to justify the assumption of a close relation been the two. The following case may serve to illustrate the connexion between laryngismus and infantile convulsions.

The first child of a gentleman, at the age of six months, was weaned; ten days after, November 16, 1855, I was called to see her. For a week previously she had, both while asleep and awake, been seized frequently with an attack of crowing inspiration, accompanied by great anxiety and occasional lividity of the countenance; the attacks were very brief, and were followed by complete recovery. She had a slight seizure on waking from sleep during my pre-

sence, but without livor. There were a few mucous rales to be heard at the base of the left lung, the remains of a former catarrh. Some directions with regard to the regulation of the diet were given, an emetic of ipecacuanha, and the daily exhibition of steel wine, were ordered. The attacks at times occurred as often as twelve times in the day; but partly by the aid of medicine, change of farinaceous to milk diet, and country air, the glottic spasm appeared to subside. On the 26th December the account is,—the child was considerably improved, till two days ago she had a violent "epileptic" paroxysm; there was complete unconsciousness, the limbs were extended, the eyes turned up, and the thumb drawn in under the clenched fingers. The child did not scream. She became very pale, and the attack was followed by great prostration. Since this seizure the attacks of glottic spasm had been very frequent. Saw the child asleep; breathing quietly; head not hot; occiput rather warmer than vertex; fontanelle normal, not pulsating; motions hard and clayey; skin not hot. Habeat hydr. cum cret. gr. i., mag. carb. gr. ij., statim, and a wet-nurse.

Dec. 28. The motions yesterday were white, and more clayey than ever, in fact, the greater part of two was as white as snow. The fits continued. She had one severe one after the nurse came yesterday, at 8 p.m. The child took the breast with many objections, but had a good suck; and the first motion

after was of a bright yellow, and feculent. Breathing calm; skin cool, and not hot. The "epilepsy" did not return, the crowing fits became gradually more sparing, and on the 4th January it is reported that she had passed twenty-four hours without any attack; on the 7th all the functions were healthy, and there had been no return. The child progressed favourably; under the care of an excellent wet-nurse she throve, till she was eleven months old. She then cut two incisors; a little catching in the breath occurred at this time, which would not have been noticed but for the previous attacks. While cutting the two upper incisors she, without being previously indisposed, had three severe epileptic attacks, at 2 A.M., 6 A.M., and 8 A.M., on April 8th. She was violently convulsed; there were carpopedal contractions; the eyes staring, the pupils dilated; complete unconsciousness, lasting several minutes; the fits preceded by a *gurgling* noise. There was no crowing. During the last fit there was considerable bluing of the features. The child was much heated; the skin dry; the bowels had acted, but the fæces were slimy, though bilious. The upper gums were hot and swollen, and on being lanced bled freely, the skin at once became cooler and moister. Some additional food had been given besides the breast, and was ordered to be omitted. Some castor-oil was administered. Four more fits occurred up to 5 P.M. on the same day; she then had a hot head; the motions

were ill-digested, and the fontanelle was large and somewhat prominent. The hair was ordered to be cut short; ice to be applied; and: hydr. cum cret. gr. i. tertiâ quâque hora. April 9, half-past 8 A.M.; slept quietly the greater part of the night; there was no return of fits; the motions less slimy; is cheerful, and recognises those about her with a smile. The convulsions did not return, but the inspiratory spasm again supervened and continued, although generally improving in health, till the exhibition of Allarton's* steel-biscuits, which she took readily and regularly. From April 24 to June 3 there was no spasm of any kind; at the last date there was a sudden fit; a calomel purge, ice to the head, and an alkaline diuretic were the remedies employed, and she did well. The report on July 20 is: Has recently had several returns of glottic spasms; relieved by opiates and warm-baths; the only traceable exciting cause was a slight bronchitic cough. She subsequently took cod-oil, spent some time at the sea-side, and when seen, Sept. 16, she is stated to have been in excellent health since the last previous report, July 30, which was also favourable; she could now walk well, and the fontanelle was closing. She continued the use of steel-biscuits, and had daily baths,

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* These biscuits, which are manufactured by Mr. Allarton, 254, High-street, Southwark, are an admirable vehicle for steel, which is entirely covered by the pleasant flavour of the material.

with the Kreuznach bittern. In November, after some premonitory restlessness, the child had two short fits; no irregularity of diet, undue excitement, or irritation of any kind could be traced. She had four double-teeth, and seemed to be cutting her right eye-tooth. The bowels were rather costive. After a purge and a diuretic, Boudault's *poudre nutrimentive* (pepsin, gr. v. bis die) was ordered, which she continued for a considerable time; it had a decided effect upon her digestion, and when the motions were out of order and contained undigested matters, they speedily recovered their healthy appearance under the use of the powder. From that time to the present, above six months, the child has enjoyed perfect health, and there has been no kind of spasmodic action.

This case may serve as a proof of the intimate pathological relation between the ordinary convulsive fits of children and the glottic spasm, to which they are so often liable. Some of the severer fits in the case related were as much epileptic as any that I have seen in adults. It was also interesting as bearing upon the doctrine of the centric or eccentric character of the disease; because, while at times the brain was palpably affected, at others an eccentric causation seemed most apparent. The variations are Protean, but it is very important to appreciate the connecting links between allied forms of disease, as the success of our practice will be materially influ-

enced by the view we take of the *rationale.* I have seen in a child, which subsequently died of glottic spasm, for a considerable time previously swelling of the left thumb, which was partially flexed across the palm, and which, as Marshall Hall pointed out in his Croonian lectures at the College of Physicians, is to be regarded as a symptom of the convulsive tendency. Such trifling manifestations of the disease may be easily overlooked; but, whatever may be the prevailing view with regard to the epilepsy of adolescents and adults, nobody denies the curability of infantile fits, and the facility of recognising their approach necessarily increases our prospects of a satisfactory treatment.

I may not conclude this inquiry into the theory of epilepsy without adverting to the experiments of Brown-Séquard, who succeeded in producing attacks apparently identical with epilepsy in guinea-pigs and other animals by making* "complete or semi-transversal section of the lower dorsal cord. In these animals a convulsive affection comes on within twelve or fourteen days from the time the cord is divided. It consists in occasional attacks of convulsive spasm, affecting first the muscles of the head and face, including those of the eye, the tongue, and the lower

* The following quotation is from Mr. Thomas Smith's able analysis of Brown-Séquard's recent researches in the British and Foreign Medico-Chirurgical Review, vol. xvii., April, 1856, p. 412.

jaw, and thence extending to the trunk and lower extremities. If a lateral half only of the cord be divided, the posterior limb of the opposite side is unaffected by the general spasms; if the transverse section of the cord be complete, neither of the posterior limbs is affected. These fits may occur quite independently of any external stimuli, or they may be produced at will by frightening or pinching the animal; of all parts of the body, irritation of the skin of the face or neck on the side of section will most surely produce an attack."

The author of the review then relates the experiments which Brown-Séquard performed at St. Bartholomew's on a guinea-pig, in which, on irritating the skin, violent convulsive spasm was produced throughout the body, accompanied by apparent unconsciousness: "The whole fit lasted about five minutes, and to an ordinary observer was undistinguishable from epilepsy, though it is said to differ from the latter in that consciousness is not completely lost, the animal remaining sensible to a strong and painful stimulus." It appears that the previous treatment of the animals had a material influence upon the production of these epileptoid seizures; those guinea-pigs which were confined in a small place and overfed were most obnoxious to the paroxysms; the more exercise the animal took, the less was the liability to fits.

With regard to these experiments, I would remark that the seizures appear to have borne much

more the character of tetanus than of epilepsy; and the facility with which they were excited reminds one strongly of the production of the paroxysms that render hydrophobia so characteristic an affection. Such a state of hyperæsthesia is by no means a feature of epilepsy in the human being, in whom the evidence, to my mind, shows irrefragably the brain to be the organ primarily involved. In order to reverse this doctrine by experiments of the kind performed by Brown-Séquard, it would be necessary to afford much more stringent evidence than he has done, that he is able to produce a typical seizure of epilepsy, and not one that can be only termed epileptiform. Moreover, I have shown above that pathology negatives the view of epilepsy depending upon spinal lesion; but the strongest evidence in favour of epilepsy depending essentially upon deranged conduction of cerebral nerve power is afforded by an examination of the phenomena of the disease itself.*

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* Although not disposed to adopt Dr. Watson's views with regard to the absence of cerebral congestion in the epileptic paroxysm, I think the following remarks explain and admirably sum up our knowledge of the true relation of the brain and spinal cord in epilepsy:—"There are good reasons for believing that the change, whatever it is, which is the immediate precursor and cause of the epileptic fit, may sometimes originate in the spinal cord, and thence extend to the brain, and sometimes originate in the brain and communicate itself to the spinal cord. Dr. Marshall Hall's doctrine that all convulsive diseases are diseases of the spinal marrow, cannot properly be applied to this convulsive disease of epilepsy. It is true that the spinal cord is

However we may wish to localize the affection, we cannot overlook the numerous facts that show the state of the blood to exercise a material influence in the production of epilepsy. We have had occasion to observe in a former chapter, that no uniform derangement is met with in the secretions, as far as we are at present informed, and which might serve as an indication of the special lesion which prevails. The close alliance between epilepsy and scrofulous affections points in this direction; while, in the great majority of cases, circumstances have preceded the outbreak which notoriously tend to impoverish the blood, and exhaust both the vascular and nervous power. But, although the disturbed polarity which induces the paroxysm most frequently depends upon exhaustive conditions,—so much so that some writers,

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concerned whenever there is convulsion, but it is concerned in every *voluntary* movement also, through the instrumentality of the brain itself; and it may be, and often is, irregularly influenced by a disordered and unnatural state of the brain. Tetanus may be fairly regarded as a disease of the cord and its proper appendages; the spasms arise and reach their height, while the powers of thought and sensation are undisturbed, and while the volition remains, although the morbid condition of the cord renders it ineffectual. In epilepsy these cerebral functions are always implicated. There is *always* a loss of consciousness, and in the epileptic vertigo, the *petit mal*, there is frequently a suspension of consciousness only, *without any convulsion at all.* The brain, therefore, we must consider to be essentially concerned in this disorder.—*Lectures on the Principles and Practice of Physic*, vol. i. p. 620. By Thomas Watson, M.D. 1843.

among whom I would specially mention Dr. Radcliffe,* regard this class of causes as the sole indication for treatment,—I am satisfied that the state of the blood need not necessarily be impoverished, but that various pathological conditions of the blood may be associated with epilepsy.

Upon no other view could we understand the very successful result of the treatment pursued by Dr. Cooke,† and which consisted mainly in the abstraction of blood, not only on the derivative plan, but on the ground of diminishing the actual amount of blood in the system. His cases are well told; and from the description of his patients, who all seem to have been florid, robust country people, the reader will probably agree with us that the treatment was sensible; unless the author be accused of downright falsehood, the success was palpable.

Other writers might also be quoted in support of the view that epilepsy at times occurs under circumstances and in individuals, justifying venæsection. This is certainly not my own experience; but the low type that appears to prevail generally at the present time in all diseases, and especially in the town population, among whom I have chiefly practised, may sufficiently account for this. Dr. Cooke formularizes his

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* Epilepsy and other Affections of the Nervous System which are marked by Tremor, Convulsion, or Spasm. By Charles Bland Radcliffe, M.D. London, 1854.

† A Treatise on Nervous Diseases. By John Cooke, M.D. F.R.S. 1823.

views thus: The predisposition to epilepsy, in whatever it consists, is evidently increased by a plethoric state of the body; though he justly observes, that the fact of the brain being found gorged with blood after the paroxysm does not prove the vessels to have been overloaded before. I shall revert to Dr. Cooke's cases again by way of illustration, and because they may tend to confirm what is so strenuously combated in other quarters, that diseases present a different type at different times and places.

In reference to epilepsy, both the quantity and quality of the blood must be taken into consideration. Many authors, among whom I would especially mention Dr. Prichard, support the doctrine that the immediate cause of the fit depends upon a preternatural influx of blood into the head. No instances are more striking evidences of this than where, as after hooping-cough, the fit is manifestly brought on by a retarded return of venous blood from the head. We have already seen that the prevailing post-mortem changes are such as cannot be explained except on the assumption of a chronic form of inflammation, or at least of a change of nutrition generally connected with a larger amount of blood than average. The frequency of congestive headache, and the success of derivative treatment in many cases, may also be mentioned in evidence. Several cases are given by Prichard in which hooping-cough was the immediate forerunner of the seizure. However much we may be disposed to admit congestion to the brain as one of

the accompaniments of the epileptic paroxysm, we cannot but see that, in the vast majority of cases of epilepsy, the patients are in a condition indicating a state of general anæmia, or a dyscrasic state of the circulating fluid—a state not certainly always, or even generally, to be measured by a physical standard, but no less recognisable by physiological tests —the state of the skin, the eye, the tongue, the pulse, the stomach, the intestines, the mental functions. In most acute diseases, even, that we have to deal with, we find that a predisposition is generated by previous debilitating influences—intemperance, debauchery, scrofulous or syphilitic taint, hereditary lithiasis. Such influences necessarily deserve equal attention in a chronic and periodic affection like epilepsy; and it is impossible to disconnect such influences, even in a disease so peculiarly in the domain of the nervous system, from a blood-lesion.

In concluding these remarks on the theory of epilepsy, I have pleasure in adverting to some observations by Dr. Handfield Jones bearing on the subject, which put it in a somewhat different light, though in the main they correspond with the views I have advocated. My friend's arguments will be better understood if taken in connexion with the case to which they are appended.*

* Cases of Nerve-Disorder, recorded with Reference to the probable Operation of Malaria as a Cause, p. 20. By C. Handfield Jones, M.B., F.R.S. London, 1856.

"S. S., aged forty-five years, a plasterer, came under my care December 22, 1856, having been under treatment for the previous ten days. He had been cupped at the back of the neck to eight ounces, had a seton put in the left arm, tartar-emetic ointment applied to the neck, and been purged, without benefit. He was of stout, rather short make; rather sanguineous aspect. He had been ill about four weeks, since a fall from a height of about eight feet. He states that he suffers from attacks of the following kind, occurring five or six times a day: He begins to wink, and then both eyes become drawn quite under the lids towards the right, one inwards and the other outwards; and he then loses consciousness for four or five minutes, and falls down: he does not scream, but moans as if choked. He has continual headache all along the right upper cranial region, from behind forwards. I witnessed the attacks more than once: they were perfectly involuntary; not attended by much flushing of head. He feels tremulous and nervous. He does not sleep well: has a trembling in the head when he lies down. Not an intemperate man: never drank spirits. Urine high-coloured; bowels open; pulse of good force; skin warm. He was similarly affected two years ago, and got well after six months. He had rheumatism twelve or fourteen years ago. He has not had syphilis, but gonorrhœa long ago. Tongue clean; eats food well. I gave him at first valerian with ammonia and iodide

"of potassium, and camphor with extract of St. Ignatius' bean, thrice daily. The camphor, &c., were soon changed for assafœtida, which was given at first in five-grain doses four times a day, and on Jan. 2 in ten-grain doses every two hours, and continued at the same rate till February 20, when he ceased to attend, having had only slight attacks in the previous fifteen days, and having been nearly free during several former weeks. The valerian and ammonia were given up when the assafœtida was given every two hours, but from January 9 to February 5 he took the following mixture :—

℞ Quinæ disulph. gr. iij.
Tinct. ferri sesquichl. ♏xxv.
Acid. hydrochl. ♏ij.
Aquæ cassiæ ℥j.
M. Fiat haustus, ter die sumendus.

He took this with an intermission of four days only. For the last fortnight, a mixture containing gallic acid, sulphate of zinc, infusion of calumba, and tincture of hyoscyamus, was substituted for the iron and quinine. He relapsed to some extent at one time when a severe frost gave way to a thaw. Remarks: I have cited this case partly because it is of much interest in itself, as a history of a curious neurosis. . . . . In this case there was nothing of the kind (aguish disorder), and I do not feel that I have any sufficient reason for ascribing the phenomena to the action of malaria The paroxysms evidently had

"much of the epileptic character, and the movements of the lids and eyeballs may be regarded as a kind of aura. The beneficial action of assafœtida, which seems to act as a peculiar cerebral nervine or toner, confirms very decidedly the opinion expressed by Dr. Todd, that 'the phenomena of the epileptic fit depend upon a disturbed state of the nervous force in certain parts of the brain—a morbidly-excited polarity.' What is wanted therapeutically is to find some drug or drugs which shall so influence the nutrition of the dynamic grey matter in the part affected, that it shall act with more steadiness, and be less mobile or excitable. How difficult this is, all experience declares. One great cause of this difficulty I believe is, that brain-tissue partakes much more of individual peculiarity, and so differs much more in its vital endowments and reactions towards remedies than nerve-tissue does. We feel a great deal more confidence in our ability to cure a neuralgia than an epilepsy; still we trace much of the same features in the one as in the other; and our therapeutic proceedings are in principle the same. If excitement, excesses, bleeding, and all debilitating influences aggravate an epilepsy, so in most cases do they a neuralgia. The curative means in both cases are such as give tone without stimulating. But it may well be conceived that the tissue of the cerebral convolutions, whose function is of so high an order, and whose nutritive actions are so liable to be de-

"ranged and impaired by mental or emotional influences, is far less likely to be in all cases modified alike by the same agent than other tissues of lower and simpler function."

Although I do not think that every variety of epilepsy is comprised in the above remarks, I am of opinion that they apply to the great majority of epileptic and epileptiform seizures that we have to deal with. But even here, as Dr. Handfield Jones justly observes, the reaction of the complex tissues of the brain (to adopt a more general term) to different remedial agents, varies much more in different individuals than the reaction exhibited by other organs and tissues. Hence the great diversity of remedies that have been lauded in the treatment of epilepsy, which certainly generally possess some analogy in their characters, but which may not unreasonably be supposed, under different circumstances and in different individuals, to have wrought different results. In this point of view, the apparent discrepancies of different observers may possibly be reconciled. I shall be unable in detail to examine even a tithe of the substances to be found in the *armamentarium epilepticum:* this would be impossible without much expanding the proposed limits of this work. I do not, however, wish it to be inferred that, if I pass over some drugs that have been highly extolled, or say less of others that have appeared valuable in some hands, than they may deserve, I deny that

cures have been effected by many of which I see the *rationale* even less than of those that I have most faith in.* Before science will be justified in speaking authoritatively on the subject, we must know more than we do of the physiology of the nervous centres, and of the definite reactions which take place in them on the administration of definite physical agents. In the meanwhile I offer, with a full consciousness of their imperfection, the following observations on the treatment of the disorder.

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* Romberg (l. c. p. 228) states that above fifty years ago anti-epileptic remedies were so numerous as to fill 150 quarto pages in Hemmings' Analecta Literaria Epilepsiam Spectantia. More accessible works are those of Tissot, Cooke, and Copland, which contain tolerably complete lists of the remedies that have been tried.

CHAPTER IX.

The treatment of epilepsy — The treatment during the fit — The treatment of the "aura" — The treatment of the interval — The author's formula of treatment — Applications to the head and its vicinity — Compression and ligature of the carotids — Purgatives — Leeches — Tonics — Iodide and bromide of potassium — Anti-spasmodics — Opiates — Sundry other remedies.

THE treatment of epilepsy resolves itself into two main considerations—the proceedings to be adopted during the fit, and the course to be pursued in the intervals.

The main object in the paroxysm is to prevent the patient from being injured by the violence of the jactitation. He should be placed on a couch, with the head raised; all mechanical restraint ought to be removed which may interfere with the circulation, especially all ligatures and confining media; neckerchiefs, stocks, cravats, stays, should be loosened. As epileptic patients are apt to injure themselves severely in their fall, they ought never to be left alone, especially not in a room with an open grate, as it but too frequently happens that the paroxysm has caused the

patient to fall into the fire, and to be grievously burnt. Tissot relates a curious case of a child whom he saw, and who became epileptic at the age of eighteen months, in consequence of a pistol being fired off close to its ear. At the age of three years the child was cured by accidentally sitting down upon a brazier of live coals, and burning his posterior. The author remarks that this is the only case in which a burn has cured a patient. I have met with no analogous case either in my own practice or in that of other writers.

Having placed the patient in a safe position, untied neckerchiefs and loosened waistbands or stays, we may apply cold water or cooling lotions to the head, but should avoid all restraint that may not be necessary to prevent the patient from doing injury to himself. The temptation to employ active treatment is necessarily great; and it is painful to stand and watch the epileptic paroxysm without being able to suggest a remedy. Perhaps more might be done if physicians more frequently saw their patients during the attack itself; but the suddenness of the seizures, and their generally brief duration, render it impossible in most cases to apprize the medical attendant of the occurrence until it has passed by. Dr. Caleb Hillier Parry* suggested and frequently employed

* Collections from the unpublished Medical Writings of the late C. H. Parry, M.D., vol. i. p. 392. London, 1825.

compression of the carotids in head affections, with the most beneficial result.* He states that he has often, by pressure on one carotid, arrested tinnitus aurium on the corresponding side of the head; and that when any degree of pain has existed about the neck and throat, strong pressure of the carotid on one side has always increased the pain on the other, owing to a larger quantity of blood passing through its fellow. "When there has been a sense of weight, and fulness of the head, and flushing heat in the face," he says, "I have many times felt all taken away by pressure on one or both carotids; and the feet, which were before cold, by this change of determination, experienced a comfortable glow of heat." Dr. Parry has seen epistaxis moderated, and sleeplessness and excitement removed, by this compression; but he does not, although he makes some valuable remarks on the subject of epilepsy, appear to have employed it in that affection. Dr. Romberg has found compression of the carotids an effectual prophylactic in patients who have forewarnings, and are able to employ it in time. One of his pupils even invented an instrument for the purpose of compressing the carotids, but it failed in its object. The only case besides those mentioned by Romberg that

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* Dr. Fleming has recently again drawn attention to the effect produced by compression of the carotids, British and Foreign Medico-Chirurgical Review, vol. xv. p. 529.

I have been able to discover, in which this proceeding was employed in epilepsy, is one stated by Dr. Prichard to have occurred in Mr. Earle's practice, where a cure was effected by bleeding and purging, but where temporary benefit was obtained in the paroxysms by compressing the carotids. As an arrest of the return of blood from the brain is a manifest concomitant of epilepsy, it is not unreasonable to suppose that this proceeding might often prove useful in epilepsy, by diminishing temporarily the supply; well-trained attendants might be permitted to employ the method at least on one side of the neck; but it would scarcely be right to permit its use to any casual attendant of the invalid. The proceeding certainly deserves an extensive trial, as the postponement of a fit, and every diminution of the severity of a paroxysm, is a gain; and if Dr. Parry's observations are confirmed, it is probable that the cephalalgia and somnolency, which the patients so frequently complain of as distressing symptoms following the attacks, might be entirely prevented. The limited experience which I have had of this procedure does not enable me to speak decidedly either for or against it.

The occurrence of the fits during the night may, if not controlled, be occasionally held in abeyance by the application of cold lotions to the head; and wherever we find the head hot, this indication is still further followed out by clipping the hair quite close. I have

before had occasion to allude to a case which fell under my own observation, in which it appeared that a dose of morphia arrested a most violent series of paroxysms; it might have been a coincidence, but whether or not, it is a fact worthy to be remembered, since, as the patient certainly was not injured, the agent might be applied again under similar circumstances. As a preventive, narcotics and sedatives certainly have failed to exercise any beneficial influence in my hands; and they are less spoken of by writers on epilepsy than probably any other class of remedial agents.

Little as we can do of a positive character during the fits, that little often requires regulation. And especially it is necessary to protest against the vulgar notion that by forcing open the clenched fist, or overcoming any other spasm of the body, by sheer violence, we may shorten the paroxysm. The notion still prevails, and should be combated by medical men.

An interesting question is involved in the treatment of the premonitory symptoms of epilepsy. It has long been held that when the *aura* can be arrested before it reaches the brain, the fit will be prevented. And, whatever may be the theory, or however we may wish to escape the fact, the evidence appears undoubted. We have seen that premonitory symptoms do not always occur, the proportion being about equal of epilepsy with and epilepsy without

premonitory symptoms. It is still less frequent to find the indication of an approaching fit assuming the character of a sensation passing up one of the extremities; it is only in this case that means can be taken to arrest the phantom current. An amusing instance is given by Dr. Lysons* of a farmer's daughter, to whom he was called, and in whom the fits always showed themselves by an aura, proceeding from the feet, in consequence of which he ordered strong ligatures to be applied below each knee. "The method had the desired effect; the epilepsy proceeded no further than the ligature, but the feet shook most violently, and made so ridiculous an appearance, that the girl herself, though in the greatest distress, could not refrain from laughing heartily, and almost at the same instant begging us to let the disease take its course, lest her feet should drop off by the violence of their agitation, which, she said, was intolerable." Strange to say, the repeated use of the ligature in this case was followed by a complete cure. The result confirms the justice of our remarks upon the influence of habit in perpetuating the disease, and the propriety of our seeking for all legitimate means by which the habit may be interrupted. Romberg† quotes a similar and an in-

* Practical Essays upon Intermitting Fevers, &c. By Daniel Lysons, M.D., Physician at Bath. Bath, 1772.

† A Manual of the Nervous Diseases of Man, vol. ii. p. 212. Translated by E. H. Sieveking, M.D.

structive case from Odier, of a soldier "who, after having received a sabre-cut across the left side of his head, often suffered from spasmodic contractions of the little finger of the right hand, which subsequently extended to the fore-arm, shoulder, and neck, and each time ended in an epileptic seizure. After having tried numerous remedies without any result, Odier advised him to bind a cord tightly round the arm at two places, between the elbow and wrist, and between the shoulder and elbow; by following this suggestion the epileptic paroxysms were staved off for three years." Unfortunately, on one occasion, in a fit of drunkenness, the patient paid a severe penalty for his intemperance, for, having forgotten the usual precaution, he died during the attack that followed. The post-mortem showed a severe intracranial lesion. I have only met with one case in my own practice in which I have reason to believe that an arrest of the aura was effected by mechanical means.

Many cases are on record where local treatment of this kind has prevented or cured the disease. The removal of a testicle, the amputation of limbs from which the aura seemed to proceed, has been followed by recovery. In some of the instances recorded there is proof of an irritation having been kept up at the part by disease or injury; in some it is probable that the part was as little the actual source of irritation as the arm in M. Odier's soldier. There is

less difficulty in understanding the *rationale* of trepanning in some cases of epilepsy, in which, by injury to the skull, causing depression, or the formation of an exostosis, a source of local irritation of the brain is established. When we have discovered some means of determining the site of intracranial lesion with more certainty than at present, we may hope to reintroduce trepanning in the treatment of epilepsy, and to employ it more extensively than it is now used. If there is a fair probability of our meeting with the irritant, we may perform the operation, but we always run a risk of searching in vain. However, the Count Philip of Nassau-Weichem will always remain a proof that trepanning is not in itself an operation to be feared. He was not epileptic; but having suffered from symptoms of compression after a fall from his horse, without any indication of the exact spot at which the effusion had taken place, the trephine was applied at random; it was not until the *twenty-seventh* application that the site of injury was discovered. This fortunate Count, who lived in the middle of the seventeenth century, survived many years after the operation, and "could even drink more wine than before without being drunk."

Mr. Travers relates a successful case of trephining in epilepsy, which was performed in a lad in whom a depression of the cranium existed; an amusing one is given by Tissot, in which, however, the operation was not performed *selon les règles de l'art*. A young French-

man who, being affected with epilepsy, went to Italy to be cured, was attacked by robbers, and received, among others, a wound on his forehead, which carried off a large portion of the bone ; the wound was long open, but got well, and at the same time the patient was cured of his disease.

We have imperceptibly encroached upon the domain of the radical treatment of epilepsy, the treatment to be adopted during the free intervals.

The belief in the powers of medicine over this disease has fluctuated much ; and especially do we find the scepticism as to the possibility of controlling the disease to prevail among physicians who have made mental diseases an exclusive study, and have had peculiar opportunities of seeing epilepsy in its most developed form. Esquirol expresses this scepticism in the crassest way when he says of epilepsy : "Je n'ai pu obtenir de guérison." We would observe that a lunatic asylum is generally made the ultimate resort of epileptic patients in whom the usual remedies have been exhausted, and in whom incipient mental fatuity has already indicated organic intracranial lesion. For my own part, I should as little wish to send an epileptic into a lunatic asylum for the purposes of cure as I should consider a hospital for consumption a suitable place for a person labouring under incipient pulmonary phthisis. However high in either case the medical talent which presided over the respective institutions, I cannot but think that the congregation

of similar cases of disease, and the necessarily depressing effect of being able to compare one's own symptoms with those of surrounding patients, must, especially in such diseases as those adverted to, exercise a baneful influence. In both cases, one of the first elements of treatment—the moral point of view—is neglected.

I may premise my further remarks on the treatment of the disease by the observation that I by no means agree with Esquirol. But while I maintain that medicine (and in that term I comprise everything that comes within the domain of the healing art) is capable of effecting much, I am willing to admit that the solitary occurrence of an epileptic seizure indicates a peculiar temperament, a peculiar nervous diathesis, which would always render the individual prone to a return of the complaint. This, however, is scarcely distinctive of epilepsy, but may be regarded as an attribute of almost any derangement in the system. A person who has once had gout rarely escapes a second attack; rheumatism is characterized by the constant recurrence of its symptoms when it has once laid hold upon a victim; sore throats, neuralgiæ, dyspepsiæ, catarrhs of all kinds, are each more liable to recur in the individual in whom they have once made their appearance, than other affections. This is so much the case, that those diseases which ordinarily occur but once in a lifetime are regarded as presenting a type by themselves.

Epilepsy only obeys the general law. A person, therefore, in whom this spasmodic affection, or a tendency to it, has once been manifested, deserves the special watchfulness of his medical friend; and the treatment of other affections by which he may be attacked should be regulated by a consideration of the possibility of a reproduction of the epilepsy. But it does not follow that this proclivity renders a return of the complaint necessary, or that there is any other connexion between an attack occurring after the interval of many years and its predecessor, than that implied by the nervous diathesis spoken of. It would not, I think, be philosophical to regard such recurrence as a proof of the actual persistence of the same morbific agent, the same predisposing or exciting causes which operated on the occurrence of the first attack. One of my cases that I have set down as cures (No. 44) had an epileptic fit seventeen years previously to coming under my care. Would it be just to say that the result of treatment in the first attack was fallacious, and did not deserve the name of a cure? Or was I wrong in regarding the case of R. P. (No. 18) as a cure, in whom fits had occurred in infancy, who became epileptic at sixteen, had had weekly seizures before he came under my care, then lost them for above a year, when he again consulted me on account of their return, but lost them again under the employment of the same remedies? In many instances there is no doubt that the result of

treatment is merely a temporary arrest or postponement of the affection, which has been erroneously regarded as a cure. Though this result may not be all that is desired, it still is better than if, by allowing the disease to take its course unchecked, we hasten the *facilis descensus Averni.*

We all know how difficult of treatment diseases become in which a moral principle is involved. Fear, love, hatred, anxiety, hope deferred, disappointment, grief, have at least as much to do with illness as physical causes; and certainly much more than is opined by those who seek for all their remedies in pharmacopœias and dispensatories alone. The moral element may not be overlooked in the treatment of epilepsy; and while I utterly disapprove and condemn the employment of falsehood and subterfuge in the treatment of disease, I think it impossible that success can be hoped for in the treatment of the disease by any medical man who does not himself believe that medical treatment may effect much. Hope and confidence are essential elements both in the physician and in the patient. How much such a frame of mind affects patients is shown even in Esquirol's account of the experiments made with new remedies at the Salpétrière; for he says that a new mode of treatment invariably suspended the attacks for a fortnight in some, in others for a month, in others again for two, and occasionally even for three months. After this period, the attacks recurred with their former fre-

quency. I so far agree with the French author, that the value of each individual remedy does not appear to have been established by the experiments, but it is impossible not to admit the effect of hope upon the unfortunate sufferers, and the control which this moral influence exercised over the paroxysms. This lesson is one that Esquirol's remarks teach, and that the medical man may easily acquire for himself; but his experiments do not prove the uselessness of all medication, because the promiscuous mode of administration adopted would in itself be a bar to its success. Confidence begets confidence, and if the physician feels it in himself, he will probably beget it in his patient. Unless he does so he is not likely to obtain successful results. This moral element should never be lost sight of in the treatment of disease, but least of all in a disease of the nervous system like epilepsy. There are no manœuvres or tricks to be learned. A thorough knowledge of his art, and a proper reliance on the powers at his command, on the part of the Asklepiad, are the bases upon which the intercourse between patient and physician should rest; the tact of the individual must do the remainder, but for that it would be impossible to lay down specific rules. Suffice it to say that, in a patient who has passed the age of infancy, everything that can be done, consistently with justice and propriety, to raise the *morale*, to strengthen the will, to rouse the moral energies of the patient, comes within the sphere of

the physician. His duty is to treat the patient in all his relations; to have a regard to his moral, his intellectual, his physical nature. Each of these elements is more or less involved in the disease: the physician's tact will consist in determining the relative influence which each exerts; his duty will be to administer his curative agents in such wise as to neglect no one indication. The overwrought intellectual powers will be the main source of the evil in one; the disappointed longings of a yearning heart may deserve special attention in a second; while, in a third, a tænia or a blow on the head may be the points to which our attention is chiefly directed. In a sense different from the one in which it was originally used, the physician who seeks to treat epilepsy may use as a motto the Terentian—

Nil humani a me alienum puto.

Before selecting the mode of treatment to be pursued in an individual case, a most minute and searching inquiry into the patient's antecedents is necessary. Without a full knowledge of the patient's history, the proceedings will necessarily be empirical. We may fail in discovering any basis for rational proceedings, but we certainly cannot avoid sheer empiricism unless we adopt the initiative inquiry suggested. We have seen that a great variety of circumstances may conduce to excite epilepsy: they cannot be surmised. We know of no specific for the

disease, like quina for ague, or arsenic for scaly forms of skin disease; but we do know that spasmodic action is the result of a variety of influences to which the nervous system may be subjected, and that, by avoiding or counteracting those influences, it may be held in subjection.

The hereditary predisposition to cerebral disease, and especially to epilepsy, the presence of scrofula and its compeer phthisis in members of the family, must be inquired into; the evidence of the presence or absence of these affections in the individual in early life or at the time of the consultation, is no less important; and all the various influences or exciting causes to which we have drawn attention in an earlier part of this work must be passed in review and eliminated until we have either determined that a certain "cause" exerts such an influence as to merit being singled out for attack, or until we have exhausted our stock of interrogatories. Not till then are we justified in prescribing one of the innumerable anti-epileptic remedies for which we possess no special indications.

We may paraphrase Lord Palmerston's definition of dirt, and say of spasm that it is force wrongly applied. We have to see that the force is regulated, that it is generated of proper quantity and quality, and that it is not wasted in efforts for which the individual is not suited.

After the general preliminary examination into

the history of the patient, it will be necessary *seriatim* to examine the state of individual organs. The head, its coverings, the evidences of local injury, the temperature of its surface, may first be inquired into. The state of the digestive organs will command special attention, as well as the genito-urinary organs. The vascular and respiratory systems will necessarily be inquired into also. The state of the cutaneous coverings, the distribution of temperature, the complexion, as indicating a plethoric or an anæmic condition, will successively be passed in review, and their condition noted. Not till all this is done should the physician attempt to arrive at a conclusion as to the nature of the case before him.

If I were to formularize the prevailing mode of treatment which I myself adopt, I should say it consisted in local derivation,* or counter-irritation directed against cerebral congestion, and, in general roborants or tonics; the selection of the special mode in which the latter indication has to be carried out necessarily depending upon the results of the inquiries into the condition of the individual organs.

The great prevalence of headache in epilepsy, either as an habitual affection, as a precursor of the attack, or as a sequel, accompanied by other symp-

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* Tissot goes so far as to say: Tout ce qui peut augmenter la quantité du sang ou la déterminer à se porter plus abondamment à la tête, doit occasionner l'épilepsie.

toms indicating a congestion to the head, suggests the propriety of attacking the head, according to the intensity of this symptom, by more or less severe counter-irritants. I have repeatedly earned the thanks of my patients whom I was unable to cure of their epilepsy, by relieving them of the intense cephalalgia of which they complained; but I am also satisfied that in some of our cases the apparent* cure was mainly due to the application of setons.

The following case, though not a typical case of epilepsy, may be quoted in point.

C. D., aged 11, the son of a gardener, five or six years before the consultation (April 30, 1848), had an "abscess in the head," and otorrhœa; since which time he has been subject to occasional fits of unconsciousness, which seize him generally without premonitory symptoms; at times he is previously troubled with giddiness, and if he then lies down the attack will pass off. The unconsciousness lasts from five to ten minutes; and on recovery there is a sense of weakness, which lasts for half an hour. He neither screams, bites his tongue, nor is convulsed. He has frequent headaches and of late occasional sickness, but is otherwise well. The fits recently about once a fortnight, formerly not so frequent. Head occa-

* In speaking of a cure of epilepsy, I always mean an "apparent" cure, fully appreciating the difficulty of determining whether it is radical or not.

sionally hot. No evidence of heart disease, or gastric disturbance. With the exception of a little castor-oil and an alkaline diuretic, the treatment consisted in a seton in the neck, which he wore for nearly six weeks. The attacks did not return; and in 1853, when his brother came under my care for a similar affection, there had been no relapse.

The case (No. 6) of G. C. K. was a similar one to the last, in which, owing to the disappearance of an acne on the back, there seemed to be a special indication for the employment of counter-irritation by ung. antimon. potassio-tartratis. The patient experienced immediate relief repeatedly on the appearance of the pustular eruption; and for this reason a seton was at last applied, and ordered to be worn in the neck, from which he appeared to derive permanent benefit.

When we wish only temporarily to produce a counter-irritant effect, the application of an occasional blister may suffice; it is regarded with less fear by the patient, and if kept open by savine ointment, answers very nearly the same purpose as the issue. But wherever it is important to secure a permanent vicarious discharge, the latter has the advantage of producing a profounder effect upon the economy.

When the symptoms of congestion to the head have been of a temporary character, dry-cupping affords relief, and but rarely is it necessary to have recourse to the scarificator. As far as my personal

experience goes, I should join with those who deprecate the abstraction of blood in epileptic subjects for any other purpose than that of derivation. Still, it is probable that, among the sanguineous patients that a country practitioner is likely to meet with, venæsection may at times be practised with benefit. There is too strong evidence in favour of that proceeding in some, especially British, writers, for whom we cannot but entertain a high respect. Thus Dr. Cooke, among the moderns, advocates venæsection, leeches, and purging as the treatment to be pursued in plethoric cases; and the method appears to have been successful in his hands. From the very opposite statements by different authors on this point, we cannot but conclude that the disease presents a different aspect at different times and localities. This is not merely a charitable way of accounting for doctors' disagreements, but consonant with the experience afforded in daily life of the variations in the forms of disease.

The effect of compressing the carotids may fairly be assumed, so far as regards the brain, to be analogous to depletion; this proceeding can, however, scarcely do more than produce a temporary effect. To render the diminished vascular tension, thus obtained, permanent, it would be necessary to ligature the carotids; and this has actually been done. Compression is not, however, a remedy which is uniformly successful in averting or avoiding the fit.

In a patient who is under our hands while writing these remarks, a fit occurred immediately on the application of pressure to the carotids, which we applied to observe the effect produced upon the headache under which she habitually labours during the intervals of the fits. We learn from Dr. Delasiauve's recent Treatise of Epilepsy* that ligature of the carotids has been employed in several instances with advantage. He refers to a case in which Dr. Preston, in Calcutta, tied the carotid artery, the operation being followed by temporary success. The same author mentions that an epileptic subject having cut his thyroid artery, with a view to suicide, M. Boileau tied the carotid, in consequence of which both the hæmorrhage and the epilepsy were stayed; he also mentions that Velpeau was accidentally called to tie the temporal and facial arteries in an individual subject to daily attacks, who was cured by the operation. Dr. Delasiauve observes that, though these results are seductive, they do not suffice to authorize the performance of so serious an operation.

As a general rule, the treatment of epilepsy may

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* Traité de l'Epilepsie, p. 426. Par le Docteur Delasiauve. Paris, 1854.

In a paper by Dr. Wood, on Ligature of the Common Carotid Artery (New York Journal of Medicine, new series, vol. iii., pp. 9-64; and Mr. Chatto's Surgical Report, British and Foreign Medico-Chirurgical Review, Oct., 1857, p. 543) this operation is stated to have been performed twice in New York for epilepsy; both cases were benefited but not cured.

be commenced with a single brisk purge, in order to make sure of the primæ viæ being properly emptied, and allow full play room for the further treatment. The presence of worms, of hard scybala, is often not suspected by the patient; and their removal is a *sine quâ non* of success. Still it will be better not to follow a mere empirical rule, but to seek for the rational indications of a given agent.

The employment of purgative medicines may be indicated in epilepsy for various purposes. The form in which they are exhibited will necessarily vary accordingly. The chief indications may be summed up under the following four heads:—They are given to secure the normal evacuation of waste matter; to derive from the head; to expel foreign matters or worms lodging in the intestines; or to promote certain physiological secretions. It is consonant with our general view of epilepsy that the purgatives employed during its course should not be of a character to impair the plasticity or diminish the respiratory functions of the blood. Drastic purgatives, purgatives that produce a very lowering and depressing effect, should therefore, as a general rule, be avoided, and those selected that are of a warm aromatic character. To secure the first indication, of simply regulating the bowels, as it is called, it will often suffice to make a temporary alteration in the diet,—even a change in the dinner-hour, and a change of beverage, may secure the object; in many

instances the omission of tea or coffee, and the substitution of milk or cocoa for the morning and evening meal will be desirable on this ground; the habitual exhibition of the mildest purgative medicine keeps up an irritant action in the alvine viscera, which we too often see fraught with the most baneful consequences. The temporary relief afforded by the evacuation covers the pernicious effects of the bad habit, which are demonstrated in the generation of a host of symptoms indicating an enfeebled nervous system. The costiveness of many of our overworked and anæmic patients will be better met by a large dose of quina, or by nux vomica or its alkaloid, than by a *haustus purgans*. In some cases, possibly, even an opiate or a sedative will more readily induce a regular action of the bowels, by overcoming a spastic condition of the intestinal muscular fibre. I would especially enter my protest against mercurials, which can scarcely ever be required on the vague ground of "improving the secretions;" their use ought to be much restricted in the treatment of disease generally, but in epileptic conditions they ought not to be administered without the most definite indications, and should on no account be given so as to "affect the system." Rhubarb, the compound colocynth pill, aloes, castor-oil, taraxacum, sulphur in combination with magnesia or rhubarb, are among the laxatives that are most suited to epileptic subjects. Nor may we omit the mention of water, which is coming into

general use in England, and possesses admirable properties as a laxative. The waters of Pullna, a bitter spring, which is imported from Bohemia, and owes its properties mainly to the sulphate of soda which it contains, in the proportion of about one hundred grains to the pint. It contains not much less of sulphate of magnesia, with smaller quantities of sulphates of potash and lime, carbonates of lime and magnesia, chloride of magnesium, and phosphate of lime, with free carbonic acid. The whole amount of saline constituents is about two hundred grains to the pint. Half an ordinary tumbler of water, taken in the morning, generally suffices to produce a full, pultaceous evacuation. In delicate subjects it is well to give it with equal portions of warm milk.

Among purgatives we must advert specially to turpentine; a remedy which may often be had recourse to, both on account of its primary action upon the intestinal canal and its secondary stimulant effects in disorders of the sexual system. In the variety of epilepsy associated with an hysterical constitution, it is often valuable. Many physicians have employed it, but none appear to have been so successful in their choice of this agent as Dr. Prichard, who details numerous very satisfactory cures of epilepsy by means of turpentine. Dr. Watson also speaks of turpentine in terms of high praise. I have not enjoyed the same measure of success in my use of this drug; a circumstance which I can only

explain by assuming that the constitutions of the patients to whom I administered it differed from those of Dr. Prichard's; in the same way as the venæsections which were beneficial in his hands and in the hands of several of the older physicians of eminence, are repudiated by practitioners of the present day. Nor can I think that we are justified in arrogating to ourselves so much superior tact and knowledge in the treatment of disease generally as to decry all that has been done by our predecessors, though it clashes with many of our views. When we read the careful histories that they have handed down to us, it is often impossible not to be struck with the masterly manner in which they handled their tools. The remark applies forcibly to a disease like epilepsy; the advantages supplied by "physical diagnosis" have afforded us no means of elucidating the affection which was not possessed by the writers alluded to. I cannot hesitate to admit that Prichard, Cooke, and others have found venæsection an important auxiliary, in some cases the sheet anchor, in the treatment of epilepsy, although I have hitherto not met with cases in which I should be disposed to employ it. The prevailing character of the pulse during the free interval in my cases was feeble, indicating anæmia rather than plethora, and demanding an infusion of new, healthy blood, rather than a diminution of the small current taking its sluggish or petulant course through the vessels. The employment

of leeches in small numbers is indicated where we desire to draw away the blood from a part, rather than diminish the general tension of the vascular system; thus in persistent congestive headache their application to the nares or temples; as an adjuvant to the restoration of the catamenia, their employment at the perinæum or hypogastrium, is often valuable.

The prevailing opinion among writers of the present day is that anything like heroic antiphlogistic treatment in epilepsy and epileptiform disease generally ought to be eschewed,—an opinion that I cordially adopt; the drugs pertaining to that category ought to be so used as to restore order where disorder prevailed; to rectify the vitiated secretions where they can be shown to be deranged; to remove local congestions or other accumulations where such means suffice for the purpose. While, then, I do not deny that epilepsy may be the result of too high a pressure, the evidence proves it in the vast majority of instances which we meet with in the present day to be due to a want of steam—of more pressure. Accordingly, the remedies most in repute in the treatment of epilepsy are those which are commonly classed together as tonics; and among these we find especially the mineral tonics to deserve and to hold a high rank. Drawing the circle still narrower, I should be disposed to place the preparations of iron and zinc first, as those which have done me most service. The various salts of iron may be given

according to the different constitutions of our patients; but generally the vegetable salts, the ammonio-citrate, the potassio-tartrate of iron, the ferrum pomatum (a malate) of the Prussian pharmacopœia, with which we may class the lactate, are preferable, on account of the facility with which they are digested. Where there is want of appetite the citrate of iron and quina is a very appropriate form of administering iron. The irritant properties of the sulphate of iron render it generally ill-suited. A very elegant form of administering iron, and one that is particularly well adapted for young children, is under the guise of Allarton's steel-biscuits, which are most palatable, so as to be eagerly taken, even by the infant.

Of zinc I would speak very favourably, though by no means with the confidence of M. Herpin. It appears to me to exercise a distinct influence over the epileptic paroxysm in many cases, which could not be traced to any local irritation, and therefore, according to the common nomenclature, deserved to be called centric. I much prefer the soluble sulphate to the insoluble oxide. The former affords us an instance proving the extreme power of the system in adapting itself to hostile impressions, if we may say so, provided the attack be gradually made. To a person in health, five grains of the sulphate taken at once are liable to prove emetic; but by cautiously increasing the dose, epileptic patients can be brought to take more than

seven times that quantity repeatedly in the day with beneficial results. One of my patients, in whom the dose was gradually augmented to thirty-six grains three times a day, appeared to be completely cured of his paroxysms. I never doubted the fact of his taking the medicine, as he assured me he did, conscientiously; but I satisfied myself by requiring him to swallow a dose in my presence, that thirty grains had no unpleasant effect upon him whatever. The zinc may be given in pills with extract of gentian, or in infusion of valerian, or other combinations indicated by the particular case. The oxide of zinc is a very insoluble substance, and does not seem to possess as energetic properties as its relative the sulphate. It has not in my hands proved equally satisfactory. The valerianate of zinc and the valerianate of iron present combinations of the bases spoken of with valerianic acid, which may be given with advantage. Among tonics we must not forget to mention strychnia, which, in suitable doses, acts as a general roborant, and diminishes that irritability of the nervous system which prevails in persons subject to epileptic seizures. The extract of nux vomica, in half-grain doses three times a day, with extract of gentian, acts in a similar way; and it is worthy of remark that we often observe the sluggish state of the bowels associated with epilepsy rectified by the exhibition of the remedies just spoken of in such a manner as to render the administration of direct purgatives unnecessary.

The preparations of silver which have been praised by some as exerting a beneficial influence upon epilepsy, have not answered my expectations, though I would not agree with Georget in entirely erasing them from the list of agents to be employed; the tonic properties of the nitrate and the oxide are scarcely to be denied, though undoubtedly the irritant properties of the former render greater caution necessary than is required where we administer the latter. In a female who died in the Salpétrière under Georget, and who before admission had taken the nitrate of silver for eight months, the mucous membrane of the stomach was found entirely destroyed at its lower half; the stomach was perforated at four or five points, and nothing but the peritoneal coat remained at several others. Georget says, in reference to this case, that he cannot comprehend how any one can be so blind as to expect to cure cerebral disease by cauterizing the stomach; it is not probable that any one who prescribes the nitrate of silver does it with this intention.

I shall have to speak of other tonics in discussing the regiminal treatment of epilepsy.

It would be useless to attempt to lay down specific rules for the mode of administering the drugs already spoken of, since the general laws of pathology and therapeutics apply equally to the treatment of epilepsy as to any other disease; therefore, as a matter of course, the endless complications which may accom-

pany epilepsy must be borne in mind, and the necessary remedies ordered accordingly. As long as an irritant of any kind resides in the system it would be next to useless to seek to counteract the spasmodic diathesis; the former must be first removed before we can expect successfully to combat the latter. The weak or diseased condition of any organ, though possibly not bearing any immediate relation to the paroxysmal affection, demands the physician's attention previous to, or in conjunction with, the radical treatment to be adopted. To give a detailed account of all the circumstances that might arise here, would render necessary a review of the whole domain of pathology.

Among the causes giving rise to epilepsy metallic poisoning holds a prominent rank; lead in this way frequently becomes a cause of the disease, and among the agents suited for its diminution none is so certain as iodide of potassium; a fact which was first established by M. Melsens,* and has since been confirmed by various observers.† With the elimination of the poison the fits are found to diminish, and may cease altogether, if the intoxication has not operated for

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* British and Foreign Medico-Chirurgical Review, April, 1853.

† Dr. Parkes, British and Foreign Medico-Chirurgical Review, April, 1853; On the Detection of Lead in the Urine in Cases of Lead Poisoning, by E. H. Sieveking, M.D. (Medical Times and Gazette, 1857); and On some of the Modes of Action of Iodide of Potassium, by E. H. Sieveking, M.D. (British Medical Journal, 1857).

too long a period. The operation of iodide of potassium is also found most satisfactory where the seizures are traceable to syphilitic disease of the cranial bones, or at least are connected with secondary and tertiary symptoms. The alterative property of iodine and iodides renders these preparations generally suitable, where we have to deal with a scrofulous constitution, and where it is important to stimulate the lymphatic as well as the secernent system. During the administration of these preparations we must be careful not to set up an irritative condition, which would neutralize the therapeutic action of the medicine; nor must we allow it to operate so long upon the kidneys as to impoverish the system, and to induce, as I have known it to do, azoturia. An analogous remedy to the iodide of potassium is the bromide of the same base, which is also known to possess the power of reducing scrofulous and other tumours, and has been employed with success in some morbid conditions of the uterus. On the occasion of a paper on Epilepsy being read before the Medico-Chirurgical Society,* in 1857, Dr. Locock, the president, observed that, in epilepsy observing a regularity of return connected with menstruation, he had been led to try the bromide of potassium by an observation

* Analysis of Fifty-two Cases of Epilepsy observed by the Author. By E. H. Sieveking, M.D. (Medico-Chirurgical Transactions, 1857.)

made by a German physician that it was capable of producing temporary impotence. Dr. Locock stated that he had administered bromide of potassium accordingly in cases of hysteria in which there was a great deal of sexual excitement attended with various distressing symptoms difficult to manage; he found that from five to ten grains, given three times a day, had the effect of calming the excitement to a very marked degree. He stated that fourteen months previously he had been induced to prescribe the remedy in a case of epilepsy connected with sexual excitement, after all other medicines had failed; that the result had been an entire cessation of the attacks after they had lasted nine years. Dr. Locock added that he had tried the bromide of potassium in fourteen or fifteen similar cases, and that it had only failed in one. I have since prescribed the bromide, but have not as yet obtained any definite results which would justify the expression of an opinion.

The medicines commonly grouped together as anti-spasmodics exert no influence over the epileptic paroxysm, such as ammonia, castoreum, assafœtida, and the like; and where more persistent stimulants are indicated, we may use them as safely if taken from the cellar as if obtained from the chemist's shop.

Opiates and narcotics do not enjoy a high reputation in the treatment of epilepsy, from the fear of their aggravating the tendency to congestion to the

brain, and from the frequency with which epilepsy and epileptiform seizures occur during sleep. I have, in an earlier part of the work, detailed a case in which morphia, administered during a severe paroxysm, appeared curative; and I am of opinion that we should do well to employ narcotics more frequently than we do at the commencement of epilepsy, as we can scarcely doubt that during sleep an irregularity in the action of the nervous system supervenes, such as may be met by soothing agents. We should not for that purpose select opium itself, but morphia and its salts, hyoscyamus, conium, belladonna, hydrocyanic acid, and perhaps in some cases chloroform. I have found the inhalation, frequently repeated, of from ten to twenty minims in a child under a year old subject to epileptic convulsions, of very marked benefit. The child was eventually cured; and although I attribute the result to other therapeutic and hygienic agents, I am of opinion that the chloroform aided in diminishing the frequency and duration of the seizures. Those who regard the arrest of a fit and the postponement of the attacks as a benefit, will be disposed to try any remedy that does not prove to be manifestly injurious, by causing some other lesion, while it diminishes the epilepsy. The necessity of carefully regulating the secretions, and promoting the nutritive processes, must also make us cautious in our employment of narcotic agents; their habitual use could scarcely ever be advisable, but with

proper care they may be administered when a peculiar irritability of the nervous system calls for them.

Among the remedies that have of late years attracted a passing attention we may mention indigo and the cotyledon umbilicus. The former was first prescribed by Professor Ideler, of Berlin, and much lauded by him; it then fell into disuse, because it was thought by physicians employing it that its main effect consisted in colouring the fæces blue. It has recently been again employed by Dr. Rodrigues,* who relates eleven cases in which he employed indigo in various forms, five of which were cured.

Dr. Rodrigues attributes the want of success which has attended those who have followed Ideler's method to the extreme repugnance excited in the patients by the continuance of the large doses of the remedy. He has therefore modified the plan, and advises the exhibition of large doses for a brief period at the commencement of treatment, so as to make an impression upon the system, and then to continue the remedy at a reduced rate for a considerable period. The comparative trials made upon different patients lend support to Dr. Rodrigues' views. The indigo may be given in an electuary, in pills or emulsion, and the dose varies from four to fifteen grammes. The following is Professor Ideler's formula:—

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* Revue Medico-Chirurgicale, Avril, 1855, and British and Foreign Medico-Chirurgical Review, Jan. 1856, p. 250.

℞ Indigo gr. xv.
Pulv. arom. gr. ij.
Syrupi q. s. ut fiat electuarium.

It is one of the many empirical remedies which we are justified in trying if our rational methods fail us. Of cotyledon umbilicus,* which has long been a popular remedy, little can be said. I have prescribed it in numerous cases, and generally the patients have appeared to benefit by taking thirty and more grains of the extract three times a day. In one case a cure seemed due to its use; but although the arrest was but temporary, a similar effect has been again obtained on re-administration.† In the paper quoted below another case will be found in which the use of the cotyledon appeared to be followed by a permanent arrest. Others which are there mentioned yielded more doubtful results. The only physiological effect which appears to result from the use of this remedy is increased diuresis; but even that is not very marked. I still think, as I thought when writing a paper on the subject for the "Medical Times and Gazette," that the cotyledon umbilicus is worthy of some consideration.

To review all the individual drugs that have been used and recommended in the treatment of epilepsy,

* A plant belonging to the natural order Crassulaceæ, and growing wild in Dorset and Devonshire.

† On the Use of Cotyledon Umbilicus in Epilepsy. By E. H. Sieveking, M.D. (Medical Times and Gazette, 1854.)

would answer no good purpose, and our readers can find very complete lists and full descriptions of their properties in the works of Tissot, Fraser, Cooke, Copland, and others.

In fact, there is not a substance in the materia medica, there is scarcely a substance in the world, capable of passing through the gullet of man, that has not at one time or other enjoyed a reputation of being an anti-epileptic. Dr. Fraser,* only so late as 1806, wrote a book to prove that the misletoe, which then was sinking into oblivion, was a sovereign remedy for epilepsy. He says of it, "If I had not tried it, as far as the limited opportunities of an individual would admit, if I had not found it efficacious in epilepsy, even beyond my most sanguine expectations, I would not now presume to offer it as worthy of the most serious attention of the faculty." "My own experience," he subsequently says, "warrants me in declaring that of eleven cases of epilepsy which were treated with viscus quercinus under my direction in 1802, 1803, 1804, nine were radically cured, one was fatal, and one received no benefit." Dr. Fraser employed the remedy in other cases, but was unable to state with what result, because not a

* On Epilepsy and the Use of Viscus Quercinus, or Mistletoe of the Oak, in the Cure of that Disease. By Henry Fraser, M.D. London, 1806. This book is valuable on account of the very complete bibliography it contains bearing on the disease in question.

sufficient time had elapsed to pronounce them radical cures. The eleven cases are given in detail, and are not without interest. The following may serve as a sample : A gentleman, aged twenty-three, had been subject to hereditary epilepsy from his third year ; after previously taking other medicines without effect, he began the powdered misletoe, in two-scruple doses, in a draught twice a day. Its administration was continued from the 5th of March, 1802, to the middle of June in the same year, after which the patient remained entirely free from the malady.

The viscus was ordered to be separated from the oak about Christmas, and when dried to be ground to a fine powder, " which ought to be confined in a bottle, and kept in a situation where both light and air are excluded, as the admission of either tends to deprive this vegetable of its natural efficacy." No less than eighteen different authors are cited by Dr. Fraser as having written specially on the uses of misletoe in epilepsy, or as having recommended it in the disease.

CHAPTER X.

The treatment of epilepsy continued — Moral and hygienic treatment — Scope of hygienic treatment — Pure air — Change of air — Water in cold, sponge, and shower baths — Bay-salt — Friction — The warm bath — Fermented beverages — Proper period for and quality of food — Rest of body and mind — Necessity of early inculcating self-control — The physician must inquire minutely into the domestic relations of the patient — Wholesome mental occupation to be substituted for irregular stimulation — The patient's confidence a necessary element in the treatment — Concluding remarks.

IMPORTANT as the proper selection of remedies undoubtedly is, pharmaceutical preparations will fail to secure a satisfactory result, unless we at the same time devote our earnest attention to the hygienic features of the case. I use the term in its widest sense. Nothing that promotes or interferes with the healthy functions of the whole being should be out of the range of the physician's ken. In a disease like epilepsy, where so many and various influences are found to be at work in the production or maintenance of the disorder, where emotions and mental stimuli operate as powerfully as the purely physical causes, we should justly accuse the physician of short-

sightedness who neglected these features in combating the malady.

The air the patient breathes, the water he drinks, and his ablutions, his daily occupation and habits, his amusements, the state of his sexual functions, his food and beverages, his clothing, his mental and moral history, his prospects in life, should be inquired into, in order to determine whether, or in how far, one of these elements may require modification.

The air our patient breathes exercises a most undoubted influence in promoting, if it be impure, that nervous diathesis, that susceptibility of the nervous system, which accompanies or leads to epilepsy. There is no morbid condition to which man is liable, which, if it be not generated, is not aggravated by foul air. In children this is especially visible; and it falls to the lot of medical men frequently to witness the palpably beneficial changes exerted upon an adolescent suffering from epileptiform attacks by improvement in the air that surrounds him. In young children the removal from one room to another often suffices to make a marked impression upon the system. A crowded bedroom, the exhalations of unclean persons or vessels, should be especially avoided, while the bracing and purer air of a country residence is but too frequently an absolute necessity for the recovery or amelioration of the patient. Repeatedly have I seen patients rendered worse by being brought to London from the country,

with a view, as it is so often done, of obtaining advice when all ordinary remedies have been exhausted. In this case the air doubtless plays an important part; but the excitement of the change, the noise and hurry-skurry of town life must no less be taken into consideration. On the other hand, I have seen individuals much benefited who enjoyed the quiet and care of a well-regulated home in London, and whose change to the country could confer no other benefit than that of purer and fresher air. Where the means permit of a choice of localities, regard must be had to the constitution and fibre of the individual, and the general rules regulating the choice of climate apply as to other diseases. The same remark holds good with regard to British and foreign watering-places. The views we adopt with regard to the phases shown in the pathology of the disease, will guide us in making the selection.

Next in importance to the air in the hygienic treatment of epilepsy or its congeners, is the use of water, as beverage undoubtedly, but still more as a roborant, externally applied. To those who are habituated to the daily use of the shower or sponge bath, it seems almost impossible to exist without them. And yet even with us, proverbially a cleanly people, it is surprising how many go, from the beginning to the end of the year, in utter ignorance of the purifying and invigorating influences of a general bath. The discomfort resulting from the omission of the daily

bath, the feeling of restlessness and almost feverishness which affects us, when from accidental causes it has been passed over, are feeble indications of the derangements of the nervous system which must ensue when the ablutions, for months and years together, are confined to the face and hands. As an hygienic application, then, the daily use of the cold bath on rising is to be ordered, where there are no special grounds that counter-indicate it. I would not undertake the treatment of a case of epilepsy in which its use, advised by myself, were objected to. The period of using it, as well as the temperature, deserve consideration, and still more the length of time during which the patient is to remain in the water. The more feeble the patient the more it will be necessary to elevate the temperature, which should be gradually lowered until he is able to bear it at the temperature of the air. If the feebleness be great, the bath should not be used until after breakfast, and it may even be advisable that this meal be taken before the toilet is arranged, in order that the patient may not have to go through the ordeal of dressing twice over. The invigorating influence of the cold sponge-bath may be much enhanced by the addition of two or three pounds of bay-salt, in which form it is one of the most admirable tonics we possess; it may, however, be well to remember, that to some persons with a delicate skin the bay-salt proves too irritating, and causes prurigo of so severe a character as to render its omission necessary.

The shower-bath is a mode of applying cold water to the surface which should not be used as indiscriminately as it is; the shock is too great in many instances, and the reaction by no means certain to be sufficient.* A certain amount of physical vigour is necessary to

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* The depressing influence which the cold shower-bath exercises upon the circulation in health is very marked. Some years ago I instituted some experiments upon myself with reference to this point, of which the following is a brief summary:—

They were divided into two series; the first consisted of twenty observations, each comprising three examinations of the pulse; it was counted soon after rising; it was again counted after taking a uniform amount of dumb-bell exercise, and again soon after the shower-bath, the precaution recommended by Dr. Graves being observed in each instance to allow about a minute to elapse after the occurrence, the influence of which upon the pulse it was desired to estimate. The averages obtained in this series were—

Pulse on rising.	Pulse after exercise.	Pulse after shower-bath.
69·50	76·90	68·85

The average increase of the pulse, therefore, caused by the exercise was 7·40; the average depression caused by the bath was 8·05.

In the second series of thirty observations the bath was taken immediately after rising, and the exercise followed the bath. The averages here were—

Pulse on rising.	Pulse after shower-bath.	Pulse after exercise.
69·17	63·03	66·24

The average depression caused by the bath was 6·14; which the dumb-bell exercise was not able to remove, the average increase of the pulse caused by it being only 3·21. It follows that the reducing effect of the bath is considerably greater than the exciting effect of the exercise; or, given in numbers, as 6·14 to 3·21.

justify its employment; and it will always be necessary carefully to watch its effects in disease, in order that we may not neutralize our good intentions by the excess of the remedy. The surface reaction which follows the cold bath will always be a safe indication of its appropriateness; if a feeling of comfort and warmth does not ensue, if the patient feels overfatigued instead of refreshed when it is over, he will not be benefited. The reaction should, however, always be promoted by vigorous friction of the whole surface with rough towels; and this should not be left to the patient, if we are not certain that his strength is ample for the purpose. The passive movement induced by friction is in itself tonic and soothing, and should not be omitted even when, for temporary reasons, the bath is counter-indicated. With regard to the temperature of the water, we must remember that the feebler the patient the more we should elevate the temperature of his bath. A bath that may be tonic to one person at 80° would be anything but invigorating and refreshing to a person whose stamina justified its reduction to 70° or 60°. A shower-bath will be tonic at a higher temperature than a sponge-bath, owing to the rapid cooling of the water as it descends, and also to the shock which the fall produces.

The warm-bath can scarcely be regarded as an hygienic measure; its employment depends upon definite indications; and these cannot be determined

by others than the medical man. Its habitual use by a healthy person is enervating; and though it may be occasionally suited to the epileptic patient, it is not adapted for daily employment. The food of the epileptic patient, as a general rule, must be nutritious and copious. Among the lower orders and labouring classes poverty often forces the patient to be content with inadequate and unwholesome diet, and is thus an accessory cause to epilepsy, promoting and fostering the atony of the vascular and nervous system, which in the majority of cases is at the bottom of the whole malady. The employment of wine or beer must depend upon circumstances. Where the tendency to cephalic congestion is marked, it commonly increases the headache and flushing, and is therefore counter-indicated; this is especially the case with regard to taking these beverages shortly before going to bed. Where the patient does not suffer from headache, there is a pale, chilly surface, and other evidences of generally defective innervation, the moderate use of wholesome beer or wine will prove beneficial. As a general rule, tea and coffee had better be exchanged for milk and cocoa for the morning and evening meals. We constantly meet with instances in which the prolonged abstinence from food, accompanied by hard work and more or less mental anxiety, produces the epileptic paroxysm; and where by ordering food at proper intervals the patient is able to go through his

work without inconvenience. I am frequently in the habit of meeting a gentleman who is epileptic, but who, since I have advised a substantial repast in the middle of the day, has had no return of his attacks. Previously he walked a considerable distance to and from his place of business, at which he was occupied from an early morning hour till late in the afternoon. In this case it was not the fatigue, but the inadequacy of the machinery to support the fatigue, which induced the paroxysm.

The quality of the food should be nutritious and digestible, well-cooked meat forming the staple article; all hard, greasy, sour, indigestible articles of food require to be specially prohibited from the dietary of the epileptic. In children, too, the mastication should be watched over, that the stomach is not charged with a "rudis indigestaque moles" of unchewed meat and vegetables.

In many cases we find that no remedial agents or hygienic suggestions will enable our patients to go through their ordinary occupations without a frequent occurrence of paroxysms, until we order them complete rest. Rest of body and mind, as we all know, is one of the most certain restoratives to a healthy state; but nowhere is its beneficial influence more palpable than where disease of an exhausting character has fastened upon the nervous system. Again and again have I had occasion to tell my patients that there was no hope for an alleviation of their

malady until they could abstain from their ordinary occupations; and though mere abstinence from work does not cure epilepsy, I have many times satisfied myself that it may cause a temporary arrest of the fits, which by proper treatment may be converted into a cure.

Under the term rest are to be comprised the avoidance of all undue stimuli to the body, and yet more to the mind, which the conventionalisms of society so frequently entail upon us, and which become disproportionately irritating the more susceptible the individual. The harassing cares of a large family; the attendance upon a sick friend, relative, or superior; visiting crowded assemblies at all times and of all kinds, especially at a time when the patient ought to have given himself up to Morpheus; over-straining the mind in the forcing-house system adopted in many schools;—are a few of the many noxious influences to be sedulously guarded against or removed in the epileptic.

And here I would take the opportunity of again inculcating, as has so often been done, but never can be done sufficiently, the necessity in early education of attending to the preservation of the due balance between the bodily and mental powers. While the processes of physical nutrition are at their height, while new impressions are constantly acting upon the susceptible nervous system, every undue tax upon the mind is laid under a heavy penalty, which physiology or nature will certainly enforce in

some shape or another. The children who promise best, whose organization seems endowed with higher capabilities than the average, are the very children who require most watching; for in them the danger of the body being sacrificed is greatest, and the result will be incapability, at man's age, of executing those duties which may be expected of a vigorous adult. The body is the mind's agent, but if the machinery is creaky it cannot fulfil its legitimate objects. The pupil-teachers of our national schools are a class of children among whom many of these over-wrought brains are found, and are often brought to the hospital on account of cephalic affections, manifestly the result of an attempt to force the mind into maturity without reference to the vigour of the body.

There is often a difficulty in ascertaining with sufficient accuracy the various domestic influences to which a patient is subjected; but it is quite certain that the physician will not be informed if it is not a matter upon which he lays stress, as the majority of patients consider it sufficient to communicate their subjective sensations to the medical man, expecting that for each symptom he has an appropriate remedy. That all medical men do not attribute sufficient importance to hygienic measures is but too patent. As an instance of the variety of injurious influences to which so many of our patients are exposed before or during the time that the epileptic fits are occurring, I quote the following graphic account given by a

patient, in the north of England, who consulted me by letter. I premise that the patient was first seized with epilepsy, no essential symptom of which was wanting to establish the diagnosis, two months after confinement with her first child :—

"That you may judge better as to the cause of my anxiety, and the labour I have gone through, and the excitement necessarily attending, I will state that after my marriage we lived in the country at ——. We had a few acres of garden-land. My husband, being a tanner, worked at his trade, and as I was always of an active turn and wanted to make all I could, I used to work a good deal in the garden, and also attended many markets—Sheffield, Barnsley, and Wakefield; to the three latter I had to travel in the night, with a horse and cart, leaving home about half-past eleven at night; this exposed me much to the night air. This was before I had the fits, and for a few years after, and at the time Mr. —— attended me." Circumstances caused removal from the country to town, where the parties kept a shop; and the writer states that, from her husband 'not being a scholar,' she had all the business matters to attend to. In addition to these necessary claims upon her, she says, "I have read and studied a great deal, and often when I ought to have been in bed . . . . I have also been very fond of singing; before my marriage and long after I used to sing in the choir at chapel; but I have not done so for a long time, except on a few special

occasions. I have often been told this excited me too much, but as I never had a fit immediately after excitement, I never could think it was the cause of them; but I cannot stand any of these things as I once did."

This extract indicates at once the various influences to which, more or less modified, our epileptic patients are commonly subjected, as well as the mode of argument adopted by them, and often, too, by medical men. The fits did not immediately follow upon one of the occurrences or occupations adverted to, therefore there was no causative relation between the two. Excessive bodily fatigue, then, and excessive mental exertion and excitement—and, yet more, a combination of the two—are to be guarded against wherever there is a tendency to spasmodic action, and, *à fortiori*, where the epileptic paroxysm has already occurred, even more than in a healthy individual. The younger the individual, the greater the necessity for these precautions.

It will not, however, suffice to prohibit only: as a good government seeks to supersede the terrors of the law by improving schools and establishing reformatories, and endeavours to substitute premiums for good conduct for the degrading influence of fear, so should the physician facilitate the patient's abandonment of prejudicial habits by suggesting modes of relaxation and occupation for those which he deprives him of. For the morbid stimulus he must substitute

healthy food, whether for mind or for body. And he must not take for granted that, when he prohibits one thing, the patient will necessarily select the thing that is right. Such careful directions are as necessary as it is that an officer who, intending his troops to leave certain quarters, and ordering them not to march by a given route, should command the road that he requires them to take. Were he to issue the former order without the latter, they might be as much and more at a loss than if he had given none at all. Though we wish to obtain rest for our patient, that does not mean sloth either of mind or of body; hence such amusements and such engagements must be sought out as will meet the requirements of the case. Here the medical man will fail without an intimate knowledge of his client's habits and character; but without it he can neither be truly successful, nor will he gain his patient's confidence.

The confidence of the patient is so important an element in the treatment of diseases of the nervous system, that no one can be considered suitable to treat them who does not possess the happy talent of inspiring it. The influence of mental conditions in arresting epilepsy is shown in the fact, pointed to by Esquirol and others, of the temporary benefit obtained in epileptics by the exhibition of any or every new remedy that was believed by the patient to promise a cure. While I willingly admit that the fleeting amelioration obtained was evidence of the

remedy not in itself possessing curative powers—at least, in the way in which it was administered — I would regard the benefit that resulted as an encouragement not to neglect the moral element. As fright has been shown undoubtedly to produce the paroxysm, so, with the other evidence before us, we are justified in believing, that influences that exalt and invigorate the will, can allay the storm. The history of the therapeutics of epilepsy brings down to us lists of remedies so unpleasant—nay, so abhorrent—that it is impossible to conceive that they should ever have been employed, had not a strong conviction on the mind of the patient, that they would benefit him, occasionally realized his hopes. Pliny, for instance, records many such ; he objects to some of the specifics for epilepsy that were recommended in his time; of others he approves, such as eating the testicles of a ram, gall mixed with honey, &c. ; but wherever he mentions a very peculiar remedy he throws the responsibility on the shoulders of the Magi ; thus—"Comitialibus detur et lactis equini potus, lichenque in aceto mulso bibendus. Dantur et carnes caprinæ in rogo hominis tostæ, ut volunt Magi."* And again : "Magis placet draconis cauda in pelle dorcadis alligata cervinis nervis, vel lapilli e ventre pullorum hirundinum sinistro lacerto

* Plinii Secundi Hist. Natur. Tomus tertius, lib. xxviii. cap. xvii. ; and lib. xxx. cap. x. Roterodami, 1668.

annexi." Forestus, as we are told by Dr. Cooke,* administered an arcanum, handed down to him by Guainerus, consisting of human cranium and hoofs of an ass in powder. Tissot, who in this as in everything else connected with epilepsy supplies us with a mine of information, enumerates many substances which were reputed as anti-epileptic remedies. Among the chief of those which he condemns as useless are, earthworms taken on an empty stomach before sunrise in June, or at the moment of coitus; the foot of an elk; of a hare; the afterbirth of a firstborn child; powdered human skull which had not been buried; scrapings of the vertebræ of a man killed by violence; human brain; crow's brain; and the like.

The great objection, as Dr. Cooke wisely remarks, in speaking of employing such and analogous means as those just alluded to, and which manifestly operate only by the influence they produce upon the mind of the patient, is, that we are unable to measure their effect. Their employment may, and often has, produced irreparable mischief; as in the case of a young man related by Tulpius, who took a draught of human blood with great repugnance, and at once became much worse: "Tantum abest," he says graphically, though not in Ciceronian style, "ut terribilis morbus inde imminueretur ut potius plurimum incrementi sumpserit, habueritque multo pejus quam ante Thyesteam hanc mensem."

* A Treatise on Nervous Diseases. By John Cooke, M.D. Vol. ii. London, 1823.

While we should scout all means of acting upon the patient's *morale* which are not consonant with our knowledge of psychology and with high-toned morality, we may not lose sight of mental influences calculated to soothe and invigorate the irritable and feeble, to rouse and stimulate the torpid and indolent. The former class will most frequently come under our notice in connexion with the disease under consideration. We shall not be able effectually to aid them without an intimate knowledge of their domestic relations, habits, and occupations. The persons that surround the patient, the books they read, the studies and pursuits they are engaged in, the amusements they are devoted to, the hobbies they ride, are all subjects which the physician must not consider beneath his attention if he wishes to be anything more than a mere prescriber. It would be impossible to lay down rules of treatment applicable to individual cases. The mode of procedure here, as in a physical point of view, must vary with the individual to be subjected to it. Those who admit and adopt the principles contended for will, with comparative facility, adapt them to each case. But whatever moral *régime* be adopted, it must always be selected and carried out so as to avoid violence to the patient's feelings, and not to impair his confidence in his adviser.

A few words on the points suggested will conclude what I wish to say on the subject. It often happens

that, in domestic circles, a feeling of irritation may be excited and kept up even unintentionally by want of regard to the wishes, or, on the other hand, by extreme consideration for the patient. We all know instances of domestic discomfort and unhappiness where we have no reason to doubt the existence of real mutual affection. In numerous families especially, the delicate child is often subjected to annoyances by the more robust, which can scarcely be obviated or prevented. It is often found that removal into other scenes and associations with different people will cause the child or the adult to exert an amount of self-control that the same person appeared incapable of at home; with the greater self-command, the irritability and susceptibility of the nervous system, will also be toned down, and greater vigour will be substituted. For another child, the removal from school or from associations of a vicious character will be of paramount importance; and with children, as with older persons, the character of the mental stimuli provided in the shape of books and other occupations in the times not devoted to study, to a profession, or a business, merits the consideration of the physician. Frivolous reading, books that exclusively excite the emotions, though in themselves of no immoral tendency—but, above all, books that are calculated to give an improper stimulus to the sexual feelings, from "Lemprière," the bane of schoolboys, to "Don Juan" or "Les Mystères de Paris," the poison

of unripe adolescents—should be sedulously avoided. For similar reasons, the influence of concerts, theatres, and balls, which should no less be prohibited on account of sanitary grounds, is to be inhibited for the young people under consideration. Those abortions of modern civilization, full-dressed children's parties, which are got up for the sake of pandering to the love of display and vanity of parents much more than for the amusement of the children, must also be mentioned as things specially to be avoided where the nervous system shows symptoms of unusual sensibility or weakness.

I should exceed the limits that I have proposed to this inquiry were I to go more into detail. I may sum up the remarks on this subject—a subject that demands on the part of the physician an intimate appreciation of character, and of the relative influences of the psychical and physiological functions—with the caution to examine every case on its own merits, to decide upon the treatment to be adopted according to the conclusions thus arrived at, and to consider no matter which may have a bearing upon the social, or moral, or physiological circumstances of the patient as beneath the dignity of science.

SUMMARY OF CASES OF EPILEPSY OBSERVED BY THE AUTHOR.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
1.	J. T.	F.	17	Single, teacher.	For four years subject to epilepsy at varying intervals; no warnings; sometimes screams and bites her tongue; headache follows fit; memory fails; not menstruated; general health good.	Irregular and defective evolution at puberty; eccentric irritation.	Coxiluvia. dec. aloes co.; ferri citr. with iod. potass.; sulph. zinc.	Has slightly menstruated once; only six weeks under treatment; no positive result.
2.	A. D.	F.	35	Wife of painter.	Subject to epilepsy for five to six years at period of first consultation; six in one week lately; previously less frequent; complete insensibility; foams; bites tongue; choking aura, also slight dimness, precede, but not time to take precautions; freest when not pregnant; catamenia regular; no hereditary predisposition; no headache; occasional brief epileptiform seizures, not amounting to complete paroxysm; great poverty.	Defective nutrition and mental anxiety.	Feb. 8 to March 29, 1853, Cotyled. umbil. 3j. t. d.; returned April 19; fits recurred, but less severe; liq. cotyl. umb. repeated; returned again in Jan. 1854; fresh attack from overwork; Jan. 1856, has again returned.	Feb. 8 to 15, one fit; Feb. 13 to March 6, free, then one fit; free till March 29, then discharged cured; return of fits April 14; the fits now less severe, but more rapid; gradual diminution of fits with c. umb.; from Aug. 21 to Nov. 18, no return of fits, discharged cured; the fits subsequently recurred during pregnancy, towards end of year; no relief from various medicines till after birth.
3.	J. M.	M.	49	Policeman, married.	Twenty-four years previously had a paralytic stroke; recently severe rheumatism; two fits, epileptic, shortly before consultation; aura	Intracranial irritation from rheumatic cause. [This	Counter irritation; calomel; magn. sulph.	Apparent cure; subsequently admitted to hospital for carbuncle; death; post-mortem

					from thumb upwards, with spasm of arm; complete unconsciousness; tongue white; pulse full, 90; urine free; much cephalalgia, constant; duration of fits, twenty minutes.	opinion was proved by the post-mortem to be erroneous.]		showed no cerebral disease, but intensely atrophied kidneys.
4.	J. D.	M.	13	Son of gardener.	For three to four weeks daily fits of unconsciousness, during which he kicks and plunges, preceded by headache; duration, ten to fifteen minutes; tongue clean; pulse small; florid; after fits weak for remainder of day.	Intracranial irritation not organic (congestion).	Blister; Epsom salts.	One fit after blister; permanent cure.
5.	C. D.	M.	11	Brother of last, J. D.	From fifth year subject to frequent fits of unconsciousness; frequent headache; no heart symptoms; does not scream or bite his tongue; the attacks attributed to otorrhœa and an abscess in the head.	Intracranial irritation.	Seton; laxatives.	Wore seton six weeks; cure; no return of fits five years after treatment.
6.	G. C. K.	M.	33	Tailor, married.	For two years subject to fits at short intervals; aura ascending from stomach, followed by brief unconsciousness; great debility; no headache; tongue not bitten; can prevent a fit by powerful mental effort; recently, disappearance of acne on back, to which he is subject.	Intracranial irritation; dyscrasic condition of blood; suppression of eruption.	Ung. antim. tart. intr. scapulas; steel; iod. potass.; seton.	Apparent cure; a marked relation between appearance of ant. tart. pustules and disappearance of symptoms repeatedly shown; for this reason a permanent issue ordered.
7.	T. C.	M.	44	Messenger, widower.	For three weeks dizziness, then a fit; unconsciousness for a quarter of an hour, leaving a temporary paralysis of hands; pain in forehead; bowels costive; motions fetid; constant papular eruption at epigastrium; repeated fits from first appearance to October 7; aura from h nd to head.	Cerebral congestion; lithic acid diathesis.	Calomel; counter-irritation; Cotyl. umbil. for a month (cotyl. acted as diuretic); tying string tight round arm on occurrence of aura.	Apparent cure; no fit from Oct. 7 to Nov. 11, when ceased attending; patient attributed much benefit to cotyl. umb.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
8.	J. M.	M.	27	Hat-maker, single.	Subject to fits since æt. eighteen to nineteen; screams out and becomes unconscious; formerly dimness and pain in right arm preceded; recently no premonitory symptoms; cephalalgia; formerly intemperate and "gay."	Cerebral congestion; hyperæsthesia, from sexual indulgence.	Cupping at nape; ad ℥iv., and alkaline diuretic; zinc sulph. gr. ij., ad gr. v. t. d. for a month; occasional laxatives and steel.	No return of complete paroxysm while under treatment; occasional slight epileptiform attacks; apparent cure.
9.	E. H.	F.	54	Married.	In perfect health till two years ago; then once a week loss of speech and tremors, with pain in head and shoulders; rarely unconscious; for half a year regular fits every month; entire unconsciousness; foams; teeth set; head turned back over shoulder; head often hot; tongue white; pulse 128; loss of hair.	Cerebral congestion; no definite predisposing cause traceable.	Purge; laxative medicine for seven weeks; then tonics and laxatives for a fortnight.	No return of complete paroxysm after commencement of treatment; for nearly a month before discharge scarce a trace of cephalic symptoms; apparent cure.
10.	M. W. (see 38.)	F.	22	Servant, single.	Fits as a baby; subsequently good health, though not robust; a fall on back eight years ago, since which severe headache; treated by a seton, which aggravated it; for nine years subject to fits, first brought on by fright; loss of sight; complete unconsciousness, with a scream; fall; tongue much bitten; constant headache; occasional scorbutic eruption; frequent sense of choking; catamenia regular; no leucorrhœa; no morbus cordis; fits often preceded by pricking in fingers and stiffness of neck.	Permanent intracranial irritation; qy. exostosis? nervous diathesis.	Nitr. arg., steel, sulph. zinci, &c.; dry-cupping gave great relief to headache.	None of the remedies appeared to avail, unless when rest could be obtained, then there were long intermissions; treatment from Nov. 8, 1853, to Feb. 17, 1854.

11.	R. P. D.	M.	17	Schoolboy.	Fits in teething; no trace of hereditary taint; robust, well-built; for three years subject to fits, once or twice monthly; attributed to over-reading; preceded by vertigo and general stiffness; unconsciousness for five minutes; temper bad at period of fits; no masturbation; occasional epistaxis; had not bitten tongue before, but did after commencement of treatment; cephalalgia; excellent appetite; triple phosphates in urine; frequent *petit mal*. [N.B. Three sets of twins in the family.]	Intracranial irritation; no eccentric cause traceable.	Cotyled. umb. liq. ʒij. t. d.; steel, sulph. zinc., quina; laxatives; seton in neck.	Except temporary removal of headache by seton, no benefit was gained; the intellect became feebler, and the debility after the fits was increased; made an in-patient, by which he was benefited.
12.	H. S.	F.	14	Single.	Subject to fits since æt. five, once a week or oftener; subject to headaches; feels ill half an hour before fits; semi-imbecile; right hand contracted in consequence of a venesection for a fit; perfect unconsciousness for two or three hours; livid countenance; bites tongue; no choking or screaming; tongue clean; points to right; pulse 124; fits chiefly in sleep.	No special cause traceable; probably centric irritation with constitutional debility.	Purge; quina, extr. gentian; vesic. nuchæ.	Only under treatment one month; no benefit, except relief to headache by blister.
13.	H. M.	M.	30	Porter, single.	Subject to fits from childhood; never had a blow on head; fits preceded by a sense of head going round; father paralytic; brother has fits; frequent choreic movements of left arm; fits once or twice a month; tongue clean and straight; no albumen in urine; costive.	Hereditary taint; intracranial irritation.	Extr. cotyl. umbil.; Epsom salts.	Only under treatment one month; no benefit.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
14.	J. J.	M.	15	Messenger.	Occasional headache, but never had fits previously; a sister died in a fit, aged eleven; father of decline; is delicate; intelligent; for fourteen days, vertigo; ten days ago fell down suddenly insensible, making a funny noise; felt stupid after; did not bite tongue; repeated headache after attack; urine normal.	Hereditary weakness; nervous diathesis; anæmia.	Vesic. nuchæ; cold sponging; nitre, followed by ferri et quin. citr.	Apparent cure; no return of fits in a month; general health improved.
15.	W. L.	M.	15	——	Scrofulous; no disease till occurrence of fits, fifteen to eighteen months ago; enuresis before fits; screams; unconsciousness sometimes for two hours; headache after fits; has several daily; does not bite tongue; no aura; no masturbation; tongue clean; bowels open.	No local affection traced; qy. hyperæsthesia in a scrofulous diathesis?	Cotyledon umbilicus; rhubarb and magn.	Marked benefit; only one fit during the three weeks of treatment.
16.	G. W.	M.	29	Slater.	Subject to fits since æt. fourteen, at intervals of six to eight months; no warning; does not bite tongue or scream; foams; entire unconsciousness; severe fit the day before attending; face has remained purple since; head large; eyes project; dull expression; drowsy after fit; cataract on right eye; albugo on left (p. 56).	Tubercle in brain, with temporary congestion.	Empl. vesic. nuch.; mist. magn. sulph.	The purging afforded relief; no radical cure attempted.
17.	S. L.	F.	38	Widow.	Subject to fits from childhood; less frequent since marriage and childbirth; two years ago a fit lasting five hours; since, often sense of approaching fits of suffocation and	Intracranial irritation, probably organic.	Blisters; laxatives; iodid. potass.; steel.	Headache relieved; general health improved. Under treatment about four months.

					tremor; no actual epileptic seizure since; constant cephalalgia and weight at vertex for two weeks; had a fit while under treatment; complete unconsciousness, leaving a numbness of the hand (left).			
18.	R. P.	M.	17	Clerk, single.	Fits during dentition; subject to headache all his life; no fit again till aged sixteen; another four months later; since then frequently weekly; scrofulous appearance; an uncle had fits; screams before fits; unconsciousness about an hour; has bitten tongue twice; headache urgent before fits; momentary warning; no albumen or sugar in urine.	Intracranial irritation; hyperæsthesia.	April 21 to May 9, magn. sulph. and cotyl. umbil.; May 9 to July 25, sulph. zinci, gr. ij. up to gr. x. t. d. in infus. calumb.	Apparent cure; felt perfectly well when discharged. April 21 to May 9, two fits, less strong than previously; May 12 to July 25, no fits.
19.	J. J.	M.	8	Son of a labourer.	Delicate; had a fit, æt. six; one seven months ago; two four days ago; loss of senses; clenched hands; foamed; mouth drawn to left; frequent headache and vertigo; no albumen or sugar in the urine; recently, pain under the heart; no morbid sounds; dulness increased, and dyspnœa; increased by pressure on heart; head hot; sounds of heart feeble at first; dulness disappeared under treatment.	Eccentric; error in diet? pericardial effusion an accidental complication?	Calomel. nitr.; digitalis and squills; tinc. ferri mur.	Apparent cure.
20.	E. J.	F.	15	Daughter of a laundress.	Scrofulous habit; subject to violent occipital headache; no fits in infancy; first fit four years ago; at first monthly; recently once or twice a week; generally in morning; no premonitory symptoms; screams and falls in complete unconsciousness; violent struggles; scar on one	Organic intracranial lesion.	Blisters dressed with ung. sabin. to nape; mist. magn. sulph.; mist. ferri; decoct. aloes, co.; commenced sulph. zinc.	Relief; under treatment for five weeks; during which only two paroxysms; *petit mal* frequently.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
					side of tongue; intellect failing; left arm and leg most convulsed; no lesion of head traceable; once slightly menstruated.			
21.	J. B.	M.	18	Porter, single.	Average height; good-natured expression; had a fit at five, leaving a contraction of left hand; no return of fits till six to eight years ago; then weekly several; lately one in three or four weeks; no headaches except after fits; dimness precedes entire loss of consciousness; foams and chokes; no screams; does not bite tongue; cut his head in last fit; tongue whitish, points to left; no albumen or sugar in urine; supervention of severe cough (pleuritis and tubercle) prevented attendance.	Centric; tubercle in right hemisphere? temporary congestion and exacerbation.	Nitr. arg.; cotyl. umbil.	Fits more frequently under nitr. arg. reduced with cotyled. umb. (interval of six weeks); felt better while taking cotyl. u. than with other medicines.
22.	B.	M.	16	Son of clergyman.	Recent attack of scarlet fever, followed by some œdema, but no albuminuria; sudden epileptic seizure, continuing with slight intermission all day; convulsions; complete unconsciousness; foaming; left side chiefly affected; pupils dilated; heart much excited; head not hot; attack preceded by a short cough (vagus); had headache. [N.B. Father formerly subject to epilepsy.]	Eccentric; probably an error in diet (veal, ham, and porter the previous dinner) in nervous diathesis.	Blister to nape, and morphia.	Went to sleep after taking $\frac{3}{4}$ gr. of morphia; complete recovery; no return of fit within above eleven months.
23.	W. C.	M.	24	Smith, single.	Inflammation of brain as a child; slightly deaf since; delicate since seventh year; subject to headache;	Eccentric? albuminuria; uræmia.	Gallic acid; tinc. ferri muriat.; inf. casc. cum	Death; kidneys atrophied, encysted, disorganized; very re-

					tall and well-built; in the month before consulting, had fits; long insensibility; foaming; swelling at throat; no morbid sounds of heart; for several months œdema of feet and abdomen; palpitation; diuresis; urine highly albuminous; no casts, but peculiar corpuscles; attributed to cold and having had tapeworm; repeated fits up to death, in six weeks; immediately before death, pericarditis.		acid. nitr.; occasional purge.	cent lymph on heart; much venous blood in cranium and brain; Medulla oblongata hard.
24.	F. T.	F.	16	Single.	In good health to eighth year; no scrofula in infancy; often stumbled; at eight, a short fit in bed; became black in the face and struggled; six months after, another fit; complete unconsciousness six hours; violent agitation; swelled neck; livid hue; vomiting; intellect impaired after each fit; had six at intervals of six months; then ceased, and thyroid swelled, and constant headaches; worse for three months; neck measured fifteen inches over thyroid; headache chiefly at right side; slight squint on left eye; scrofulous; heavy appearance; articulates well; catamenia regular.	Intracranial irritation; centric; qy. tubercle?	Seton in neck; iod. potass.; and gentian.	Headache cured; not a radical cure; was very partial to seton.
24*a*.	J. S.	F.	1½	——	Subject to fits since six months old, from cutting upper incisors; at first, five to six daily; now one a-week; much convulsion; sickness before fits; carpopedal contraction; livid face in fits; anterior fontanelle open; only twelve teeth cut; no	Eccentric; dentition?	Hydr. cum creta; iod. potass.; hirudines; acet. potass.; balnea calida vespere, b. frigida mane.	March 11 to end of April, gradual improvement; when she had a severe fall on her head; after that the fits returned, and though she appeared

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
					albumen in urine; thirst; urine high coloured; motions watery; offensive for eight months; intercurrent bronchitis; severe fall at end of second month of treatment.			to improve again, the fits had only ceased a fortnight when she ceased attending.
25.	D. C.	F.	17	Servant.	First fit, æt. seven, after swallowing core of apple; second, æt. fourteen (always delicate); subsequently every fortnight; for three to four months before treatment, weekly; catamenia irregular and scanty; duration of fits ten to fifteen minutes; perfect unconsciousness; flushing of head and neck, limited by a horizontal line across neck; head and body twist to right side; right side of tongue frequently bitten; fits day and night; sleeps after fit; no aura; bowels costive; good appetite; pulse calm; tongue slightly furred; great restlessness during sleep; no albumen or sugar in urine; choking in throat during fit; pupils large during fit; involuntary micturition during fit.	Irregular innervation, from defective hæmatosis; defective menstruation.	July 1 to July 15, amorphous phosph. gr. x., t. d.; pil. aloes co. camphor.; July 15 to July 29, oxid. zinc. gradually increased from gr. iiss. to gr. v. t. d. in inf. valer.; July 29 to Oct. 7, sulph. zinc. in inf. valer. gr. iv. to gr. xij., with pil. aloes co.; cold sponging throughout.	No improvement.
26.	A. P.	M.	9	Child of ostler.	Robust and ruddy; always good health till æt. five; had four fits at intervals of two to three weeks; unconsciousness; left extremities paralysed; mouth drawn to left side; four months ago a slight fit, and three since, not followed by pa-	Cephalic irritation; qy. capillary apoplexy in right hemisphere?	Cold sponging; extr. cotyled. umbil. (Jan. 1, 1856) gr. xxv. t. d.	Only seen Jan. 1 and 8; no return of fits during the time.

					ralysis; last fit preceded by "lightness of head, followed by oppression;" no aura previously; veget. functions normal; pulse 100; no morbus cordis.			
27.	L. H.	F.	26	Dressmaker.	Scarlet fever, æt. eleven, followed by a squint of right eye; operated æt. sixteen; the operation followed a week later by a fit; fits since every month; during last year every three months only; no relation to catamenia, which are normal; face and neck suffused during fits; no headache; frequent vertigo; urine not examined.	Not sufficient data for diagnosis.	Sulph. zinc. gr. ij.; inf. valerian, ℥ss t. d.	Only seen once.
28.	B. C.	M.	20	Gardener, single.	Never seriously ill till occurrence of fits two years ago; no aura at first; lately has had a sense of strangeness before fits; slight headache after fits; duration generally two to four minutes; bites tongue; good appetite; pulse 60; masturbation before fits came on; no albumen or sugar; urine scanty, sp. gr. 1012; fits once a month; the last before attending three weeks previously.	Debility; irregular innervation.	Feb. 6 to April 10, 1855, extr. cotyled. ℥ss. to ℥j. t. d. (four fits); April 10 to March 14, sulph. zinc. gr. ij. to gr. xxxvj., gradually raised, in pills, with extr. gent. or in infusion of valerian; no inconvenience from medicine.	Gradual diminution in number and strength of fits after commencing zinc. sulph.; no fit after Oct. 30, when the zinc was raised to gr. xxij.; cure.
29.	E. O.	F.	1½	Child of labourer.	Well formed; æt. five weeks stunned by a fall; first fit æt. fourteen months; second four days ago; otorrhœa at left, formerly at right ear; congestion of face in fits; unconsciousness ten minutes; convulsive movements of limbs; fits begin	Debility; dyspepsia.	Ol. morrhuæ ℥j. t. d.; weaning; milk diet; p. rhei et magn.	No return of fits from April 11 to July 11.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
					with movements of head; sickness after fits; bowels relaxed; fontanelle nearly closed; fed on arrow-root and mother's milk.			
30	C. B.	M.	32	Tailor, married.	Syphilitic six years ago; fits once a month for one year; out of health for five or six years; in perfect health previously, though he had one fit æt. fifteen; none before; no aura; bites tongue; duration quarter of an hour; no headaches; dull after fits; no trace of syphilis; good appetite; pulse 64; last fit attributed to unwholesome diet; otherwise assigns no cause.	Debility; deficient innervation from syphilitic poison?	Aug. 3 to Nov. 13, iod. potass., liq. hydr. bichl., etc.; Dec. 28, sulph. zinc. gr. ij. in inf. valer., increased; Jan. 25, ox. zinc. to Feb. 29 (gr. iv.).	Decided improvement according to his own and wife's statement; fits continued, however; ceased attending of his own accord.
31.	W. C.	M.	3	Son of fishmonger.	Nine months ago had three fits; attributed to "stomach;" o. p. under me; in good health since; looks well; five days ago had a fit, preceded by a pain at stomach, and sickness; eyes fixed, wide open; foamed; perfect unconsciousness for an hour; face blue; pupils not large at visit; assigned cause, costiveness.	Abdominal irritation.	Purge; vin. ferri ʒj. t. d.	No return of fits from Feb. 1 to April 22; cure.
32.	G. S.	M.	27	Shoemaker.	Never had fits as a child; looks healthy; not subject to headache; eight or nine years ago had a blow on his head, three weeks before first fit; fits generally at intervals of eight weeks since; no aura; total	Intracranial irritation; qy. exostosis?	Iodid. potass. gr. ij. t. d., July 15 to Aug. 5.	Slight fit August 5; ceased attending.

					unconsciousness for ten minutes; screams, but does not bite his tongue; feels stupid after the fit; neck swells in fits.			
	33.	S. T.	F.	13	Daughter of plasterer.	Pains in head at right occiput for two weeks; drowsy; fit night before attending; unconsciousness for three or four hours; never had fits before, but has once or twice complained of head; memory fails; pulse feeble, 100; no cause assigned.	Chronic meningitis.	Empl. vesicat. loco dol.; iod. et carb. potass.; pulv. hydr. cum cret. rheo.	Treatment from July 15 to July 22; last report, less headache, not drowsy by day, sleeps quietly at night, appetite good, no fit.
	34.	E. W.	F.	28	Wife of footman.	Rheumatism six months ago, followed by bilious attacks; fits five months before last confinement, two years and a half ago; unconsciousness Jan. 26, with loss of power of left side; fit lasted half to three quarters of an hour; aura, in shape of loss of power of left hand, twenty minutes before fit; much cephalalgia and drowsiness.	Debility and cephalic irritation.	Empl. vesic. nuchæ, liq. opii sedat., followed by quina and bark.	Jan. 27 to July 18 no return of fits.
	35.	M. K.	F.	39	Needle-woman, widow.	Seven years ago had fits, owing to great anxiety; ceased for a long time; return during last six months; severe; complete unconsciousness; bites her tongue; the last a week ago; severe and constant headache for four months; pulse full, 68; tongue clean; no appetite; bowels relaxed; repeated hæmatemesis; urine contains no albumen or sugar; gradual loss of memory; the hæmatemesis returned, and one fit while under treatment.	Debility; intracranial irritation.	Hydrocyanic and tannic acids; leeches to nostrils.	Under treatment from July 17 to Sept. 18, during which one fit; head not relieved.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
36.	J. A.	M.	23	Coalporter.	Large; robust; a fit three years three months and two days before attending; rigors precede; severe occipital headache follows; insensible for one hour and a half; has not bitten tongue; tongue clean, points to left; no causes assigned; is temperate; no sugar or albumen in urine.	Intracranial irritation.	Purges, blisters, strychnia, mist. ferri (treatment for intercurrent gonorrhœa and pneumonia).	April 27 to May 16, gradual improvement; fit on May 16; no return up to July 27; cure?
37.	A. W.	F.	15	Daughter of a cattle dealer.	A fit a year ago, attributed to approach of catamenia; otherwise always healthy; catamenia appeared six months ago, regular; fits begin with head turning to right shoulder, followed by sudden unconsciousness; three fits during last week before attending; her mother subject to fits at intervals of five years; no sugar in urine; some albumen; contains renal epithelium and pus (July 17); subsequently no albumen till Aug. 31.	Disordered innervation; no local cause demonstrated; qy. the renal affection?	Nux vomica, purges, gallic acid, inf. valer. cum sulph. zinc. gr. j. to gr. v. (July 27 to Oct. 2).	Under treatment from May 11 to Oct. 2; fits diminished in frequency.
38.	M. W. (See 10.)	F.	24	Dressmaker, single.	(For previous history, see No. 10). Return of fits after a free interval of seven months; fell down in Shoreditch; complete insensibility; has had four fits lately; choking before the fits; urine gravelly; dysuria; much cephalalgia; pain in left side and hypogastrium; pulse 96; tongue clean and red;	In former paper: "Permanent intracranial irritation; qy. exostosis; nervous diathesis?"	Antacids, tonics, and laxatives.	This time under treatment from Feb. 22 to April 27, 1855, during which had one incomplete fit; no material alteration in general health.

					assigned cause, overfatigue (bodily); scanty menstruation.			
39.	H. S.	F.	34	Nurse, single.	Never had fits or other illness till present attack, though for three or four years has occasionally felt giddy; parents healthy; ten days ago fell down suddenly; struck her face and breast, and bit her tongue; a slight attack three days later; very sick after first attack; attributed to anxiety with children; catamenia regular; leucorrhœa; subject to sick headaches; robust appearance.	Hyperæsthesia; cephalic congestion.	Mercurial pill; mist. rhei et magnesiæ.	First seen May 8; report on May 11, "Much better, no headache or vertigo, going into country."
40.	J. G.	F.	42	Wife of tailor.	Similar attack five years previously; much vertigo and sickness, but no actual fits; for six months constant vertigo; it rushes over her head, and she falls down momentarily; during past month has fallen down twice a week; unconsciousness scarcely lasts a minute; does not scream or bite her tongue; catamenia somewhat irregular; no sugar or albumen in urine; much pain in head, chiefly occiput; heat and heaviness in forehead.	Intracranial irritation.	Nitr. argent. gr. ss. ad gr. j.; vesicat. nuch.; valer. zinci.	General improvement; from Jan. 30 to April 27, eight fits in the three months; "Quite lost pressure at top of head, pain at occiput better, less vertigo."
41.	S. P.	F.	50	Wife of butler.	Broke her leg a year ago; had fits two months before, and two since; unconsciousness, followed by headache; headache severe, chiefly at right of forehead; frequent vertigo; failing memory; tongue clean, straight, not bitten; pulse 160, feeble; fits last ten to fifteen minutes; face as "black	Intracranial irritation; qy. hæmorrhage?	Cetaceum nuch.; iod. potass.; D. cinchon.	Under treatment (Nov. 21 to Dec. 1) she became more obtuse; the tongue became furred and pointed to left; recommended for admission into hospital.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
					as a coal" in fits; assigned cause, fright; right pupil larger than the left.			
42.	W. F.	M.	34	Marble-polisher, married.	Subject to fits for fourteen years since in London; intermission for four years, attributed to leaving off beer, till the last month, during which he has had three; knows the fits are coming by "a shaking and curiousness" in head; has time to sit down; fit begins with a scream; perfect unconsciousness; bites his tongue; headache and stupor after fits; tongue whitish; poor appetite; pulse 56; never had a blow on the head; no albumen or sugar in urine.	Intracranial irritation.	Empl. vesicat. nuchæ; argent. nitr. gr. ss. to gr. jss.; argent. oxid.	Nov. 1 to Dec. 12, "Head much better; feels better after fits than previous to treatment;" fits appeared to be more frequent, but not so severe.
43.	C. W.	M.	46	Coachman.	Six years ago hurt his head by a fall from a horse; was insensible; subject to fits for four years; generally has had two or three every week; rarely a week without fits; much cephalalgia; sight impaired; tongue not bitten; face "black" in fits; memory fails; great difficulty in remembering occurrences of previous day; has a whirl or lightness in head before fit; has been blistered and physicked; no albumen or sugar in urine; pain in head not worse on side struck than other.	Qy. exostosis from fall?	Cetaceum nuch.; cotyl. umb.; iod. potass.; abstinence.	Dec. 1, 1854, to Feb. 2, 1855, slight improvement; pain in head diminished; was admitted into hospital, during which much better; subsequently return of fits, which continue till now, Nov. 1856; finds relief in regular purgation; no other remedies have produced material benefit.

44.	S. T.	F.	47	Wife of carpenter.	Under treatment for dyspepsia, &c., from which she had suffered two months; she was recovering from this when she was suddenly seized with epilepsy, without known cause; loss of consciousness; "black" in face, leaving tremors and great debility; when æt. twenty-seven had similar attacks for a year; no albumen or sugar in urine.	Eccentric irritation; qy. abdominal?	Tonics and nitr. arg.	Dec. 5 to May 14, treated with mist. quinæ and steel, nitr. arg., and extr. gentian; discharged cured.
45.	T. J.	M.	49	Painter.	Colica pictonum ten years ago; otherwise no illness till sudden fits last night at 7 and 12 p.m.; complete unconsciousness; has had no work for two months, but slight blue line round all teeth; not subject to vertigo or headache; no hereditary predisposition.	Intoxicatio saturnina.	Iod. potass.	Treatment, Feb. 6 to Feb. 27, no return of fits; last report, "Continues to improve, more steady in hands."
46.	E. G.	F.	49	Daughter of labourer.	Florid; well-built; subject to fits for two years; feels a heavy weight on her before fits; unconsciousness for about an hour; fits once a week; violent spasmodic action of whole body during fits; bites tongue; no hereditary predisposition; fits chiefly at night; occasional frontal headache; no trace of superficial injury to head; fits lately more frequent and stronger.	No special cause traceable.	Cotyl. umb.	Treatment only for three weeks; no effect proved.
47.	S. F.	M.	11	Son of dairyman.	Scrofulous appearance; good health till occurrence of "bad fever," æt. three; fits for ten weeks after fever; return of fits two months ago, during sleep, with choking noise; bit tongue; a fit four days ago; no special cause traceable; no worms;	Malnutrition; hereditary influence.	Ol. jecoris aselli.	Jan. 16 to Feb. 23, no return of fits; strength improved.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
					father's family subject to fits; recent sudden poverty; slight bronchitis, right side.			
48.	A. W.	F.	2	Daughter of porter.	Had a fit the second night after birth, and a slight one æt. six months; subject to fits for four months; for nine months has had discharge at ears, with occasional hæmorrhage; constant cough; last fit lasted one hour and three quarters; complete unconsciousness; much struggling and foaming; blue in face; bowels relaxed.	Scrophulosis; qy. intracranial irritation?	Ol. jecoris aselli.	April 24 to May 8 no fits.
49.	W. W.	M.	34	Bricklayer, married.	Twelve years ago had a fit; after marriage, seven years ago, had a second; three years ago left side of face much drawn, in consequence of a cold; very temperate; never had any "bothers;" more fits since Christmas, and loss of memory all last summer; very drowsy; no pain anywhere; sometimes loses his speech.	Intracranial irritation.	Iod. potass. with steel and quassia.	Treatment from May 4 to May 25, 1855; no further report.
50.	M. A. A.	F.	10	Daughter of gardener.	Violent cough and retching three years ago, followed by fits; scrofulous appearance; no worms; less intelligent than formerly; no fits in teething; bowels very obstinate; articulation much affected; fits at	Intracranial irritation; qy. tubercle?	Zinc. s. ad gr. viij.; iod. potass. et syr. ferri iod.; counter-irritation; nitr. argent.; purges.	Treatment from Sept. 12, 1854 to May 15, 1855, with progressive increase of symptoms.

					fall and change of moon for three years, increasing in violence; left hand and leg paralysed for three days after fits; dribbles after fits; entire insensibility, groaning, and struggling in fits; froths at mouth, but does not bite her tongue; does not often sleep after fits; pulse small and feeble; head and cheek often swelled after fits; no albumen or sugar in urine.			
51.	W. W.	M.	19	Labourer, single.	Two years before fits was struck on head with half a brick; fits since twelve years old; was a healthy child; no hereditary taint; well built; florid; one fit weekly; for two years past they have occurred at night; no pain in head, except after fits; no aura; does not bite tongue; violent convulsions and frothing for three minutes, then sleeps for an hour; during first four years had the fits by day; fell down like a stone; diuresis; pulse 100, feeble; tongue white; no albumen or sugar in urine.	Intracranial irritation.	Zinc. oxid. ad gr. viij. t. d.; then zinc. sulph. Mar. 27 to Apr. 24, gr. ij. ad gr. xv. in inf. valer. et d. cinch. t. d.; then cupri ammonio-sulph. ad gr. j. t. d.; then indigo sulph. ad gr. x. t. d.; then arg. oxid., July 3 to Aug. 7, ad gr. j. t. d.; vesicat. nuch., fontanella brach. sinist.	The head appeared to be relieved by counter-irritation, but no effect was produced upon the epilepsy; treatment from Jan. 6 to Aug. 7, 1855.
52.	R. P.	M.	18	Clerk.	(For previous history, see No. 18.) Return of fits lately, the last at 9.45 p.m., six days ago, while asleep; woke immediately before fit.	Intracranial irritation; hyperæsthesia.	April 10 to April 27, valer. zinci ad gr. iv. t. d.; one fit April 11 to April 27; June 8, sulph. zinc. ad gr. viiss. t. d.; no return of fits.	Apparent cure.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
53.	J. G.	M.	3	Son of lath-render.	Mother subject to vertigo from childhood, father to headaches; child subject to fits from four months old; losing use of left extremities; nursed by mother to fifteen months old; cannot talk; fits preceded by a cry sometimes; face and left extremities blue in and after fit; head turned to left side in fits; pupils large; all teeth cut; the child is well made; there is a marked irregularity of bone, like an indentation on right parietal, near sagittal suture; throat swells much before fits. [N.B. Great poverty.]	Intracranial irritation.	Treatment continued for one year and eight months without any satisfactory result; iod. ferri, counter-irritation, tonics, ol. jecoris, cotyled. umb., sedatives.	No permanent benefit.
54.	J. L. [First consult. Dec. 30, 1856.]	M.	14	——	Had no fits as a child; with the exception of measles, small-pox, and hooping-cough, has always enjoyed good health; two years ago, while engaged in paper-staining, he was first seized with fits; they occurred suddenly, and without premonitory symptoms; altogether he has had seven fits; they occur at different times of the day; lately they have been more frequent, and he has been more convulsed; he bites his tongue and lips; had a fit two days before Christmas, and on Christmas morning; does not scream, but moans; after fits sleepy	Cerebral congestion.	Dec. 30, hydr. chlor. gr. viij.; pulv. jalapæ gr. viij. statim; t. ferri mur.; eth. chlor. āā ʒiij.; a. piment. ad ℥vj.; ʒij. t. d. ex aqua; the mixtures taken till Feb. 3.	He improved in appearance and strength; had no return of the fits, and was therefore discharged cured Feb. 3.

					and giddy; no headache, but at times a drumming in the head; tongue clean; good appetite; has enough food; good pulse, 68; circumference above ears and over occipital protuberance, 21¼ inches; no worms seen, but suspected; no sugar or albumen in urine.			
	55.	B. R. [First consult. Dec. 30, 1856.]	F.	14	——	Had no illness before fits; twelve months ago had a blow on top of head with a stone; was senseless; a scar visible, but no pain there; no hereditary taint; subject to epilepsy since last March; the first occurred the week after burial of mother, another after two months; since then one every week, or once in three weeks; this week and last week two; is "spiteful and low-spirited" for a day before fits, but has no aura immediately before; no headache, except after fit; fits generally in the morning, before waking up; intelligent; head often hot; 21¼ inches circumference above ears; bites tongue; screams in fits; convulsions the same on both sides; perfect unconsciousness; large appetite; worms.	Eccentric irritation; ascarides.	Purge, followed by t. ferri mur.	No fit returned within a month; passed ascarides after first purge, none after second; cured.
T	56.	E. B. [First consult. Feb. 24, 1857.]	F.	18	——	Always enjoyed good health; thinks she had convulsions as a baby; no hereditary taint; tall, well-built, sallow; had the first fit on Jan. 2; two since then; the last, eight days ago; no premonitory symptoms; catamenia regular; no leucorrhœa;	Eccentric irritation? ascarides?	Feb. 24, sulph. zinc. gr. ij., inf. zinc. ℥ss. t. d.; hydr. chlor. gr. v., p. jalapæ gr. x., statim; Feb. 27, rep. mist.,	Only seen twice; no fit from Feb. 24 to 27.

No.	Name.	Sex.	Age.	Condition.	History.	Probable cause.	Prominent treatment.	Result.
					perfect unconsciousness during fit; bites her tongue each time; pain in head, and ill all over after fit for a whole day; the fits occur in morning after rising, about 8 a.m.; pulse 100, small; no spinal tenderness; no morbid sounds of heart; tongue slightly furred; had worms as a child, but not now; no trace of albumen or sugar in urine, sp. gr. 1027, acid, clear, dark yellow; after fits often feels numbed in all extremities for an hour; frequent cramps in hand (copious ascarides passed after first powder).		add. sulph. zinc. gr. ij., mist. albæ ʒij. cret. macer.	
57.	S. T. [First consult. Jan. 25, 1856.]	F.	32	Servant.	In perfect health till a year ago; she had a nervous affection, for which her head was shaved and blistered; since then subject to fits; has had about twelve; no premonitory symptoms; "comes over in a heat" two or three minutes before fit; does not scream; complete unconsciousness; foams; has not bitten tongue; headache sometimes before, generally after fits; sometimes sleeps after fit; catamenia regular, but scanty; fits chiefly before or after catamenia; tongue whitish; pulse 120; no sugar or albumen in urine.	Uterine irritation?	She took large doses of sulph. of zinc (ad gr. xij. t. d.), oxide of zinc, steel in various forms, aloes; treatment for above fourteen months.	There was no marked change; the fits were about as frequent as at commencement of treatment.

58.	M. D. [First consult. Mar. 10. 1857.]	F.	20	Servant.	Never had fits before scarlet fever, for which she has recently been in-patient; she has had a fit daily for a week; previously only three or four; premonitory symptoms, always "a sensation at the heart;" no œdema; in some fits quite unconscious; has once bitten her tongue and side of her mouth; much vertigo; constant headache; catamenia irregular before scarlet fever; regular since; pulse 88, fair strength; in two fits seen to be pale; did not scream; no albumen or sugar in urine.	Irritation of brain from scarlet fever poison?	Alkalies, cetaceum filiforme nuchæ, t. ferri mur.	Marked relief, especially reduction of headache; returned home to Scotland after ten days' treatment.

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